

University of Warwick institutional repository: <http://go.warwick.ac.uk/wrap>

A Thesis Submitted for the Degree of PhD at the University of Warwick

<http://go.warwick.ac.uk/wrap/36186>

This thesis is made available online and is protected by original copyright.

Please scroll down to view the document itself.

Please refer to the repository record for this item for information to help you to cite it. Our policy information is available from the repository home page.

*The Existence of Feedback and its
Relationship with
Information Systems Planning Success*

Bernadette S H Baker

*Thesis submitted for the degree of Doctor of Philosophy
University of Warwick, UK
Warwick Business School*

October 1996

*'Between truth and lies are images and ideas we imagine and
think are real, that paralyse our imagination and
our thinking in our efforts to conserve them.
We must continually learn to unlearn much that we have learnt,
and learn to learn what we have not been taught.
Only then do we and our subject grow.'* (Laing, 1972)

To Leslie.

Table of Contents

<i>List of Figures.....</i>	<i>v</i>
<i>List of Tables</i>	<i>viii</i>
<i>Acknowledgements.....</i>	<i>ix</i>
<i>Declaration</i>	<i>x</i>
<i>Abstract.....</i>	<i>xi</i>
1. Introduction	1
1.1 Purpose of the Research	1
1.2 Objectives of the Research.....	2
1.3 Outline of the Dissertation.....	2
2. Literature Review.....	5
2.1 What is Information Systems Planning?	5
2.2 The Evolution of ISP.....	7
2.2.1 The Data Processing Era.....	7
2.2.2 The Management Information Systems Era	8
2.2.3 The Strategic/Competitive Information Systems Era	8
2.3 The Importance of ISP.....	11
2.4 ISP as a Research Topic.....	13
2.4.1 Summary of Previous ISP research.....	14
2.4.2 Classification of Previous ISP Research	23
2.5 The Dimensions of ISP.....	24
2.5.1 Outcome.....	26
2.5.2 Context.....	26
2.5.3 Input.....	27
2.5.4 Outputs.....	27
2.5.5 Process	27
2.5.6 Method.....	28
2.5.7 The Formulation Activity: Content vs Methodology	28
2.5.8 Implementation	28
2.5.9 Feedback	29
2.5.10 A Multidimensional Model of ISP: The Systems Perspective.....	29
2.5.11 Feedback: The Missing Link?	30
2.6 The Research Objectives.....	32

3. Research Methodology.....	33
3.1 <i>The Research Methodology.....</i>	33
3.1.1 Define Problem.....	33
3.1.2 Conduct Literature Review	33
3.1.3 Develop and Operationalise the Research Models	35
3.1.4 Develop the Questionnaire (Research Instrument).....	35
3.1.5 Conduct the Case Study and Revise Questionnaire.....	38
3.1.6 Conduct Pilot Survey and Revise Questionnaire.....	41
3.1.7 Conduct Survey	43
3.1.8 Data Preparation.....	43
3.1.9 Validity and Reliability.....	43
3.1.10 Data Analysis	48
3.1.11 Interpret Findings (Conclusions).....	48
3.2 <i>Critique of Research Design and Methodology.....</i>	48
3.2.1 The Philosophy of the Research Methodology.....	48
3.2.2 The Research Design	52
3.2.3 Research Methods.....	54
3.2.4 Summary	55
4. The Research Models.....	57
4.1 <i>Feedback.....</i>	57
4.1.1 Types of Feedback	57
4.1.1.1 Feedback on the Activity vs Feedback on the Activities' Output	57
4.1.1.2 Characteristics of Feedback.....	60
4.1.1.3 Feedforward - A Related Concept.....	62
4.1.2 A Conceptual Model of Feedback.....	62
4.1.2.1 Feedback Methodology (Existence): The Conceptual and Operational Models	64
4.1.2.2 The Content of Feedback.....	68
4.1.2.2.1 The Informational Inputs of Feedback	69
4.1.2.2.1.1 The Contingent Nature of ISP	69
4.1.2.2.1.2 The ISP Factors.....	71
4.1.2.2.2 The Contextual Content of Feedback	79
4.2 <i>ISP Success</i>	83
4.2.1 Introduction.....	83
4.2.2 Evaluating the Success of ISP	83
4.2.3 Measuring Effectiveness	85
4.2.4 A Framework for Measuring ISP Effectiveness	85
4.2.5 Other Evaluation Issues	89

4.2.6	A Measure of ISP Effectiveness (Success)	90
4.2.6.1	Information System Effectiveness Research	91
4.2.6.2	Planning System Effectiveness Research	93
4.2.6.3	Deficiencies of the Evaluation Models	94
4.2.6.3.1	The Research Methodology	94
4.2.6.3.2	Evaluation Focus	98
4.2.6.3.3	Evaluation Approach	98
4.2.6.3.4	Summary	98
4.2.6.4	Evaluation Issues of the Current Research	99
4.2.6.5	Conceptualisation and Operationalisation of the Evaluation Model	100
4.3	Summary	102
5.	Case Study	104
5.1	<i>Changes in the Public Sector Environment</i>	<i>105</i>
5.1.1	The Reforms	105
5.1.2	The Changing Information Requirements of LAs	109
5.2	<i>Cheshire County Council</i>	<i>113</i>
5.2.1	Introduction	113
5.2.2	Internal Environment	114
5.2.3	IS/IT Environment	115
5.2.4	The Business Planning Environment	116
5.2.5	IS Planning	117
5.3	<i>Cheshire Fire Brigade</i>	<i>118</i>
5.3.1	Participants	118
5.3.2	The Internal Environment	119
5.3.3	Organisational Strategy	121
5.3.4	The IS/IT Environment	121
5.3.5	ISP Environment	129
5.3.6	The IS Planning Activity	132
5.3.7	Feedback	135
5.3.8	Output: The Plan's Contents	136
5.3.9	Management of Change	137
5.3.10	Human Resourcing Issues: Training	138
5.3.11	Summary	138
5.4	<i>Cheshire Social Services</i>	<i>143</i>
5.4.1	Participants	143
5.4.2	The Internal Environment	144
5.4.3	Organisational Strategy	146
5.4.4	The IS/IT Environment	147
5.4.5	ISP Environment	158

5.4.6	The IS Planning Activity	161
5.4.7	Feedback	168
5.4.8	Output: The Plan Contents.....	169
5.4.9	Management of Change.....	169
5.4.10	Human Resourcing Issues: Training.....	169
5.4.11	Summary	170
5.5	Conclusion	173
6.	Results of the Survey.....	174
6.1	Data Collection/Preparation	174
6.2	Reliability and Validity of the Constructs	175
6.2.1	Reliability.....	175
6.2.2	Construct Validity	175
6.2.3	Criterion-related Validity.....	177
6.3	Data Analysis	177
6.3.1	Profile of Respondents and their Organisation	178
6.3.2	ISP Effectiveness and Feedback	199
6.3.3	Important ISP System Characteristics	217
6.3.4	Contextual Factors of Feedback	223
6.3.5	Summary of Results.....	226
7.	Conclusion.....	229
7.1	Summary of Research Objectives and Results.....	229
7.2	Contribution to Knowledge.....	230
7.2.1	Contributions of the Results.....	230
7.2.2	Contributions to Method.....	231
7.3	Implications to Researchers.....	232
8.3.1	Conceptual Limitations and Further Research.....	232
8.3.2	Methodological Limitations and Further Research	233
8.3.3	Further Analyses.....	234
7.4	Implications to Practitioners	234

Addendum

<i>Appendix A</i>	<i>Summary of Previous Planning Research</i>
<i>Appendix B</i>	<i>Covering Letter and Questionnaires</i>
<i>Appendix C</i>	<i>Summary of Previous Planning Evaluation Research</i>
<i>Appendix D</i>	<i>Survey Results and Analyses</i>

References

List of Figures

Figure 1.1 - Structure of the dissertation relative to the research stages	3
Figure 2.1 - ISP in context	6
Figure 2.2 - Model of IS/IT usage within organisations	11
Figure 2.3 - Classification grid for IS strategic process research.....	16
Figure 2.4 - The components of an activity.....	28
Figure 2.5 - Multidimensional model of ISP: the systems perspective.....	29
Figure 3.1 - Overview of the research methodology	34
Figure 4.1 - Type of feedback on the IS plan	59
Figure 4.2 - A conceptual model of feedback: a systems perspective	63
Figure 4.3 - A conceptual model of the feedback methodology (existence).....	66
Figure 4.4 - IS conception to delivery and the appropriate evaluation points.....	92
Figure 4.5 - Conceptual model of ISP effectiveness	100
Figure 5.1 - Cheshire County Council organisational structure.....	114
Figure 5.2 - Organisational structure of the new Resources Group.....	114
Figure 5.3 - Cheshire Fire Brigade's organisational structure	120
Figure 5.4 - The stages of growth model	124
Figure 5.5 - Categorisation of CFB IS in the strategic grid	126
Figure 5.6 - The changing focus of IS/IT strategy.....	127
Figure 5.7 - Information gathering/reporting tools used in ISP	130
Figure 5.8 - Extent of participation by stakeholders in ISP	131
Figure 5.9 - Overview of CFB ISP process	139
Figure 5.10 - The information flow of ISP.....	139
Figure 5.11 - Earls ISP framework	140
Figure 5.12 - Planning stages of growth.....	141
Figure 5.13 - Components of IS strategy	142
Figure 5.14 - Cheshire Social Services organisational structure.....	145
Figure 5.15 - The stages of growth model	149
Figure 5.16 - Categorisation of CSS IS in the strategic grid	152
Figure 5.17 - The changing focus of IS/IT strategy.....	155
Figure 5.18 - Information gathering/reporting tools used in ISP	159
Figure 5.19 - Extent of participation by stakeholders in ISP	161
Figure 5.20 - Categorisation of types of information.....	166
Figure 5.21 - Overview of CSS ISP process.....	171
Figure 5.22 - Earl's ISP framework.....	171
Figure 5.23- Planning stages of growth.....	172
Figure 6.1 - Management level of respondent.....	178
Figure 6.2 - Number of reporting levels between respondent and CEO	178
Figure 6.3 - Organisational level of respondent in the organisation	179

Figure 6.4 - Level at which respondent is involved in ISP	179
Figure 6.5 - Main role of respondent in ISP	180
Figure 6.6 - Type of organisation	180
Figure 6.7 - Organisation size	181
Figure 6.8 - Organisational culture	182
Figure 6.9 - Industry sector use of information and IT	183
Figure 6.10 - Amount spent on IT	183
Figure 6.11 - Structure of the IS organisation	184
Figure 6.12 - Number of reporting levels between the top IS Manager and CEO	185
Figure 6.13 - Main focus of information systems.	185
Figure 6.14 - Main focus of current IS plan	186
Figure 6.15 - Number of organisations exhibiting different political environments	187
Figure 6.16 - Existence of IS plan and ISP Experience	188
Figure 6.17 - IS planning cycle	189
Figure 6.18 - Strategic planning horizon of IS plans	189
Figure 6.19 - Major objective/focus of ISP	190
Figure 6.20 - Relationship between ISP and business planning	191
Figure 6.21 - Is the IS Planner well informed of changes in the environment?	191
Figure 6.22 - Level of management support	192
Figure 6.23 - Role in the ISP activity	192
Figure 6.24 - General approach taken to ISP	193
Figure 6.25 - Process management characteristics	193
Figure 6.26 - Total amount of participation by stakeholder group	194
Figure 6.27 - Total participation in each ISP stage	195
Figure 6.28 - Total amount of usage by tool	195
Figure 6.29 - Total amount of tool usage in each ISP stage	196
Figure 6.30 - Overall effectiveness of each ISP stage and methods available	197
Figure 6.31 - Support/control structures used in ISP	198
Figure 6.32 - Average score on each ISP effectiveness item	200
Figure 6.33 - Distributions of average ISP effectiveness	201
Figure 6.34 - Average ISP effectiveness	201
Figure 6.35 - The constituent parts of ISP system feedback	203
Figure 6.36 - The components of ISP system feedback	203
Figure 6.37 - % of total <u>possible</u> monitoring, reviewing and updating	204
Figure 6.38 - The formal/informal elements of ISP system feedback	205
Figure 6.39 - % of total <u>possible</u> formal/informal feedback	206
Figure 6.40 - Total ISP system feedback presence	207
Figure 6.41 - The constituent parts of IS plan feedback	209
Figure 6.42 - The components of IS plan feedback	209

Figure 6.43 - % of total <u>possible</u> total monitoring, reviewing and updating	210
Figure 6.44 - The formal/informal elements of IS plan feedback	211
Figure 6.45 - % of total <u>possible</u> formal/informal feedback.....	212
Figure 6.46 - Total presence of IS plan feedback	214
Figure 6.47 - % of total <u>possible</u> feedback	215
Figure 6.48 - Single loop learning vs ISP system feedback	224
Figure 7.1 - A flow diagram of ISP system feedback in practice	235

List of Tables

Table 2.1 - Summary of previous ISP empirical research.....	18
Table 3.1 - The elements of research design.....	52
Table 3.2 - A summary of research methods.....	55
Table 4.1 - Types of feedback.....	60
Table 4.2 - Model of information politics.....	73
Table 4.3 - Dimensions of IS success	87
Table 4.4 - An evaluation framework.....	87
Table 4.5 - Summary of planning effectiveness research	95
Table 5.1 - Overview of IS/IT	152
Table 6.1- Testing non-response bias using the Order of return.....	174
Table 6.2 - Reliability assessment of measurement scales.....	175
Table 6.3 - Convergent validity of the composite measurement scales	176
Table 6.4 - The total number of organisations who monitor, review and/or update	204
Table 6.5 - Reviewing against updating by (no) monitoring	205
Table 6.6 - The total number of organisations who exhibit informal/formal elements of feedback.....	206
Table 6.7 - Components vs elements of ISP system feedback.....	206
Table 6.8 - The total number of organisations who monitor, review and/or update	210
Table 6.9 - Reviewing against updating by (no) monitoring	211
Table 6.10 - The total number of organisations who exhibit informal/formal elements of feedback.....	212
Table 6.11 - Components vs elements of IS plan feedback.....	213
Table 6.12 - Zero-order correlations of average ISP effectiveness and feedback.....	216
Table 6.13 - Underlying dimensions of important ISP system characteristics (IS Planner responses) ..	222
Table 6.14 - Underlying dimensions of important ISP system characteristics (non-IS responses).....	222
Table 6.15 - Underlying dimensions of contextual factors related to feedback.....	225
Table 6.16 - Difference in the proportion of responses between IS Planners and non-IS respondents ..	226

Acknowledgements

I would like to take this opportunity to thank Bob Galliers who has not only been my mentor over the last six years but also a good friend. Without his guidance and encouragement none of this would have been possible.

Thank you also to those who have in one way or another supported this research. I would like to thank my colleagues in the Information System Research Unit at Warwick Business School who have provided me with feedback which has enabled me to learn. In particular, thanks to Margi Levi and Stephanie Stray who spent a significant amount of their time providing feedback on the final draft. Thanks also to Pat Lewis, Joan and James Rowlands who spent some of their holiday helping me to do the more mundane but nevertheless necessary tasks this research involved.

I would also like to thank my family and friends for their support. In particular, thanks to Steve Currum and Frances O'Brien whose friendship has kept me going. A special thanks to my mother and late father who provided me with all the necessary things in life as well as the determination to finish what I have started.

Last but certainly not least, I would like to thank my husband Leslie who has given me a great deal of emotional and financial support needed to survive this 'experience'... I dedicate this thesis to you.

Declaration

The following references are materials contained in this thesis which have been published/presented elsewhere:

Baker, B S H, 1995, The Role of Feedback in Information Systems Planning, *Journal of Strategic Information Systems*, 4 (1), pp 61-80

Galliers, R D & Baker, B S H, 1995, An Approach to Business Process Reengineering: The Contribution of Socio-technical and Soft OR Concepts, *Infor*, 33 (4), November, pp 263-278

Galliers, R D & Baker, B S H (Eds.), 1994, Strategic Information Management Reader, Butterworth Heinemann

Baker, B S H, 1994, Improving the Effectiveness of Information Systems Planning, *Proceedings of the PICT International Doctoral Conference*, 28th -30th March

Baker, B S H, 1994, A Research Manifesto for Improving Information Systems Planning Effectiveness, Warwick Business School Working Paper Series No. 107, February

Baker, B S H, 1992, Improving the Effectiveness of Information Systems Planning, *Proceedings of the International Conference in Information Systems PhD Consortium*, Dallas, USA, December

Baker, B S H & Galliers, R D, 1991, Strategic Information Systems Planning as a Learning Process, *Proceedings of the Fourth UK Conference on IS Teaching. Improving the Practice*, Sunningdale, 3-5th April, pp 101-106

Abstract

For many years now, information systems planning (ISP) has been one of the major concerns of IS Managers. Despite the wealth of research in the ISP area, particularly over the last decade, there is little sign that IS Managers are having greater success with their ISP activity than they did previously. From an analysis of the existing literature, feedback was identified as a neglected area of ISP research but one with the potential of providing a reason as to why ISP is still judged to be only partially successful within organisations.

The focus of this thesis is on the extent to which feedback exists and what relationship it has with ISP success. Two types of feedback were investigated, feedback on the ISP system and feedback on the IS plan, the former addressing the activity itself while the latter is concerned with feedback on the contents of the plan. These were both conceptualised in terms of three main components (activities): monitoring, reviewing and updating. In addition, the research identifies ISP system characteristics related to ISP success, providing the foundations of a system-oriented evaluation tool upon which organisations can build their own tailor made diagnostic tool. Finally, the research looks at contextual factors related to feedback as a basis for future contingency-based research.

Case study and survey research were used to answer the four main research questions: (1) To what extent does feedback exist within organisations?; (2) Is feedback related to ISP success?; (3) What ISP system characteristics are related to ISP success? (4) What contextual factors are related to feedback? Case study research was used to test the validity of the research instrument within the public sector context, while survey research was used to gather data from a variety of organisations concerning their ISP practices.

Two self-administered mail questionnaires (one for the IS Planner, the other for non-IS participants of the ISP activity) were used to survey 145 individuals from 90 organisations. The results of the survey indicated that neither ISP system nor IS plan feedback were prevalent in organisations: only 19% and 38% of organisations exhibited all three components of feedback, respectively. There was also evidence to suggest that organisations exhibiting more feedback exhibited more ISP success and that informal feedback, on average, was more common than formal.

These results suggest a possible reason as to why IS Managers are still struggling to make their ISP successful. In the main, organisations seem ill-equipped to monitor, review and update their ISP activity. As a consequence they may also find it difficult to assess and take on board recommendations made by previous ISP research studies, thus providing a potential reason as to why ISP problems that were identified over a decade ago still exist today.

1. Introduction

Few organisations nowadays could survive for any length of time without their information technology¹ (IT) based information systems (IS). While IS have always existed in one manual form or another, it is only since the advent of IT that the full potential of information to enhance the organisation's efficiency, effectiveness and competitiveness (*c.f.*, Sinclair, 1986) has been realised.

IT has revolutionised the way in which information is collected, stored, processed and used within organisations. Through the medium of IT, vast amounts of data can now be quickly gathered from different geographical sources, manipulated and analysed electronically to support decision making through the provision of information that previously would have been impracticable, and in some cases impossible, to produce by manual means alone. Information has now become critical in ensuring organisational success (King, 1984).

As IT has increased in power and reduced in price (Scott-Morton, 1991), its use has spread throughout organisations at a rapid rate. The increase in investment associated with this proliferation of IT has increased management concerns about 'value for money'. This together with the identification of new opportunities for information usage (*e.g.*, new information-based products and/or services), has led to a growing awareness by senior management that organisations need to manage both their IT acquisition and information resource strategically. Information systems planning (ISP) provides a way of doing this.

ISP success has, however, for many years now been a major problem for IS executives (*c.f.*, Dickson *et al.*, 1984; Hartog & Herbert, 1986; Brancheau & Wetherbe, 1987; Niederman *et al.*, 1991; Watson & Brancheau, 1991; Clark, 1992; Galliers *et al.*, 1994). There is little evidence to suggest organisations are addressing problems identified by the ISP literature over the years since the same problems/issues in undertaking ISP are regularly identified by this research (*e.g.*, lack of management involvement).

1.1 Purpose of the Research

The purpose of this research was to establish a possible reason as to why ISP is still a problem and to suggest how ISP practice might be improved in the future. A study of the literature revealed that a major aspect of ISP had not been addressed in any great detail, namely feedback.

The activity of feedback involves not only the identification of problems associated with the planning activity but also mechanisms by which solutions to problems are identified and the recommendations subsequently implemented. The lack of research in this area may reflect the situation

¹ Information technology includes hardware, software and communications technologies.

in practice. If feedback does not exist in organisations then improvements to the ISP activity is unlikely to occur (except serendipitously). The absence of such feedback may provide an explanation as to why ISP continues to appear on the list of top five information management concerns expressed by IS managers.

1.2 Objectives of the Research

The primary objectives of this research were to investigate whether feedback exists within organisations and, if it does, what relationship it has with ISP success. In order to do this, it was necessary to establish a measure for feedback and ISP success. Based on previous research, conceptual models of ISP success and feedback were developed, operationalised and tested for reliability and validity.

In addition to the primary objectives, generic success factors of the ISP activity are identified in order not only to provide organisations with a foundation on which to build their own tailored system-oriented evaluation (diagnostic) tool, but also to provide the building blocks for future research. Finally, the relationships between feedback and a variety of contextual factors are explored to establish avenues of further research.

In summary, the main objectives of this research are to:

1. establish whether ISP feedback exists within organisations;
2. establish whether a relationship exists between ISP feedback and ISP success;
3. identify ISP system characteristics that influence ISP success in order to develop the foundations of an system-oriented evaluation (diagnostic) tool;
4. identify contextual factors related to feedback, providing a foundation for future research.

In order to satisfy these objectives, data on the ISP and feedback practices of 90 organisations has been collected from multiple stakeholders via a self-administered questionnaire.

1.3 Outline of the Dissertation

Figure 1.1 summarises the structure of the dissertation in the context of the research stages followed.

Chapter 2 provides a summary of the literature reviewed and charts the identification of the research question. It includes a definition of ISP as used in the context of this research; a brief history of the evolution of ISP; the importance of ISP to organisations today; a summary of previous ISP research; the identification of a multi-dimensional ISP model from which the research topic was identified, and a summary of the research objectives and corresponding questions.

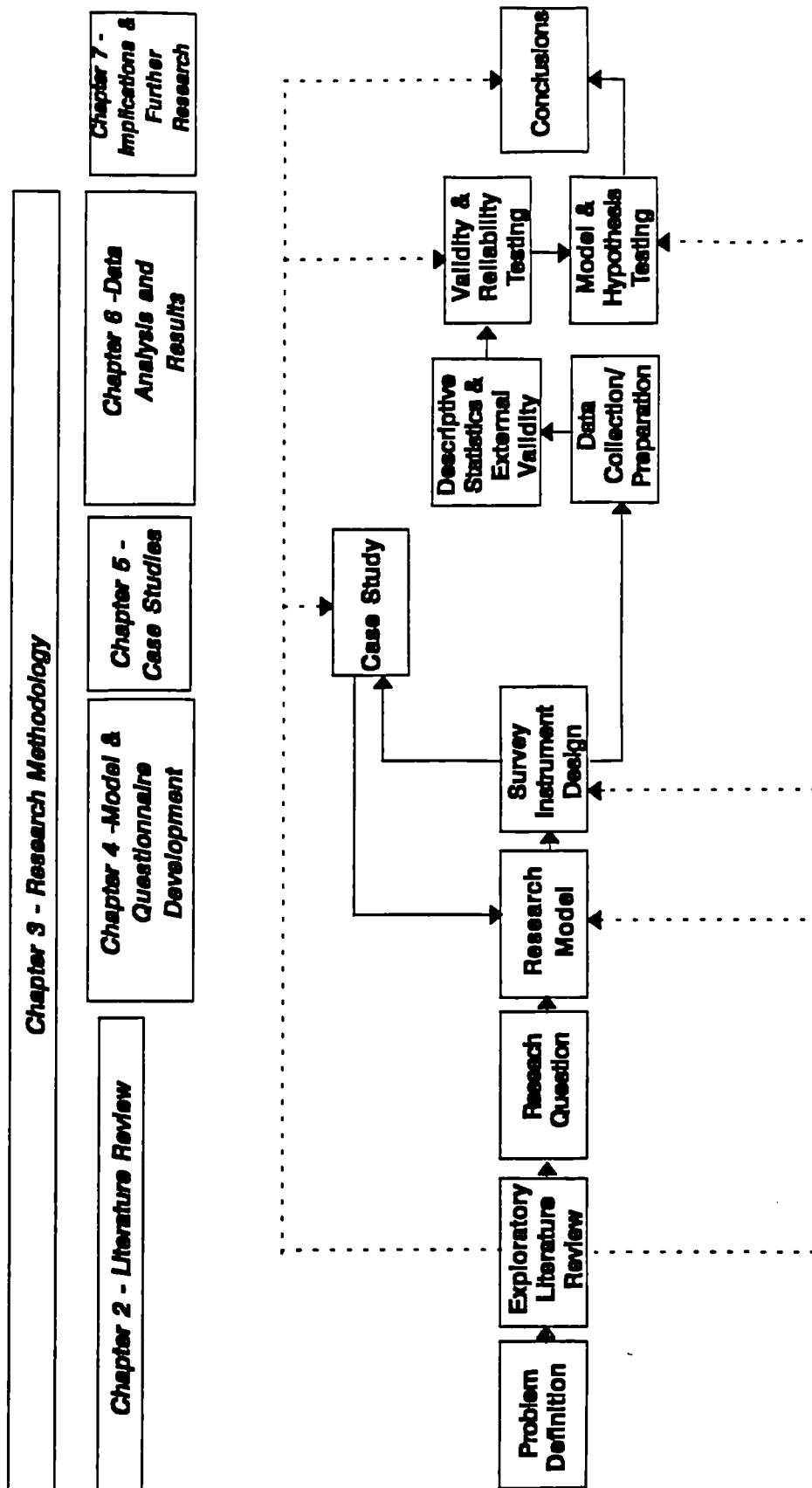


Figure 1.1 - Structure of the dissertation relative to the research stages

Chapter 3 provides a detailed description of the methodology used to conduct the research including a discussion of the methodological issues concerning the development, implementation and verification of the research instrument, and a critique of the research design used.

Chapter 4 describes the development and operationalisation of the two main conceptual models used in this research: a conceptual model of feedback and a conceptual model of ISP success. In addition, the chapter identifies potential ISP factors that may influence ISP success and discusses the development of the research instrument.

Chapter 5 describes the applicability of the research instrument, which is derived predominantly from private sector research, to the public sector setting using case research. Validation of the research instrument within this context was needed since half the sample organisations expressing a willingness to participate in the survey were from the public sector. The chapter contains a detailed case description of ISP practices within two Local Authority departments together with the criteria against which the research instrument was judged to be applicable within this context.

Chapter 6 describes the preparation and analysis of the data collected by the research instrument. It includes validity and reliability tests of the operationalised conceptual models used in the research; background information on the respondents and their organisations; descriptive statistics regarding the presence of feedback within organisations, the level of ISP success and the relationship between the two; identification of the ISP system characteristics related to ISP success which provide the basis of a system-oriented evaluation (diagnostic) tool, and finally, the identification of contextual factors related to the existence of feedback.

Chapter 7 concludes the thesis with a summary of the results relating to the research objectives; the perceived contribution to knowledge this thesis makes together with its major limitations; the implication of the results to both academics and practitioners, and possible areas of future research.

2. Literature Review

The impetus for this research came from a desire to improve the activity of information systems planning (ISP). This chapter provides the foundation for the rest of the thesis by summarising the research conducted in the area of information systems planning (ISP) to-date, and identifying a research topic which is thought to influence ISP success but is inadequately addressed by past research.

The chapter begins with the definition of ISP as used in this thesis followed by a brief summary of how the focus of ISP has changed over the last three decades in order to arrive at the point at which it is today. The importance of ISP to organisations is then discussed followed by a summary of ISP research to-date, identification of a research framework for classifying this research, development of a multi-dimensional ISP model and the identification of the research topic. The chapter ends with a summary of the research objectives and questions.

2.1 What is Information Systems Planning?

From a review of the literature it becomes obvious that there is no clear agreement as to a definition for Information Systems Planning (ISP)¹. It is important when embarking on ISP that researchers and practitioners alike are aware of the different terminology which may be used so expectations regarding the deliverables resulting from the study may be managed appropriately. It is for this reason that the first section of this chapter is devoted to scoping and defining terminology in order to provide a backdrop for the dissertation as a whole.

One of the earliest definitions defines ISP as involving “decision making (by top management) in three areas: establishing computer planning objectives on the basis of corporate goals; determining corporate policy for growth, resource commitment, and the management organisation for computer systems, and appraising the company's current position (with respect to) computer systems development” (Kriebel, 1968).

Given what we now know of ISP from research and practice, this definition was very insightful for its time. ISP research carried out since then has reinforced the need to address the issues covered by Kriebel's definition and the lack of common practice in doing so (*e.g.*, the linkage between the business/corporate and IS plan (*c.f.*, Galliers, 1987c); problems associated with resource commitment (*c.f.*, Lederer & Sethi, 1988a)).

The definition of ISP adopted in this thesis builds on that given by Kriebel. In particular it highlights other areas of IS application (not necessarily those directly related to the corporate goals) and

¹ Similar terms are Information Systems Strategic Planning (ISSP), Strategic Information Systems Planning (SISP) and Information Systems Strategy (ISS).

the need for ISP to consider not only resourcing issues but also those associated with the management of change. The revised ISP definition is as follows:

ISP involves the identification of prioritised Information Systems (IS) that are efficient, effective, strategic (c.f., Sinclair, 1986) and/or competitive in nature together with the necessary resources (human, technical and financial), management of change considerations (c.f., Galliers, 1991a), control procedures and organisational structure needed to implement these IS.

Figure 2.1 provides a high level contextual picture of ISP and its relationship with other major processes within the organisation. While being a simplistic model, it seeks to clarify the different planning activities that make up ISP as a whole and how ISP links with the business planning and project management processes within the organisation. The four planning activities - competitive, strategic, management and operational ISP - seek to identify competitive, strategic, effective and efficient IS applications respectively, while tactical planning deals with the practical aspects of the IS plans implementation.

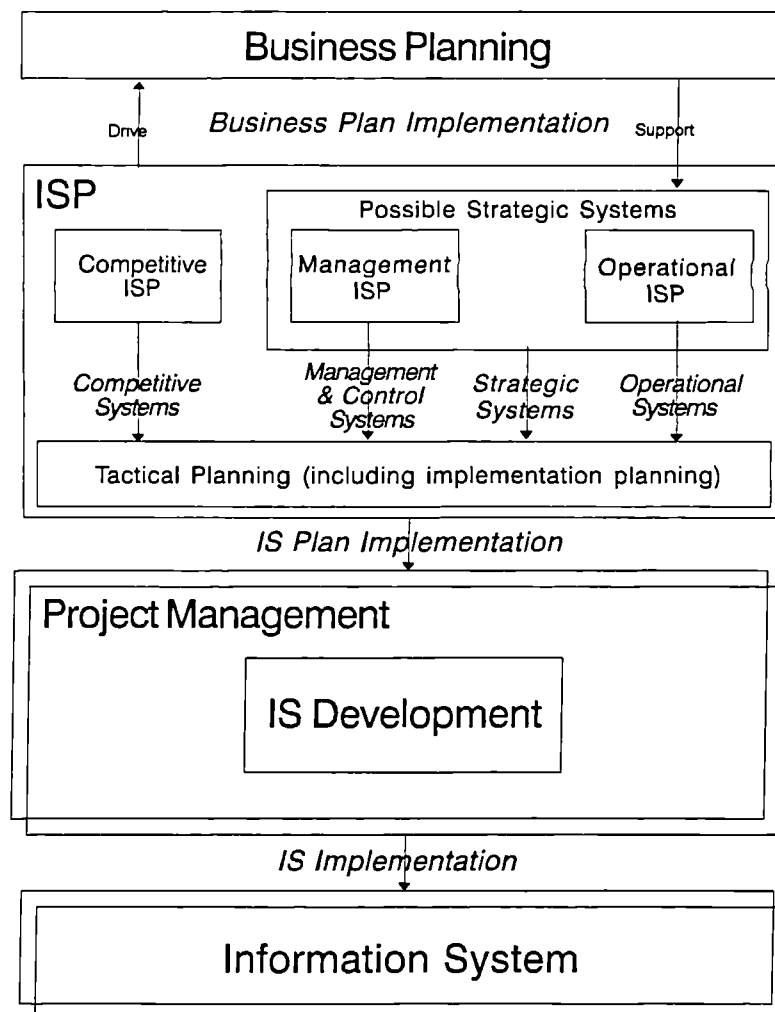


Figure 2.1 - ISP in context

O'Connor (1993) identifies three levels of ISP: strategic, tactical and operational. Strategic ISP (SISP) is defined as the process of identifying the types of information systems the organisation requires. Tactical ISP is defined as the prioritisation, scheduling and actioning of the IS plan and provides details as to how the plan is translated into resource requirements (*c.f.*, Albrecht, 1973). Operational ISP is defined as 'the development of specific detailed plans for each project'. In the context of this research, SISP is equivalent to the group of activities labelled 'competitive, strategic, management and operational information systems planning' in Figure 2.1, tactical ISP is equivalent to the 'tactical planning' activity while operational ISP is equivalent to the 'project management' activity.

The focus of this research is on strategic and tactical ISP as defined above. It is argued elsewhere (§4.2.6.1) why operational ISP has not been included within the boundaries of this research. Implementation in the context of this research refers to the activities associated with the implementation of the IS plan itself (*i.e.*, assigning responsibilities and deciding on resourcing tactics) not the contents of that plan (*i.e.*, development and implementation of individual IS). This includes ensuring that a structure to support co-operation between project teams is in place if necessary. If the IS projects identified by the plan are implemented by different project teams, it is important for these teams to communicate well with each other. Pellegrinelli & Bowman (1994) stress that because the relationship between the components of strategy are 'usually complex, overlapping and interdependent' that 'integration of the projects is often the root of successful strategy implementation'.

2.2 The Evolution of ISP

ISP has, in one form or another, been carried out since the advent of the first business computers back in the 1950s. The focus of planning, however, has evolved over the last few decades as the price of information technology has decreased, executives have become more involved in the activity and our understanding of ISP in general has developed.

Ward *et al.* (1990: p 10) among others (*e.g.*, Somogyi & Galliers, 1987) identify three distinct eras of information systems: the data processing era, the management information era, and the strategic information systems era. The focus of ISP has mirrored the changing data/information requirements of these eras as discussed below.

2.2.1 The Data Processing Era

During the early years of business computing, the role of ISP was limited in scope. The focus was on managing the technology, and the process was divorced from on-going business decisions. There was little choice as to the sort of hardware that could be bought and there was no 'off-the-shelf' software available. Hardware was costly so only the largest organisations could afford to make such investments.

At this time, ISP (or more appropriate data processing planning (DPP)) was essentially concerned with the identification of possible applications that would improve the efficiency of the organisation's operation (*e.g.*, order entry/processing and invoicing) by handling vast amounts of data in the least amount of time (Gallo, 1988).

There were no guidelines as to how DPP should be carried out and little interest on the part of senior executives who regarded DPP as the responsibility of computer specialists. As a consequence the main planning emphasis was on resource allocation, prioritisation and justification of applications in terms of efficiency (King, 1988). DPP was carried out on an ad-hoc, irregular basis resulting in slow movement up the ISP learning curve during the 1960s and into the 1970s.

2.2.2 The Management Information Systems Era

During the 1970s, as technology became cheaper and the benefits of it more widely recognised, applications moved from a transaction-based batch processing (data-driven) environment to an interactive (information-driven) one. Building on the data processing applications of the previous era, systems were developed which focused more on day-to-day business operations and short-term tactical needs of the organisation (Gallo, 1988). These new applications sought to support planning and control activities at various levels of management, and as a consequence, companies had to rethink their approach to ISP.

The focus of ISP changed with the rapid progress in technology and a growing realisation as to the key role that information could play. The emphasis of ISP changed to satisfying the information needs of management and users, systems integration, ensuring the compatibility of hardware and software, and defining an organisational information architecture (King, 1988). Around this time, formal ISP methodologies started to appear that helped to support the range of business activities and concerns (*e.g.*, IBM's Business Systems Planning (IBM, 1975)). Some of these even attempted to link ISP with business planning although they only met with limited success (Sullivan, 1988).

2.2.3 The Strategic/Competitive Information Systems Era

During the 1980s, with the integration of telecommunications and computer technology (based on the microchip), electronically based information services began to appear (*c.f.*, Clemons & McFarlan, 1986).

Decreasing cost-performance ratios (Scott-Morton, 1991) opened up new opportunities by removing related constraints. Organisations now had a wider range of choice and sophisticated architectures to choose from. As a result, investment in IT increased and the growth of end-user computing (EUC) this technology encouraged (Gerrity & Rockart, 1986), lead to the decentralisation of computer activities and the transfer of ownership and control of information resources away from the IS department to other departments (Zmud *et al.*, 1986).

This transfer of ownership had a significant impact on ISP (Henderson & Treacy, 1986); it had come at a time when there was a strong need for centralisation of infrastructure services (*e.g.*, telecommunication network services, maintenance of corporate databases, cross-functional large volume transaction processing applications) (Zmud *et al.*, 1986).

Several organisations (or more accurately individuals within those organisations), began to see the potential of this new technology and the information it could deliver to improve operations (Ciborra, 1994). In several cases (*c.f.*, Ward *et al.*, pp: 20-22 for examples) these new applications had far more reaching effects than initially sought by providing organisations with significant advantages over their competitors (Senn, 1992).

These cases helped to publicise the competitive advantage achievable through the use of IT giving IS a higher profile in the minds of senior management. It was around this time that academic articles started to appear in an attempt to help practitioners manage their IS investments more competitively (*e.g.*, McFarlan, 1984; Porter & Millar, 1985; Large, 1986). Consequently, the focus of ISP shifted away from the identification of IS applications to improve the efficiency and effectiveness of an organisation to those that could improve its competitiveness (Sinclair, 1986).

The tenuous (uni-dimensional) linkage between business and information systems planning cultivated in the management information system era was reinforced through implementation of a two-way relationship: identification of information systems to *support* the business strategy and identification of information systems to *drive* the business strategy. Vitale *et al.* (1986) named the former mode of strategy formulation *alignment* and the latter *impact*. The systems identified by these different modes are strategic and competitive information systems, respectively (*c.f.*, Huff & Beattie, 1985).

In practice, the terms strategic and competitive information system are often used interchangeably. However, there is a difference, albeit a subtle one, and failure to differentiate between the two may result in lost opportunities.

2.2.3.1 Strategic Information Systems

Strategic systems (or *inward-looking* systems as defined by Huff & Beattie (1985)) include those that support the *derivation* of business strategy (*e.g.*, an executive information system (EIS)). Strategic systems also include those that support the *achievement* of business strategy. For example, if an organisation pursues the generic strategy of a low cost producer², then systems that reduce the cost of operations or directly reduce the cost of buying and servicing the product may be deemed to be strategic to the organisation. If an organisation pursues the generic strategy of a differentiator then systems that

² Porter (1985) identifies three types of generic business strategy that an organisation may pursue: cost reduction, differentiation and niche player.

integrate the use of information in the organisation's value adding process may directly add value to the product or service (e.g., improve order processing) and thus be strategic to the organisation concerned. Finally, organisations pursuing niche strategies will not only benefit strategically from a combination of both types of system mentioned previously but also from systems used to monitor and select appropriate market segments for the purposes of establishing the niche.

While these strategic systems may also make the organisation more competitive, the primary objective is on improving *internal* operations or *delivering* the business strategy.

2.2.3.2 *Competitive Information Systems*

Competitive systems (or *outward-looking* systems as defined by Huff & Beattie (1985)) are those that have the ability to change an industry's structure (Porter, 1985). Competitive systems are externally focused, seeking to change the basis of competition by diminishing the bargaining power of suppliers and customers, raising barriers to entry (therefore holding off new entrants), and lowering the possibility of substitution for goods. Galliers (1991c) identifies nine types of applications, based on Porter's five forces, that may enable an organisation to gain 'direct' rather than 'indirect' competitive advantage as in the case of the strategic systems identified above.

Inter-organisational systems (IOS) provide such advantages by utilising electronic data interchange (EDI) technology to link organisations with their customers and/or suppliers. This type of technology has the effect of reshaping organisational boundaries and changing the basis of competition (Cash & Konsynski, 1985). Other systems that develop, produce, market and/or deliver new or enhanced information-based products or services may also be regarded as competitive systems. However, the use of IS/IT is limited to the skills and knowledge of the organisational members which means that the full potential of IS/IT may yet to be recognised.

The strategic/competitive IS era has made senior management reassess their view of IS/IT as only a tool for improving the efficiency and/or effectiveness of an organisation. This combined with the growing realisation that management need to exert greater control over IS/IT investment has meant ISP is no longer the sole responsibility of the IS department. IS/IT has now found a place on most top management agendas.

2.2.3.3 Summary

Figure 2.2 (adapted from Ward *et al.*, 1990: p 3) provides a summary of the IS/IT usage in organisations over the last 45 years.

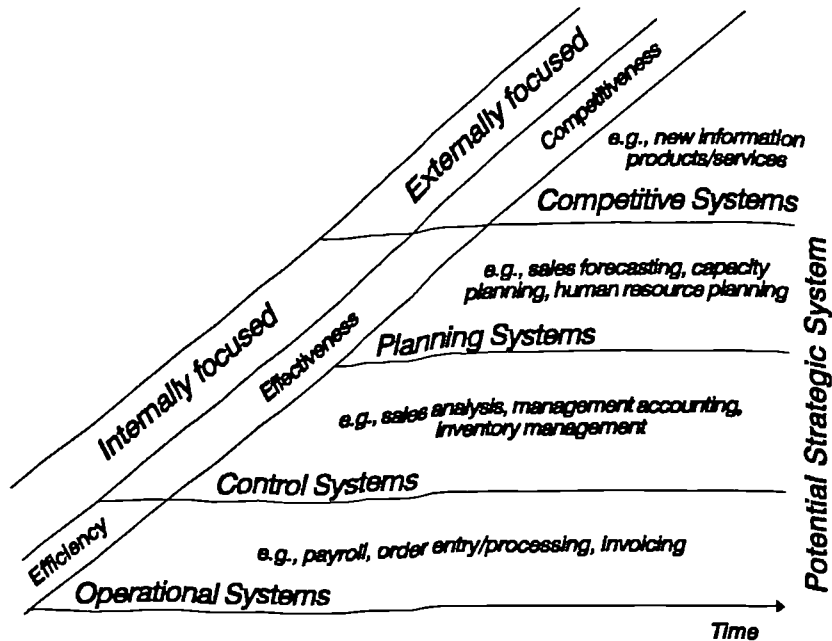


Figure 2.2 - Model of IS/IT usage within organisations

2.3 The Importance of ISP

McFarlan (1971) identified four major reasons as to why organisations should plan for their IS: technology improvements; scarcity of appropriate human resources; scarcity of corporate resources, and the trend towards systems integration. His research suggested that IS were more effective in those organisations that planned for them than in those that did not. This has been substantiated by other researchers in the area (*e.g.*, King, 1983) who have identified a positive relationship between planning systems and their impact on the organisation's performance.

When McFarlan conducted his study, however, he found that ISP was by no means prevalent in organisations at that time. There is evidence to suggest this is no longer the case (*e.g.*, Galliers, 1987a; King & Raghunathan, 1987; Wilson, 1989), ISP has become a major concern of IS management as organisations seek to manage their IS/IT investments more efficiently and effectively.

A recent review conducted by Price Waterhouse (Grindley, 1993) reveal that some of the reasons for planning are similar to those highlighted by McFarlan 22 years' previously. In particular, cost containment of IT has been of increasing concern to senior executives, especially over the last few years, due to the recession and to senior management concern that IT has sometimes failed to deliver the expected business benefits (Galliers, 1992). IS planning can help to address this by aiding the deployment of the company's resources in an efficient and effective manner.

The integration of IT into the organisation is still important and, with the adoption of open systems as against proprietary architecture, is becoming increasingly so. While staff recruitment/retention is no longer viewed to be a major issue for most IS executives due to the slowing down of staff migration and the plentiful supply of skilled workers in this area (Galliers *et al.*, 1994a), organisations still need to address personnel implications (*e.g.*, training) in the development and implementation of their IS plan.

With the introduction of the PC during the early 1980s, computers have become increasingly available to all areas of the organisation. The interconnection between these stand-alone machines became an issue in its own right and so interest turned towards telecommunications. This new technology in turn not only allowed information to flow between different departments within the organisation (intra-organisational systems) with greater efficiency and effectiveness, but also provided the opportunity to enhance the information flow between the company and their suppliers and/or customers (inter-organisational systems) as discussed by Cash (1985).

This diffusion and decentralisation of technology throughout the organisation brings with it a lack of control over applications development and IT acquisition. One of the major pressures to plan now is due to the proliferation of IT. Planning can help not only to reduce the costs associated with data replication and integrity but also to ensure similar systems are not being re-invented in different areas of the organisation thus resulting in the inefficient use of resources. That is, ISP can help to capitalise on intra-organisational synergistic opportunities.

A trend towards (horizontal) systems integration was highlighted as one of the major pressures to undertake ISP in the 1970s. However, with the advent of databases it has become feasible to update file structures without having to update the existing programs that use those files. This data independency has allowed systems to be integrated with each other more easily, and thus the pressure on planning due to horizontal systems integration has decreased.

However, while there has been a decrease in the pressure of horizontal systems integration (*i.e.*, across departments within organisations) there has been an increase in the need for vertical systems integration (*i.e.*, with external organisations). Organisations are now seeking ways to lock in customers and link up with suppliers through the use of IS/IT, in order to gain an advantage over their competitors (*e.g.*, Cash, 1985; Porter & Millar, 1985; Hopper, 1990; Venkatraman *et al.*, 1993; Fieldler *et al.*, 1995).

Other factors making it necessary for organisations to plan their IS/IT activities are highlighted from a variety of studies in ISP spanning the last decade. Factors influencing the necessity to plan include:

- cost containment (Grindley, 1993);
- the growing awareness of management as to the strategic and competitive opportunities that IS can provide (Porter, 1985; Venkatraman, 1985/1986; Lederer & Mendelow, 1986a; Boynton & Zmud, 1987; Atkinson, 1990; Earl, 1990a; Premkumar & King, 1991);
- the unstable and increasing competitiveness of the business environment (Grindley, 1991);
- the rate of technological change (Hartog & Herbert, 1986; Venkatraman, 1985/1986; Brancheau & Wetherbe, 1987; Hayward, 1987; Atkinson, 1990; Grindley, 1991);
- resource deployment considerations (Venkatraman, 1985/1986; Galliers, 1987c; Kieckhaefer & Inderrieden, 1987; Earl, 1990a) which result in the need to prioritise IS developments (Kay *et al.*, 1980; Kieckhaefer & Inderrieden, 1987; Gupta & Guimaraes, 1991);
- the search for a co-ordinated approach to organisation-wide IS (*e.g.*, to enable the development of a common IS architecture) (Venkatraman, 1985/1986; Galliers, 1987c; Atkinson, 1990);
- the need for more effective IS across functions (Venkatraman, 1985/1986; Galliers, 1987c; Atkinson, 1990; Earl, 1990a);
- the need to facilitate communication between IS personnel and others (Kieckhaefer & Inderrieden, 1987; Gupta & Guimaraes, 1991);
- the need to develop a capital budget for the IS function (Gupta & Guimaraes, 1991);
- the potential impact of IT on business process redesign (Hammer, 1990; Davenport & Short, 1990; Scott Morton, 1991);
- the need to assist organisational change (Lederer & Mendelow, 1986a; Galliers, 1991a; Gupta & Guimaraes, 1991);
- the increasing role of telecommunications and distributed processing in the day-to-day operations of many organisations (Boynton & Zmud, 1987);
- increased end-user computing (Brancheau & Wetherbe, 1987; Hayward, 1987);
- scarcity of personnel & other corporate resources (Brancheau & Wetherbe, 1987);
- validation of the corporate plan (McFarlan *et al.*, 1983b);
- trends to database design (McFarlan *et al.*, 1983b).

These and other factors such as the relatively new demand for internet services have ensured ISP a place high on the IS Management agenda of many larger organisations (Niederman *et al.*, 1991; Galliers *et al.*, 1994a). The generally accepted view is that ISP is vital to continuing organisational success and effective IS performance (Brancheau & Wetherbe, 1987).

2.4 ISP as a Research Topic

Research carried out over the last ten years into key information systems management issues (*e.g.*, Dickson *et al.*, 1984; Hartog & Herbert, 1986; Brancheau & Wetherbe, 1987; Niederman *et al.*, 1991; Watson & Brancheau, 1991; Clark, 1992) has ranked ISP as one of the most critical issues facing

IS Managers. It is likely that this is due not only to the intrinsic importance of the topic but the problems in undertaking and implementing ISP successfully (Galliers *et al*, 1994a).

With the relatively recent growth in the number of organisations conducting ISP, it is not surprising to find an increase in the number of ISP problems being identified. These problems are well documented in articles since the early 1980s (*e.g.*, Ball, 1982; Earl, 1983; Galliers, 1987b; Lederer & Sethi, 1988a; Wilson, 1989). Some of the problems that have been repeatedly identified by different authors over this period include (*ibid*):

- lack of managerial involvement and support;
- failure to review plans;
- lack of planning directives (*e.g.*, absence of or limited linkage to business plan) and procedures;
- insufficient allocation of resources to planning;
- insufficient attention paid to strategy implementation.

However, ISP in some organisations *is* successful. Exactly what constitutes success is debatable, indeed this is likely to vary across different levels of management and from one perspective to another (*c.f.*, Galliers, 1987b; Earl, 1993). Notwithstanding, for some organisations, ISP satisfies the expectation of the stakeholder groups involved in its formulation and implementation (*ibid*). It is not surprising therefore that ISP has, for a number of years, been the focus of much academic attention due to the successful experiences of some organisations and the less than successful experiences of others (*c.f.*, Sullivan, 1985; Galliers, 1987b; Lederer & Sethi, 1988a; Wilson, 1989; Earl, 1993).

2.4.1 Summary of Previous ISP research

Previous researchers have attempted to categorise the types of ISP research. For example, Harris (1989) classified past ISP research into five (non-mutually exclusive) categories: problems/issues of ISP (*e.g.*, Lederer & Mendelow, 1986a); approaches/techniques (*e.g.*, Rockart, 1979); methodologies (IBM, 1975); comparative reviews (*e.g.*, Galliers, 1987a), and empirical studies (*e.g.*, Lederer & Sethi, 1988a).

Premkumar & King (1991) identify two 'streams' of ISP research: conceptual and empirical. They argue that most of the early ISP research was conceptual in nature, based on the top-down approach to planning, seeking to develop conceptual models for ISP (*e.g.*, Zani, 1970; McFarlan, 1971; McLean & Soden, 1977). Empirical studies came later and were mostly exploratory in nature, focusing on identifying problems/issues in ISP that effected the efficacy of planning (*e.g.*, McLean & Soden, 1977; Martino, 1983; Lederer & Mendelow, 1986a; Galliers, 1987a; Lederer & Sethi, 1988a).

Boynton & Zmud (1987) summarise past research along two dimensions: planning agendas (which includes intra-organisational political analysis, organisational learning and cultural analysis), and planning behaviours (which includes the extent of 'buy-in' on the part of key stakeholders and identifying and communicating the organisational role of IT). In summarising the literature, they suggest that research aimed at a better understanding of *how* to carry out an effective planning process are likely to be more significant than projects focused on identifying additional issues to be addressed in the planning process. In line with this argument, this thesis attempts to address the *how* of planning.

A useful framework which encompasses all the categories of planning identified above is the strategic *process* research framework of Huff & Reger (1987). This framework was based on an earlier one developed by Fahey & Christensen (1986) which focused on the strategic *content* rather than *process* research. While *content* researchers study the relationship between particular decisions and the resulting performance, *process* researchers focus on the prescriptive/descriptive planning methods used to reach those decisions together with the way in which these decisions are implemented.

While these frameworks were derived for the classification of business strategy research, they are both equally applicable to the classification of information system strategy research. However, since it is *process* rather than *content* research that is of particular interest to this thesis, an adapted version of the Huff & Reger process framework is used to summarise the types of ISP research conducted to-date.

The framework classifies strategic process research along three dimensions: (1) *formulation* (decision generating) *vs implementation* (executing the decision); (2) *normative* (the ideal) *vs descriptive* (what happens in practice), and finally (3) *rationality* (which assumes planning can be regarded as a 'sequentially rational, analytical process') *vs non-rationality* (which assumes planning cannot be regarded as such due to the political environment within which it takes place).

In addition to the eight categories identified in the framework, Huff & Reger add a ninth category which they name '*integrative*'. Figure 2.3 shows an adapted version of this framework and a brief description of each semi-quadrant is given below.

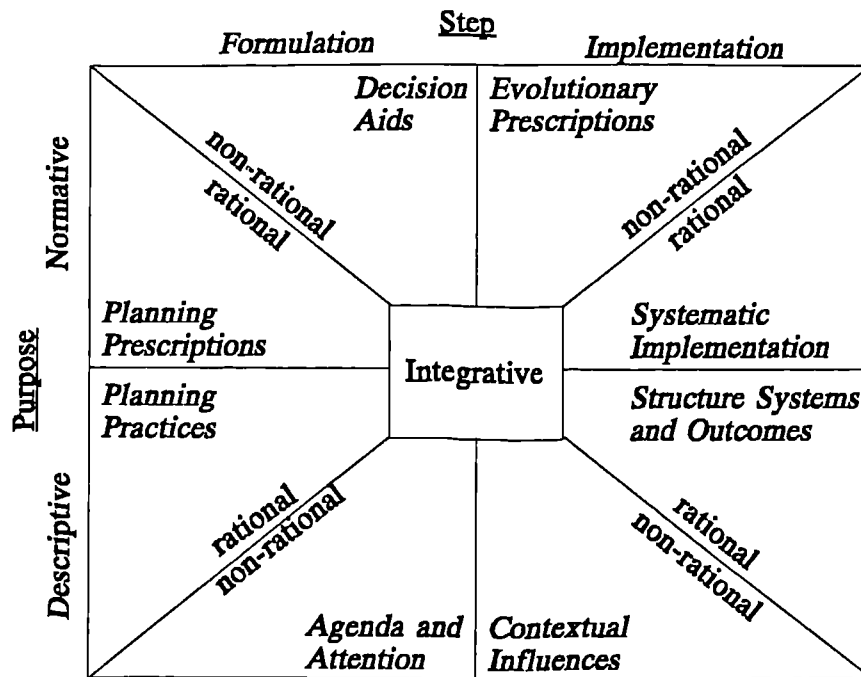


Figure 2.3 - Classification grid for IS strategic process research

2.4.1.1 Normative Formulation

The *planning prescriptions* semi-quadrant typifies research that attempts to rationalise planning in order to help organisations in their planning endeavours. It covers the identification of general models of planning (e.g., Earl's Multiple Methodology: Earl, 1989: p 71), specific steps in the planning activity (e.g., Zachman, 1982; Bowman *et al.*, 1983), specific planning environments (e.g., Raghunathan & Raghunathan, 1990) and specialised approaches (e.g., Bullen & Rockart, 1981; Hardaker & Ward, 1987).

Planning contingency frameworks can also be included under this category, linking the context of planning to its formulation (e.g., Pyburn, 1983; Sullivan, 1985). Contingency theory (*c.f.*, Galbraith, 1973; Hax & Majluf, 1988; Kukalis, 1991) argues that the way in which an organisation should plan will depend on its context.

The *decision aids* semi-quadrant comprises research based on the assumption that planning is not a rational activity but is fundamentally problematic due not only to the limitations of human beings in their ability to analyse and synthesise information, but also due to the political undercurrents present in organisations which often makes consensus hard to achieve (e.g., Sambamurthy *et al.*, 1993). These decision aids help decision makers analyse strategic alternatives effectively, many of which are taken from the field of business strategy. (e.g., Conlin, 1989; Thomas *et al.*, 1989). Decision aids such as brainstorming (e.g., Graham, 1977) and nominal group techniques (e.g., Bartunek & Murnighan, 1984) help to structure ill-defined problem situations.

2.4.1.2 Normative Implementation

The *evolutionary prescriptions* semi-quadrant assumes the non-rational perspective of planning, that is, strategy should not be predetermined but left to evolve (*c.f.*, Mintzberg, 1988; Ciborra, 1994) through a series of incremental changes triggered by feedback from the environment (Earl, 1993).

The *systematic implementation* semi-quadrant includes research that treats implementation separately from formulation, viewing it as a logical sequential series of steps carried out after the formulation step has been completed (*e.g.*, Hrebiniak & Joyce, 1984). It focuses on prescriptions for systematic implementation and covers such research topics as general models of implementation (*e.g.*, Nutt, 1983) and specific implementation issues (*e.g.*, King & Rodriguez, 1981).

2.4.1.3 Descriptive Formulation

The *planning practices* semi-quadrant contains research that has sought to clarify the types of strategy formulation taking place in practice (*e.g.*, Galliers, 1987a; Lederer & Sethi, 1988a; Earl, 1993). Table 2.1 provides a summary of previous ISP empirical research. Based on this research, recommendations have been made as to how strategy formulation may be improved through the establishment of, for example, Critical Success Factors (Rockart, 1979), taking the research into the realms of the normative research quadrants.

The *agenda and attention* semi-quadrant typifies research focusing on the cognitive and political impacts of strategic decision making. This research not only identifies how strategic decision making processes take place within the organisation's political and bureaucratic structure, but also what impact individuals' cognitive, perceptual and other psychological traits have on them (*e.g.*, Boynton & Zmud, 1987; Hoffer *et al.*, 1989).

2.4.1.4 Descriptive Implementation

The *contextual influences* semi-quadrant comprises research based on the notion that strategic change is a political process (*c.f.*, Mumford & Pettigrew, 1975).

The research conducted in the *structure, systems and outcomes* semi-quadrant relates to the descriptive accounts of the relationship between strategy, structure, systems and organisational performance. That is, what impact the implemented strategy has on the organisation and its performance (*e.g.*, Raghunathan, 1985; Premkumar & King, 1991). How organisations use information systems to implement strategy and how these systems subsequently affect performance are largely unexplored areas in strategy research (Huff & Reger, 1987).

Year	Researcher(s)	Research Method	Sample Size	Focus of Study
1968 (US)	McKinsy	Postal Questionnaire	36	Link between ISP & business performance.
1971 (US)	McFarlan	Interview	15	Problems in ISP & IS performance.
1977 (US)	McLean & Soden	Conference survey	20	Developed a framework addressing the different planning stages and their respective outputs. Major IS and business planning characteristics, and the pitfalls of ISP were examined.
1983 (UK)	Earl	Postal Questionnaire	42	Trends, benefits, problems in ISP.
1983 (US)	Selig	Postal Questionnaire	25	Investigated the state of ISP in the 1980's within multinational organisations identifying the trends, benefits and major problems with ISP.
1983 (US)	Pyburn	Case Study	8	Investigates the link between organisational factors and planning performance and identifies 3 approaches to planning based six organisational characteristics.
1983 (US)	Martino	Postal Questionnaire	334	Characteristics of business planning processes; scope of IS plans; benefits being achieved; benefits desired for the future; planning techniques used; major problems encountered; linkage between business plans and IS plans.
1984 (US)	Doll & Ahmcd	Postal Questionnaire	445	Objectives of systems planning.
1985 (US)	Raghunathan	Postal Questionnaire	140 (paired samples)	Studies the relationship between ISP, IS implementation and IS performance.
1987	Raghunathan & King			Reports on the results from Raghunathan (1985).
1987	King & Raghunathan			Makes suggestions as to what constitutes good planning practice. Reports on results from Raghunathan (1985).
1985 (US)	Sullivan	Interviews	37	Identified a fit between extent of computer use (<i>i.e.</i> , extent of organisation's dependence on IS (infusion) and extent of IS use within the organisation (diffusion)), and planning approach.
1985 (UK & Australia)	Gindley	Postal Questionnaire (UK) (Australia)	340 211	Problem in IS strategy studies in UK and Australia.

Table 2.1 - Summary of previous ISP empirical research (after Premkumar, 1989)

Year	Researcher(s)	Research Method	Sample Size	Focus of Study
1986a (US)	Lederer & Mendelow	Group discussion Interviews	24	Group discussions identified the difficulties which the managers faced in developing their IS plans.
			20	This list was then used in structured interviews to identify why each item on the list was a problem and how they would overcome them.
1986b		Group discussion	24	For each level of management in the IS function, identified key issues in ISP.
1987		Interviews	20	Identification of ISP formulation and communication problems and how they could be addressed.
1988a				Interviews with systems executives in major organisations to identify 10 critical planning issues.
1988b				Focuses on the issues of convincing top management of the potential strategic impact of IS. Identifies reasons why this is difficult and suggests techniques to overcome this.
1993				Identification of issues and techniques to convince top management of the potential strategic impact of IS which impedes ISP.
1986 (UK)	Meiklejohn	Postal Questionnaire	26	Investigates the ISP methodology used by consultants.
1986 (US)	Sinclair	In depth Interviews	7	Motivations for conducting ISP & the techniques used.
1986 (US)	Vitale <i>et al.</i>	Conference Survey	17	Studied the ISP approaches used, the knowledge of IS, and satisfaction with ISP.
1987 (US)	Blair	Postal Questionnaire	200	Investigates the approaches taken to ISP.
1987a (UK & Australia)	Galliers	Postal Questionnaire (UK) (Australia)	209 (130) (79)	Assessment of current ISP practice in the UK and Australia. Different stakeholders view of ISP success.
1986b		(UK)	(130)	Investigates the views of IS professionals on the current success of systems planning. Provides a summary of the main study (Galliers, 1987a).
1987b				Compares senior managers and IS planners viewpoints of ISP in UK organisations.

Table 2.1 - Summary of previous ISP empirical research (continued)

Year	Researcher(s)	Research Method	Sample Size	Focus of Study
1987c	Galliers (continued)	(UK) (Australia)	(130) (79)	Summary of findings and a comparison of ISP practice between UK and Australian organisations.
1987 (US)	Waibel	Postal Questionnaire	34	Investigates the relationship between ISP effectiveness and different attributes associated with the presence and composite of an IS steering committee.
1988	Jones	Postal Questionnaire		Studies linkage between business strategy, the IS strategy and IS operations. Data based on financial institutions.
1988 (US)	Raghunathan & Raghunathan		178	Studies the impact of top management support on IS Planning.
1988a (US)	Lederer & Sethi	Postal Questionnaire	80	Identification and untested categorisation of ISP problems.
1988b,c; 1989				Identifies the major issues and pitfalls of planning.
1991				Identifies & tests 5 underlying dimensions of the ISP problems.
1992a				The relationships among these 5 major dimensions are explored.
1992b				Identifies 18 (S)ISP problems and suggests how to address them.
1988 (Finland)	Saaksjarvi	Postal Questionnaire	71	Explores the success of ISP in Finnish companies in order to generate an improved understanding of the relationship between ISP mechanism and success factors, and to give practical guidelines for effective ISP.
1989 (UK)	Wilson	Postal Questionnaire	186	Investigates the extent to which major UK companies had adopted a strategic view of IS and development.
1990a,b (UK)	Earl	Case studies Interviews (21 companies)	6 63	Investigates what contributes to effective SISP, how SISP can contribute to identification of competitive advantage applications and gain a better understanding of the organisational dynamics of (S)ISP.
1993				Identifies 5 different SISP approaches and provides evidence to suggest that one particular approach is more effective than the others.

Table 2.1 - Summary of previous ISP empirical research (continued)

Year	Researcher(s)	Research Method	Sample Size	Focus of Study
1989 (US)	Premkumar	Postal Questionnaire	245	Evaluation model developed and tested. Interrelationships within the model were investigated.
1991	Premkumar & King		245	Analysis of planning practices & affect of organisational factors on ISP.
1992			249	Evaluates the differences in planning, organisational support, and performance characteristics of ISP among organisations with different roles.
1994a			249	Develops a research model of two major ISP dimensions and uses this to test the impact of certain organisational characteristics on ISP success.
1994b			249	Summary of research findings from original study (Premkumar, 1989).
1990 (US)	Raghunathan & Raghunathan	Postal Questionnaire	192	Examines the role of the IS planner in relation to the organisational reporting level of the top IS executive.
1994				Adapts and validates a model developed to originally measure business planning systems success to the IS context.
1992 (UK)	BDO Consulting	Postal Questionnaire Interviews	183	Studies the current views on planning and identifies emerging trends.
1993 (US)			27	
	Gupta & Guimaraes	Postal Questionnaire	131	Looks at issues relating to ISP: triggers to planning, formal business planning approach, areas covered in plan.

Table 2.1 - Summary of previous ISP empirical research (continued)

2.4.1.5 Integrative

The *integrative* school of thought aims to bring together ideas from both the rational and non-rational perspectives of planning across both normative and descriptive dimensions (e.g., Wilson, 1989). The close link between strategy formulation and implementation this type of research advocates cannot be over emphasised. Implementation is seen by some as an integral part of the strategy process (e.g., Ansoff, 1987: p 236).

Mintzberg (1988) posits that strategy may be derived in two ways, through **formulation** (i.e., deliberate) or **formation** (i.e., emergent). While strategy formulation seeks to separate thought from action, strategy formation regards the two to be inseparable.

Strategy *formulation* depicts strategy making as a deliberate process by which strategy is first formulated and then implemented. This has been the assumption of much of the business and IS strategy research to-date. However, Mintzberg suggests and indeed has evidence for strategy *formation*; that a strategy '*can form as well as be formulated...in response to an evolving situation*' (p 78), that is the strategy emerges continually in response to previously implemented actions and to changes in the environment.

It is unclear whether Mintzberg's evidence of strategy *formation* is **controlled** or **uncontrolled**. In the situation of *controlled* formation, one would expect the organisation to derive and implement strategy using mechanisms embedded within the culture and structure of the organisation, managing *proactively* the future of the organisation. At best the organisation attempts to *create* its own future and at worst attempts to *manage* it. *Uncontrolled* formation looks, at least on the surface, to be the same as controlled formation (since there is no readily definable approach to strategy) except no mechanisms exist to manage proactively the future. In this situation, the organisation at best attempts to *cope* with changes in the environment while at worst will not survive them.

For strategy *formation* to take place, decision making and implementation must be woven into the very fabric of the organisation since in order to be continuous (as the theory of evolution contends), it can not have a clear beginning and end (as in the case of strategy *formulation* which is periodic and is triggered at particular points in time). Continuous in this context must mean that activities are happening simultaneously (and therefore are part of the day-to-day operations of the organisation) since continuously cycling (sequentially) through the planning activity is just another form of strategy formulation except no time exists between planning cycles.

The knitting together of strategy formulation and implementation (i.e., strategy formation in Mintzberg's terms) allows the outcome to be flexible and easily adaptable, helping the organisation to foster a learning environment (c.f., Senge, 1990) which is necessary for long-term survival (Garrett, 1987). However, while a purely emergent strategy facilitates learning, it excludes control. Since both

learning and control are desirable, strategic decision making should exhibit both deliberate and emergent properties (Mintzberg, 1988).

If strategy is totally embedded within the organisation as strategy formation suggests, then the study of strategy formation (as opposed to formulation) would be difficult to do due to the absence of a readily observable process. Unless, that is, in-depth longitudinal research is undertaken. Due to the nature of this research, which will be described in more detail later, and the resultant need to conduct a large scale survey, this research focuses on strategy formulation rather than formation.

2.4.2 Classification of Previous ISP Research

The majority of ISP research to-date falls into the four *rational* semi-quadrants identified by the framework. The *planning practices* and *planning prescriptions* semi-quadrants are where most of past and present ISP research is located, the majority of which is in the *planning practices* semi-quadrant (Jarvenpaa *et al.*, 1990).

Much of the ISP literature has its roots in business strategy research which has tended to take the deliberate rather than the emergent view of planning, focusing more on the business plan's formulation than its implementation, and being concentrated in the descriptive quadrant of the framework.

The applicability of business strategy research to the area of ISP is adequately argued by Venkatraman (1985/1986: pp 68-70) who identifies three reasons why business strategy research provides an appropriate benchmark for ISP. Firstly, it is argued that both areas assume 'formal planning systems and processes lead to better decision choices, more informed evaluation of alternatives, and ultimately better levels of organisational performance'. Secondly, in the same way business strategy research has focused on the 'role and benefits of formalised systems and processes adopted by organisations as an integral part of their strategic management processes', so has the area of ISP. Finally, both business strategy and ISP research 'began approaching their respective research objectives by focusing on selected case studies' and 'have moved toward comparative analysis using large samples' in order 'to move away from generalisations based on isolated case studies'.

This relationship between business and IS strategy research combined with the relative immaturity of both strategy and information systems as subject areas in general, provides some vindication as to why most ISP research to-date falls into the descriptive quadrant of the framework.

Previous descriptive research has been focused on the identification of problems and issues of ISP which have, in some cases, led to normative method-based recommendations to help organisations formulate their ISP (*e.g.*, Bullen & Rockart, 1981; Zachman, 1982; Ives & Learmonth, 1984; Porter & Millar, 1985; Hardaker & Ward, 1987). Although these methods have provided planners with tools and

techniques to aid the planning activity, they have not provided guarantees as to the resultant IS plan's implementation or subsequent success. Reports of IS plans in some organisations becoming *shelfware* (Atkinson, 1992) and the implementation of information systems not identified by the up-to-date plan (Sinha, 1990), are by no means uncommon. This not only results in a waste of resources used during the planning activity itself but also a loss of credibility with regard to formal planning procedures and the way in which IS/IT is generally perceived within the organisation.

Given the difficulties still being experienced, ISP is an important topic worthy of research. While future research must seek to take a more integrative perspective to planning research (addressing all three of the dimensions highlighted by the strategic process research framework: rational/irrational; formulation/implementation, and descriptive/normative) it appears to be time to refocus attention on something other than ISP methods, (which seems to have predominated until now) as argued in the following section.

2.5 The Dimensions of ISP

There is little doubt that methods aid the planning activity. However, there is no evidence to suggest that they, on their own, make the planning activity successful (Sinclair, 1986). Ramanujam *et al.* (1986: p 365) argue that 'effective planning requires more than merely using sophisticated analytical techniques'. This is echoed by Earl (1990b) who says that 'focusing on methods alone is not sufficient' due to the complex nature of strategy-making.

More recent research suggests that researchers need to refocus their attention on the 'multi-dimensional nature of strategic ISP (SISP)³'; namely method, process and implementation (Earl, 1990b). The *multi-dimensional* nature of strategic planning is corroborated by other researchers as well (*e.g.*, Hax & Majluf, 1984; Ramanujam & Venkatraman, 1987a; Lederer & Sethi, 1991), although 'there is as yet no consensus as to what these dimensions are' (Ramanujam *et al.*, 1986: p 348).

In the quest to discover possible dimensions of ISP, both the IS and business planning literature have been reviewed. Different terminology is used by different researchers in describing similar dimensions and therefore words contained in parenthesis are used as the basis of comparison.

- Learned *et al.* (1965) identify two important, although not entirely separable aspects of strategy, that of formulation [*method & process*] and implementation.
- King (1984) identifies six dimensions of planning: inputs; goals [*inputs*]; the strategic planning system [*methods & process*]; outputs; business performance [*outcome*], and external standards [*feedback*], which refer to the 'body of standards' that the process elements may be compared against.

³ The definition of ISP given in §2.1 incorporates what Earl terms SISP.

- Boal & Bryson (1987) suggest three dimensions that should be included when analysing planning. These are context (in which they include inputs), process and outcome.
- Galliers (1987a), in his assessment of past ISP research, classifies problems identified by his research into two dimensions: process and outcomes [*output*].
- Lederer & Sethi (1988a) categorise ISP problems into three dimensions: resource related [*input*], process [*methodology*] and output problems. They also attempt to measure overall satisfaction based on what they term methodology [*method*], resource requirements [*input*], process, output and carrying out the plan [*implementation*].
- Hoffer *et al.* (1989) propose that (S)ISP problems be grouped into five dimensions: organisational [*context/input*]; commitment/contractual [*input/output*]; expectations [*input*]/outcomes; expertise/technical [*input/methods*], and implementation.
- Waema & Walsham (1990) view IS strategy formulation as a social process based on context, content [*method/output*] and process.
- Chan & Huff (1992) contend that when one researches strategy it is necessary to consider both strategy content [*method/output*] and process.
- Premkumar & King (1991) adapt a model previously constructed by King (1988) showing the ISP activity as comprising five distinct elements/dimensions: information input and resource [*input*]; process; output, and outcome. These are shown within an organisational/external environment [*context*].

Other researchers have highlighted the importance of specific dimensions of ISP. For example:

- Hrenbriniak & Joyce (1984: p 197) believe that evaluation, feedback and an appropriate reward system [context] 'is critically important for the reinforcement of behaviour that is consistent with the successful implementation of strategy';
- Adriaans & Hoogakker (1989) stress that the quality of the planning process is important due to its influence in determining 'the degree of acceptance (of the plan)....and hence (its) influence on the desired effects of ISP';
- Pyburn (1983) regards planning as a 'developmental process rather than an observable outcome or document'.
- Lederer & Sethi (1991) suggest that plan implementation should be investigated in more depth due to the number of problems experienced with this 'dimension' alone.

Based on a review of the previous planning literature, eight dimensions of ISP were identified: *context, inputs, process, method, outputs, implementation, outcome and feedback*. Each of these dimensions may have a tangible and/or intangible factors associated with them.

Tangible factors are more readily measurable and as a consequence have been the focus of much of the business and ISP literature to-date. It is argued by some (*e.g.*, Pyburn, 1983; Boal & Bryson, 1987; Boynton & Zmud, 1987; Waema & Walsham, 1990) that a focus on improving the

intangible aspects of planning will result in improving the effectiveness of ISP as a whole. However, these intangibles are seldom, if at all, recognised by organisations (Premkumar & King, 1991) and consequently not managed appropriately if at all. Other researchers too have commented on the many benefits of planning both of a tangible and intangible nature (*c.f.*, Venkatraman & Ramanujam, 1987: p 688).

2.5.1 Outcome

Outcome differs from the other seven dimensions as it refers to the organisational impact of the ISP output (*i.e.*, the contents of the IS plan) which may be tangible (*e.g.*, improvement in business performance) and/or intangible (*e.g.*, organisational learning (Senge, 1990)) in nature. Outcome is a measure of ISP success rather than an ISP dimension, and could be regarded as a function of the other seven dimensions. If each of these dimensions are 'successful' (whatever success means in the context of each dimension), then the desired outcome is more likely to be achieved.

2.5.2 Context

Context refers to internal and external environmental factors that may have an affect on ISP and the resultant plan's success. Contextual factors may be categorised as controllable, partially controllable or uncontrollable (*c.f.*, Ein-Dor & Segev, 1978a) *inputs* and/or *outputs* of the ISP activity. The tangible factors may include organisational size, structure, style of management and characteristics of the IS function (*e.g.*, maturity), whereas intangible factors are those relating to the organisation's political environment.

Whether a contextual factor is controllable, partially controllable or uncontrollable will determine the extent to which, in the short term at least, the planner, planning team and/or ISP activity itself can change this factor.

If the contextual factor is classified as *controllable*, the ISP activity and/or the participants can *manage* the factor in question (*e.g.*, commitment to the plan can be managed through the ISP activity). Factors falling under this category are those which are primarily within the boundary of the ISP activity and can therefore be categorised as manageable inputs/outputs of planning (*e.g.*, commitment to the plan, which may be viewed as an output of the ISP activity, can be managed by the ISP process).

If the contextual factor is classified as *partially controllable*, the ISP activity and/or the participants have some control over the factor in question and may therefore be able to *influence* it (*e.g.*, the environment is highly conducive to ISP). Factors falling into this category are those which represent the *interaction* between the ISP activity and the rest of the organisation.

Finally, if the contextual factor is classified as *uncontrollable* (e.g., the culture and structure of the organisation, the organisation's external environment), while not being able to control it, the ISP activity and/or the participants must ensure the ISP output takes it into *consideration*. Factors falling into this category are those lying outside the boundaries of the ISP activity which nevertheless impose constraints on its ultimate success.

2.5.3 Input

Inputs refer to the resources needed to conduct the ISP activity. These not only include the tangible inputs of time, money, informational and human resources (e.g., who should participate, expertise of the planning team individually and collectively) but also intangible inputs such as stakeholder expectations (c.f., Galliers, 1987b; Ruohonen, 1991).

2.5.4 Outputs

Outputs refer to the deliverables of the ISP activity. Tangible ISP deliverables include the actions that need to be taken together with the necessary resource commitment, while the intangible deliverables help to create an environment conducive to the implementation of these actions (e.g., motivation).

2.5.5 Process

Process relates to 'the sequence of steps, relationship transformations, and interpersonal and intellectual transactions needed to reach an end state or outcome' (Quinn, 1980). The process is the engine which drives an activity from start to finish.

It is evident from the planning literature that the term process is frequently used to describe both process and method (in terms of the definitions given here). The combination of both process and method is used by this researcher to constitute a methodology. This definition allows method to be treated independently from process which may, among other things, improve the flexibility (in terms of reaction to environmental impacts) of the approach taken to ISP.

Process has both tangible and intangible factors associated with it. Tangible factors address the way in which an activity is carried out (e.g., the stages of decision making), whereas intangible factors refer to the way in which an activity is managed (e.g., how planning participants interact and how these interactions are managed). Schein (1969) discusses in depth this issue of process management and how it can be used as a tool to manage organisational change.

2.5.6 Method

Method refers to the instruments used during the stages of planning to deliver the IS plan. In short, these instruments gather (*e.g.*, workshops), analyse (*e.g.*, SWOT analysis) and present (*e.g.*, pre-formatted document) information. They can either be *hard* ('tangible') (*i.e.*, those that are more appropriate for structured elements of an activity) or *soft* ('intangible') in nature (*i.e.*, those that are more appropriate for unstructured elements of an activity).

2.5.7 The Formulation Activity: Content vs Methodology

Context, input, output, method and process can be summarised under two main headings: content and methodology. The context, input and output dimensions have no action associated with them, they are 'static' concepts (snapshots of the situation) which, when used in conjunction with methodology, constitute an *activity*. Context, input and output provide the *content* of an activity whereas the interaction between process and method (*i.e.*, *methodology*) provides the action (*c.f.*, Figure 2.4). The activity described in detail above under each individual dimension, is the strategy *formulation* activity.

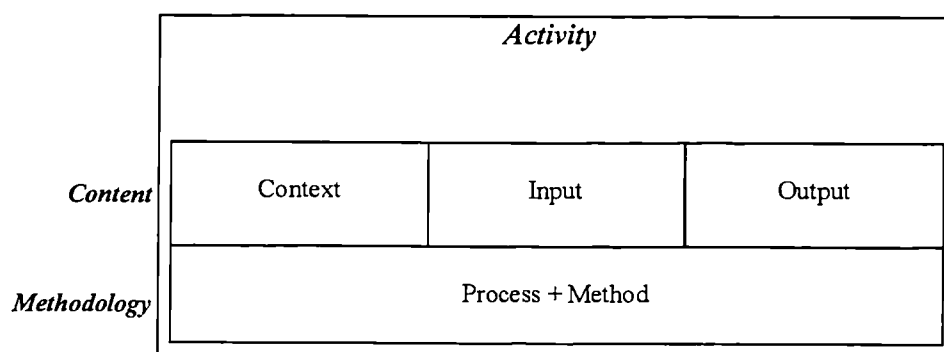


Figure 2.4 - The components of an activity

The two remaining dimensions identified from the planning literature, *implementation* and *feedback*, are in fact *activities* in their own right. In the same way the activity of formulation comprises the sub-dimensions of context, input, method, process and output, so do the activities of implementation and feedback.

2.5.8 Implementation

Implementation is the activity which delivers the ISP output and is more commonly called the project management activity (which includes IS development). It is distinct from the implementation of the ISP activity (*c.f.*, Austin *et al.*, 1988) which in the context of this research is addressed by the ISP *formulation process* dimension.

2.5.9 Feedback

Feedback is the activity which evaluates, reviews and updates ISP from one cycle to the next in line with changes in the environment. Two types of feedback associated with planning are identified in the literature: feedback on the activity itself (*i.e.*, evaluation, reviewing and updating the way in which the IS plan was derived), and feedback on the content of the output (*i.e.*, evaluating, reviewing and updating the contents of the IS plan).

2.5.10 A Multidimensional Model of ISP: The Systems Perspective

Taken together, these seven ISP dimensions can be viewed as a general systems model comprising context, input, process (which includes both method and process in terms of the definition given above), output and feedback, with implementation being located on the boundary of the ISP system (Figure 2.5). These dimensions were further validated by a general review of the problems and issues identified from previous empirical ISP research, each of which could be categorised under one of these seven dimensions (*c.f.*, Appendix A).

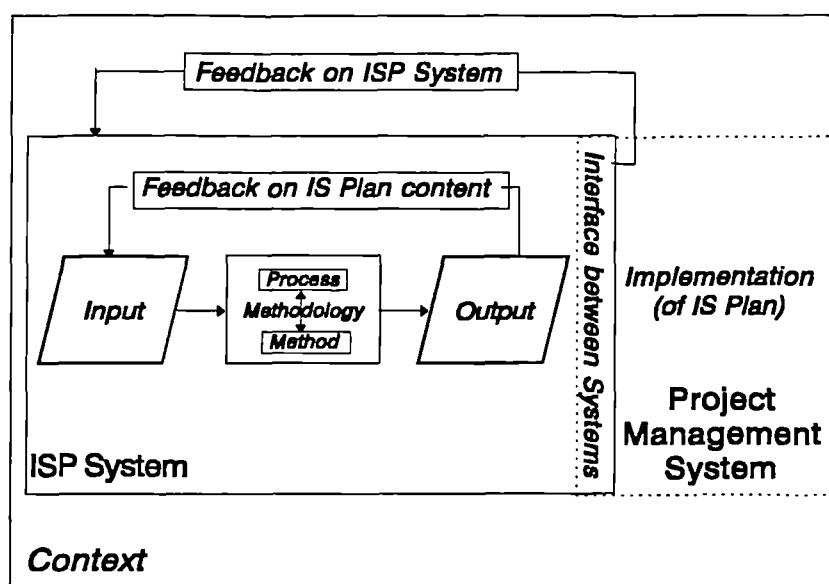


Figure 2.5 - Multidimensional model of ISP: the systems perspective

This ISP systems model provides a good foundation on which to conduct further research, in particular it satisfies the call for a multi-dimensional perspective to be taken when investigating ISP. In addition, while this thesis focuses on strategy formulation (§2.4.1.5), the model is equally applicable to formation. If implementation and ISP systems are intrinsically interlinked (as in the case of strategy formation), the two systems interface with each other totally so only one meta-system exists. If implementation and ISP systems are totally separate (which is the extreme case of strategy formulation), there will be no interface at all and two separate systems will exist.

Systems thinking provides a framework which helps to deal with complex things in a holistic way (Flood & Carson, 1988). In any systems study, they say, 'an appropriate level of resolution has to be chosen [so that]...the wider system of interest and the environment are appropriately identified...This requires that a systems scientist be both a holist (looking at the system as a whole) and a reductionist (converting the system into many simpler forms) at the same time (*ibid*: p 14).

The boundary of this research (*i.e.*, the level of resolution) is drawn primarily around the ISP system only but recognises that the ISP system has the joint 'responsibility' (together with the implementation system) of managing the interface between each other. In other words, while the main focus of this research is on formulation and not on the implementation of the IS plan, the critical success factors that need to be addressed by the ISP system to help ensure smooth transition to the implementation system, will be investigated.

If one does consider ISP in general systems terms, classification of the important ISP factors identified by previous research under these seven dimensions reveals an absence of research with regards to feedback.

2.5.11 Feedback: The Missing Link?

The concept of feedback is one of the fundamental building blocks of general systems theory (Flood & Carson, 1988). It implies that organisations are capable of adapting and improving over time in response to information, similar to how a thermostat changes the operation of a heating unit based on information it gathers about temperature (Nadler, 1977).

Organisations must learn to adapt to their economic, commercial, social and political surroundings if they are to be effective (Beer, 1981). Feedback provides a means by which an organisation may change. Systems within organisations need to adapt to changes in their internal and/or external environment in order to continually satisfy their reason for being. 'The rapidly changing business environments, increased involvement of end users, accelerated technological change, and lack of reliable methods have created a continuing need to improve ISP' (Raghunathan & Raghunathan, 1990: p 287).

Ackoff (1970) argues that any planning system may be classified as satisficing, optimising or adaptivising and that the nearer the system is to an adaptivising one the more effective will it be. He believes that the primary benefit of planning is the process of producing the plans rather than the product, and that this process should be capable of adapting to the future. This adaptive behaviour of the planning system has been mentioned by several authors as a key to success (*e.g.*, Ramanujam & Venkatraman, 1985; Boynton & Zmud, 1987; Galliers, 1987c; De Geus, 1988; Lederer & Sethi, 1988a; Earl, 1993). Feedback is the basic mechanism of adaptive behaviour (Simon, 1960) and therefore improvement.

While feedback in the ISP literature is noticeable by its absence, business planning research has touched on the area (*e.g.*, Locke *et al.*, 1981; Armstrong, 1982; Dyson & Foster, 1983a; King, 1983; Hrenbriniak & Joyce, 1984; Lenz, 1987; Karimi, 1988; Hoffer *et al.*, 1989).

Lenz (1987: p 34) argues that 'most strategic planning processes do not facilitate the self-reflective learning that is necessary for organisations to adapt to changing competitive conditions...like a product or service, the planning process itself must be managed and shaped'. This self-reflective learning however, is not assessable through the 'management by exception' philosophy⁴ that many organisations adopt. Hrenbriniak & Joyce (1984) stress that this type of management may result in the reporting of negative feedback deviations only which has a negative effect on control. In this type of organisation, employees avoid making mistakes (and the resultant punishments) at all costs in order to minimise risk, by being conservative, avoiding attention, and doing as they are told rather than using initiative. When mistakes do occur, cover-ups ensue. 'Successful implementation depends on a learning process that is premised on sound communication, confrontation of task-related problems, and evaluation of the reasons or factors underlying significant [positive and negative] deviations from expected performance'. Making mistakes should be treated 'as a necessary consequence of a planning and control system...Organisations that embrace error exhibit a relatively greater tolerance of experimentation and more novel, less tried approaches to problem solving and decision making' (*ibid*: p 199).

Dyson & Foster (1983a) found in their study of business planning practices that organisations did not undertake such a review, mainly because the executives interviewed believed the situation appraisal conducted at the beginning of each periodic (normally annual) planning cycle was adequate in monitoring any changes that had occurred since the last planning cycle. Some of the organisations believed that the reviews built into the budget structures were enough to monitor the implementation of strategy. With regards to this state of affairs, Dyson and Foster argue that 'the value of good monitoring seems to be so clear that it is perhaps surprising that actual practice is not better. A good monitoring system will at the very least ensure that you know what may be your current position and consequently enable an immediate start to be made in the business of coping with any unforeseen problems' (*ibid*: p 155).

While business strategy research has touched on the concept of feedback, there is little attention paid to feedback as an activity, and what constitutes the type of feedback required to aid continual improvement. Given the parallels between business and IS strategy research (*c.f.*, §2.4.2), it is therefore not surprising to find hardly a mention of feedback in the ISP literature. If ISP feedback does not exist, as there is some evidence to suggest from the business strategy research (*e.g.*, Dyson & Foster, 1983a; Lenz, 1987), there will be no controlled⁵ improvement in ISP which provides a potential reason as to why ISP problems identified over a decade ago still exist today.

⁴ 'Management by exception' emphasises only significant deviations from targeted performance deserve managerial attention.
⁵ Controlled as opposed to uncontrolled where change happens by chance not by design.

2.6 The Research Objectives

From a review of previous ISP literature it is evident that many organisations are still finding ISP success elusive. The type of ISP research mainly conducted to-date can be categorised as rational and descriptive, focused mainly on the formulation rather than implementation of strategy (*i.e.*, planning practices semi-quadrant of Figure 2.3). This descriptive research has identified ISP problems/issues which have been shown to impede ISP success, and have tended to focus one dimension of ISP.

More recently, ISP researchers have suggested that a more multi-dimensional viewpoint be taken when investigating ISP. The general systems model provides one such multi-dimensional viewpoint of ISP, encompassing the different dimensions mentioned by both IS and business strategy researchers.

Categorising empirical ISP problems/issues research according to the multiple dimensions of the general systems model, highlights the absence of research in the area of feedback, a fundamental building block of general systems theory. To-date, there has been no empirical research on the activity of ISP feedback within organisations and as a consequence it is uncertain whether feedback exists in practice and if it does exist what relationship it has with ISP success. It would seem sensible to suggest that the lack of feedback would have a detrimental effect on ISP success, after all if problems/issues are not identified, discussed and then solution suggested, ISP will continue to be unsuccessful. Without some form of feedback, *improvement* will not occur (except serendipitously). Indeed, a major belief in organisational behaviour literature is that feedback improves performance (Ang *et al.*, 1993: p 240).

This thesis therefore argues that a lack of ISP feedback may be impeding ISP success. In order to establish whether or not this is the case, a conceptual model of feedback and ISP success is developed (*c.f.*, Chapter 4), the presence of feedback is explored, and the relationship between feedback and ISP success is investigated.

In addition, this research seeks to establish a system-oriented diagnostic evaluation tool to help organisations evaluate problems with their ISP system, and identify contextual factors related to the existence of feedback as a foundation for future research. In brief, the four main research questions may be stated as follows:

1. To what extent does feedback exist within organisations?
2. Is feedback related to ISP success?
3. What ISP system characteristics are related to ISP success?
4. What contextual factors are related to the existence of feedback?

The next chapter provides a detail discussion of the research methodology used to find the answers to these questions.

3. Research Methodology

This chapter provides a description and justification of the methodology used to conduct this research. The first section describes the stages of the methodology in some detail, identifying the methodological issues taken into consideration at each stage, while the second section provides a general critique of the research methodology and its underlying assumptions.

3.1 The Research Methodology

Table 3.1 provides an overview of the research methodology. The stages of the research are shown in boxes on the right hand side of the diagram whereas the outcomes of each stage are shown on the left. The following discussion is structured around each of the stages identified.

3.1.1 Define Problem

The research activity is initiated when the researcher perceives a deficiency in the current knowledge and seeks ways of addressing this. In the context of this research, the researcher's previous experience in the field of ISP led to the perceived deficiency in the ability of organisations to improve their ISP activity. Despite the growth in ISP research since the mid-1980s, successful ISP has been, and still is, identified as one if not the most pressing problem facing IS managers/executives. Indeed, the reasons given as to why many organisations still find ISP success elusive today are similar to those identified over a decade ago (*e.g.*, top management commitment and involvement). This suggests that organisations are failing to address the problems associated with successful ISP identified by research.

The problem is defined, therefore, as 'despite the growth in ISP research, why is it that ISP success is still a major concern of IS managers/executives?'.

3.1.2 Conduct Literature Review

The literature review was exploratory in nature, searching for possible reasons as to why ISP was not successful. In an attempt to provide some structure to the analysis and in response to some researchers' recommendation of moving away from the unidimensional perspectives of ISP, a multi-dimensional ISP model was derived by amalgamating the different dimensions of ISP identified from the planning literature. The multi-dimensional model derived was identified as being a general systems model comprising input, process, method, output, feedback and implementation dimensions.

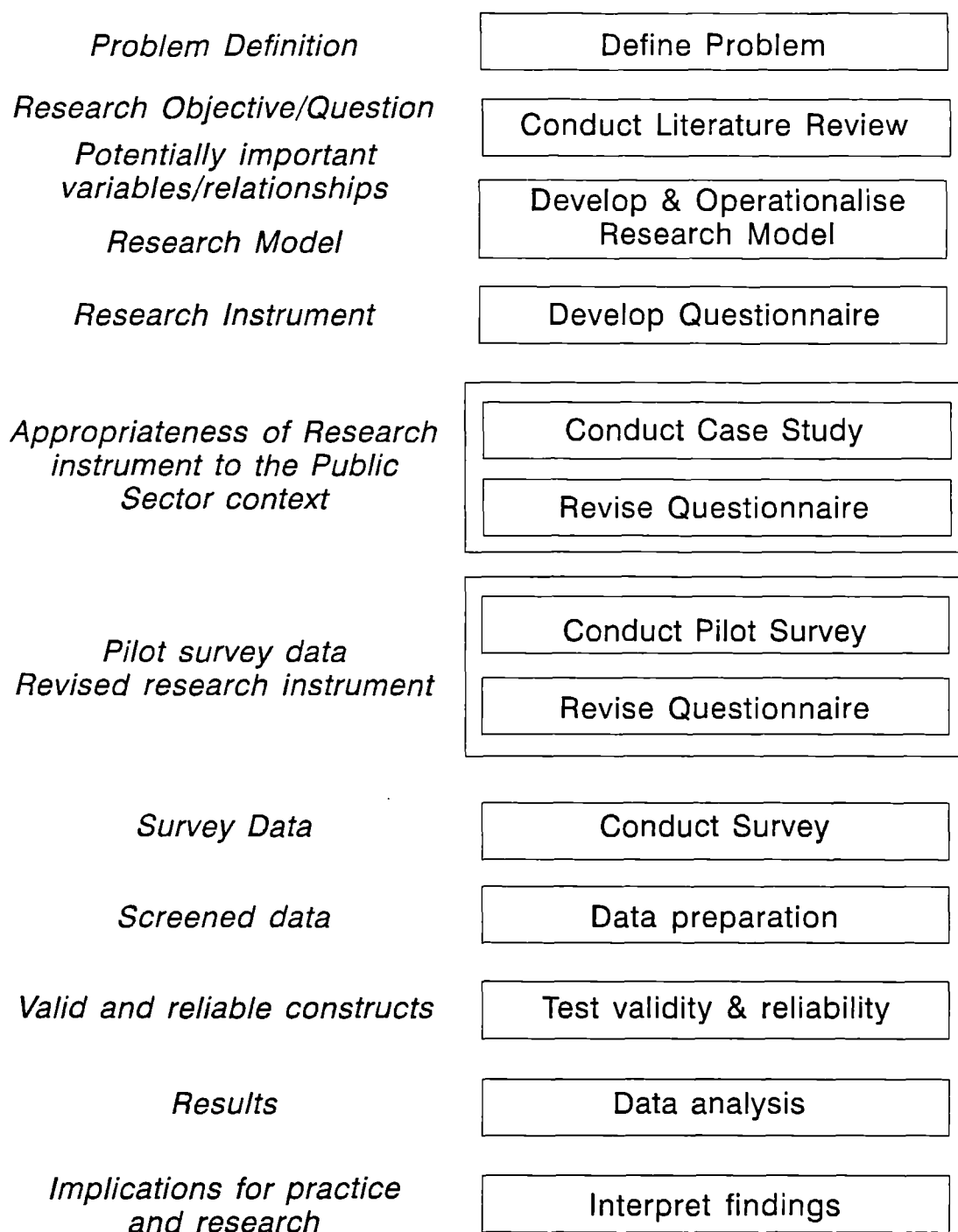


Figure 3.1 - Overview of the research methodology

This multi-dimensional systems model was used to classify factors identified from previous empirical ISP research which provided a general overview of the extent to which each dimension had been addressed. The categorisation revealed no empirical research on ISP feedback. The lack of feedback on ISP could be an explanation as to why there has been little progress in improving ISP to-date.

Based on this finding, the research objectives/questions were derived. The main research objectives were to establish whether feedback existed, and if it did what relationship it had with ISP success.

In order to establish the existence of feedback within the organisation and to investigate its relationship with ISP success, it was necessary to identify a way in which feedback presence and ISP success could be measured. A conceptual model of feedback and a conceptual model of ISP success were then developed and operationalised.

3.1.3 Develop and Operationalise the Research Models

The research models were developed from a study of previous literature. The model of feedback was derived from a study of both the general feedback and organisational development literature. The model of ISP success was derived from a study of previous evaluation research and sought to address some of the deficiencies that currently exist with such models. Both models were operationalised using multiple indicants.

3.1.4 Develop the Questionnaire (Research Instrument)

In order to establish whether ISP feedback exists in practice and if it does what relationship it has with ISP success, a large sample survey (via a self-administered questionnaire) was undertaken in order to gain some insight into the general situation. A more qualitative method (*e.g.*, case study) was not regarded as appropriate due to lack of knowledge regarding the existence of feedback in general.

While a questionnaire-based instrument was judged to be the most appropriate method for gathering data, there was some concern that the notoriously low return rates associated with this method would not be sufficient to gain a general understanding of the existing situation. In anticipation of this potential problem, and before making a final decision on the use of a self-administered mail questionnaire, 1400 organisations were asked (via mail) if they would be interested in participating in this research.

Of the 1400 letters sent, 150 organisations replied that they would be interested in participating and as a consequence the decision was taken to use the self-administered mail questionnaire as the research method for collecting data.

The advantages and disadvantages of self-administered questionnaire-based research are well documented in the literature (*e.g.*, Erdos & Morgan, 1970; Oppenheim, 1986; Galliers, 1990b).

Advantages include:

- large number of variables may be studied;
- large numbers of people can be studied;
- description of real life situations;
- generalisable results if a large enough representative sample is collected;
- wider geographical area can be covered;
- no interviewer bias;
- better chance of a truthful and thoughtful reply;
- fast and economical;
- time-saving;
- the production of data that can be expressed in statistical form enabling comparisons to be made between different groups and populations.

The disadvantages include:

- return rates may not be high making it difficult to establish how representative the sample is;
- little insight into causes/process behind phenomena being studied;
- only provides a snapshot of practice at a particular point in time from which inferences are made regarding relationships that exist in the past, present or future;
- respondents are self-selecting;
- doubts of respondents cannot be clarified;
- respondents may attribute different meanings to the questions since surveys use the researchers' language and frameworks not the informants';
- measures attitudes and claimed behaviours not actual behaviours;
- difficulty in constructing a mailing list;
- mailing list is incomplete or biased;
- problems of semantics;
- respondents need good literacy skills.

With these disadvantages in mind a questionnaire was constructed according to guidelines identified in the literature (*c.f.*, Erdos & Morgan, 1970; Oppenheim, 1986; Moser & Kalton, 1989; Sekaran, 1992). Sekaran (1992: p 202) identifies three principles of good questionnaire design which were followed in the construction of the questionnaire. These are: the wording of the questionnaire; how the variables are categorised, scaled and coded, and the general appearance of the questionnaire.

3.1.4.1 The Wording of the Questionnaire

Only questions relating to the research objectives were included in the questionnaire. These questions were all vetted to ensure they did not bias the answers (*i.e.*, no leading or loaded questions).

Double-barrelled and ambiguous questions were actively avoided as was the use of jargon/specialist language. Question length was also kept to a minimum using the rule of thumb of not more than one full line in print whenever possible (Oppenheim, 1986).

Survey respondents are sensitive to the context in which a question is asked as well as to the specific words used to ask it. While randomly placing questions in the questionnaire would have reduced ordering effects¹ and therefore systematic response bias, this may have led to confusion and disorientation on the part of the respondent. The questions were therefore sequenced to lead respondents through a natural progression of topics, as suggested by Sekaran (1992). In addition, questions were sequenced from those that were more general in nature and relatively easy to answer (*e.g.*, position in organisation, industry sector), to those that were more specific and relatively less easy to answer (*e.g.*, good quality business plans are produced, planning participants are effective at problem solving).

Mutually exclusive closed-ended responses were predominantly used, requiring the respondent to make choices among a set of alternatives including 'Other' or 'Don't Know'² categories which made the list of choices collectively exhaustive. Using a finite number of responses not only helped respondents to make quick decisions but also helped the researcher to code the answers more easily. The questionnaire ended with an open-ended question inviting respondents to comment on important system characteristics not covered by the questionnaire.

3.1.4.2 How Variables are Categorised, Scaled and Coded

The nature of the information being tapped were a mixture of both objective facts and subjective feeling. Objective facts (*e.g.*, number of reporting levels between the top IS manager and the CEO) were measured using nominal or ratio scales whereas subjective feelings (*e.g.*, the environment is highly conducive to ISP) were measured using a 5-point³ Likert scale (strongly disagree...undecided...strongly agree). While the Likert scale is theoretically an ordinal scale, for the purpose of analysis it is commonly assumed in the social sciences to estimate an interval scale⁴. All variables, except the open-ended question at the end of the questionnaire, were pre-coded.

3.1.4.3 General Appearance of the Questionnaire

The appearance of the questionnaire refers to its general layout. The questionnaire should appear neat, brief and as 'easy to complete' as possible. The fewer the pages, the higher the percentage of returns and therefore questionnaires should not be longer than 6-8 pages (Erdos & Morgan, 1970).

¹ The meaning of almost any question can be altered by a preceding question.

² Experimental research shows that more people will say 'don't know' when this alternative is explicitly offered than when it is not (Converse & McDonnell, 1986: p 35).

³ Research indicates that a 5-point scale is just as good as any and that an increase from five to seven or nine points does not improve the reliability of the ratings (Elmore & Beggs, 1975).

⁴ The assumption made here is that the distances between points are equal.

While the questionnaire developed for this research was six (double-sided) pages in length, it did appear 'easy to complete'. However, the length of time to complete the questionnaire (estimated at between 45-60 minutes) was clearly stated in the letter of introduction in an attempt to manage expectations of would-be participants.

In addition, the questionnaire included instructions on how it should be answered, general definitions of terms used in the questionnaire that participants may be unfamiliar with or have a different understanding of, and a reassurance that the data provided would be treated as confidential in order to encourage truthful answers.

The draft questionnaire was shown to four IS academics and two practitioners in order to assess the content validity of the research instrument. Based on their comments and recommendations, the draft questionnaire went through several revisions.

3.1.5 Conduct the Case Study and Revise Questionnaire

Of the 150 organisations expressing a willingness to participate in the research, over half were public sector organisations. Given that up to the end of the 1980s public sector organisations were fundamentally different to private sector organisations in terms of their organisation goals and their operational environment, there was no evidence to suggest the research instrument, which had been derived from private sector research, would be applicable to public sector organisations. Case research was therefore undertaken in order to establish whether the research instrument was applicable to the public sector context.

Yin (1989: p 29) identifies five components of research design for case studies, each of which were applied to the current study:

1. ***What is the study's questions?*** How appropriate is private sector ISP research to public sector ISP activities?
2. ***What is the purpose of study?*** To establish if the research instrument is applicable in the public sector context.
3. ***What is the unit of analysis?*** The ISP group within individual organisations.
4. ***What is the logic linking the data to the purpose?*** Four pieces of logic were used to link the data to the purpose: (1) public sector organisations are now facing the same kind of environmental pressures as those in the private sector, forcing them to plan in similar ways; (2) ISP models derived predominately from private sector research, are just as applicable to public sector organisations; (3) in-depth description of ISP (based on the structure of the research instrument) within a public sector organisation, and (4) pre-pilot the updated research instrument (based on the case research) in the case organisation.

5. *What are the criteria for interpreting the findings?* Pattern matching⁵ (*c.f.*, *ibid*: p 33) between private and public sector organisations.

The advantages and disadvantages of case research are well documented in the literature (*e.g.*, Benbasat *et al.*, 1987; Yin, 1989; Nissen *et al.*, 1991). Advantages include:

- researcher can adapt questions as necessary, clarify doubts and ensure that responses are properly understood by repeating or rephrasing questions;
- allows researcher to pick up on non-verbal cues from the respondent;
- captures reality in greater detail through the analysis of more variables;
- studies a phenomenon in its natural context;
- good way of developing and refining concepts for further study.

The disadvantages include:

- geographical limitations;
- cost;
- restricted to a single event/organisation and therefore results are not statistically generalisable;
- lack of control over variables limiting the internal validity of conclusions;
- different interpretation of events by interviewees;
- interviewees do not always say what they believe or do;
- selective perceptions of the interviewee;
- risk of improper interpretation;
- potential bias of researcher.

3.1.5.1 Data Collection

Case material was collected using both primary (*i.e.*, focused interviews) and secondary data sources (*i.e.*, documents). Several interviews were conducted using open-ended questions structured around the sections of the research instrument (*i.e.*, personal details, IS/IT environment, general planning environment, external organisation/IT environment, internal organisation and the ISP activity). Respondents (informants) were asked for facts as well as opinions/insights into certain events identified during the course of the interview. The researcher proactively attempted to ask unbiased questions and clarified important information given by informants through the restating/rephrasing of the information they provided.

All interviews were recorded and lasted, on average, for two hours. Interview transcripts were sent to each interviewee to ensure that it was a true and accurate record of the interview. Returning scripts to interviewees for validation also allowed the researcher to clarify points of confusion.

⁵

Several pieces of information from the same case may be related to the same proposition.

The three principles of data collection identified by Yin (1989: p 95) have been adhered to in this research. These are:

1. *using multiple sources of evidence*. Multiple informants took part in the case research and secondary data sources were also used;
2. *creating a case study data base*. Primary and secondary data collected during the research has been organised and documented;
3. *maintaining a chain of evidence*. This research allows the reader to follow the derivation of any evidence from initial research question to ultimate case conclusion (*c.f.*, Chapter 5).

3.1.5.2 *Validity and Reliability of the Case Study*

Yin (1989: p 40) identifies four criteria appropriate for judging the quality of case studies: construct validity, reliability, internal and external validity. Construct validity and reliability are concerned with the quality of the research *instrument*, whereas internal and external validity are concerned with the quality of the research *design*.

Construct validity is concerned with whether the researcher has gained full access to the knowledge and meanings of informants (Straub, 1989). Yin (1989) suggests several ways in which this may be established: using multiple sources of evidence, establishing a chain of evidence and asking key informants to review the draft case study report. This research uses all three to establish construct validity of the research instrument.

Reliability refers to the ability of the research instrument to repeat the same findings and conclusions if it were to be implemented by another researcher at another point in time (Straub, 1989). Yin suggests using a case study protocol (*i.e.*, procedures and rules to follow when using the research instrument), and developing a case study database (*i.e.*, organising and documenting the data collected) to help ensure the reliability of the research instrument. The review of the case method in this chapter provides a broad overview of the case study protocol used in this research. In addition, a case study database has been created comprising transcripts of the original interviews and secondary documents used in the case report (*c.f.*, Chapter 5).

External validity is concerned with how general the ideas and theories generated in the case research are applicable to other settings (Straub, 1989). Yin (1989: p 38) identifies two types of generalisation: statistical which is appropriate to survey research, and analytical which is appropriate to case research. Analytical generalisation is attained when two or more cases support a previously developed theory and replication can be claimed. Statistical generalisation is attained when an inference is made about a population on the basis of empirical data collected from a sample. Analytical generalisation has been achieved in the case research presented in this thesis.

Internal validity is concerned with the extent to which observed cause and effect relationships may be influenced by some other unhypothesised and/or unmeasured variables and, as a consequence, is only appropriate in explanatory (causal) studies (Yin, 1989: p 40). The case research described in this thesis is explanatory in nature, seeking to test the research instrument which has been derived from private sector research, within the public sector context. Pattern matching (*c.f.*, Yin, 1989: p 43), that is drawing parallels between public and private sector organisations, was used to help ensure internal validity of the research design.

3.1.5.3 Summary

Case research provided evidence that the research instrument, with a few minor changes in wording, was appropriate within the public sector context (*c.f.*, Chapter 5).

3.1.6 Conduct Pilot Survey and Revise Questionnaire

The revised questionnaire was pre-tested by four academic colleagues and two ISP practitioners as a first stage in establishing the *content (face) validity* of the research instrument. Recommendations made by the pre-test participants were incorporated into the questionnaire and the updated version used in the pilot survey.

The pilot survey was conducted to judge the adequacy of the questionnaire on a sample of respondents that were to be used in the main survey. Three pilot questionnaires were sent to ten public and ten private sector organisations⁶, one for the IS Planner/Manager and the other two for non-IS participants of ISP. The letter accompanying the questionnaires asked respondents to complete them as far as possible and to comment on any questions they could not answer. They were also asked to identify factors that they believed to be important but had not been included in the questionnaire. In addition, they were also asked to comment on the questionnaire's general layout, ease of completion and adequacy of the instructions given.

Replies were received back from eight organisations (five private sector, three public sector). The remaining twelve were contacted by telephone to ascertain why they had not returned the questionnaires. Out of the twelve, two of the contacts who had originally been approached about the research had left their organisations⁷ and their successors did not wish to participate, three said they had not had the time to fill it in due to other commitments but were still interested in participating in the main survey, five said they no longer wished to participate due to pressures/changes at work and the remaining two could not be contacted and did not return the call.

⁶ No other distinguishing factor except whether the organisation was public or private was known at this stage. The 20 organisations were therefore chosen at random from the two sub-populations (public vs private) who indicated they were interested in participating in this research.

⁷ The time between the initial contact and the questionnaire being sent out was nine months.

The comments received from those who did respond were useful particularly in clearing up question ambiguity. A preliminary analysis of the responses also indicated some ambiguity in how certain questions were phrased. As a consequence of the comments and the analysis, the 'offending' questions were reworded.

The analysis of responses did not reveal any bunching of answers to questions which would indicate a question was leading or that people were giving stereotypical answers, nor did it show a substantial number of 'Don't Know' or 'Other' responses indicating that a question was vague, went beyond the respondent's experience or categories were not exhaustive.

While there were no major problems in the responses given by the IS Planner/Manager, it became evident both from comments that were explicitly made and the way in which the questionnaire was answered by the non-IS participants of ISP (*i.e.*, neutral responses), that some questions were too detailed. In addition, IS Planners/Manager expressed concern in terms of asking their colleagues to spend 45 minutes to one hour completing it.

As a consequence a second questionnaire (Questionnaire B) was constructed which was based on the original questionnaire (Questionnaire A) but was aimed specifically at the non-IS participants of ISP. Questionnaire B was a lot smaller in length (two pages, four sides) and contained considerably less detail than Questionnaire A. It was hoped that the much reduced length of Questionnaire B (with an estimated 10-15 minutes completion time) would increase the response rate of non-IS participants.

Questionnaire B included the personal detail section from Questionnaire A and the questions related to contextual factors which were perceptual (*e.g.*, is the environment conducive to ISP) rather than factual in nature (*e.g.*, number of reporting levels between top IS manager and CEO). In addition, it contained those questions which involved non-IS participants directly (*e.g.*, do ISP participants have a good understanding of ISP process?) or to which they would have an opinion (*e.g.*, was an appropriate amount of time spent in planning? How successful they regarded ISP to be?) rather than the detailed questions relating specifically to the ISP methodology

All questions appearing in the Questionnaire B were phrased in exactly the same way as in Questionnaire A. However, the concept of feedback as operationalised in Questionnaire A, was too detailed for the non-IS participants. As a consequence the six questions which operationalise the concept of feedback (three relating to IS plan feedback and three to ISP system feedback) in Questionnaire A were summarised in Questionnaire B using two general questions (*c.f.*, Appendix A: questions 16 and 18d, respectively).

3.1.7 Conduct Survey

The revised questionnaire was sent to the remaining 135⁸ organisations who had expressed a willingness to participate in this research. Three questionnaires were sent to each organisation, one Questionnaire A for the IS Planner/Manager and two Questionnaire Bs for two non-IS participants of ISP to complete. Self-addressed envelopes were included for all three questionnaires so non-IS participants could send their completed questionnaire straight back to the researcher without having to go through the IS Manager. This was done to encourage non-IS respondents to be as honest as possible in their responses.

One month was the time limit given to complete the questionnaires. The first mailing received responses from 55 organisations. Those organisations which had not responded were telephoned and reasons given for not replying were similar to those identified during the pilot study. A second mailing followed for those who requested another copy of the questionnaires, with a time limit of one month for completion. From the second mailing an additional 27 were received providing a total sample size of 90 organisations (including those from the pilot study) for Questionnaire A and 55 for Questionnaire B.

3.1.8 Data Preparation

Once the data had been coded and entered into the computer, the first step in the data analysis was to do a detailed examination of the data in order to identify any unexpected variability due to incorrect data entry, missing values and/or outliers. The data was screened through tabulation and visual representation (*e.g.*, boxplots, histograms); potential problems were identified and dealt with accordingly.

3.1.9 Validity and Reliability

3.1.9.1 Validity

Straub (1989) identifies four types of validity: internal, external, instrument and statistical conclusion. On closer inspection it becomes evident that the objective of statistical conclusion validity is to ensure the generalisability of the results, that is it provides a measure of external validity. Of the remaining three, internal and external validity are concerned with the *research design* whereas instrument validity is concerned with the *scale* used to measure the phenomena under investigation.

3.1.9.1.1 External Validity

External validity addresses the extent to which the research findings are generalisable to other people, events or settings. There are two main types of error associated with data collected via surveys which may call into question the external validity of the results: (1) *sampling (response) error*, which occurs because a sample is used instead of the complete population and (2) *non-sampling (non-response) errors*, caused by non-response, collection of inaccurate information and/or inaccurate coding and analysis.

⁸ 130 from the remaining sample plus five non-respondents from the pilot study (including the two who could not be contacted).

Sampling (Response) Error

The underlying assumption of survey research is there exists a 'true' value that the researcher is trying to measure. Any deviation from this 'true objective' value is regarded as a sampling or response error which has an effect on the generalisability of the sample results to the rest of the population. The size of this sampling error will depend on the sample size, the variability of the underlying population, and how the sample was chosen (Conway, 1967).

In theory, a simple random sample⁹ (SRS) is the simplest way of sampling from a population. In practice, however, due to the problems associated with gaining a comprehensive list of the population and the trade-off between cost and accuracy, simple random sampling is rarely used in social science research (Conway, 1967).

In the current research, the sample of 1400 organisations originally approached about participating in the research, were identified primarily from four sources: an existing contact database, the Strategic Planning Society membership list, media articles and personal contacts. Due to the problems of obtaining a list of all UK organisations conducting ISP¹⁰, taking a random sample from this list and then finding the name of the appropriate person¹¹ to send the questionnaire to, is a difficult if not impossible task to complete within the time scales of Doctoral research. This together with the fact that response rates to sample surveys are often quite low (Goyder, 1988) making the difference in representativeness between research based on random samples and other types not as large as is sometimes implied (Bryman & Cramer, 1990), led to the decision to construct the sampling frame used in this research.

Non-Sampling (Non-Response) Errors

Wallace & Mellor (1988) identify two main types of non-sampling or non-response errors: questionnaire and item non-response. The latter is addressed by the statistics literature under the subject of missing values and is dealt with in more detail in §3.1.8, while the former is discussed in more detail here.

One of the major non-sampling errors is concerned with those who do not respond to the questionnaire. If the non-respondents are not randomly distributed in the sample, that is they represent a different sub-population of the population under study, the generalisability of the results may be called into question.

There are other factors too which may contribute to this type of error occurring such as those respondents who give the wrong answers, do not remember, misunderstand questions or do not wish to answer. Other non-sampling errors may occur in the coding and/or analysis of the data.

⁹ Every member in the population of interest has an equal chance of being chosen.

¹⁰ The research is only interested in those that currently do ISP (whether formally or informally) since the objective of the research is to improve ISP.

¹¹ Response rates are higher for questionnaires which are addressed to the appropriate person rather than addressed to a job title.

Wallace & Mellor (1988: pp 132-133) identify three tests on questionnaire non-response, two of which rely on knowing some information about the non-respondents. While these two attempt to directly ascertain the representativeness of the response received, the third provides a 'surrogate' measure 'based on the presumption that late responders are reasonable 'surrogates' of non-respondents' (*ibid*: p 133; Oppenheim, 1966: p 34). Since no information was available on non-respondents, the surrogate measure identified by Ferber (1948-49), which is based on the order of return, was used in this research.

3.1.9.1.2 Internal Validity

Internal validity addresses the extent to which observed effects may be influenced by other unhypothesised and/or unmeasured variables. If the objective of the research is to demonstrate causality, which is the aim of many quantitative studies (Bryman & Cramer, 1990), then the internal validity of the research design needs to be established.

The majority of IS research, including the current study, involves investigating the phenomena of interest in its natural setting (*i.e.*, field studies). As a consequence, internal validity is difficult to establish because variables cannot be manipulated in order to identify all the possible causes of an effect. Causation in the context of this research, therefore, does not mean that the dependent variable (the effect: ISP success) is *totally influenced* by the independent variable (the cause: feedback), only that variation in the dependent variable is *affected* by variation in the independent variable.

3.1.9.1.3 Instrument Validity

Instrument validity measures the extent to which the research instrument gives the right answer (Kirk & Miller, 1990), that is it is measuring what it is supposed to be measuring. Validated instruments allow researchers to measure the same research constructs in the same way, improving the measurement of independent and dependent variables. The majority of IS research instruments have not been validated and/or checked for reliability which could account for the differences in results that plague many streams of MIS literature (Straub, 1989).

Sekaran (1992) identifies three main types of instrument validity: *content*, *construct* and *criterion-related*. Content validity measures the extent to which a set of items covers all the dimensions of the construct being measured. Achieving content validity involves two interrelated steps: (1) specifying the domain of content by exploring the literature and gaining some general understanding of the phenomenon, and (2) constructing and/or selecting items associated with the domain of content. Face validity is a basic index of content validity indicating that the items supposed to measure a construct (on the face of it) actually do so.

The major problem associated with content validity is that there is no agreed-upon criterion for establishing whether it has been attained. Cronbach (1971) suggests a review process whereby experts in

the IS field familiar with the concepts being investigated, evaluate the instrument. Content validity has been addressed in this research through a pre-pilot review of the instrument by four academic colleagues and two ISP practitioners, and the subsequent piloting of the questionnaire on a sample of ten public and ten private sector organisations. Participants of both the pre-pilot and pilot studies were asked, among other things, to comment on the appropriateness of the questions (items) and to identify any others that were not mentioned but they believed to be appropriate.

Construct validity is concerned with the ability of the instrument to measure the underlying construct. Achieving construct validity involves three distinct steps (Zeller & Carmine, 1980: p 81): (1) establishing the theoretical relationship between the concepts themselves; (2) examining the empirical relationship between the measures of the concepts, and (3) interpreting how the empirical evidence clarifies the construct validity of the particular measure. There are two types of construct validity: *convergent* and *discriminant* validity.

Convergent validity is the extent to which multiple attempts to measure the same concept through different methods are in agreement. This can be established either by measuring the degree of correlation between two *different* measurement instruments used to measure the same construct (*i.e.*, multi-method) or, more commonly, one measurement instrument used to measure the same phenomena in two separate ways (*i.e.*, mono-method), such as two questionnaire-based measures of the phenomena (*c.f.*, Premkumar & King, 1994a: p 100).

The mono-method test of convergent validity is more commonly called *unidimensionality* and aims to show that a set of items measures a single theoretical concept using factor analysis techniques (Zeller & Carmines, 1980: p 61). Unidimensionality requires that the items which measure a concept load on to the same factor with relatively high loadings. The unrotated factor matrix should show that: (1) the first extracted component explains a large proportion of the variance in the items (say, > 40%); (2) subsequent components explain fairly equal proportions of the remaining variance except for a gradual decrease; (3) all or most of the items should have substantial loadings on the first component (say > 0.3), and (4) all or most of the items should have higher loadings on the first component than on subsequent ones. Unidimensionality is the test of convergent validity used in this research for both the feedback and ISP success constructs.

Discriminant validity is the degree to which a concept differs from other concepts and is also established through the use of appropriate factor analysis techniques. Items that do not load significantly to any factor can be dropped (Green, 1978). Discriminant validity was tested between feedback and ISP success constructs.

Criterion-related validity establishes whether a measure differentiates individuals on a criterion it is expected to predict. There are two types of criterion-related validity: *concurrent* and *predictive* validity. *Concurrent validity* is concerned with the ability of the criterion variable to discriminate

between individuals who are known to be different on a particular measure at the *same point in time*. It is established when the scale discriminates between the individuals who are known to be different. *Predictive validity* is concerned with the ability of a *future* criterion variable to discriminate between individuals known to be different on a particular measure (*e.g.*, job selection tests).

Concurrent validity is the criterion-related validity appropriate to this study as data on the criterion variable (*i.e.*, ISP success) and the particular measures of interest have been taken at the same point in time. Previous empirical ISP research enables the ISP success scale to be tested for concurrent validity but not the feedback scales, due to the lack of empirical feedback research. Two measures known to be related to ISP success were used to test the concurrent validity: degree of top management involvement, and whether a link existed between ISP and business planning.

3.1.9.2 Reliability

Reliability measures the extent to which the instrument produces the same answer independent of who, when and where it is used (Kirk & Miller, 1990), in other words, measurements are repeatable and consistent. It is essentially an evaluation of measurement accuracy (Straub, 1989). *Stability* and *equivalence* are the two basic strategies for measuring repeatability and consistency, respectively.

Measures of *stability* focus on the analysis of the same measure at multiple points in time, whereas measures of *equivalence* focus on multiple indicators of a theoretical concept measured at a single point in time.

If the same population is measured at more than one point in time then the measurement instrument needs to be tested for *stability*. The test-retest or parallel-form reliability coefficients are the appropriate tests to measure the instrument's reliability in this context.

If multiple indicators are used to measure a construct evaluated at a single point in time (as in this research) then the instrument needs to be tested for *equivalence* (*internal consistency of measures*). The split-half or inter-item consistency reliability coefficient are the appropriate tests to measure the instruments reliability in this context. Cronbach's alpha (Cronbach, 1946) is the most popular test of inter-item consistency reliability used for multipoint-scaled items, and is considered an adequate index of the internal consistency of the measures (Sekaran, 1992: p 174). An alpha value of more than 0.6 indicates that the sample of items is an adequate representation of the underlying latent variable (Sekaran, 1992: p 287).

Equivalence rather than stability is the reliability measure appropriate to the current research. Cronbach's alpha was used to test the reliability of both the ISP success and feedback constructs.

3.1.10 Data Analysis

Univariate statistics (descriptive statistics) were used together with visual representations (*e.g.*, histograms, stem-and-leaf displays) to summarise the data and to report on the existence of feedback within organisations.

Correlation analysis and regression were used to establish the relationship between the existence of feedback and ISP success. Correlation and factor analysis were used to determine the ISP system characteristics important to successful ISP and to identify the contextual factors related to feedback.

3.1.11 Interpret Findings (Conclusions)

The results of the research are presented in terms of the research objectives stated in Chapter 6. The implications of these results with respect to practitioners and other researchers are discussed in Chapter 7.

3.2 Critique of Research Design and Methodology

This section provides a more general overview of the research and the assumptions underlying it. In particular, it discusses the underlying philosophy of adopting different approaches, the research design and the methods used.

3.2.1 The Philosophy of the Research Methodology

There are a great number of ways in which research may be carried out in the social sciences (Orlikowski & Baroudi, 1991). The choice of research methodology depends on the researcher's belief as to the underlying nature of the phenomena under study (*i.e.*, the ontology adopted) which in turn leads to the identification of the nature of valid evidence (*i.e.*, the epistemology adopted) and the appropriate research methods to use (*i.e.*, the methodology adopted).

Ontology is the branch of metaphysics¹² that deals with the nature of being, that is whether the social and physical world are independent of humans (*i.e.*, objective viewpoint) or only exists through human action (*i.e.*, subjective viewpoint). When undertaking research concerned with human phenomena, assumptions must be made relating to human rationality (*i.e.*, the intention ascribed to human action) and social relations (*i.e.*, how people interact). The objective view of reality sees human rationality as stable and social relations as orderly, whereas the subjective view sees human rationality as essentially dynamic and social relations conflictive.

¹² Metaphysics is the branch of *philosophy* dealing with the investigation of the nature and structure of reality.

The view of reality adopted will determine what criteria will be used for constructing and evaluating knowledge (*i.e.*, the epistemology). Based on the epistemology, the appropriate research methods for generating evidence can be chosen, and this constitutes the research methodology.

3.2.1.1 *The Epistemologies of the IS Research Field*

There are two main epistemologies underlying IS research: *positivism* and *interpretivism*. A third has been identified by Orlikowski & Baroudi (1991) - the critical perspective - which is more evaluative in nature seeking to go beyond the predictive/explanatory/exploratory focus of the other two, by critiquing existing social systems, raising awareness about the barriers to achieving full potential and encouraging, as a consequence, transformation of social reality. According to this perspective, phenomenon should be studied within its natural setting using a longitudinal research design, and that it can only be properly understood through a historical analysis. The use of this epistemology, however, is by no way prevalent in the field of IS research. Orlikowski & Baroudi (1991) found none of the 155 IS research studies they investigated adopted this perspective. As a consequence only the two main IS research epistemologies are discussed in more detail below.

3.2.1.1.1 *Positivism as the Research Epistemology*

Positivism derives from the ontological assumption that reality (both physical and social) is objective (*i.e.*, absolute, that is independent of the process or circumstances of viewing), human action is intentional and (boundedly) rational and can therefore be easily modelled (through cause and effect) and measured in ways similar to events in the natural world.

This epistemology assumes that knowledge is only valid if it is based on empirical observations used to verify or falsify theories (Keat, 1981). In addition it assumes that (*c.f.*, Galliers, 1985; Easterby-Smith *et al.*, 1991):

- the researcher is independent of the subject of research;
- there is a distinction between fact (which can be objectively measured) and value (which can only be subjectively measured);
- what and how to research is determined by objective criteria rather than by human beliefs and interest;
- the research aims to identify causality and laws to explain regularities in human social behaviour;
- the concepts need to be operationalised in a way which can be quantitatively measured;
- problems can be broken into elements which can then be analysed (reductionism);
- choosing samples of sufficient size allows the researcher to make generalisations about the population;
- comparisons of variations across samples are valid for doing cross-sectional analysis.

Positivism is built on the foundations of the scientific approach (which is used to study the natural world) and has for many years been the dominant vehicle for research in the IS community (Orlikowski & Baroudi, 1991). The scientific approach assumes that a priori relationships exist and the researcher can objectively identify these.

The objectivity of a research study (whether in the natural or social sciences) can be established through the measures of reliability and validity (Kirk & Miller, 1986: p 21). Objectivity in the natural sciences is based on repeatability, refutability and reductionism (Checkland, 1981). Social scientists, however, have questioned the applicability of these three objectivity measures to their research domain (*e.g.*, Morgan, 1980; Galliers & Land, 1987). They argue that:

- in the social sciences it may not always be possible to repeat a study and get the same results as it is difficult to control the environment in which the study takes place;
- while physical systems cannot react to things said about them, social systems can;
- social systems are more than the sum of their individual parts.

Instead, social scientists have attempted to measure objectivity by other means such as the validity and reliability measures identified in §3.1.5.2 and §3.1.9.

Within this paradigm two distinct types of methodologies are often used: (1) those that adhere to the more traditional empirical methods (*e.g.*, surveys), or (2) those that use more descriptive methods (*e.g.*, case studies that present facts and not interpretations) where the researcher uses pre-defined constructs.

The main weakness of the positivist paradigm, argued from the perspective of the interpretivist paradigm, is that it fails to take into consideration the (*c.f.*, Weber, 1947; Orlikowski & Baroudi, 1991):

- intrinsic link between physical and human activity systems;
- number of possible interpretations of a given social situation;
- subjectivity of the researcher;
- distinction between fact and value is itself not value-free;
- possibility of discovering other characteristics not identified by the pre-defined construct used to measure the phenomena.

In a review of the MIS literature, Orlikowski & Baroudi (1991) found that positivism was by far the most dominant IS research epistemology (96.8% of cases), with surveys and laboratory experiments being the primary methods used to promote this paradigm. The current research is also founded on the underlying philosophy of positivism.

3.2.1.1.2 Interpretivism as the Research Epistemology

The ontological beliefs of the interpretivist are in direct conflict with those of the positivist. Unlike positivist researchers who believe that objective social reality is there to be 'discovered', interpretivists believe that social reality can only be interpreted. To the interpretivist, social systems are not independent of humans but are given meaning by them and thus are subjective in nature. They argue that the phenomena to be observed cannot be measured by objective means but instead through '*sensation, reflection or intuition*' (Easterby-Smith *et al.*, 1991).

The assumptions made by this paradigm are (*c.f.*, Easterby-Smith *et al.*, 1991; Orlikowski & Baroudi, 1991):

- social systems can only be interpreted; there is no objective reality;
- people assign their own subjective meanings to the phenomena in their environment;
- the researcher attempts to analyse the phenomena through the eyes of the stakeholders in order to explain why people have different views;
- social reality is not measured by a set of pre-defined constructs and instruments but instead constructs are derived from the field of study;
- researchers themselves are not independent of the phenomenon they are studying.

Interpretivists argue that adopting this type of paradigm leads to research that provides a greater understanding of the phenomena within the given situation, by looking at these phenomena over a period of time, incorporating people's viewpoints into the analysis, and adjusting to new issues and ideas as they emerge. Unlike the positivist paradigm, it does not primarily seek to generalise this understanding to other environments.

There are two distinct types of methodologies used by researchers adopting this paradigm (Orlikowski & Baroudi 1991): (1) reality is interpreted through the eyes of the stakeholders, using their words and categories to provide possible reasons for the phenomena, or (2) reality is interpreted through the eyes of researcher, using the researcher's personal constructs of the world. The research setting appropriate to generating valid interpretative knowledge are field studies, as these examine humans within their social settings.

The interpretative research philosophy has been criticised (*e.g.*, Burrell & Morgan, 1979; Fay, 1987). Criticisms include:

- data collection involves a great deal of time and resources;
- analysis and interpretation is not easy;
- it fails to examine the conditions which give rise to certain meanings and experiences which could help in the interpretation;
- interpretivist techniques fail to identify unplanned effects resulting from an action; these unplanned side effects may shape social reality;

- it fails to address conflicts and contradictions which may be endemic to social systems,
- it fails to deal with situations where participants accounts of action and intentions are inconsistent with their actual behaviour, and hence it cannot discern or analyse the means by which actors may be blinkered in their self-understanding and limited in their social interactions;

3.2.2 The Research Design

The research design is 'the blueprint for the collection, measurement and analysis of data' (Gable, 1994: p116). It is influenced by the researcher's epistemological viewpoint, the objective of the research and the resources available.

In choosing a research design it is necessary for the researcher to be aware of their own strengths, weaknesses and bias. It is also important that the researcher has an understanding of the political and ethical issues surrounding the different methods of research (*c.f.*, §3.2.3) so the research is productive. Previous methodologies used to study the phenomena in question together with the research context, need to be identified to ensure the research to be undertaken will indeed contribute to knowledge

Sekaran (1991: p 93) identifies six elements of research design (*c.f.*, Table 3.1), each of which will be briefly discussed in turn.

<i>Purpose of Study</i>	<i>Study setting</i>	<i>Type of Investigation</i>	<i>Researcher interference</i>	<i>Unit of analysis</i>	<i>Time Horizon</i>
Exploratory (Theory building)	Lab experiments Field experiments Field studies	Correlational Causal	Observer Participant	Country Society Organisation Department Group Individual	Longitudinal Cross-sectional Process traces ¹³
Explanatory (Theory testing)					

Table 3.1 - The elements of research design

3.2.2.1 The Purpose of the Study

Depending on the objective of the research (*i.e.*, theory generating and/or theory testing), the purpose of the study will be exploratory and/or explanatory (hypo-deductive) in nature. If the objective of the research is theory generating, then the study will be exploratory in nature whereas if the objective is theory testing, the study will be explanatory in nature.

¹³ Continuous data collection over a single discrete event not lasting more than a few hours (*c.f.*, Orlikowski & Baroudi, 1991. p 4).

The current research is both exploratory and explanatory in nature in that a theory was generated through the exploration of the current ISP literature (*i.e.*, that the absence of feedback may be impeding ISP success) and this theory was tested through the collection of data.

3.2.2.2 *Study Setting*

There are primarily three study settings (Sekaran, 1991): *laboratory experiment* in which the researcher is in complete control of all variables in an *artificial* situation; *field experiment* in which the researcher is in complete control of all variables in a *real life* situation, and *field study* in which the researcher has no control over the variables whatsoever in a *real life* situation.

The positivist will seek to use laboratory experiments or field experiments (through the use of control groups) rather than field study, to examine the variables of interest. Where this is not possible they will instead seek to measure objectively these variables in their natural setting through more quantitative techniques that produce data that can be mathematically/statistically analysed. The interpretivist will always use field studies to examine the phenomena of interest and apply more qualitative techniques to collect and analyse the data.

This research, as with the majority of IS research to-date, uses the field study setting.

3.2.2.3 *Type of Investigation*

Sekaran (1991) identifies two types of study: *correlational* which identifies important factors (*i.e.*, independent variables) *associated with* the problem (*i.e.*, dependent variable), and *causal* which identifies what the problem is actually caused by.

Correlational studies are conducted in the phenomena's nature setting (*i.e.*, field studies) where there is no control over the variables of interest. Causal studies are conducted in an environment which the researcher has control over (*i.e.*, laboratory or field experiments). Therefore the current research is classified as a correlational not a causal study.

3.2.2.4 *Extent of Researcher interference*

The extent of researcher interference with the study will be determined by the type of investigation that is to be carried out. Causal studies imply that the researcher actively controls the environment in order to study the phenomena of interest, whereas correlational studies imply that the researcher is an observer.

The one exception in the case of correlational studies is when the researcher uses the action research method to test a theory. Action research involves participation and active problem solving by the researcher in an attempt to *influence* (*n.b.*, not control as in the case of causal studies) the phenomena of interest.

With respect to the current study, the researcher had minimal direct interference with the phenomena of interest.

3.2.2.5 Unit of analysis

The unit of analysis refers to the level at which data is aggregated. The current research aggregates the data at both the level of the organisation, when looking at the issues of feedback and its relationship with ISP success, and at the level of the individual, when comparing responses between different ISP stakeholder groups within each organisation.

3.2.2.6 Time Horizon

Sekaran (1991) identifies two types of research time horizons: cross-sectional and longitudinal. Orlikowski & Baroudi (1991) splits cross-sectional into one-shot and multiple time periods and includes an additional time horizon, the process trace.

Cross-sectional involves the gathering of data at one particular point in time (*i.e.*, one-shot) or at several different points in time over a period (*i.e.*, multiple time periods). Longitudinal studies take place over a period of time but, unlike multiple time period cross-sectional studies, data is gathered continuously over an uninterrupted time period. Process traces are similar to longitudinal studies except they take place over a single discrete event which lasts a short length of time (*e.g.*, meeting). The current research, was one-shot cross-sectional in nature.

3.2.3 Research Methods

In an attempt to make some sense of the different research methods discussed in the literature and in order to provide some structure to the preceding discussion, a framework is proposed in Table 3.2.

The research design, the cost associated with the research and the current state of knowledge of the topic, will determine what data is needed, the method of data collection, the data collection technique and how the data should be subsequently analysed. The process of collection and analysis constitutes the research methodology. Examples of the type of data that may be collected, the different methods of data collection, and the types of data collection and analysis techniques available to collect that data, are identified in Table 3.2.

Quantitative data and the techniques used to collect it (*e.g.*, questionnaires) are predominantly associated with the positivist paradigm and the testing of hypotheses (Kirk & Miller, 1986), while qualitative data and the associated techniques (*e.g.*, interviews) are predominantly associated with the interpretivist paradigm. However, quantitative methods can be used to study human perceptions as can qualitative methods be used to analyse 'facts'

<i>Method</i>	<i>Type of Data Collected</i>	<i>Data Collection Technique</i>	<i>Data Analysis Technique</i>
Action Research	Qualitative	Primary Source:	Mathematical/statistical:
Case Study	Quantitative	Direct observation	Hypothesis testing
Survey		Participative observation	Theorem proof
Ethnomethods ¹⁴	Factual (objective)	Interviews	Time series analysis
Comparative	Opinion/Speculative (subjective)	Questionnaires	Non-mathematical:
Forecasting		Diary techniques	Content analysis
Futures Research		Focus groups	Grounded theory
Simulation	Past (historical)	Secondary Source:	Pattern matching
Game/role playing	Present	Documentation	Argumentative
	Future	Archival records	Reflective
		Physical artefacts	Critical incident
		Official statistics	Repertory grid
			Projective
			Protocol
			Cognitive mapping

Table 3.2 - A summary of research methods

Given the diverse nature of the field of information systems, some argue for an eclectic approach to IS research (*e.g.*, Benbasat *et al.*, 1987; Kaplan & Duchon, 1988; Banville & Landry, 1989, Orlikowski & Baroudi, 1991; Gable, 1994). It is argued that positivism, the predominant IS research methodology to-date (Orlikowski & Baroudi, 1991), cannot on its own explain the complex, ambiguous and unstable nature of organisational systems (Daft & Wiginton, 1979; Benbasat *et al.*, 1987; Kaplan & Duchon, 1988). Combining both qualitative and quantitative methods in order to triangulate result, (*i.e.*, validate) have improved the quality of research by addressing each others weaknesses (Cook & Reichardt, 1979; Jick, 1983; Kaplan & Duchon, 1988; Klein *et al.*, 1990; Orlikowski & Baroudi, 1991).

Qualitative research was used during the early stages of this research to assess whether the ISP problems/issues identified from private sector literature were applicable to public sector organisations. By applying the private sector research instrument to a public sector setting, the external validity of the problems/issues which had predominately been identified via quantitative research methods, were tested using a qualitative approach (*i.e.*, triangulation).

3.2.4 Summary

The main objective of the current research was to establish the existence of feedback within organisations and if it exists, what relationship it has with ISP success. This primary objective therefore requires the gathering of data from a number of organisations (since no data on this exists at present) in order to identify current practice and to test the relationship hypothesised. The most appropriate method of collecting data from a number of organisation, given the resources available, was via a postal-survey, the results of which were statistically analysed.

¹⁴ Concerned with experiments of the 'what if' variety (*e.g.*, sensitivity analysis).

One of the major limitations of the research is the sampling frame used, although this type of sampling is by no means unusual in the social sciences (Mitchell, 1985). General difficulties in gathering a comprehensive list of the population together with low response rates often quoted for postal surveys (which could lead to unrepresentativeness and therefore problems of generalisability even if a random sample is taken (Wallace & Mellor, 1988)), led to the decision to use the sampling frame identified in this research. While it is recognised that this may introduce bias, making it difficult to generalise the results to the population as a whole, it is argued that due to the current lack of empirical data on the topic of feedback, that the research still provides a useful foundation for future research.

4. The Research Models

As discussed already, the major aim of this research is ultimately to improve the ISP activity. It was argued in Chapter 2 that the lack of feedback on the ISP system within organisations could be impeding progress towards ISP success.

The chapter is divided into two main sections, the conceptualise and operationalise the two main models used in this research to investigate this hypothesis: a model of feedback (methodology) and a model of ISP success.

4.1 Feedback

This section discusses different aspects of feedback leading to the conceptualisation and operationalisation of a feedback model.

4.1.1 Types of Feedback

4.1.1.1 Feedback on the Activity vs Feedback on the Activities' Output

Two types of feedback were identified in §2.5.9: feedback on an activity (*i.e.*, how the output was derived, which in the context of this research refers to feedback on the ISP system), and feedback on the contents of the output of that activity (which in the context of this research refers to feedback on the contents of the IS plan). In other words, while *ISP system feedback* addresses the appropriateness of ISP activity, *IS plan feedback* ensures that the plan is kept up-to-date between planning cycles.

According to the definition of an ISP system adopted in this research, however, the IS plan (*i.e.*, the *output*) together with ISP *inputs, methods, process* and *implementation* are all dimensions of the ISP system. This implies that IS plan feedback is in fact a component of ISP system feedback. That is, information about the output (*i.e.*, the plan) together with information on the inputs, methods, process and implementation provide the *informational input* into the *ISP system feedback* activity.

In addition, and to adopt Beer's (1981: p 25) argument, ISP system feedback itself is part of the ISP system, 'the first principle of control is that the controller is part of the system under control [*i.e.*, ISP system feedback is itself part of the system]...The controller moreover grows with the system, and, if we look back through time, we see that the controller evolved with the system too'. This implies that information regarding how good the ISP system feedback (*c.f.*, §4.1.2.2) is, should itself be included in the *informational input* of the ISP system feedback to ensure that the feedback activity along with the rest of the ISP system functions and continues to function, effectively.

While IS plan feedback is a component of ISP system feedback, it is unlike the other dimensions of ISP system feedback in that the contents of the IS plan need to be kept up-to-date *between* planning cycle (in line with changes in the environment), whereas the other dimensions need only be updated *during* the next planning cycle.

Unforeseen changes in the environment which the organisation cannot control, may trigger updates to the contents of the plan. Changes to the remaining ISP dimensions, are controlled by the organisation and are triggered by an *internal* evaluation of the ISP system feedback activity.

This internal evaluation should be conducted immediately after the planning cycle so the ISP experience is still fresh in the minds of the evaluators. In addition, changes in the environment between planning cycles also need to be assessed at the beginning of the next planning cycle (*i.e.*, during the pre-planning stage) to ensure that the underlying assumptions of the ISP activity as well as the improvements suggested at the end of the last planning cycle, are still appropriate. Recommendations for improvements initiated by both evaluation activities (ante- and post-planning), should be fed into the next planning cycle in order to keep the ISP system up-to-date.

Due to the fundamental difference in feedback triggers between the output (*i.e.*, uncontrolled trigger) and the remaining dimensions of the ISP system (*i.e.*, controlled trigger), the dimension of IS plan feedback will be investigated in more detail.

IS Plan Feedback

Armstrong (1982), among others (*e.g.*, Driscoll, 1988), argues that in order to maintain commitment to the plan, a monitoring system which informs all key stakeholder and provides relevant, accurate and timely feedback, should be developed. If the output of the plan is not flexible enough to take into account unanticipated changes in the organisation and its environment, plans will soon become out of date (Atkinson, 1992; Earl, 1993).

Changes in an organisation's business and technological environments can render some IS (partially) obsolete (Earl, 1993). This may include: IS already implemented, those that are in the process of being implemented or those that are being developed (*i.e.*, at the project management stage) (*c.f.*, Figure 4.1). Without reviewing, resources may be wasted on both the ongoing development and maintenance of obsolete IS.

As new information comes to light, it should be used to update the plans not only through the planning cycle¹ (Dyson & Foster, 1983a) but also once the plans have been 'committed' to paper² (Galliers, 1987c). There should be clear procedures set for plan revision (Singleton *et al.*, 1988) so that the output of the plan can be flexible enough to react quickly to unanticipated changes both within and outside the organisation.

¹ Through the activity of feedforward rather than feedback (*c.f.*, §4.1.1.3).

² Through the activity of feedback.

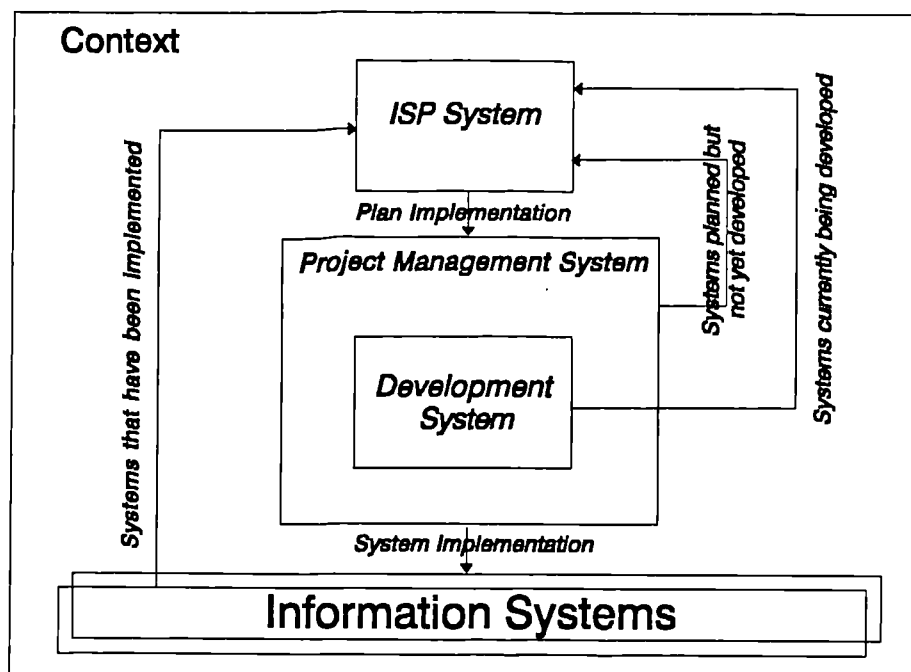


Figure 4.1 - Type of feedback on the IS plan

During planning cycles, there must be a procedure in place that monitors changes in the environment and triggers feedback on the IS plan. A way of assessing whether or not the IS are still appropriate given a change in the environment, is to establish the critical assumptions on which individual IS are based, which must be explicitly documented during the planning stage. If the environment changes, the assumptions on which individual IS are identified and developed may also change. Documenting the assumptions will therefore help to identify quickly those systems that are likely to have been affected by these changes.

Atkinson (1992) stresses that in order to keep the plan 'evergreen' between planning cycles it is essential to have 'a disciplined well-conceived maintenance process in place along with the commitment to ensure that it is adhered to'. Doing this will also pay dividends at the beginning of the next planning cycle as time and resources will not be spent refocusing on the task in hand. In particular, he states that 'during the planning cycle...[the organisation]...will be better positioned to factor the impact of IT into the business planning equation...to devote more...efforts to helping assess the IS implications of the business strategies and programs being formulated and to assist in dealing with them' (*ibid*: p 55).

Atkinson suggests that the 80/20 rule be applied to updating the plan, that is 20% effort can cope with 80% of situations likely to arise, thus keeping the plan sufficiently up-to-date to be useful between planning cycles. He argues that the plan can be kept sufficiently current by:

- using a methodology and support tools not only during the planning cycle but also between cycles to help with updating;
- clearly identifying persons responsible for updating the IS plan after the planning cycle;
- identifying new situations that might call for changes in direction;
- engaging other areas of the business in helping to keep the plan current.

The ISP literature provides some evidence that a few organisations do review their plans (Ball, 1982; Galliers, 1987a; Lederer & Sethi, 1988a). Wilson (1989) found that 65% of organisations in his study monitored their strategies periodically through performance reviews. Earl (1993) reports similar findings where 58% of the organisations in his study reviewed their IS plans periodically and a further 24% reviewed them on an ad-hoc basis. However, it is uncertain from these studies whether review is seen as an end in itself or a means to an ends (*i.e.*, as the first stage of improvement).

As already indicated, this research seeks to establish the extent to which feedback on the IS plan exists and the relationship it has with both ISP success and ISP system feedback.

4.1.1.2 Characteristics of Feedback

Feedback affects individuals by either motivating behaviour (*i.e.*, creating or generating energy for change) or directing behaviour (*i.e.*, informing the kinds of behaviour that will lead to a certain outcome or result). Table 4.1 summarises four kinds of motivating feedback and two kinds of directing feedback (Nadler, 1977).

	<i>Feedback Function</i>	<i>How the Mechanism Works</i>	<i>Necessary Conditions</i>
<i>Motivating Function</i>	Disconfirmation	Feedback motivates behaviour by providing information that presents inconsistent perceptions.	Data must be perceived as accurate. Conditions must be present to prevent defensive behaviour.
	Internal-reward expectancies	Feedback motivates behaviour by setting up expectations that behaviour will lead to feedback, which in itself generates positive feelings in the individual or group. In addition, it provides a standard against which goals can be set.	Level of behaviour to obtain favourable feedback must be attainable. Task must be challenging so that attainment is desirable. Feedback must include some comparison data as a standard. Conditions must be present to facilitate goal-setting.
	External-reward expectancies	Feedback motivates behaviour by setting up expectations that behaviour will lead to feedback which in turn will lead to the attainment of other valued rewards form the environment.	Level of behaviour to obtain rewards must be attainable. Instrumentality of feedback for rewards must be high. Rewards must be valued ones.
<i>Directing Function</i>	Cueing	Feedback calls attention to errors which can be corrected through known and established routines of behaviour.	Feedback must be specific. Correction routines must be clear and understood.
	Learning	Feedback calls attention to errors where correction behaviour has not yet been identified and thus must be discovered	Feedback should be on process as well as outcome variables. Feedback should include models of effective behaviour. Group or individual must have effective search routines.

Table 4.1 - Types of feedback (Nadler, 1977)

The focus of this research is on the directing nature of feedback rather than the motivational one (since the primary objective of this research is to seek ways of actually *improving* the ISP activity). Since the ISP system feedback is likely to identify errors where corrective behaviour has not been identified and must therefore be discovered, the learning function of feedback is more appropriate to this research than cueing (Nadler, 1977).

Feedback as a Political Activity

While *directing* feedback is the focus of this research, the absence of the motivation to improve ISP is likely to make directing feedback unsuccessful. The threatening nature of evaluation and subsequent feedback sets it apart from other collaborative activities within the organisation. Since feedback is a public event, the seeker may not only run the risk of losing creditability but may, in less tolerant organisational environments, even lose their job.

Feedback is an information intensive activity. Information on individual attitudes/perceptions, group performance, and/or relationships are all sensitive but important to the successful implementation of feedback. However, information is power (Pettigrew, 1972); to make public what few know or to give away privileged information, is to give away power. Feedback may also upset the balance of power through the changes it recommends and, as a consequence, is likely to be resisted if the organisation does not support and encourage the motivation to change.

Feedback is therefore a political activity as well as a technical one. It must be managed proactively to help ensure appropriate motivations exist to implement the recommendations (*e.g.*, communicating to individuals what and why data are being collected and what is to be done with that data).

The political aspirations of individuals are part of the organisation's culture. Together with the organisation's structure, these provide the organisational context in which all the organisation's systems must function. Without the appropriate structure and culture in place, the feedback activity is unlikely to be successful.

Feedback must therefore be actively supported and encouraged by the organisation's culture and structure in order to provide a conducive directing feedback environment (*e.g.*, tying the feedback activity into the organisation's incentive system (Ilgen *et al.*, 1979)). Such motivational mechanisms are discussed in depth within the organisational behaviour literature (*e.g.*, Handy, 1985).

Given the focus on *directional* rather than *motivational* feedback, factors relating to the motivational aspect of feedback are not addressed in detail by this research. However, since the learning function of feedback is the focus of this research, organisations will be assessed to establish whether a supportive learning climate exists.

It is therefore argued not only that ISP is likely to be more successful in organisations that exhibit feedback than in those that do not, but also that ISP is likely to be more successful in organisations that exhibit both feedback and learning environments than in those that exhibit neither or only one of these. Continuous improvement requires a commitment to learning, in the absence of learning, organisations simply repeat old practices (Garvin, 1993) and eventually die (Garrett, 1987). If learning is to occur, then the organisation must encourage and support organisational learning. While feedback stimulates organisational learning (Locke & Latham, 1990), for directing feedback to be successful, the organisation must exhibit some form of learning already.

The operationalisation of a learning environment measurement and its relationship with feedback will be discussed in more detail in §4.1.2.2.2.

4.1.1.3 Feedforward - A Related Concept

Associated with the idea of feedback is that of feedforward. Wilson & Chua (1993: p 40) define feedforward control as ‘a monitoring device for the continual scanning of both the environment and the transformation process of the system’. They recognise that before a plan has been fully implemented or the objective(s) of planning achieved, circumstances are likely to have changed.

The major difference between feedback and feedforward is that feedforward *proactively* seeks to avoid deviations between actual and desired outcomes whereas feedback *reactively* compares the output achieved with the desired output and takes whatever corrective action is necessary if a deviation exists.

Indeed, it is argued that if strategy *formation* (as oppose to formulation) takes place within organisations, feedforward (rather than feedback) becomes a necessity, otherwise (controlled³) strategy evolution will not occur.

Wilson & Chua (1993) suggest that the most effective approach to control comes from using both feedback and feedforward. While feedback is the major focus of this research, feedforward will be addressed briefly by the inclusion of two questions in the survey, one relating to the presence of feedforward on the ISP system (*c.f.*, Appendix A: Question 46D), the other to feedforward on the IS plan (*c.f.*, Appendix A: Question 52D).

4.1.2 A Conceptual Model of Feedback

Feedback, while being a dimension of the ISP system, is an activity in its own right (*c.f.*, §2.5.7, §2.5.9). In other words, it may be conceptualised as a sub-system of the ISP system, itself comprising the dimensions of context, input, method, process, output, implementation and feedback (on the feedback system) (*c.f.*, Figure 4.2).

³ Controlled vs uncontrolled strategy (*c.f.*, §2.4.1.5).

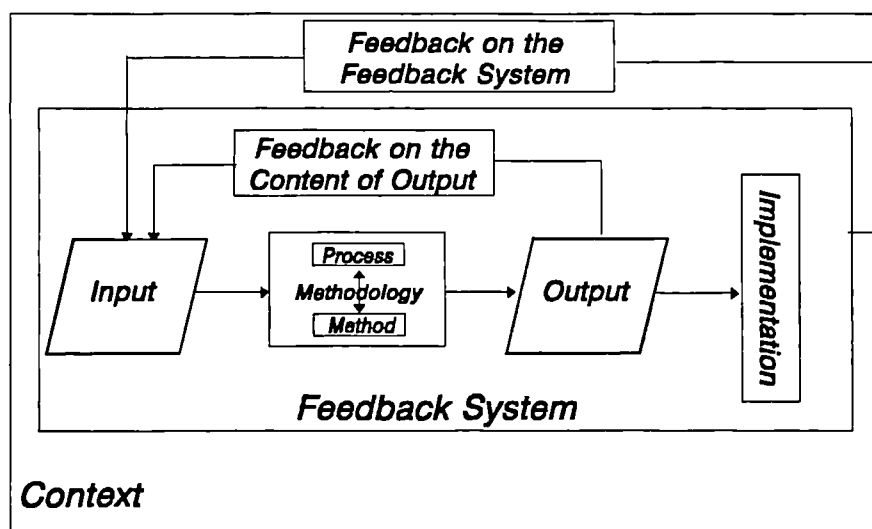


Figure 4.2 - A conceptual model of feedback: a systems perspective

Unlike the ISP system, however, implementation is included within the feedback system boundary since implementing recommendations made by the feedback system should be part of the feedback cycle. That is, the implementation of the recommendations regarding improvements to the ISP system, should be part of the feedback activity.

Feedback on the feedback system identifies problems with the feedback activity itself (*i.e.*, methodology and/or content of feedback) and should be evaluated alongside the other ISP system dimensions, providing the informational input into the feedback activity.

Operationalising this multidimensional conceptual model of feedback is regarded as too detailed given the lack of current knowledge regarding the existence of ISP feedback in general. Developing a detailed research instrument to measure each of the seven feedback dimensions (*i.e.*, context, input, process, method, output, implementation and feedback) may be inappropriate if feedback does not exist in practice.

This research aims, instead, to measure the *existence* of feedback. Conceptualising the feedback activity at its more simpler level of methodology (*i.e.*, method and process) and content (*i.e.*, context, input and output) as shown in Figure 2.4 (*c.f.*, Chapter 2), allows a less complex model of feedback existence to be identified and conceptualised. Existence of feedback is measured by determining the degree to which organisations have a feedback *methodology* in place.

While the content of feedback, and in particular the contextual and *informational* inputs of feedback, are tentatively investigated, the focus of this research is on whether organisations exhibit a feedback methodology.

The methodology of feedback comprises process and method dimensions⁴. The process of feedback relates not only to the individual steps taken (*i.e.*, the decision making stages) but also how those steps are managed (*e.g.*, how conflict is dealt with), while the method of feedback relates to the tools used to gather (*e.g.*, questionnaire), analyse (*i.e.*, simple descriptive statistics), and present (*i.e.*, report) feedback information.

If the informational input is inadequately analysed by insufficient or faulty information processing capabilities (*i.e.*, a method-related problem), or the collection process creates suspicion and anxiety (*i.e.*, a process management-related problem), then feedback is unlikely to be successful (Nadler, 1977).

The primary objective of this research is to establish whether the ISP system feedback exists and what relationship it has with ISP success. As a consequence, the researcher argues that, at this stage in the research, it is sufficient to study the existence of feedback methodology as a whole rather than operationalising both method and process components. If feedback is shown to exist, future research could investigate these individual components in more detail. The next section identifies a conceptual model for the feedback methodology.

4.1.2.1 Feedback Methodology (Existence): The Conceptual and Operational Models

Feedback is the mechanism by which *controlled* improvement can occur. Richardson (1991) provides an in-depth discussion of how concepts from different disciplines over many centuries have come together to form two main streams of feedback thinking in the social science area: the *servo-mechanisms* and *cybernetics* approaches to feedback.

In essence, a servo-mechanism is 'a machine controlled by the consequences of its own behaviour' (Annett, 1969), such machines refer to electronic and mechanical devices. The servo-mechanism approach regards a system as being closed in that any interaction effecting the output of a system are only caused by the internal workings of that system. The most important feature in the system is the design of the feedback loop, how the output of the system is translated into an appropriate transformation rule in order to control the input and thus the internal workings in order to produce the desired output. In a servo-mechanism, the dynamic behaviour of the system is represented by formal mathematical models. Feedback is seen as an intrinsic part of the system itself not mechanisms of *external* system control, and is represented as a series of differential equations.

Wiener (1948) adapted the theory of servo-mechanisms to the study of living organisms to create the theory of cybernetics. Cybernetics describes the laws that govern the passing of information and control operations of a dynamic situation. The cybernetic approach regards a system as being open⁵,

⁴ Implementation, in the case of the feedback system, is part of the underlying feedback process.

⁵ An open system exchanges material or information with its environment, whereas a closed system does not.

freely interacting with its environment. Inputs to the system are regarded as variable and random unlike that of a servo-mechanistic approach with its emphasis on inputs generated by the system regulator itself. Traditional cybernetics regard organisms as black boxes where only the inputs and outputs can be observed but not the functional relationship between the inputs and the output. This type of system is viewed to be essentially deterministic, controlled by external goal setting and self-regulation.

Whereas servo-mechanisms focus on endogenous dynamic behaviour generated by positive and negative feedback said to exist naturally in all complex systems, cybernetics focuses on both exogenous and endogenous homeostatic⁶ mechanisms, stability, and the use of feedback for controlling stochastically varying system inputs.

Both servo-mechanism and cybernetic feedback concepts have been used in the social sciences. In adopting the servo-mechanism approach to feedback, social scientists have used differential equations to represent feedback (*e.g.*, Forrester, 1961). Social scientists adopting the cybernetics approach, however, describe feedback using verbal analysis rather than mathematical models.

Beer first applied the theory of cybernetics to the area of management (*c.f.*, Beer, 1959), arguing that while 'cybernetics is the science of control, management is the profession of control' (Beer, 1981: p 17). While he acknowledges that organisations are not 'alive' he argues that they do behave like living organisations, adapting themselves to economic, commercial, social and political surroundings (*ibid*). In addition, he recognises the impact of human interaction with the system and argues that organisations should not be regarded as merely black boxes but instead the internal 'components' can and should be analysed in order to provide information that can be used to improve the system under investigation. Beer's viewpoint, in effect, falls between the traditional cybernetic and servo-mechanism camps (Richardson, 1991).

Since organisations are very complex open systems, the cybernetic view of Beer (defined as organisational cybernetics by Jackson, 1986) seems to be the more appropriate model on which to base the conceptual model of the feedback methodology. It is not the aim of this study to find complex mathematical formulae to model elements of planning and their interaction, but instead, to investigate the extent to which feedback exist through more qualitative means.

Figure 4.3 shows an adapted version of the conceptual model of feedback (methodology) proposed by Beer (1981: p 31) which comprises seven elements: effectors (*i.e.*, sensors or transducers), stream of afferent impulses⁷, sensory plate, anastomotic reticulum⁸, motor plate, stream of efferent impulses⁹ and effectors (*i.e.*, sensors or transducers).

⁶ Homeostasis defines the process whereby key variables are maintained in a state of equilibrium even when there are environmental disturbances.

⁷ Conditions calling for change directed *towards* the appropriate decision making group.

⁸ A switching network which is, in effect, the decision making process.

⁹ Decision taken by the decision making group.

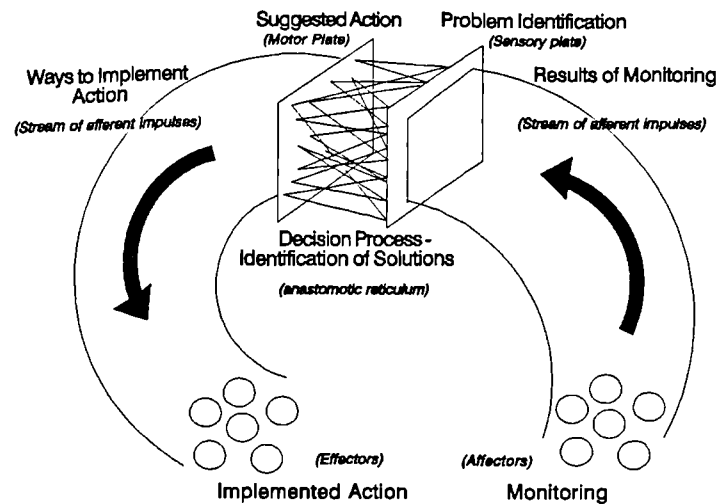


Figure 4.3 - A conceptual model of the feedback methodology (existence)

The affectors register and translate stimulus¹⁰ in the internal or external environments into something meaningful which is carried by a stream of afferent pulses to the sensorium (*i.e.*, the anastomotic reticulum, sensory and motor plates) to act upon. The sensory plate classifies stimuli based on which transducer has been stimulated and a decision making process (*i.e.*, anastomotic reticulum) is initiated where potential solutions are developed and a particular course of action decided upon. The chosen course of action is translated by the motor plate into the necessary courses of action which are in turn conveyed, via a stream of efferent impulses, to the effectors which produce the necessary change.

This conceptual model of feedback (methodology) is supported by the organisational development (OD) literature as well. Kolb and Frohman (1970) identify a five staged model of OD similar to that of Beer's feedback model, comprising scouting/entry (affectors/stream of afferent pulses), diagnosis and planning the intervention (sensorium), action (stream of efferent pulses, effectors), and finally evaluation/termination (assessing interventions). The latter is not identified specifically in Beer's model but is implied since evaluation of the implemented action happens during the next feedback cycle.

The conceptual model identified in Figure 4.3, can be broken down into three major activities: monitoring, reviewing and updating.

Monitoring refers to the activity that initiates feedback (*i.e.*, affectors and stream of afferent pulses in Figure 4.3). The trigger may be changes in the internal and/or external environment (*i.e.* uncontrolled¹¹ trigger) such as changes in the organisation's and/or competitors' capabilities (Armstrong, 1982: p 201), and/or the conscious decision to evaluate the object of interest (*i.e.*, controlled¹² trigger). **Reviewing** refers to the discussion and subsequent recommendations made about

¹⁰ An interference which affects the system's operation in some way, being neither so mild as to be significant to the operation nor so drastic as to destroy the system itself (Beer, 1981: p 26).

¹¹ Uncontrolled by the organisation since they do not know when changes will occur.

¹² Controlled by the organisation since they decide when to instigate monitoring (*i.e.*, evaluation).

the issues identified (*i.e.*, the sensory plate, anastomotic reticulum and motor plate in Figure 4.3) by the monitoring activity. Finally, **updating** refers to the activity that ensures any recommendations are implemented (*i.e.*, stream of efferent pulses and the effectors in Figure 4.3) during the next planning cycle. This may involve changing the system's objectives, amending the predictive model of the process to be controlled, changing the system's inputs, and/or changing the nature of the process itself (Wilson & Chua, 1993: p 47).

The extent to which these three main activities are present within organisations will give an indication of the amount of feedback existence. Each of these activities may be either formal (*i.e.*, explicit procedures put in place by the organisation to carry out the particular activity) and/or informal (*i.e.*, procedures that have not been formalised) in nature.

The conceptual model of the feedback methodology was operationalised by asking respondents the degree to which they agreed/disagreed (using a five point Likert scale) with the following statements:

With respect to the IS plan, there are (in)formal processes in place which:

1. monitor changes in the internal/external environment that may affect the IS planned or already under development (*i.e.*, **Monitoring** the contents of the IS plan);
2. allow time to discuss and make recommendations about the opportunities/threats arising from these environmental changes which affect the IS planned or already under development (*i.e.*, **Reviewing** the contents of the IS plan);
3. ensure that the plan and development schedule are updated in response to these changes in the environment (*i.e.*, **Updating** the contents of the IS plan);

With respect to the ISP process¹³, there are (in)formal processes in place which:

1. identify strengths and weaknesses of the planning process (*i.e.*, **Monitoring** the ISP process);
2. allow time to discuss and make recommendations about the weaknesses of the planning process (*i.e.*, **Reviewing** the ISP process);
3. ensure that the planning process is updated in line with these recommendations (*i.e.*, **Updating** the ISP process).

¹³ ISP process rather than ISP system was used in the survey since the former terminology is more generally understood by the practitioner than the later.

4.1.2.2 The Content of Feedback

The context, input and output dimensions represents the *content* of feedback. *Inputs* refer to the resources used during the feedback activity (*i.e.*, information, finance, human resources and technology). *Outputs* refer to the resultant decisions (*e.g.*, allocate resources to improve management involvement in ISP, collect new types of information to input into feedback¹⁴). *Context* refers to environmental factors which may have an impact on the feedback activity and its subsequent success (*e.g.*, learning environment). Controllable contextual factors may be regarded as inputs and/or outputs of the feedback system (*c.f.*, §2.5.2) depending on whether they influence (*i.e.*, inputs) or they are influenced by (*i.e.*, outputs) the feedback activity.

The objective of the feedback activity should be to improve the ISP activity, that is to make it more successful. Information is the fundamental cornerstone of feedback (Nadler, 1977), providing the interface between the ISP and feedback activities. These *informational inputs* to the feedback activity should not only include information on those ISP inputs, process, method, outputs¹⁵ and implementation factors that influence ISP success but also information on the feedback activity itself (*e.g.*, are adequate resources available for feedback?; Is information being adequately gather, analysed and presented?).

This research seeks to identify the factors that have an influence on ISP success and should therefore be monitored by feedback activity. Details concerning these ISP factors should provide the informational inputs to the feedback activity thus providing the foundation on which issues are uncovered and potential solutions can be identified to improve ISP.

While informational input is but one component of the input dimension, identification of the ISP factors that need to be monitored by the feedback activity, will not only provide a springboard for further research, but may also be used as the foundation on which organisations can build their own tailored evaluation (monitoring) tools.

While informational inputs will be the main focus with respect to the *content* component of feedback, a contextual factor argued to have an effect on the success of feedback, namely the presence of a learning environment, will also be addressed. It is argued that organisations exhibiting both learning and feedback are more likely to be successful at ISP than those organisations where neither or only one of these conditions exist (*c.f.*, §4.1.2.2.2). In addition, other contextual factors related to the presence of feedback will be identified to provide a basis for future research.

¹⁴ The former represents updates to ISP system whereas the latter represents updates to the ISP system feedback.

¹⁵ IS plan outputs refers to the type of information referred to in the IS plan (*i.e.*, structure) rather than the actual IS identified since this is covered by IS plan feedback.

The usefulness of such information as a change tool, however, is also reliant on how the political and other cultural processes within the organisation are managed. In order to encourage the necessary trust and honest sharing of information, it is imperative that the feedback activity is managed (Nadler, 1977). This can be done through the feedback methodology (*i.e.*, process management).

4.1.2.2.1 The Informational Inputs of Feedback

Quality of the informational inputs of feedback, will influence the effectiveness of that feedback. Information quality has been measured in terms of its relevance, accuracy completeness, conciseness, presentation and timeliness (Nadler, 1977: p 12; O'Brien, 1994: p 310). If one or more of these aspects of quality are not adequately addressed, the resultant recommendations may not be appropriate.

Whereas accuracy, completeness, conciseness, timeliness and style of presentation affects how good the collected information is, relevancy focuses on what type of information needs be collected for the task in question. While information may be accurate, complete, concise, timely and presented well, if the information is irrelevant it is useless.

This research seeks to establish some *relevant* informational inputs of feedback by identifying which ISP factors are related to ISP success. It does not, however, seek to establish the other aspects of quality mentioned above. While these other aspects should be addressed by an organisation wishing to undertake feedback, attempting to measure such attributes within the context of the current research would be difficult, particularly if no formal feedback activity exists.

Potential relevant factors have been identified from previous problems/issues/success factor research in the areas of ISP and business planning. Factors showing a significant relationship (either positive or negative) with ISP success are those that should have information collected on them during feedback in order to determine whether they can be improved. Improving these ISP factors should therefore improve ISP success.

4.1.2.2.1.1 The Contingent Nature of ISP

There can be little doubt that context influences the success of any organisational activities. Handy (1985: p 15) identifies several contextual factors influencing the organisation's ultimate effectiveness including an individual's ability and motivation to work, economic, physical and technological environmental factors, style of leadership, group relations and the systems and structures in place to support the workings of the organisation (*e.g.*, reward system, power structure).

Lorange (1982: p 36) argues, among others (*e.g.*, Galbraith, 1973; Lindsey & Rue, 1980; Hax & Majluf, 1988; Kukalis, 1991), that because every organisation differs in some degree from every other, each (formal) strategic planning system should be tailored to fit the 'unique characteristics of the company'. Ramanujam *et al.* (1986) support this by saying that systems should be tailored not only to the particular purposes of planning but also to the organisational context.

Within the field of ISP in particular, researchers have also stressed the contingent¹⁶ nature of planning (*e.g.*, Kay *et al.*, 1980; Bowman *et al.*, 1983; McFarlan *et al.*, 1983b; Pyburn, 1983; Sullivan, 1985; Raghunathan & Raghunathan, 1990; Waema & Walsham, 1990; Galliers, 1991a; Premkumar & King, 1994a). Boynton & Zmud (1987) comment that the 'relationship between the application of IT resources and the management of such resources clearly suggest that ISP should be contingent upon an organization's overall environment'.

Studies into the contingent nature of ISP have generally taken the form of case studies in a small number of organisations (*e.g.*, Pyburn, 1983) thereby greatly limiting the generalisability of the results. The few large-scale empirical studies there have been conducted, focus on only a small set of organisational factors (*e.g.*, Premkumar, 1989; Raghunathan & Raghunathan, 1990), and provide evidence to suggest that ISP approaches must be adapted to fit with the characteristics of the organisation (Cash *et al.*, 1983; Sullivan, 1985).

There is no one best way to do ISP (McLean & Soden, 1977; Holloway & King, 1979; Goodhue *et al.*, 1988; Sullivan, 1988; Earl, 1989; Barlow, 1990; Ward *et al.*, 1990). As a consequence, Venkatraman (1985/1986) suggests the development of any research framework must reflect a contingency or situational perspective. Such a viewpoint would mean that feedback too should be regarded as contingent in nature.

Notwithstanding, there is evidence to suggest that there are some ISP factors such as management commitment and involvement (*c.f.*, Ward *et al.*, 1990: p 119) which have been shown to be important to ISP success independent of organisational type (*e.g.*, Galliers, 1987a; Lederer & Mendelow, 1988a; Ugboro, 1991). Identifying such generic factors are necessary since 'without some commonality between [organisations], the development of theory would be impossible and thus planning practice could never advance beyond an art' (Pyburn, 1981).

It is generic factors of ISP success the current research seeks to identify. Organisations can use these as a foundation on which to build their own tailored made evaluation (monitoring) tool. The dimensions of the ISP system model (*c.f.*, §2.5.10) can be used by organisations to help identify additional ISP success factors appropriate in their own context.

¹⁶ Contingency theory states that there is no single best way to achieve the necessary fit among different organisational factors and the organisational system under investigation.

It should be noted that it is not the aim of this research to verify the systems model which is already well accepted in the area of social science, but instead the research seeks to use the model as a classification tool in order to provide more structure not only to the research but to an organisation's exploration of relevant informational inputs to the feedback activity.

4.1.2.2.1.2 *The ISP Factors*

Literature from both the business planning and ISP areas has been reviewed to identify factors that may influence ISP success. Given the extent of the review and the number of factors identified, justification for each factor is not provided here. Instead the researcher directs the reader to Appendix A which provides a summary of all the factors identified from the literature. The operationalisation of each factor has meant some compromise in terms of the terminology used by different authors. The researcher is aware of potential problems in terms of interpretation of a factor. While semantics is a potential problem across all social science studies, this has been minimised by single-researcher categorisation (*i.e.*, interpretation and representation was carried out by one researcher only) and careful consideration of each factor within the context of the study in which it was referenced.

In addition, Appendix A provides tentative categorisation of each factor with respect to the ISP system dimension it may be classified under together with the measurement scale used to measure it. Contextual factors have been classified as uncontrollable, partially controllable or input/output in the case of controllable factors (*c.f.*, §2.5.2). While both partially controllable and uncontrollable contextual factors may also be regarded as inputs/outputs to the ISP system, they are difficult or impossible to change in the short term (*i.e.*, between planning cycles). Since resources are normally limited, organisations should focus on improving those factors which are totally under the control of the ISP system.

Categorisation of the items in general has not been easy since some factors could arguably be placed under more than one dimension. This may be the result of some factors representing *interactions* between dimensions rather than one particular dimension, that is, these factors may be regarded as the 'glue' that binds the ISP system together, making its operation more than a sum of its parts.

While the researcher does not claim the list to be comprehensive in its coverage of factors that may influence the success of ISP system, it is believed the factors identified provide a good basis to establish some generic success factors for ISP. The ISP success model developed in this thesis (*c.f.*, §4.2.6.5) will be used to identify what these factors are.

The rest of the section provides a summary of the ISP factors considered by this research and the structure of the research instrument. The research instrument was divided into three parts (*c.f.*, Appendix B):

1. general information about the respondents, their organisation and its internal/external business and IT/IS environments;
2. details about the ISP activity itself, and
3. assessment of ISP success.

While parts one and two of the research instrument are discussed in more detail below, part three, the assessment of ISP success, is discussed separately in §4.2.

Part One

Part one of the research instrument is divided into six sections and identifies, primarily, those contextual factors regarded as either partially controllable or uncontrollable by the ISP system in the short to medium term. These sections are: personal respondent details; organisational details; the internal IS/IT environment; the general ISP environment; the external organisational/IT environment, and the internal organisational environment.

Section one provides background information on the respondent while *section two* provides general information on their organisation, (*i.e.*, its size, structure, industry sector and primary activity in that sector).

Section three provides details on the type of IS/IT environment that exists within the organisation (*i.e.*, IT spend, importance of IS/IT to the organisation, focus of IS/IT usage (*c.f.*, McFarlan, 1984), structure of IS function (*c.f.*, Hodgkinson, 1991), status of IS executive) including an assessment of the organisation's information politics (*c.f.*, Davenport *et al.*, 1992) thus somewhat satisfying calls by researchers for the more political aspects of planning to be taken into consideration (*e.g.*, Mumford & Pettigrew, 1975; Peattie, 1993).

Davenport *et al.* (1992) identify five models of information politics based on a study of the information management approaches in more than 25 organisations (*c.f.*, Table 4.2). Evidence suggests the use of IT is limited by the organisational members' resistance to the sharing of information. They say that 'political behaviour regarding information should be viewed not as irrational or inappropriate, but as a normal response to certain organisational situations' (*ibid*: p 54).

An organisation may exhibit one or more of these information management environments. In some situations one environment will predominate while in others the existence of different environments will be a source of conflict. Davenport *et al.* stress that maintaining multiple models of information management within an organisation 'is confusing and consumes scarce resource' and suggest that 'the first step in managing information more effectively and realistically is explicitly recognising these existing models and then choosing a single desired state' (*ibid*: p 55).

<i>Technocratic Utopianism</i>	A heavily technical approach to information management stressing categorisation and modelling of an organisation's full information assets, with heavy reliance on emerging technologies.
<i>Anarchy</i>	The absence of any overall information management policy, leaving individuals to obtain and manage their own information.
<i>Feudalism</i>	The management of information by individual business units or functions, which define their own information needs and report only limited information to the overall corporation.
<i>Monarchy</i>	The definition of information categories and reporting structures by the firm's leaders, who may or may not share the information willingly after collecting it.
<i>Federalism</i>	An approach to information management based on consensus and negotiation on the organisation's key information elements and reporting structures.

Table 4.2 - Model of information politics (Davenport et al., 1992: p 56)

Since information and its associated quality is one of the primary inputs to and outputs from the ISP activity, the political environment of an organisation may have a significant impact on the ISP system. Davenport *et al.* argue that the less effective models are feudalism and technocratic utopianism, while the more effective ones are monarchy and federalism.

Section four of the research instrument provides details on the general ISP environment. In particular it covers: the existence of an IS plan; the time between planning cycles; maturity in ISP; planning horizon; length of planning cycle; whether a budget is available for ISP; the major objectives/focus of ISP (discussed in more detail below); the relationship between business planning and ISP; whether the ISP participates in business planning and/or is kept fully informed of changes in the business, and the management level of ISP sponsor and champion.

Five categories of ISP objectives/focus were identified from a review of the literature, an 'Other' category was also included in order to ensure the list was exhaustive. The five categories are:

- *Strategic/competitive* focus provides long-range objectives for IS and/or aligns IS with business strategy and/or seeks to enhance/identify IS/IT based products/services (*c.f.*, Galliers, 1987c; King, 1988; Saaksjarvi, 1988; Raimond & Eden, 1990; Lin, 1991; Ugboro, 1991; Premkumar & King, 1992; Earl, 1993);
- *Efficiency/resource* focus is concerned with increasing organisational efficiency by improving control over IS and/or improving resource allocation (*c.f.*, Armstrong, 1982; Galliers, 1987c; Sinha, 1990; Lin, 1991; O'Connor, 1993; Raghunathan & Raghunathan, 1994);
- *Effectiveness* focus is concerned with improving co-ordination, communication, system integration, decision making, management of operations short and/or long term IS performance (*c.f.*, Camillus, 1975; Zmud, 1979; Dyson & Foster, 1983b; Galliers, 1987c; Venkatraman & Ramanujam, 1987; Hoffer *et al.*, 1989; Sinha, 1990; Kukalis, 1991; Lin, 1991; O'Conner, 1993; Raghunathan & Raghunathan, 1994);

- *Intangible* focus is concerned with the softer deliverables such as learning, management development, raising IS awareness and/or improving management/IS relations (*c.f.*, Camillus, 1975; Lorange & Vancil, 1977; King & Cleland, 1978; Steiner, 1979; Galliers, 1987c; Venkatraman & Ramanujam, 1987; Kukalis, 1991; Lin, 1991; Premkumar & King, 1992; Earl, 1993; O'Conner, 1993; Raghunathan & Raghunathan, 1994);
- *Technical/Output* focused organisations are concerned with technological leadership, prioritising applications portfolio, developing IT architecture and/or building a firm foundation for subsequent service level agreements/commitment planning programmes (*c.f.*, Bowman *et al.*, 1983; Galliers, 1987c; Edwards, 1989; Earl, 1989; Dyson, 1990; Lin, 1991; Premkumar & King, 1991; O'Conner, 1993).

The second part of this section is more oriented toward the ISP activity: it establishes the role (*e.g.*, facilitator *vs* recommender of strategy) of the ISP champion and consultant (if applicable); identifies the general ISP approach taken using Earl (1993) categorisations; assesses the amount of participation of different stakeholder groups in each ISP stage; identifies the types of information gathering/reporting tools used in each ISP stage; establishes where the main decision making stage of ISP takes place, and identifies the main focus of the most recent IS plan.

Based on research conducted in 27 UK organisations, Earl (1993) identifies five ISP approaches: *organisational led*, *business led*, *method driven*, *administrative driven* and *technological driven*. Earl (1993) compared the effectiveness of each approach with regards to three measures of success and found that the organisational led approach was the most effective. These categories of ISP approaches together with four questions in part two of the research instrument (*i.e.*, question 46) provide a general overview of the ISP approach taken by the organisation.

The ISP system identified in this research differentiates the process (or stages) of planning from the methods used to collect, analyse and present the information. The process of planning (in its strictest sense) refers not only to the different stages of the decision making process but also how these stages are managed. These two aspects of process are addressed by the two types of approaches identified in the decision making literature: rational and non-rational (behavioural) (*c.f.*, Mumford & Pettigrew, 1975).

In the rational model, activities are set out as a sequential process largely ignoring the context (*e.g.*, political environment) in which they take place. This model is based on the assumptions that 'goals are known and consistent; actors are analytically objective in carrying out logical activities; cause-effect relationships are fairly well understood, and enough information is available to tackle most issues effectively' (Waema & Walsham, 1990: p 29).

While the rational approach to planning has been empirically determined to be the most prevalent planning practice in organisations (Vitale *et al.*, 1986) and indeed in the academic literature (Waema & Walsham, 1990), many argue for a non-rational approach (*e.g.*, Mumford & Pettigrew, 1975; Dyson & Foster, 1980; Pearce & Randolph, 1980; Lyles & Lenz, 1982; Davis & Olson, 1985; Ramanujam & Venkatraman, 1987b; Singleton *et al.*, 1988; Waema & Walsham, 1990; Galliers, 1991a; Mintzberg, 1994). There is considerable evidence that political activities are important to strategic decision making (Mintzberg *et al.*, 1976: p 262).

It is now widely recognised that planning 'is a political rather than a purely rational activity' (Peattie, 1993: p 10). Political activities clarify the power relationships within organisations helping to bring about consensus and a conducive environment for implementation (Mintzberg *et al.*, 1976). Environmental uncertainty, conflicts in objectives and the role of controls within the organisation (*e.g.*, reward system), combine to make purely rational planning inappropriate because human needs, expectations and relationships of planning (*i.e.*, how participants interact with each other and the rest of the organisation) are ignored (*c.f.*, Mumford & Pettigrew, 1975; Hall, 1977; Hax & Majluf, 1988; Waema & Walsham, 1990).

The planning process is a strong emotional event creating opportunities for individuals and sub-groups to enhance their own position (Raimond & Eden, 1990). Planning leads to the reallocation of resources which has the potential to change the power relationships within the organisation. The irrational model of decision making recognises the impact of these psychological, social and political behavioural processes.

Process management is important in dealing with the behaviour issues influencing any organisational activity including planning (Schein, 1990). Other authors too have stressed the importance of managing the process (*e.g.*, Ackoff, 1970; Pyburn, 1983; Boal & Bryson, 1987; Langley, 1988; Pedler *et al.*, 1991).

Boal & Bryson (1987) provide evidence that the planning process is strongly related to the effectiveness of the outcome. They say that 'more frequent communications and greater conflict resolution efforts increase the likelihood of favourable outcomes...[thus]...the planners may be well advised to pay attention to the development and application of communication and conflict resolution skills'. This research corroborates what Pyburn (1983) concludes about effective (S)ISP. Since (S)ISP, he says, is 'primarily concerned with the relationship between IS and the rest of the firm and the communication between top management and IS management...effective (S)ISP is a process of building some consensus regarding the role of IS, vis-à-vis the rest of the firm, and the resources that will be committed to achieving that role'.

While both rational and irrational models have increased understanding of organisational decision making, neither of them, on their own, adequately provide a comprehensive explanation of the effectiveness of strategy formulation in all contexts. Some researchers suggest that in order to derive a fuller explanation the formal analytic thinking of rational decision making should be combined with the behavioural aspects of irrational decision making (Camillus, 1972; Quinn, 1980; Hax & Majluf, 1991).

This research attempts to address both the rational and irrational (behavioural) aspects of ISP decision making. While decision making is represented as a six stage rational activity, behavioural aspects have been included in the analysis (*c.f.*, Appendix A: questions 19, 42, 43, 47 and 49). In particular, Mumford & Pettigrews' (1975) ten politically-oriented critical success factors of planning, have been incorporated into the research instrument (*c.f.*, Appendix A).

From a review of the literature, six stages of decision making have been identified (*c.f.*, Simon, 1965; Cohen & Cyert, 1973; Lichfield *et al.*, 1975; Henry, 1979; Armstrong, 1982; Nutt, 1982; Anderssen & MacDonald-Taylor, 1983; Duncan, 1989/1990; Dyson, 1990; Reponen, 1990; Ward *et al.*, 1990). These are the:

- ***pre-planning*** stage which involves activities that need to be carried out before planning begins such as establishing the objectives of ISP, developing a plan of work identifying the stages, time scales and checkpoints of the ISP activity;
- ***intelligence*** stage which involves searching the environment for conditions calling for decisions by assessing current strengths, weaknesses, opportunities and threats both internally and externally;
- ***design*** stage which involves inventing, developing and analysing possible courses of action, and the use of methods to help understand the problem, generate solutions and test their feasibility;
- ***choice*** stage which involves evaluating and selecting a course of action from the alternatives available, prioritising projects, assigning responsibilities and drawing up a timetable for the plan's implementation;
- ***implementation*** stage which involves implementing the IS plan and identification of management of change issues;
- ***review*** stage which involves reviewing the implemented IS identified by the plan.

Bakopoulos (1985) reports over 200 methodological approaches to ISP such as Business Systems Planning (IBM, 1976; Zachman, 1982), Information Engineering (Martin, 1982), Customer Resource Life Cycle (Ives & Learmonth, 1984), Soft Systems Methodology (Checkland, 1981), Critical Success Factors (Rockart, 1979), Value Chain Analysis (Porter, 1985) and Scenario Planning (*c.f.*, Galliers, 1991a). All or some of these six stages of decision making together with specific methods, underlie all these proprietary ISP methodologies, the majority of which, it should be noted, ignore the behaviour dimension of planning (Butler, 1985).

Information Gathering/Reporting Methods

The way in which information is gathered may affect the ultimate success of ISP (*c.f.*, Reponen, 1990). Information gathering and reporting methods, cover two of the three types of methods used in ISP, the other one being methods to analyse the information.

Methods of analysis refer to those techniques used during the ISP activity which create awareness, position the organisation and identify opportunities (*c.f.*, Earl, 1989: p 202). Such methods include SWOT analysis, matrix analysis approaches (*c.f.*, Ward, 1988), Process Quality Management (Ward, 1990) which translates business requirements into information needs, break-even analysis which helps select between alternative solutions (*c.f.*, Davis & Olson, 1985: p 176), and project prioritisation (*e.g.*, Agarwal *et al.*, 1994; Wong *et al.*, 1994).

There are many methods which could be used at different stages of the analysis. As a consequence, it was decided not to investigate the methods of analysis used by particular organisations in detail, but rather to assess whether respondents believed the methods currently being used within their organisation, were judged to be effective (*c.f.*, Appendix A: question 58).

Information may be presented verbally and/or non-verbally (*i.e.*, written document). The media used to *present* this information is similar to those used to *gather* it (*i.e.*, workshops; interviews; open-ended questionnaires; closed-ended questionnaires; formal meetings; informal meetings, and reports). Respondents were asked which of these information gathering/reporting methods were used in each stage of their ISP activity. An 'Other' category was included to ensure the list was exhaustive.

Section five provides details of the organisation's external environment. In particular it assesses: how heterogeneous, dynamic and hostile the organisation's environment is; the focus of information usage in their sector (*i.e.*, information is sold as a product/service and/or information is used to add value to the principal services/products being supplied); the availability of the necessary resources and skills in the external IS/IT marketplace to enable an organisation do what they want to with IS/IT, and the main use of IT in the organisation's sector.

Section six, the final section in part one of the research instrument, provides details of the internal organisational environment. In particular it identifies: the type of organisational culture which exists; the relationships between the IS function and the rest of the organisation; the perceived status of IS/IT by non-IS staff, and whether the environment is conducive to ISP.

The type of organisational culture was identified using Handy's (1985: pp 186 - 196) four categories:

- **power culture** which is best pictured as a web with a central power source. There is an autocratic style of management where leadership is controlled by the key central figure, few rules or procedures (*i.e.*, little bureaucracy) and individuals (not committees) make decisions;
- **role culture** is essentially the bureaucratic model in organisational terms in which the organisational strength lies in the functions or specialities, co-ordinated at the top by a narrow band of senior management. There are formal procedures in place for organisational roles and communications;
- **task culture** is a job or project oriented environment, being influenced by expertise rather than position. The role of top management is to allocate resources to different projects as appropriate, and multi-functional project-teams work closely together to complete the task.
- **people culture** can be viewed as an 'anarchic' model in organisational terms. The organisation is subordinate to the individual who is regarded as key. Influence and roles are shared according to expertise, control mechanisms and management hierarchies are impossible without mutual consent.

Part Two

Part two of the research instrument is focused on the ISP activity itself. It aims to collect information regarding ISP inputs, methodology (method and process), outputs and implementation.

Inputs include factors relating to the financial, human, informational and technical needs of ISP including both soft (*e.g.*, best people available for planning, management of planning participants' expectations, planning participants' experience in planning) and hard (*e.g.*, number of people taking part, use of automated tools, the support/control structures important to planning) aspects of the input dimension.

Factors relating to the methodology dimension are structured around the six stages of decision making identified above. In particular, the type of issues that need to be addressed by the methods during each stage of decision making are identified. In addition, the perceived effectiveness of each stage of planning and an assessment of whether an appropriate amount of time was spent on each, provides an overview of the methodology's success.

The ISP output should be oriented towards satisfying the ISP objectives whether they be tangible (*e.g.*, identification of strategic IS) or intangible (*i.e.*, enhance organisational learning) in nature. The tangible output from ISP (*i.e.*, the IS plan) should be structured around some pre-defined deliverables identified by the organisation (*e.g.*, Soden & Tucker, 1976; Ball, 1982; Anderssen & MacDonald-Taylor, 1983; Singleton *et al.*, 1988; Ward *et al.*, 1990: p 130) which should provide documentation of what went on during formulation as well as the resultant decisions. The intangible

outputs of ISP will be those controllable contextual factors managed by the ISP activity to create an appropriate environment in which to implement the plan (e.g., ownership of plan). This research investigates the general contents of the plan and the type of intangible factors which lead to a better chance of successful implementation.

The implementation of the ISP output refers to the critical factors that provide a smooth transition (hand-over) from the ISP system to the project management system. It does not refer to the actual implementation of the individual decisions (IS) identified in the plan. Even a good plan, if not properly implemented, may lead to dissatisfaction (Learned *et al.*, 1965) so it is imperative the transition between systems is seamless. Some researchers (e.g., Schein, 1969: p 52; Premkumar & King, 1994a) suggest the people who formulate the strategy should also implement it, while others (e.g., Dyson, 1990: p 7) suggest it is the planning process and how it is managed which is important to the final plan's implementation. It is argued here that managing the factors interfacing the formulation and implementation activities (which implicitly happens when those doing the formulating also do the implementing) will help to ensure ISP is more successful.

The implementation factors identified in this research are both tangible (*i.e.*, readily identifiable sponsor for the implementation task) and intangible (e.g., commitment by stakeholders to the IS plan's implementation) in nature.

4.1.2.2.2 The Contextual Content of Feedback

As discussed briefly in §4.1.1.2, if organisations are not open to learning, then feedback will probably not be successful. While this is unlikely to be the only contextual factor affecting the effectiveness of feedback in an organisation, it would seem to be one of the most important.

While the notion of organisational learning (OL) is widely accepted, there is no one unifying theory or model of the concept. OL is often described in terms of different types of learning. Argyris (1991) identify two distinct types of learning within an organisation: single-loop and double-loop learning. Single-loop learning occurs when individuals detect errors and correct them within a set of organisational norms. These experiences may¹⁷ become part of the organisation's strategies and assumptions, allowing the organisation to retain the learning long after individual employees have left. Individual learning is the foundation of the organisation's learning since it is through the changing perceptions of individuals that norms can be reshaped.

Double-loop learning occurs when the norms of an organisation are directly challenged. Norms are 'invisible' to those who follow them making challenging them, and thus this kind of learning, difficult. Indeed, a dichotomy seems to exist, for to become a learning organisation, it must undertake

¹⁷ Depending on how the organisation reacts to errors (*i.e.*, punishment vs learning experience).

the very activity that makes it one, that is, it must challenge the norm of questioning existing norms! Instead, challenging a particular set of norms can be more easily done by others who follow a different set.

Most of the learning taking place within organisations is single-loop in nature (Argyris, 1991), enforced by systems to identify and correct errors within set policy guidelines. Indeed, traditional MIS have tended to focus on outputs such as variance reporting which supports single-loop rather than double-loop learning (Davis & Olson, 1985).

If learning is focused on adjustments to current performance, without the examination of the assumptions and theories underlying performance, then only single-loop learning will occur. While single-loop learning focuses on the operational performance of the system, double-loop learning focuses on surfacing relevant assumptions on which to base these operations (Davis & Olson, 1985: p 347).

Senge (1990) also identifies two types of learning within organisations: adaptive and generative. Adaptive learning is about *coping* with change and can either be reactive (reacting to change when it occurs) or proactive (*i.e.*, planning to manage the change before it occurs). According to Senge, adaptive learning is only the first step in the process of becoming a learning organisation; generative learning is also important. Generative learning is about proactively *creating* the change by looking at the world in different ways in order to improve the business (*c.f.*, Galliers' (1991a) call for scenario planning). Pedler *et al.* (1991) echo this sentiment when they say 'the learning company tries to develop rather than exploit their worlds' (*ibid.*: p 197).

Fiol & Lyles (1985) distinguish between these by calling one learning and the other adaptation. Learning they define as being 'the development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future actions' (*i.e.*, generative learning), whereas adaptation is 'the ability to make incremental adjustments as a result of environmental changes, goal structure changes, or other changes' (*i.e.*, adaptive learning). Argyris' (1991) perspective of learning is more focused towards reactive learning (*i.e.*, learning occurs when problems are detected), while Senge's (1990) is more focused towards proactive learning (*i.e.*, learning occurs because the organisation seeks opportunities to change; learning is all about creating the future).

While there is no generally accepted conceptual model of learning, it is evident from the literature that there is a general consensus that organisational learning is more than the sum of individual learning. Stata (1989) identifies two main ways in which organisational learning is different from individual learning. Firstly, organisations learn at the speed of its 'slowest link' since they learn through 'shared insights, knowledge and mental models'. Secondly, organisational memory (*c.f.*, Stein, 1995), which is based on institutional mechanisms (*i.e.*, strategies) and individual memory, is important to organisational learning. Unless the organisation finds an effective way of absorbing and retaining the memory of individuals, it will be lost when they leave.

The degree to which organisations can absorb individual learning is influenced by how they deal with failures (Beer, 1981). If failures are viewed in a productive way (*i.e.*, failure that leads to insight, understanding, and to commonly held wisdom within the organisation), failure, while not being encouraged, is not likely to be 'punished' when it occurs. While the individual concerned will still (hopefully) learn from failing, in situations where failure is punished, the organisation is unlikely to absorb learning into its own memory since failures are less likely to be openly acknowledged and reflected upon.

An organisational culture that does not place blame and administer punishment when mistakes are made, encourages both individuals and the organisation as a whole to learn from these experiences. Individuals should be encouraged continually to improve through experimentation and learning from their and others' experiences (Pedler *et al.*, 1991). This type of organisational climate will facilitate innovation, the acceptance that not all ideas will work and encourage the use intuition. Punishing failure will lead to organisational members avoiding mistakes (and the resultant punishments) at all costs, by being conservative, avoiding attention, and doing as they are told rather than using any initiative. This in turn will lead to a reduction in the amount of risk decision makers are willing to take, which in turn stifles innovation.

Hrenbriniak & Joyce (1984: p 199) argue that making mistakes should be treated 'as a necessary consequence of a planning and control system...Organisations that embrace error exhibit a relatively greater tolerance of experimentation and more novel, less tried approaches to problem solving and decision making'. There is some evidence to suggest organisations that encourage their members to experiment and continually explore new opportunities, outlive those organisations that do not (Senge, 1990).

Hrenbriniak & Joyce (1984: p 197) stress the process of evaluation and follow-up (*i.e.*, feedback) should not 'contribute to an unhealthy emphasis on avoiding risks and errors at all costs. Rigid and uncompromising control systems that do not tolerate error, and thus breed an overly conservative emphasis on maintaining the status quo and being safe, have debilitating effects on motivation as well as on the formulation and achievement of intended plans of action'.

In the area of planning in particular, the activity itself can provide a learning platform (Taylor, 1979; Hrenbriniak & Joyce, 1984; De Geus, 1988; Henderson & Sifonis, 1988; Pedler *et al.*, 1991; Ruohonen, 1991; Walsham, 1991; Huysman *et al.*, 1994; Michael, 1973; Reponen, 1994) providing one of several (*c.f.*, Ramanujam & Venkatraman, 1987a), less tangible but nevertheless desirable objective of the planning activity.

The 'process of evaluation and learning is critical for continued success in the implementation of the strategy' (Hrenbriniak & Joyce, 1984: p 197). Understanding the reasons for past performance affects positively organisational learning and the ability to plan in the future. 'A strategic planning process that emphasises learning and concentrates on iterative feedback...will be beneficial to the organisation' (Henderson & Sifonis, 1988). Pedler *et al.* (1991) believe this to be possible through the constructive management of conflicts arising during the planning process, adding that this is a necessary course of action in order to transform a non-learning organisation into a learning one.

The relationship between organisational learning and ISP success is evident in the organisational (ISP) approach identified by Earl (1993). The approach emphasises collective learning by focusing IS developments on one or two themes which grow in scope over several years, and the use of multi-disciplinary senior executive project teams or full-time task forces which help to create the necessary energy and creativity for change (Pedler *et al.*, 1991). The IS function works in close partnership with the rest of the organisation to tackle business problems from which major IS initiatives later emerge. IS strategy often emerges from ongoing organisational activities such trial and error changes to business practices, continuous and incremental enhancement of existing applications, and occasional system initiatives and experiments within the business.

As mentioned above, the five approaches identified by Earl (1993), the organisational approach was ranked the most successful based on three measures of ISP success. Wightman (1987) also provides evidence that organisations who identify a number of common *themes* [my emphasis] (*e.g.*, a marketing stance that includes use of IT directly or indirectly as a competitive weapon) seem to be successful and innovative users of IT for competitive advantage.

The current research seeks to establish the relationship between learning and feedback existence within organisations, and to investigate the effect of both of these variables on ISP success. One would expect ISP to be more successful in organisations exhibiting both feedback and learning than in those exhibiting neither or only one of these characteristics.

In order to test this hypothesis, it is necessary to establish whether an organisation is a learning one or not. Since there is no unified theory of learning, Argyris' (1991) theory of single-loop and double-loop learning will be used in this research.

Single-loop learning occurs when individuals detect errors and correct them within a set of organisational norms. This will be measured by asking respondents whether organisational members can expect support from the organisation in learning lessons from mistakes (*c.f.*, Appendix A: question 43d). Double-loop learning occurs when the norms of an organisation are directly challenged. This will be measured by asking respondents whether organisational members are actively encouraged to question underlying organisational policy/goals (*c.f.*, Appendix A: question 43c).

While each aspect of learning will be measured using a single-item, two additional items are included in the research instrument in order to test their validity. Respondents are asked to indicate whether their organisation actively encourages innovative solutions to problems, and whether an individual's intuition is accepted as a valid tool in decision making (*c.f.*, Appendix A: questions 43e and 43f, respectively). Positive responses to both these questions would help to validate the presence of a learning environment.

Part three of the research instrument is concerned with measuring ISP success. This is the subject of the next section.

4.2 ISP Success

This section discusses the concept of evaluation, building on it to develop a conceptual and operationalised model of ISP success. The operationalised model will subsequently be used to test whether a relationship exists between feedback, a learning environment and ISP success, and to identify which of the ISP factors in § 4.1.2.2.1.2 influence ISP success.

4.2.1 Introduction

Evaluation is defined as 'a decision about the significance, value, or quality of something, based on a careful study of its good and bad features' (Collins, 1990). It is an essential part of the management activity which can be measured either in terms of money or success/failure (Angell & Smithson, 1991).

While it may be generally true to say that 'what gets evaluated gets done', the completion of an activity should not be the only factor (or indeed the most important one) driving an evaluation process. Evaluation as an end in itself (*e.g.*, controlling budgets) is of no real value beyond verifying whether a particular outcome has been satisfied. It is only when evaluation is used as the first step to improvement (*i.e.*, monitoring activity of feedback), that it becomes a valuable tool for initiating change within an organisation.

4.2.2 Evaluating the Success of ISP

Venkatraman & Ramanujam (1987; p 688) argue that it is important theoretically, empirically and pragmatically to *define* what is meant by planning system success. Theoretically it is important because it helps develop formal planning theory; empirically it is important because more direct¹⁸ ways of measuring success can be devised instead of using the traditional indirect financial surrogate indicators such as ROI and ROE (*c.f.*, Pearce *et al.*, 1987 for a more detailed review), and pragmatically it is important so that organisations have a tool by which to adapt their planning activity to the changing environment.

¹⁸ The indirect approach seeks to satisfy the goals of the organisation whereas the direct approach seeks to satisfy the goals of the planning process (*c.f.*, King, 1983).

Hirschheim & Smithson (1988) propose three frameworks of evaluation based on the underlying assumptions of objectivity and subjectivity. These frameworks focus on three possible measures of performance: *efficiency*, *effectiveness* and *understanding*. The assumptions underlying these frameworks range from total objective measurements (*i.e.*, the efficiency framework) through a mixture of both subjective and objective measurements (*i.e.*, the effectiveness framework) to totally subjective measures (*i.e.*, the understanding framework). With the frameworks come techniques which are based on these objectivity/subjectivity assumptions, allowing the user to evaluate according to their own system of belief. Although these frameworks were originally suggested for the evaluation of IS *per se*, they are equally applicable to the evaluation of ISP.

The effectiveness framework, which takes a balanced view of social reality, has been chosen to underpin the measurement of ISP success derived in this research. King (1988) supports effectiveness as a measurement of ISP success arguing that both subjective and objective types of measurement should be used.

Truly objective measurement within the social sciences disciplines are, however, difficult to obtain in practice. While objective evaluation is desirable it may not be reliable or even meaningful. Angell & Smithson (1991) argue that formal 'objective' evaluation studies of information systems may be 'totally worthless' because of the 'complexity and ambiguity inherent in organisations, when considered as social and political systems, implies that simplistic notions of objective measurement and positivist causality are quite inappropriate'.

Business performance indicators are the main way in which evaluation studies have conceptualised objective measures of planning effectiveness. Numerous studies (*e.g.*, Ansoff, 1970; Grinyer & Norburn, 1975; Hofer & Schendel, 1978; Lorange, 1979; Wood & LaForge, 1979; Kudla, 1980; Armstrong, 1982; Pearce *et al.*, 1987; BDO, 1992) have been conducted in an attempt to establish a link between (business) planning effectiveness and more 'objective' financial performance measures (*e.g.*, profit, ROI, market share). The underlying logic is that the ultimate objective of planning is to improve the organisation's financial performance and therefore these are the standards by which planning should be judged (King, 1983: p 265). However, there is no conclusive evidence that planning can lead to business effectiveness (Armstrong, 1982; King, 1983; Sinha, 1990). While some studies have provided evidence for a relationship (*e.g.*, Ansoff, 1970; Wood & LaForge, 1979), others have not (*e.g.*, Grinyer & Norburn, 1975; Kudla, 1980). The inconclusive results may be due to financial performance being dependent on more factors than planning alone (*c.f.*, Pearce *et al.*, 1987).

The search for more objective measures of effectiveness has led researchers down the methodological route of collecting multiple stakeholder viewpoints (*e.g.*, Galliers, 1987a; Premkumar, 1989; Earl, 1990). While this does not provide a truly objective measure, it does give a more balanced, less biased view of reality. Indeed, it has been argued that perceived effectiveness is more important than actual effectiveness (Singleton *et al.*, 1988: p 326).

This research seeks more objective measures of ISP effectiveness by using multiple stakeholder viewpoints. While financial performance measures are included in the ISP effectiveness (success) model, these will be measured using the subjective value judgements of different stakeholders.

4.2.3 Measuring Effectiveness

There is no universal definition for effectiveness (*c.f.*, Greenley, 1983; Quinn & Rohrbaugh, 1983; DeLone & McLean, 1992: p 61). Based on a review of the effectiveness literature, Campbell (1977) identifies 30 different effectiveness criteria, concluding that 'different people adhere to different models, and there is no correct way to choose among them'.

Cameron & Whetton (1983) suggest a variety of models exist due to the different conceptualisations of what an organisation is and therefore how it should be evaluated (*i.e.*, contingency perspective to planning effectiveness). They conclude (*ibid.* pp 261-277) that the pursuit of one universal model of effectiveness is futile and instead propose that different frameworks of effectiveness should be developed. The next section seeks to develop such a framework for measuring ISP effectiveness.

4.2.4 A Framework for Measuring ISP Effectiveness

In the field of business planning, Cameron & Whetton (1983: p 273) identifies five different approaches to measuring *effectiveness*. These are the:

- **goal-centred judgement** approach which evaluates the degree to which the objectives or targets of planning have been achieved (*e.g.*, improved business performance). This approach is focused on the impact planning has on the organisation;
- **comparative judgement** approach which makes comparisons between a particular system and other similar systems in comparable organisations (using external benchmarks) as a basis for evaluation;
- **normative judgement** approach which makes comparisons between a particular system and the 'ideal' system (using internal/external benchmarks) according to a set of standards;
- **improvement judgement** approach which evaluates the degree of improvement due to an action taken specifically instigated to improve the system;
- **trait judgement** approach which evaluates the extent to which an organisation possesses certain desirable characteristics. This approach is focused on the planning activity itself rather than on the impact planning has on the organisation (*i.e.*, the means rather than the ends).

In practice, distinguishing between comparative and normative approaches is difficult since both are forms of benchmarking; the former involves benchmarking against comparable systems in comparable organisations, while the later involves benchmarking against the notion of an 'ideal' system

based on general external standards or state of the art knowledge (such as academic research). In order to determine, therefore, whether a comparative or normative approach is being used, it is necessary to establish whether the standards are characteristics of an 'ideal' system or those from a comparable organisation. The use of both internal and external criteria (*e.g.*, objectives of planning system and best practice in planning, respectively) in the evaluation activity have been advocated by some researchers (*c.f.*, Foster & Foster, 1982; King, 1988).

Some of these approaches are appropriate for different managerial contexts while others are more appropriate for research purposes. For example, the comparative judgement approach is easier for a researcher to implement than an organisation since it requires gathering commercially sensitive data from a wide range of sources.

Other researchers have also identified one or more of the approaches suggested by Cameron & Whetton (1983). Dyson & Foster (1983a) identify two distinct approaches to evaluating planning effectiveness: *goal-oriented* (*i.e.*, goal-centred) and *process-oriented* (*i.e.*, trait judgement). Zutshi (1981) identifies four approaches: *macro system analysis* (*i.e.*, comparative judgement), *micro systems analysis* (*i.e.*, normative judgement), *goal-based positivistic enquiry* (*i.e.*, goal-centred) and *process-based positivistic enquiry* (*i.e.*, trait judgement).

King (1983) identifies two approaches to evaluation that are both concerned with the objectives of planning (*i.e.*, components of the goal-centred approach) which he names *direct* and *indirect*. The *indirect* approach assumes that improved business profitability or growth is the ultimate objective of planning, and thus improved business performance is the standard by which effectiveness should be measured. The indirect approach has therefore been operationalised through business performance measures such as ROI, ROE, EPS, sales growth and pre-tax profit. The *direct* approach assumes that organisations may wish to pursue more non-economic objectives of planning such as improving the quality of management, becoming a unifying, co-ordinating workforce, facilitating communications and collaboration throughout the organisation (Lorange, 1982: p 44). Planning can be expected to confer many intangible benefits besides the more tangible business performance oriented ones (Camillus, 1975; Steiner, 1979; King, 1983; Hax & Majluf, 1984). Some researchers suggest that evaluation should consider both (*e.g.*, Premkumar & King, 1991).

DeLone & McLean (1992) identify six major dimensions of IS success (*c.f.*, Table 4.3) which they then map against those identified by Shannon & Weaver (1949) and Mason (1978). While this taxonomy was originally developed for IS success, parallels can be drawn between it and those approaches identified by Cameron & Whetton (1983). *Systems* and *information quality* focus on the desired characteristics of the IS and its output (*i.e.*, trait judgement). *Use*, *user satisfaction*, *individual* and *organisation impact* focus on IS outcomes and are ends-oriented (*i.e.*, goal-centred).

<i>DeLone & McLean (1992)</i>	<i>System Quality</i>	<i>Information Quality</i>	<i>Use</i>	<i>User Satisfaction</i>	<i>Individual Impact</i>	<i>Organisational Impact</i>
Shannon & Weaver (1949)	Technical Level	Semantic Level	Effectiveness or Influence Level			
Mason (1978)	Production	Product	Receipt	Influence on Recipient		Influence on System
Cameron & Whetton (1983)	Trait judgement		Goal-centred			

Table 4.3 - Dimensions of IS success

It can be argued that the goal-centred and trait judgement orientations are fundamentally different from the comparative, nominative and improvement judgement approaches in that they provide the *focus* of evaluation rather than an *approach* to evaluation.

A goal-centred focus is concerned with the evaluation of *outcomes* (either direct and/or indirect: King, 1983) and represents the ‘ends’ of planning. Outcomes in this context include overall (perceived) success of ISP (*c.f.*, Harris, 1989), fulfilment of ISP objectives (McLean & Soden, 1977; Premkumar, 1989) and impact on the business, normally measured through financial performance indicators (Selto & Grove, 1984). A trait-judgement focus is concerned with the evaluation of the *system* characteristics, and represents the ‘means’ of planning.

Independent of whether the focus of the evaluation is system- and/or outcome-focused (*i.e.*, trait-judgement and goal-centred, respectively), the comparative, improvement and/or normative approaches identify the type of evaluation carried out (*c.f.*, Table 4.4). One or more of these can be used to evaluate the outcomes of planning and/or the system characteristics of planning (*c.f.*, Table 4.4).

	<i>Focus of Evaluation</i>	
<i>Evaluation Approach</i>	<i>System-oriented (Means)</i>	<i>Outcome-oriented (Ends)</i>
<i>Comparative</i>	comparison of system characteristics relative to the system characteristics of similar systems	comparison of outcomes relative to the outcomes of other similar systems
<i>Normative</i>	comparison of the system characteristics relative to the system characteristics of the ‘ideal’ system	comparison of outcomes relative to the outcomes of the ‘ideal’ system
<i>Improvement</i>	comparison of the system characteristics relative to the system characteristics of the previous system	comparison of outcomes relative to the outcomes from previous system

Table 4.4 - An evaluation framework

Whether one takes an outcome- or system-oriented focus to evaluation depends on the objective (or purpose) of the evaluation. If the evaluation is to be used solely to verify that specific outcomes have been attained, then an outcome-oriented evaluation is appropriate. If the purpose of the evaluation is to identify where improvements can occur, then a system-oriented focus should be taken.

A number of researchers have identified problems associated with adopting an outcome-oriented focus of evaluation (*c.f.*, Dyson & Foster, 1980; Foster & Foster, 1982; Greenley, 1983; King, 1983; Fitzgerald, 1993). These are that:

- it assumes goals attainable at the beginning of the activity are still attainable (or even desirable) at the end despite possible changes in the environment;
- it assumes that a causal relationship exists between goal attainment and the activity;
- organisational members often find it difficult to agree on objectives leading to multiple objective setting, making the evaluation activity too complex;
- the achievement of certain objectives may prove difficult to measure, or different stakeholder groups may be satisfied by different levels of achievement;
- easily attainable goals may be set so the activity is always viewed to be highly effective;
- the evaluation activity itself provides little guidance on how to improve the activity.

The system-oriented focus also has a number limitations, some of which can be addressed by the evaluation tool itself. These are that:

- the value of this as a diagnostic tool is only as good as the relevance of the list of critical characteristics to the activity's effectiveness. This list should be regularly updated;
- while identifying necessary conditions for effectiveness, it may be difficult to obtain sufficient ones;
- some characteristics may be more important than others and therefore should be weighted;
- some characteristics may be difficult to measure;
- it assumes a causal relationship exists between the characteristics and effectiveness;
- the important characteristics may be difficult to agree on.

Some researchers suggest that both an outcome- and system-oriented focus should be taken to evaluation (*e.g.*, Foster & Foster, 1982; Pearce *et al.*, 1987; Henderson & Sifonis, 1988). While the outcome-oriented focus establishes whether a problem exists, the system-oriented focus provides a valuable diagnostic tool to identify where that problem lies.

In practice, the planning system will never be perfect and will always need improvement. A point will come, however, when diminishing returns will set in, that is, the amount of effort and resources required to improve the situation outweighs the benefits of doing so. As a consequence, one would expect an outcome-oriented evaluation to be conducted first, and only if ISP is shown to fall below a *certain level of satisfaction* (identified by the organisation), should system-oriented evaluation be implemented.

The primary objective of this research is to establish whether there is a relationship between ISP effectiveness and feedback. A secondary objective is to identify generic ISP success factors which could be used as a basis for the development of a system-oriented diagnostic evaluation tool. In order to satisfy these two objectives, only an outcome-oriented focus to evaluation is appropriate at this stage.

4.2.5 Other Evaluation Issues

Other issues need to be addressed when evaluating in addition to the 'what' (*i.e.*, the focus or purpose of the evaluation) and the 'how' (*i.e.*, the approach) which were identified above. Several researchers have highlighted different issues that need to be addressed when measuring effectiveness (*e.g.*, Nadler, 1977; Cameron & Whetton, 1983; Green & Keim, 1983; Szewczak, 1991; Srinivasan, 1985; Pearce *et al.*, 1987; King, 1988; Singleton *et al.*, 1988; Sinha, 1990). These are:

1. ***What activity is being evaluated?*** It is important to identify clearly the boundary of the activity which is being assessed in order to prevent confusing or contradictory research results.
2. ***What is the purpose (focus) of the evaluation?*** Is the evaluation used to judge *compliance* of the activity with pre-specified goals (*i.e.*, outcome-oriented) or to provide a *diagnosis* of system problems (*i.e.*, system-oriented)?
3. ***When should the evaluation take place?*** Is the evaluation conducted before, during or after implementation¹⁹? Evaluations normally take place after implementation (Green & Keim, 1983). Angell & Smithson (1991) express some reservation of evaluation carried out post-implementation, as it is 'likely to be muddled by post hoc rationalisation, where mistakes are concealed and lucky successes attributed to good planning'. Green & Keim (1983) suggest that evaluation should take place at all stages of the activity in order to manage and control it, to ensure compliance with stakeholder objectives before its completion, and to ensure that proper procedures and policies are being carried out. Evaluation and correction during the activity is in fact the concept of feedforward discussed in §4.1.1.3.
4. ***What time frame is being employed?*** Long-term may be incompatible with short-term effectiveness, therefore it is important to select an appropriate time frame when evaluating.
5. ***What is the level of analysis?*** Effectiveness may be evaluated at the individual, sub-unit, organisational, population, industry or societal levels of analysis. Often effectiveness measured at each of these levels are incompatible and so it is important clearly to identify the level of analysis at which the evaluation is taking place.
6. ***Who should evaluate?*** Different stakeholders have different perspectives of effectiveness so it is important clearly to identify from whose point of view effectiveness is being evaluated (Lorange, 1982; Galliers, 1987a). Ward *et al.* (1990; p 124) argue that general

¹⁹ Implementation in the context of a system-oriented evaluation would refer to the implementation of the activity, whereas in the context of a goal-oriented evaluation it would refer to the implementation of the product of that activity.

management's view of effectiveness is significantly *more important* than that of IS management with regard to the activity of ISP in particular. Others have argued that multiple stakeholder viewpoints should be taken into consideration when evaluating (*c.f.*, Galliers, 1987b; Ireland *et al.*, 1987; Lorange, 1982; Venkatraman & Ramanujam, 1987; King, 1988; Earl, 1990).

7. ***What approach is to be taken to evaluation?*** What standard is going to be used to judge effectiveness: comparative, normative and/or improvement? Judgements of effectiveness can differ significantly depending on what approach is used (*e.g.*, an organisation may be effective in achieving its goals but ineffective relative to its competition).
8. ***What item(s) will be evaluated?*** What item(s) operationalise the concept of effectiveness used in the evaluation? Since effectiveness is a complex concept, a multi-item measure is important (Steers, 1975; Cameron & Whetton, 1983; King, 1988).
9. ***How will items be measured?*** Will the focus be on objective data (*e.g.*, official documents) and/or subjective judgements (*e.g.*, stakeholder perceptions); quantitative and/or qualitative measurement; external and/or internal measures? In the case of quantitative data the measurement scale to be used needs to be identified for each item. There are four scales that can be applied to the measurement of variables: the nominal, ordinal, interval and ratio scales (*c.f.*, Sekaran, 1992: pp 159-167). For example, an 'n-item' Likert (ordinal) scale can be used to assess perceptions, whereas financial ratios (*i.e.*, ratio scale) could be used to assess business performance.
10. ***How should the evaluation be administered?*** How should evaluative data be collected (*e.g.*, questionnaire, interview, informal conversation)?

Each of these evaluation issues are addressed in turn in §4.2.6.4 with respect to the current research.

4.2.6 A Measure of ISP Effectiveness (Success)

Evaluation in the area of IS to-date, has predominantly focused on the evaluation of individual information systems. In comparison, there has been little research into the evaluation of ISP. The lack of research in this area may be due not only to the failure in reaching a consensus on a definition for strategy, but also the difficulty in measuring the direct impact of strategy on the organisation's performance (Crowston & Treacy, 1986).

The IS evaluation and business planning evaluation literature have the potential of providing a foundation on which to build a model of ISP effectiveness. Both sets of literature are discussed in turn below.

4.2.6.1 Information System Effectiveness Research

The evaluation of IS is a complex task which is heavily subjective in nature (McFarlan, 1971). The difficulty lie in the fact that IS are not only social systems but also the value of the information they produce is not easy to measure (*e.g.*, reduction in operation costs, cost avoidance, improved customer service, enhanced quality of the working environment), particularly since, unlike any other resource, information is reusable (Angell & Smithson, 1991).

Individual IS successes have been investigated by many researchers (*e.g.*, Lucas, 1978; Gremillion, 1980; Ginzberg, 1981; Srinivasan, 1985; Hirschheim & Smithson, 1988; Hawgood & Land, 1988) many of whom have sought to establish a relationship between IS success and such factors as design characteristics, user involvement, individual differences of uses, and users' attitudes (*c.f.*, Zmud (1979) for a comprehensive review of this literature). IS success, however, is predominately based on measures of MIS satisfaction (*i.e.*, outcome-oriented) rather more than task-orientation (*i.e.*, system-oriented) (Cooper, 1988).

Srinivasan (1985) identifies two types of (surrogate) IS success measures: *user perceived effectiveness* (user satisfaction) and *behavioural effectiveness* (system usage). While the former measures effectiveness as perceived by system users and is highly *subjective* (*e.g.*, perceived systems quality), the latter uses behavioural indicators as surrogates for IS effectiveness, providing a more *objective* viewpoint (*e.g.*, number of reports generated). Srinivasan's tested the relationship between these two measures of IS effectiveness and found they were not always positively associated as one would expect.

There are advocates for (*e.g.*, Ein-Dor & Segev, 1978) and against (*e.g.*, Ginzberg, 1978) system usage. Ives *et al.* (1983) suggests that both system usage and user satisfaction measures should be taken when assessing IS success.

The surrogates measures of system usage and user satisfaction are equally applicable when measuring the ISP system. User perceived effectiveness of ISP and ISP system usage (in terms of the extent to which IS identified by ISP are actually implemented) have been incorporated into the evaluation of ISP effectiveness (*c.f.*, §4.2.6.5). It should be noted that the measures relate to ISP system perceived effectiveness and usage rather than the *individual* IS identified via the ISP activity.

Some researchers have, however, used the surrogate of individual IS effectiveness to measure ISP effectiveness (*e.g.*, McFarlan, 1971; Raghunathan, 1985; Premkumar, 1989). The extent of the relationship between IS effectiveness and ISP is unclear, while some researchers have found a positive association between the two (*e.g.*, McFarlan, 1971), others have found that no relationship exists (*e.g.*, Raghunathan, 1985).

It is argued here that measuring the effectiveness of individual IS, once implemented, is not an appropriate measure of ISP system effectiveness. While intuitively one would expect some kind of relationship between ISP and IS effectiveness, it is clear from previous research that this link is not as strong as one would expect it to be. There could be several reasons for this. One such reason could be that IS plans become *shelfware* (Atkinson, 1992) and IS not originally identified by the plan are implemented instead (Sinha, 1990). Indeed, Lederer & Sethi (1988a) provide evidence to suggest that ISP methodologies may often produce satisfactory plans but that organisations lack the management commitment and control mechanisms to ensure they are implemented.

Another reason is that if IS effectiveness is indeed influenced by ISP effectiveness, then it would be fair to argue that it could also be influenced by the other activities taking place between IS conception and delivery (*i.e.*, project management and systems development) (*c.f.*,

Figure 4.4). IS projects are often successfully justified but fail in their development. This is usually caused by ineffective management of the project during development (Waldrop, 1984: p 13). Reich & Benbasat (1990) also comment, albeit at the level of development, that evaluating information systems success at a given stage of development is not necessarily an indication of success at subsequent stages due to the different factors influencing success at each of these stages.

The above implies that even if the ISP activity produces a 'good' plan, there is no guarantee the resultant IS will be effective. Indeed, it might also be true that 'good results can be achieved in spite of planning rather than because of it' (Foster & Foster, 1982).

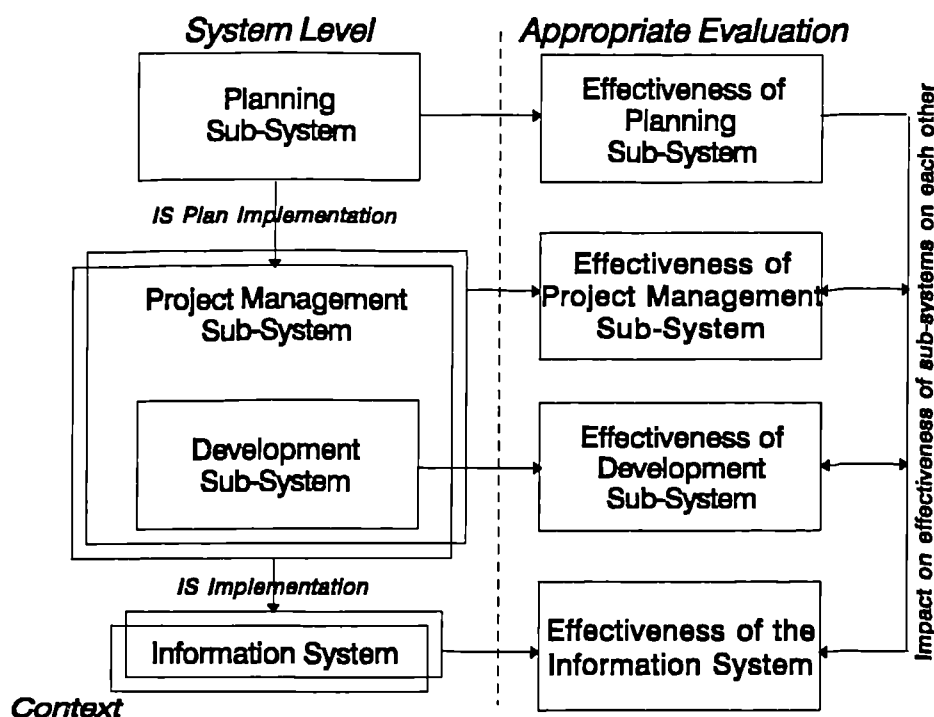


Figure 4.4 - IS conception to delivery and the appropriate evaluation points

A possible solution to this would be to investigate the complete '*Conception to Delivery*' system. This would require not only the analysis of the ISP, project management and IS development sub-systems, but also analysis of the relationship between these. Such an undertaking is far too complex for one research study alone, particularly when the only reason for doing so would be to ensure that individual IS effectiveness is an appropriate measure of ISP effectiveness. This together with the fact that the area of IS effectiveness measurement is itself plagued with problems of its own, IS effectiveness will not be used as a measure of ISP effectiveness in this study.

While it is recognised that breaking the total system down into more easily analysable sub-systems goes against the philosophy of pure system theory, in practice the researcher needs to be both 'holist (looking at the system as a whole) and a reductionist (converting the system into many simpler forms) at the same time' (Flood & Carson, 1988: p 14) so that a complex system can be studied.

One way partly to compensate for this reductionist approach, is to investigate not only the sub-system of interest (which in this case is the ISP system) but also the factors that interface between the two, enabling smooth transition from one sub-system to the next. This research therefore takes into consideration factors which enable smooth transition from ISP to the project management system such as assigning project managers (champions) to each identified IS at the ISP stage (*c.f.*, Appendix A for those factors categorised under the implementation dimension).

4.2.6.2 *Planning System Effectiveness Research*

Within the strategic planning effectiveness literature, two clear streams of research exist: research that seeks to *develop* an evaluation model and research that *implements* an evaluation model in order to test a relationship between planning effectiveness and some other factor of interest. Venkatraman & Grant (1986) call this *measurement* and *substantive* streams of research, respectively, commenting that the latter has been overemphasised in strategic management research. It is widely accepted that a more systematic operationalisation of the complex constructs related to the design and success of strategic planning systems is a necessary prerequisite for theory development (Venkatraman & Ramanujam, 1987).

This research seeks to develop a validated *measurement* model for ISP effectiveness which seeks to address the deficiencies of similar models in the area. The following section provides a summary of planning effectiveness models in both the areas of business planning and ISP, building on these to provide a comprehensive model of ISP effectiveness.

While there are a few studies addressing the development of an evaluation model in the area of ISP (*e.g.*, King, 1988; Premkumar, 1989; Raghunathan & Raghunathan, 1994), the majority of *measurement* research with regard to planning has been conducted in the area of business strategy (*e.g.*, Dyson & Foster, 1980; King, 1983; Venkatraman & Ramanujam, 1987).

Table 4.5 provides a summary of both the measurement and substantive streams of planning evaluation research conducted to-date. Each study has been summarised in terms of the research profile, the focus (*i.e.*, process-oriented and/or outcome oriented) and approach taken (*i.e.*, normative, comparative and/or improvement). The research profile provides information on the research methodology, the number of effectiveness items used in the evaluation, the number of underlying dimensions, and whether the evaluation tool was validated. Appendix C provides a more detailed description of each research study, showing how the items in each research study have been categorised in the table.

4.2.6.3 Deficiencies of the Evaluation Models

From Table 4.5, one or more problems associated with the research methodology, focus and/or approach of these planning evaluation studies can be identified.

4.2.6.3.1 The Research Methodology

The early planning evaluation studies were concerned with the development of normative models and the application of these models to a small number of case studies. Since the mid-1980s the research has predominately been questionnaire-based, gathering large cross-sectional samples in order to generalise results of the evaluation models, and in some situations, to test a model's validity (*e.g.*, Ramanujam & Venkatraman, 1987b, Raghunathan & Raghunathan, 1994).

Samples have been primarily taken from large organisations and therefore the results are likely only to be generalisable to similar organisations. In addition, the cross-sectional nature of the studies has limited the ability to imply causal relationships since data is collected on the possible cause and effect at the same point in time.

Multiple Stakeholders

The majority of planning evaluation research to-date has not taken into consideration multiple stakeholder viewpoints. Research has shown (*e.g.*, Galliers, 1987a; Earl, 1993) that perception of success differs from one stakeholder group to another and, as a consequence, in order to minimise informant bias, multiple stakeholders should be included in the evaluation of ISP effectiveness. Multiple stakeholder viewpoints are particularly important since none of the studies use any truly objective measures of effectiveness. Even those looking at business performance indicators use perceptions of whether they have improved or not rather than actual quantitative measurements (*e.g.*, Ramanujam *et al.* 1986; Premkumar, 1989).

Researcher(s)	Research Profile						Focus		Approach		
	Sample Size	Research Method	Multiple Stakeholders	Number of Effectiveness Items	Number of Underlying Effectiveness Dimensions	Effectiveness model validated?	Outcome-oriented	System-oriented	Normative	Comparative	Improvement
Camillus (1975)	0	not empirically tested	n/a	7	Not identified	no	✓ (7)		✓ (5)		✓ (2)
Steiner (1979)	0	not empirically tested	n/a	43	5 (not tested)	no	✓ (13)	✓ (30)	✓ (38)	✓ (1)	✓ (4)
Dyson & Foster (1980, 1983a)	10	Interviews & document appraisal		13	3 (Foster & Lock, 1990)	no		✓ (13)	✓ (13)		
Zutshi (1981)	8	Interview	no	24	4	no	✓ (6)	✓ (18)	✓ (19)		✓ (5)
Pyburn (1981, 1983)	8	in-depth case study	no	3	Not identified	no	✓ (3)		✓ (3)		
Foster & Foster (1982)	0	not empirically tested	n/a	16	Not identified	no	✓ (1)	✓ (15)	✓ (16)		
King (1983, 1988)	0	not empirically tested	n/a	11	Not identified	no	✓ (5)	✓ (6)	✓ (10)	✓ (1)	
Ramanujam et al. (1986)	93	mail questionnaire	no	11	3?	content validity only	✓ (11)		✓ (4)	✓ (4)	✓ (3)
Ramanujam & Venkatraman (1987a)	91	mail questionnaire	no	22	3?	yes	✓ (10)	✓ (12)	✓ (15)	✓ (4)	✓ (3)
Ramanujam & Venkatraman (1987b)	207	mail questionnaire	no	4	1?	yes	✓ (4)			✓ (4)	
Venkatraman & Ramanujam (1987)	202	mail questionnaire	no	18	2	yes	✓ (6)	✓ (12)	✓ (15)		✓ (3)

Table 4.5 - Summary of planning effectiveness research

Researcher(s)	Research Profile						Focus		Approach		
	Sample Size	Research Method	Multiple Stakeholders	Number of Effectiveness Items	Number of Underlying Effectiveness Dimensions	Effectiveness model validated?	Outcome-oriented	System-oriented	Normative	Comparative	Improvement
Galliers (1987a)	209	mail questionnaire	yes	1	1	no	✓ (1)		✓ (1)		
Waibel (1987)	34	mail questionnaire	3	12	Not identified	yes		✓ (12)	✓ (12)		
Lederer & Sethi (1988)	80	mail questionnaire	no	4	Not identified	no	✓ (1)	✓ (3)	✓ (4)		
Saaksjarvi (1988)	71	mail questionnaire	no	11	3?	content validity only	✓ (6)	✓ (5)	✓ (6)		✓ (5)
Harris (1989)	92	mail questionnaire	no	21	2?	no	✓ (9)	✓ (12)	✓ (15)		✓ (6)
Prenkumar (1989); Prenkumar & King (1991, 1992, 1994b)	245 249	mail questionnaire	no	7	1	yes	✓ (7)				✓ (7)
Earl (1990, 1993)	27	Interviews	yes	3	Not identified	no	✓ (2)	✓ (1)	✓ (3)		
Sinha (1990)	17 117	interviews mail questionnaire	no	2	1	no	✓ (2)		✓ (2)		
Lederer & Sethi (1991, 1992)	80	mail questionnaire	no	1	1	yes	✓ (1)		✓ (1)		
Lin (1991)	545	mail questionnaire	no	6	2?	yes	✓ (4)	✓ (2)	✓ (6)		
Ugboro (1991)	63	mail questionnaire	no	11	Not identified	no		✓ (11)	✓ (11)		
Prenkumar & King (1994)	249	mail questionnaire	no	25	2	yes	✓ (7)	✓ (18)	✓ (18)		✓ (7)
Raghunathan & Raghunathan (1994)	192	mail questionnaire	no	20	2	yes	✓ (9)	✓ (11)	✓ (10)		✓ (10)

Table 4.5 - Summary of planning effectiveness research (continued)

Unidimensionality & Multi-item indicators

Crowston & Treacy (1986), among others (*e.g.*, Venkatraman & Ramanujam, 1987), have criticised previous planning research for conceptualising planning (evaluation) in a purely unidimensional way. The problem with these studies is that they have been preoccupied with the financial payoffs of planning rather than other possible outcomes and process benefits. However, the majority of the studies summarised in Table 4.5 conceptualised planning effectiveness in a multi-dimensional way.

All except one of the studies identified in Table 4.5 focused on *perceived* (user satisfaction) measures of effectiveness as oppose to system *usage* measures. Sinha (1990) was the exception, viewing planning effectiveness in terms of the degree of *usage* of the planning system by the decision makers. It is argued that if the planning system is effective then more decisions (particularly major decisions) will be made through it.

Social science studies have been criticised for using single indicants (*e.g.*, overall measure of success) to operationalise theoretical concepts (Bohrnstedt, 1970; Cooper, 1988; Sekaran, 1992). Single indicants are rarely sufficient to tap all the underlying facets of any concept, let alone one as complex as effectiveness. From a measurement perspective, this is highly undesirable since single indicants are affected more by random error than multiple ones which means that, unless there is a priori information available, it is impossible to estimate its reliability. There is now general agreement that a theoretical concept should be operationalised using multiple-indicants to ensure measurement reliability (Nunnally, 1978). All but two of the studies in Table 4.5 use multiple-indicants to operationalise the concept of effectiveness.

Measurement Properties: Reliability & Validity of the Scale

The lack of valid and reliable measurement scales has been one of the impediments to theory development in the planning field in general (Venkatraman & Grant, 1986). The measurement instrument is reliable if repeated measurements made with it give the same result, whereas an instrument is valid if it sets out to measure what it is suppose to. Data collected through large scale field surveys can help to satisfy the minimum standard of measurement properties (Lin, 1991).

Most of the existing planning effectiveness measures have questionable measurement properties (Crowston & Treacy, 1986; Pearce *et al.*, 1987; Venkatraman, 1989). In terms of the research shown in Table 4.5, only a third have tested the reliability and validity of the planning effectiveness model identified in the respective study.

4.2.6.3.2 Evaluation Focus

In terms of the focus taken to planning evaluation (*c.f.*, §4.2.4), eleven of the studies identified in Table 4.5 have either an outcome-oriented (8) or a system-oriented (3) focus to evaluation but not both. Of the 24 studies shown in the table, 22 have an outcome-oriented focus to evaluation, of which 13 also have a system-oriented focus. This provides some evidence to suggest that an outcome-oriented focus is predominantly taken by planning evaluation studies.

4.2.6.3.3 Evaluation Approach

In terms of the approach taken to evaluation (*i.e.*, normative, comparative and/or improvement), due to the nature of academic research and its search for outcomes/characteristics of 'ideal' systems, it is not surprising to find that the majority of items identified use the normative approach to evaluation. While it may be argued that *all* the items identified by researchers are normative in nature, where measurement indicants specifically relate to a *previous* or a *similar* system (maybe from another organisation), these measures have been categorised under the improvement and comparative approaches, respectively.

Of the 24 studies identified in Table 4.5, five of them take a comparative approach to evaluation while eleven take an improvement approach. Thirteen studies take a single approach to evaluation, eight use two approaches and the remaining three use all three approaches.

Of those three studies taking all three approaches, one study never tested the evaluation model for validity (*i.e.*, Steiner, 1979) and the other two pieces of research relate to the same study but with effectiveness being operationalised in slightly different ways (*i.e.*, Ramanujam *et al.*, 1986; Ramanujam & Venkatraman, 1987a).

4.2.6.3.4 Summary

All the studies identified in Table 4.5 fail to address one or more of the aspects concerned with research methodology, evaluation focus or evaluation approach identified above. This research aims to address these deficiencies through the development and operationalisation of a multi-dimensional outcome-oriented evaluation tool which includes all three approaches to evaluation. In addition, it identifies important system characteristics that could provide the foundations of a multi-dimensional system-oriented evaluation (diagnostic) tool.

Through the use of a large cross-sectional survey, the research aims to test the measurement properties of this multiple-indicant evaluation model using multiple stakeholders viewpoints, thereby reducing informant bias.

4.2.6.4 Evaluation Issues of the Current Research

Before conceptualising and operationalising an ISP effectiveness model, it is important to address each of the issues identified in §4.2.5 in order to provide a framework for the evaluation.

1. *What activity is being evaluated?* The activity being evaluated is the ISP system comprising inputs, methodology (method and process), output, implementation and feedback.
2. *What is the purpose of the evaluation?* There are two purposes to the evaluation. Firstly, and most importantly, it provides a way of testing the relationship between feedback and planning effectiveness. Secondly, it will be used to identify the generic ISP system characteristics important to planning effectiveness thereby providing the foundations of a system-oriented (diagnostic) evaluation model. In order to satisfy both these objectives, an outcome-oriented focus to evaluation is appropriate at this stage of the research.
3. *When should the evaluation take place?* Ideally, evaluation of *system characteristics* should be conducted as soon after the activity as possible while the experiences of ISP are still fresh in the minds of the participants. However, since the organisations under investigation have different planning cycles, when to evaluate is difficult to control. Participants will be asked to answer questions with respect to the most recent ISP activity.
4. *What time frame is being employed?* Strategic planning is typically intended to improve an organisation's performance in the longer term so measuring the *outcomes* of the plan outside the targeted time period may give a distorted view (Pearce *et al.*, 1987). The research of such issues is complicated by the variability in performance time frames and different objectives found from one organisation to another. For this reason, ISP (*outcome-oriented*) effectiveness is measured in terms of the impact ISP has had in general rather than relating it to one particular occurrence of the ISP activity.
5. *What is the level of analysis?* The evaluation will be carried out at the level of the ISP activity within individual organisations.
6. *Who should evaluate?* The IS managers and up to two non-IS participants of ISP from each organisation, will be asked to participate in the study.
7. *What approach is to be taken to evaluation?* All three approaches (*i.e.*, comparative, improvement and normative) will be used in order to provide a more eclectic evaluation based on *similar*, *previous* and *ideal* ISP outcomes.
8. *What item(s) will be evaluated?* A 13-item ISP effectiveness model will be used to provide a multi-dimensional assessment of ISP effectiveness (*c.f.*, §4.2.6.5). This multi-item measure was reduced to one overall effectiveness measure by averaging the equally weighted²⁰ 13-items.

²⁰

It is recognised that some items may be more important to an organisation than others. However, given the cross-sectional nature of the study and that an item's importance may differ from one organisation to another, all items have been equally weighted.

9. *How will items be measured?* A 5-item Likert scale is used to assess informants' perceptions of each ISP effectiveness item. While this type of measurement provides a subjective assessment of ISP effectiveness, multiple stakeholders from each organisation will be asked to participate in this assessment so to provide a less biased (and more objective) measure of effectiveness. Both internal and external measures of effectiveness will be used.
10. *How should the evaluation be administered?* The evaluation is to be conducted via a self-administered postal questionnaire.

4.2.6.5 Conceptualisation and Operationalisation of the Evaluation Model

Figure 4.5 shows the multi-dimensional conceptual model of ISP effectiveness based on a review of existing evaluation research. This model uses all three approaches to ISP effectiveness (*i.e.*, normative, improvement and comparative), provides a behaviour measure of ISP effectiveness as well as perceptual ones, considers both direct/indirect and external/internal ISP effectiveness measures, and explicitly addresses the issue of ISP improvement.

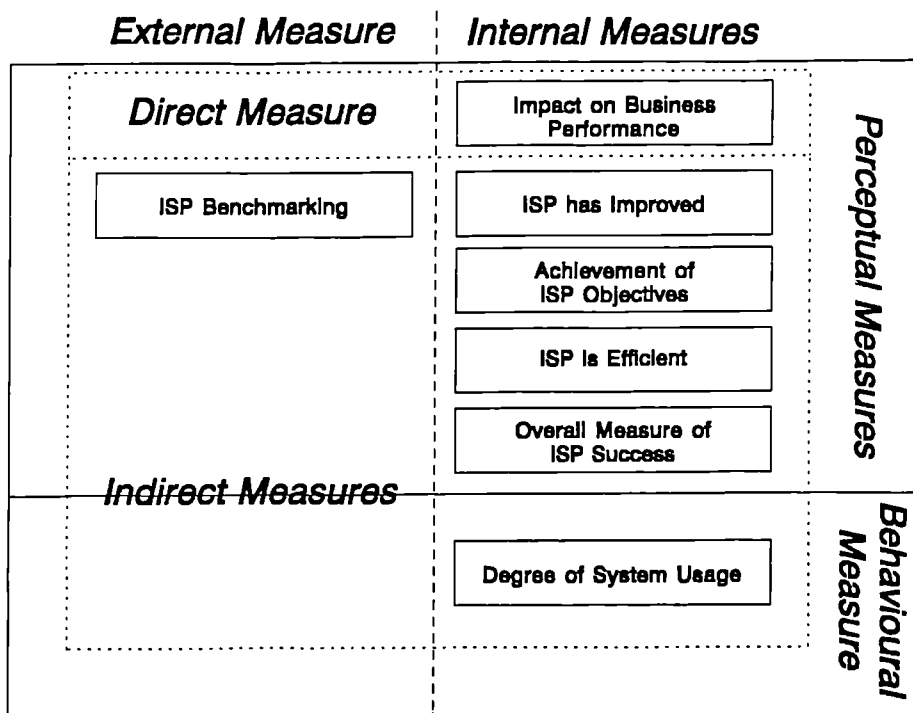


Figure 4.5 - Conceptual model of ISP effectiveness

These seven dimensions were operationalised using thirteen different items. Organisations were asked whether their ISP had:

- *helped their organisation to be more effective than similar organisations at identifying IS opportunities.* This item has not previously been used to measure ISP effectiveness. The item is included as it not only provides external benchmarking but also explicitly invokes the use of the

comparative approach. It can also be argued, particularly with respect to the identification of competitive systems, that this should be a desirable outcome of ISP.

- ***improved since the last time it was carried out.*** This item has not previously been used to measure ISP effectiveness either. The item is included as it is arguably one of the desirable (albeit implicit) objectives of planning, that is, planning needs to be continually improved in order to address the changing needs of the organisation as argued by a number of researchers (*e.g.*, Galbraith, 1973; Lorange & Vancil, 1977; Ramanujam & Venkatraman, 1985; Galliers, 1987c; King, 1984; Lorange, 1982; Boynton & Zmud, 1987; Lederer & Sethi, 1988a; De Geus, 1988; Raghunathan & Raghunathan, 1990; Earl, 1993). The item explicitly requires the evaluator to compare the most recent ISP activity with the *previous* ISP activity, therefore providing an improvement approach to the evaluation.
- ***improved business performance*** (*e.g.*, Ramanujam *et al.*, 1986; Ramanujam & Venkatraman, 1987; Premkumar, 1989; Raghunathan & Raghunathan, 1994). This dimension is made up of seven items relating to the impact of ISP on the following business performance indicators:
 - (i) sales volume;
 - (ii) market share;
 - (iii) profit;
 - (iv) customer satisfaction;
 - (v) return on investment with respect to IT in particular;
 - (vi) efficiency of the organisation as a whole;
 - (vii) effectiveness of the organisation as a whole.

Each is measured using the improvement approach to evaluation.

- ***achieved the planning objectives.*** Previous research advocates the attainment of *specific* planning objectives to measure planning effectiveness (*c.f.*, MacLean & Soden, 1977; Doll & Ahmed, 1983; Davis & Olson, 1985; Ramanujam *et al.*, 1986; King, 1988; Premkumar, 1989; Raghunathan & Raghunathan, 1991; Lin, 1991). It is argued here that because different organisations may not share common ISP objectives, the attainment of specific planning objectives is therefore inappropriate as a measure of ISP effectiveness given the cross-sectional nature of this research. Instead, a more general question on whether the respondents believe their organisation's ISP objectives have been achieved, is more appropriate in this context. This provides a normative approach to evaluation
- ***identified all the information systems which had been ultimately implemented.*** This measure is advocated by the system usage (*c.f.*, Srinivasan, 1985) camp of researchers (*e.g.*, Zmud, 1979; Bergeron *et al.*, 1991; Sinha, 1990; Lederer & Sethi, 1992b; Earl, 1993). It is argued that if ISP was truly effective then only those IS identified during planning (and the subsequent updating of the IS plan to take into consideration changes in the environment) would be implemented. The plan's implementation has been shown to be the best predictor of overall satisfaction (*c.f.*, Pearce *et al.*, 1987; Raghunathan & King, 1987; Hoffer *et al.*, 1989; Lederer & Sethi, 1991). ISP effectiveness has not to-date been operationalised in this way. This item provides a behavioural rather than solely

perceptive measures of ISP effectiveness which have traditionally been used, and is measured using the normative approach to evaluation.

- *made good use of the resources available (i.e., was efficient)*. Davis & Olson (1985) suggests the system has to be efficient in order for it to be perceived as successful. This is measured using the normative approach to evaluation.
- *overall been successful (e.g., Ramanujam et al., 1986; Harris, 1989; Lin, 1991)*. This item was included primarily as a validity check on the other twelve and is akin to the traditional user satisfaction measure used in IS evaluation. This is measured using the normative approach to evaluation.

4.3 Summary

The main objective of this research is to investigate the existence of ISP feedback within organisations and to establish what relationship it has with ISP success (effectiveness). In order to do this, two models have been conceptualised and operationalised in this chapter: a model of feedback (existence) and a model of ISP effectiveness.

The chapter begins with a discussion of the two types of ISP feedback investigated in this research, ISP system feedback and IS plan feedback (*c.f.*, §4.1). This is followed by the identification of a conceptual model of feedback (*c.f.*, Figure 4.2) which, however, is argued to be too detailed for our current state of knowledge. Given the lack of empirical data regarding feedback in general, a second conceptual model is developed specifically to measure the *existence* of feedback within organisations by establishing the extent to which an organisation has a feedback methodology in place. In other words, a model of a feedback methodology is conceptualised (*c.f.*, Figure 4.3) then operationalised in order to measure the degree to which feedback exists within organisations.

In addition to the primary objective of establishing whether ISP feedback exists and if it does what relationship it has with ISP success (effectiveness), a secondary objective is to identify generic ISP system characteristics related to ISP success which can be used as a foundation for a system-oriented (diagnostic) evaluation. Potential success factors are identified and grouped according to the sections of the research instrument in order to provide structure to the discussion (*c.f.*, §4.1.2.2.1.2).

The second section of this chapter (*i.e.*, §4.2) discusses the conceptualisation and operationalisation of an ISP success model. Using effectiveness as a basis for measuring ISP success, a multi-dimensional conceptual model of ISP effectiveness is identified (*c.f.*, Figure 4.5) which addresses some of the weaknesses of existing evaluation models identified in §4.2.6.2. The section ends with the operationalisation of the seven ISP effectiveness dimensions using thirteen items.

The literature used to develop both models and to identify system characteristics, is based on research conducted in the private sector. Given the profile of organisations willing to participate in this research (*i.e.*, approximately half of which are public sector organisations), it was deemed necessary to validate the appropriateness of the research instrument within the public sector setting. The following chapter seeks to do just that.

5. Case Study

The majority of the ISP literature to-date has focused on research carried out in private sector organisations. This is not, however, an oversight by the ISP literature alone; the whole area of strategic management has until quite recently neglected the public sector (Ferlie, 1992). Over the last few years, the public sector have been encouraged to adopt private sector values in their service delivery, it is no surprise therefore that the application of strategic research to public sector organisations has been the subject of growing debate within the academic and practitioners community alike.

The research instrument developed in the previous chapter is based primarily on research conducted in private sector organisations. However, since approximately half the sample of organisations willing to participate in the questionnaire were from the public sector¹, it was important to establish whether the research instrument was applicable within this setting. While there are now some detailed studies of public sector ISP practices (*e.g.*, Flynn & Hepburn, 1994), at the time of investigation few existed. This chapter reports on case studies carried out in two departments of a local authority (LA), providing evidence that the research instrument is appropriate to public sector organisations environment.

Evidence is provided in four ways. Firstly, the scale and nature of environmental changes over the last few years have forced public sector organisations to become more like those in the private sector. These changes, and their impact on public sector operations, are discussed in some detail. Secondly, the research instrument is used as framework for discussing the ISP activities within both departments, thus providing 'direct' evidence that it is applicable to public sector organisations. Thirdly, a variety of IS models, initially derived from private sector research, are applied in the public sector context thus providing evidence that similar IS/IT issues face both types of organisations. Finally, case study informants were asked to take part in a pre-pilot of the draft questionnaire (updated in line with findings from the case studies), providing final evidence of the appropriateness of the research instrument to public sector organisations.

The chapter is divided into three main sections: environmental changes and their impact on public sector operations; description of public sector ISP practice within two local government departments, and a concluding section summarising the main points of the case.

1 These were primarily made up of Local Authorities. While it is recognised that Local Authorities only represent a sub-set of the public-sector, the same environmental forces, primarily in the form of legislation, have had similar effects on all public sector organisations.

5.1 Changes in the Public Sector Environment

There are currently 47 County² and 333 District Councils in England and Wales. These local authorities (LAs) are huge diverse organisations administering between 600 and 700 different functions (LGMB, 1993) and are the single largest employers in the area they serve.

During the post-war years up until 1975, the economy grew at a steady rate and LAs expanded in response to requirements for a new range of public services. In 1976, Britain borrowed from the International Monetary Fund, a condition of which was that LAs would curb their growth in expenditure. While the central government (CG) at that time responded by reducing LAs capital³ expenditure, it was not until the change of CG in 1979 that changes to the LAs began in earnest.

The new CG, believing LAs to be inefficient, irresponsible, unaccountable and out of control, reduced the central funding given to LAs. Whilst this kept local capital spending low, LAs increased their revenue⁴ expenditure financing it through a rise in the business rates. As a consequence only a modest reduction in expenditure was actually achieved.

In response, CG introduced legislation that aimed to change the way in which LAs operated. However, these changes were directed at only a small section of LA operations, leaving the majority of LA operations relatively untouched. It was not until the enactment of the 1988 Local Government Act that fundamental changes in all LA operations began to occur.

5.1.1 The Reforms

This Act allowed CG to introduce a programme of reforms which have had a direct impact on the traditional role and structure of LAs. These reforms have sought to improve internal efficiency, increase financial constraint, instigate new forms of accountability, and improve service quality. The aim is to make LAs more customer oriented, entrepreneurial, innovative, flexible, and responsive to the changes in legislation (Newman, 1994).

In particular, the Audit Commission (1994) identifies four main organisational consequences of the reforms. These are:

1. *local service providers* with considerable managerial and financial autonomy over the manner in which defined services are delivered;
2. *contractors*, either owned by the council or private bodies;
3. *clients* which specify and monitor the delivery of activities by the first two categories;
4. *a corporate core* which sets priorities, allocates budgets, listens to customers, and maintains a framework within which the first three can function.

2 Made up of six metropolitan county councils and 39 non-metropolitan county councils.

3 The capital budget finances long-term investments, physical assets such as buildings, land and machinery.

4 The revenue budget finances the day-to-day running of the local authority, expenses such as salaries/wages and the purchase of materials.

There has been primarily two types of reforms which have had a profound effect on LAs. The first is legislation aimed at changing the fundamental operational structure and culture of LAs as a whole (*e.g.*, Compulsive Competitive Tendering), and the second is legislation relating to particular service areas within the LA (*e.g.*, the NHS & Community Care Act which relates primarily to the Social Services Department). While both types of reforms have common themes running through them, it is the former type of legislation which is discussed in more detail in this section. In summary, these reforms are: local government (LG) funding, the Citizens Charter, LG review (LGR), compulsive competitive tendering (CCT) and the creation of independent agencies.

It should be noted that the chapter does not seek to appraise critically the legislation that has led to the radical changes in the public sector environment (*c.f.*, Benington & Stoker, 1989; Leach, 1994). Rather it aims to provide a summary of the impact these changes have had in general and with respect to the use of IS/IT in particular.

5.1.1.1 LG Funding & The Citizens Charter

LAs finance their spending primarily from two independent sources: rate revenue and capital borrowing. The 1988 Local Government Finance Bill imposed tighter forms of financial control over LG and a higher degree of accountability to the rate payer. The poll tax was one way used to increase accountability by reducing the distance between the individual and LA services.

Accountability has been governed by the Citizens Charter and the 1992 Local Government Act which requires all public services to publish targets on the level of service the public should expect together with whether these targets have been achieved. A means of redress is offered through a regulator, ombudsman or small claims court if these targets have not been reached.

The Citizens Charter was introduced to provide the 'customers' of public services with an element of consumer choice: 'consumer power'. True consumer choice allows the recipient of a service (or product) to decide for themselves between competing service (product) providers, which is not possible in the case of public services. However, 'consumer power' has been introduced into public service delivery by including 'customer' wants and needs in the definition of service performance standards.

The Audit Commission (1992) has identified five areas to be covered under performance standards: overall cost of the service; amount of service provided; the extent of use made of the service by the public; the 'quality of effectiveness' of the service, and its value for money. While the first three factors are quantitative and relatively easy to measure, the measurement of the last two are somewhat more difficult.

How service quality/effectiveness and value for money are measured is a continuing debate both within LG and academic circles (Palmer, 1993; Stewart & Walsh, 1994). ACC (1990: p 7) reports that most county councils now use independent market research to judge the quality of their services and customer satisfaction. Private sector organisations use similar descriptors of performance using market share to measure service/product usage and profitability to measure value for money; they also have a similar problem when it comes to measuring quality of their product/service.

5.1.1.2 Local Government Review

Local Government Review (LGR) aims to improve both the internal efficiency and service effectiveness of LAs through the restructuring of LG. CG believe that the two-tiered system in the majority of LAs today is inappropriate for the efficient working of the 'modern' LA. Instead they advocate a move to unitary authorities in order to: simplify the financial arrangements; increase quality, reduce bureaucracy and costs through economies of scale; recruit and retain high calibre staff by offering high quality training and reasonable career progression; improve co-ordination of services particularly those that are related but are currently the responsibility of the two different tiers (e.g., Social Services and Housing); eradicate duplication of specialisms, equipment and service where it occurs, and eliminate the confusion which exists in the public's mind when faced by two main service providers (county and district councils) thereby enhancing the lines of accountability between local authorities and their community (Department of Environment, 1991).

The Local Government Commission, an independent body established in 1991 to advise the Secretary of State for the Environment on the reorganisation of each of the Shire Councils, is set with the task of creating or recreating quite different (unitary) authorities altogether. However, restructuring has run into a number of problems and as a consequence there is increasing political reaction at Westminster suggesting that just the unpopular authorities should be dealt with and that the rest should be left as they are.

If restructuring does go ahead as planned it will have a huge impact in terms of how resources are distributed and services delivered. Whether district councils are to be merged or county councils are to be broken up, the problem associated with the integration or disintegration services/resources (including IS/IT) is a major one. The current IT provision within LAs may complicate any restructuring because of incompatible systems in merging authorities. For LAs required to split into smaller unitary councils, there will be losses in economies of scale, purchasing power and procurement expertise not only in IS/IT but also in other areas of the organisation. The potential disruption is enormous in terms of support systems such as payroll, council tax collection and social services.

The uncertainty of the situation has meant that organisations are finding planning for services and the deployment of resources difficult. As a consequence, many LAs are planning under the assumption of a status quo rather than actively seeking out alternative scenarios which could reflect their demise.

5.1.1.3 *Compulsive Competitive Tendering (CCT)*

CG, believing in the 'efficacy of markets', is attempting to introduce market disciplines into LA operations. In addition to reorganising LG structure into unitary councils, CG is attempting to reorganise the internal structures of LA departments by dividing their traditional role into two: service purchaser (*i.e.*, the client) and service provider (*i.e.*, contractor). Whereas services were once identified and provided by LA, the major role of the LA now is the *identification and management of service provision*, the services of which may be provided by an 'in-house' supplier, private sector and/or voluntary organisation. It is hoped that service provision will become more efficient by opening it up to competition from external organisations.

Two mechanisms are being used to introduce market disciplines into LA operations: establishing a client-contractor relationships between the service purchasers and service providers through the use of internal trading accounts which mimic the operations of a market, and subjecting LA services to competitive tendering so that the purchasers have a choice of where to buy the service. As a result, 'in-house' contractors either become a stand-alone direct service organisation (DSO) or amalgamate with other CCT services to become a single trading department, enabling economies of scale. The new relationship between the client and contractor (whether internal or external) is governed by contracts and service level agreements (SLA). DSOs are required to make a surplus equivalent to a rate of return on capital of at least 5%, failure to do so over three consecutive years may lead to their closure.

Decentralisation and Management Responsibility

In conjunction with the Financial Management Initiative⁵ enacted through the 1992 Local Government Act, CCT is leading to decentralised control of resources and devolution of management responsibility. Local managers have been empowered with a financial budget to spend how and with who they think appropriate.

The new management focus of 'steering, not rowing' (Osborne & Gaebler, 1992) has meant the need for local managers to learn new skills related to the securing and monitoring of service provision. The shift from an operational to a management focus requires not only specifying clearly the work that needs to be done, setting appropriate standards and monitoring performance of the service delivered, but also skills in writing and monitoring contracts (Osborne & Gaebler, 1992). Contracts put out to tender may vary in length from three to seven years. This means that major policy and budgetary decisions have to be made years in advance since significant changes to contracts may lead to high cost variation. The need to write contracts that will stand a number of years has meant that LAs now need to plan several years ahead.

5 The Financial Management Initiative encourages the devolution of budgeting responsibility and decision making down to the local managers level, making them more accountable for their actions.

'In-house' service providers will also have to learn new management skills in order to survive in the pseudo⁶-competitive environment. For example, Shaw *et al.* (1994) report that in a small number of authorities, 'in-house' service providers examine the operations and pricing policy of their potential private sector rivals.

New Public Management (NPM) is the name given by Hood (1991) to the new style of leadership emerging in the LAs. Bellamy & Taylor (1994) analyse the move from public administration to NPM at two levels, the strategic and operational. At the strategic level of management and policy-making, NPM is concerned with service acquisition and monitoring needed to achieve certain policies but not the detailed execution of that service delivery. The new role of the policy-makers is to develop clear statements of service quality, the ways in which it should be monitored and who should be contracted to deliver the service. At the operational level, NPM is concerned with the detailed service delivery and its effectiveness without interference from policy-makers.

This has the effect of 'depoliticise [the] process of management and administration' (Benington & Stoker, 1989: p 121). Before CCT, LG organised service provision through a series of committees which focused on the operational necessities of service delivery (Stewart, 1989). With the frequent changes in leadership and policies due to the short political cycles, short-term operational decision making may have been adversely affected in the longer term. With the advent of CCT, traditional committee structures are no longer viable due to the potential conflict of interest arising if a committee tries both to tender and oversee DSO bids. Instead boards have emerged that deal with DSO affairs and which react more quickly than the traditional committee. Detaching policy-making from implementation addresses the problem of short-termism and allows LA managers to plan for the longer term.

5.1.1.4 Creation of Independent Agencies

Recent reforms have also had the effect of marginalising LAs role within their community by transferring the responsibility for some services to independent agencies in order to create 'exit-options' for the consumer (Stoker, 1988: p 253). The Housing Action Trusts (HATs), set up to take over and sell off council estates, is an example of such an agency.

5.1.2 The Changing Information Requirements of LAs

Given that LAs administer between 600 and 700 different functions, the majority of which either generates data or makes use of information, it is perhaps not surprising that IT-based IS accounts for about 3% of LG expenditure (Audit Commission, 1994: p 1).

6 'Pseudo' because 'in-house' service providers are not allowed to tender for external private sector contracts.

The reforms have changed the nature and importance of information flows within LAs. In the past, LAs collected, stored and processed data to support the vertical information flows of traditional bureaucracies thereby reinforcing compartmentalisation, command structures and reporting regimes. Data is now, however, expected to flow horizontally within LAs, not only across departments but also across organisational boundaries. Only those authorities with technology and network strategies are likely to be able to achieve horizontal integration (SOCITM, 1992).

In addition to changing the internal workings of the organisation, reforms have altered the nature of LAs relationship with its environment. LAs are not only having to deal with external service providers for the first time but are also being held accountable to their communities. In addition, clients in the client/contractor split are having to change existing internal relationships to those more appropriate between a customer and supplier. As consequence of these new relationships, a whole range of information requirements have been identified.

5.1.2.1 Changes in Internal Relationships

The new style of management (*i.e.*, NPM) calls for new information resources and flows not only to enrich policy-making and provide effective performance monitoring but also to support the new structure and relationships that are emerging.

Bellamy & Taylor (1994: p 59) argue that effective implementation of NPM requires the development and application of new 'sophisticated' information systems to support not only the new intra- and inter-organisational relationships that are evolving, but also the achievement of both managerial autonomy and accountability and overall co-ordination of the newly fragmented organisations (Bellamy & Taylor, 1994: p 59).

Success of NPM, they believe, is critically dependent upon innovations in the communication of information and the integration of the IS strategy with the organisational strategy (*ibid*: p 61). Integration between these two strategies has been identified by other researchers as critical to the success of private sector organisations (*e.g.*, Galliers, 1987a; Premkumar & King, 1992; Earl, 1993; O'Connor, 1993). The costs of being unable to share data will increase. Without standards and conventions for collecting and storing data intra- and inter-organisationally, 'data islands' will be created leading to data duplication and uncontrolled redundancy.

The introduction of new technology and systems to support the new organisation will not be easy. The large financial and human investment of existing systems coupled with the cost and long lead-times associated with innovation, is likely to lock LAs into their legacy systems which reinforce old management styles and ways of working. Failure to change the existing culture of command and control may mean that new IS/IT reinforce rather than support the changes needed in the existing hierarchical structures. In addition, new information flows and technologies to support them raises highly sensitive

political issues at both the operational and policy making levels. Since 'information is power' (Pettigrew, 1972), the move towards horizontal integration is challenging informational domains. The issues of ownership and regulation will have to be addressed if horizontal integration is to be successful.

Decentralisation and the accompanying devolution of management has meant an increase in the use of financial IS that help Resource Centre Managers manage their new budgeting responsibilities and top management to monitor resource deployment. In this new decentralised environment, the identification and management of the appropriate information flows is critical to the organisation's operational coherence (Audit Commission, 1994: p 4).

5.1.2.2 Changes in the LA-Customer Relationship

LAs have been made accountable to their communities in terms of their quality of service provision. Customers of public services have been encouraged by reforms to participate in defining service quality and how it should be measured. It is the LA's responsibility to ensure correct mechanisms are put in place so that targets can be set, monitored and reported to the customer and CG. IT-based IS have become the primary enabler of delivering such performance related information.

IS/IT has also been used to improve the efficiency and/or effectiveness of individual services. For example, circulation and control information regarding library loans provides a detailed profile of 'consumption' patterns enabling librarians to tailor book stocks on the basis of local preferences.

Finally, IT-based IS are also used on the front-line to interface with the public. For example, customers with a variety of different queries related to different council departments and external agencies, can now be dealt with through a single point of contact (*i.e.*, the concept of the 'one-stop shop').

5.1.2.3 Establishing LA-Supplier/Agency Relationships

The reforms have forced LAs to forge new relationships with external suppliers and independent agencies. For the first time LAs are having to manage relationships outside their own traditional hierarchical culture which has up to now relied heavily on reporting relationships and the 'power of the budget' to ensure service delivery.

Agency relationships are having to be managed by the 'power of influence'. In order to treat the customer in a holistic way, co-ordination between independent agencies and different LA departments are of primary importance. This has huge implications in terms of inter-organisational information requirements and management of that information (*e.g.*, who owns the data?, who updates it?).

Supplier (*i.e.*, service providers) relationships (whether they be internal or external) are managed through contracts or SLAs. LAs have the responsibility of ensuring that service providers attain a certain quality of service provision. Service provision therefore has to be monitored and information gathered on the relevant performance indicators which are reported to customers and CG. In addition, IS/IT is being used to manage 'in-house' relationships governed through internal trading accounts and to ensure 'in-house' contractors meet the specified return on capital.

5.1.2.4 *The Changing Face of the IS/IT Function*

Traditionally, IT/IS has been managed as a central services function, normally under the control of the financial services department, and financed through a central IS/IT budget.

CCT has, however, led to the close examination of the central services role in LAs (*e.g.*, Treasurer, Personnel, Legal, IT). While central departments provide services to the rest of the LA, they have also traditionally had the role of enforcing formal accountability of departments through budgets. However, with the decentralisation of budgets and devolution of management, LA service departments are no longer directly accountable to central services as they once were. LAs are now having to reassess the role of the central departments identifying which functions are *corporate* (*e.g.*, committee administration), *control* (*e.g.*, internal audit), and *support* (*e.g.*, IT services) in nature.

Recently CCT has been extended to central support services, the category which IT services have traditionally fallen in. CCT for central IT departments is due to be implemented by September 1996 by which time 80% of what is currently described as 'corporate service' computing should be subject to the tendering process (Audit Commission, 1994: p10).

As the central support services move towards the provider role in the purchaser-provider relationship, initial evidence (Shaw *et al.*, 1994) suggests these relationships to be less than harmonious. Central support services have always been in a 'provider' role (albeit in a monopolistic environment) and has in the past been 'holder of the purse' which has naturally caused friction with service departments. Central support services are now having to manage the new decentralised relationship (and devolved budget) through SLA using 'the power of influence' rather than 'the power of the budget', as they once did.

As a consequence of devolving the majority of the IS/IT budget to service departments, there has been a reduction in investment on corporate systems and mainframe computing, and an increased emphasis on decentralised processing, networking and package acquisition to support independent service units (SOCITM, 1992). The role of the IS/IT function is therefore beginning to change within LAs.

As with other services which have been subject to CCT, a split has occurred in the IS/IT function. The client side of the IS/IT department, which acts as a client agent, provides 'consultancy' services to the rest of the organisation. Services include: development, agreement and maintenance of strategy; recognition of opportunities offered by technology; preparation of specifications; procurement of solutions; project management of the implementation process, and management of the contract with the IT supplier whether they be external or internal. However, while the client agent provides a pool of expertise, it is the client's responsibility to ultimately specify what services are required, acquire the service contract, pay for the service, ensure value for money, monitor performance, and determine ownership of the systems data and equipment.

The contractor side of the IS/IT department is a provider of IS/IT services. While some have become DSO others have become commercial entities, independent of the LA to which they originally belonged, operating alongside other private sector facilities management organisation.

5.2 Cheshire County Council

The following section describes interviews carried out in two service departments of Cheshire County Council (CCC). Open-ended interviews were conducted around the framework provided by the research instrument discussed in Chapter 4. The interviews were taped, transcribed and the transcript verified by interviewees. The report below provides a summary of these interviews together with general information about the organisations to put the ISP activity in its proper context.

The two service departments chosen were the Fire Brigade and Social Services. The departments were chosen by the Corporate IS Planner who believed them to reflect the two extremes of ISP within the organisation.

5.2.1 Introduction

Cheshire is a Welsh border county covering 900 square miles and housing a population of approximately one million people, making it one of the largest Shire Counties in the UK. It is governed by one county council, eight district councils, and 225 parishes and towns councils. While CCC provide the majority of services, some are split between borough/city councils (*e.g.*, council tax and refuse collection). Parish and town councils provide local facilities, such as village halls, allotments and recreation grounds. The cost of all services each year amount to approximately £800 million.

5.2.2 Internal Environment

CCC is a typical county council taking responsibility for the 'front line' services identified in Figure 5.1 (excluding the Resource Group which provide internal services). The directors of each service department together with the CEO make up the Cheshire County Council Management Board. Each Service Director has overall responsibility for and co-ordination of strategic policies, priorities and resources of their service area and report to the appropriate Service Committee.

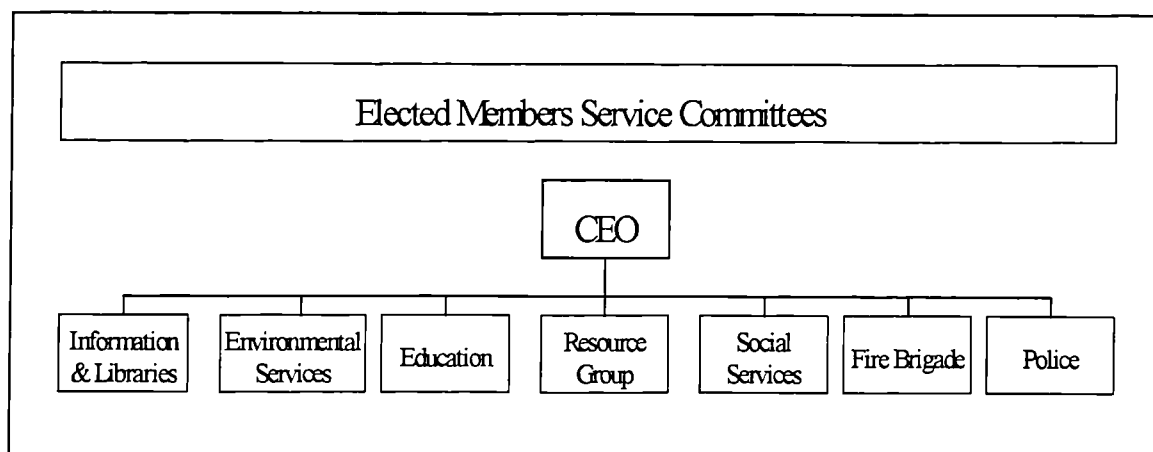


Figure 5.1 - Cheshire County Council organisational structure

The Resource Group

In response to the requirements of CCT, the Resource Group was created comprising both contractor and client support services (*c.f.*, Figure 5.2) including IS/IT services. All contractor services are governed by an internal market and trading accounts whereas all client support services are funded by a corporate resource pool.

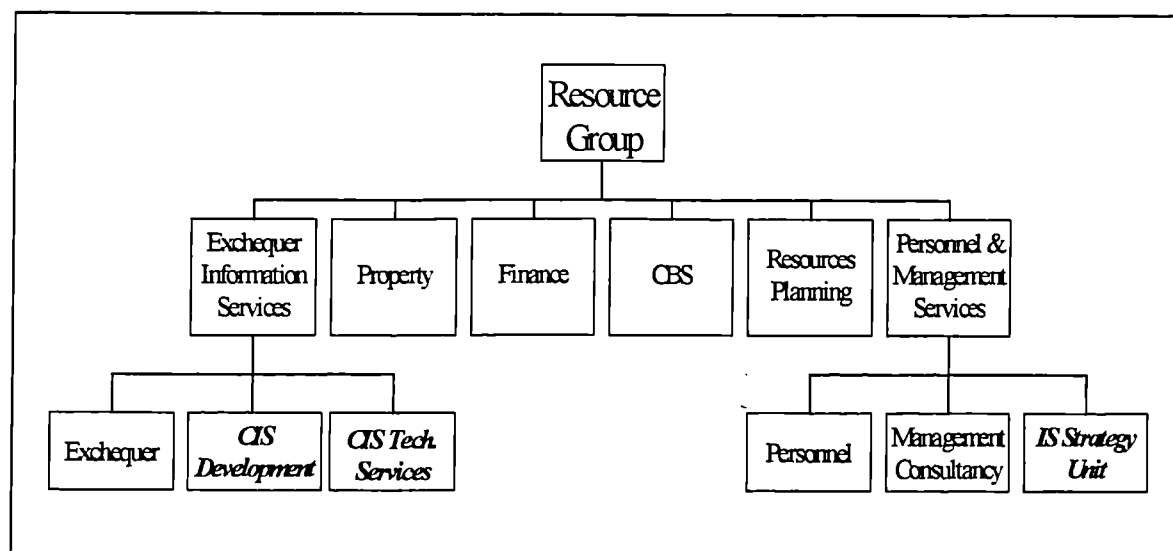


Figure 5.2 - Organisational structure of the new Resources Group

5.2.3 IS/IT Environment

Prior to 1989, the County Council's IS/IT department known as County Information Systems (CIS), then under the control of the Financial Group Director, was geared to the big corporate system users such as Exchequer, Finance, and Personnel. At this time, CIS (which comprised Development and Technical Services) were involved only with a small number of departmental systems serving specific operational needs. There was no ISP activity as such, instead IS identification was needs-led, and IS were developed and delivered by CIS in consultation with user managers. In order to satisfy the day-to-day operational needs, service departments bought and ran their own systems and as a consequence individual IS/IT departments grew in a number of service areas resulting in a disjointed County approach to IS/IT.

In 1989, CIS was asked to take on the role of corporate IS/IT provider. CIS Development Services was reorganised into teams each reporting to different service areas which made CIS more service-oriented. A CIS Planning Unit was established with the remit of formulating a corporate IS strategy (ISS). Early planning endeavours, however, were more tactical than strategic in nature, providing detailed inputs to the development cycle but not providing a longer term view of IS/IT requirements.

At the beginning of 1994, in response to the requirements of CCT, CIS Development & Technical Services were split off from the CIS Planning Unit and merged with Exchequer Services to become an 'in-house' contractor. The CIS Planning Unit was renamed the IS Strategy Unit (ISSU) and became part of client support services, retaining 20% of the corporate IS/IT budget. The remaining 80% was apportioned to service departments in the form of CIS development hours which they are committed to spend with CIS Development & Technical Services. By September 1996, however, service departments will no longer be restricted to purchasing IS/IT services from the 'in-house' contractor.

5.2.3.1 CIS Development & Technical Services

CIS Development & Technical Services (CIS) together with Exchequer Services have become the new Exchequer Information Services Unit (*c.f.*, Figure 5.2). In its new contractor role, CIS provides facilities management, systems design and development services to the rest of the organisation. They have a diverse number of clients who have varying degrees of dependency upon their expertise.

CIS maintains a number of computers which house both authority-wide and departmental applications. An IBM mainframe supports mainly the Exchequer Systems, a Vax Cluster supports office applications and CHESHIRElink (the County-wide communications system), and two AS400 which are maintained by CIS but are used for specific departmental applications.

5.2.3.2 *IS Strategy (CIS Planning) Unit*

The Information Systems Strategy Unit (ISSU) is part of the Personnel & Management Services Group (*c.f.*, Figure 5.2) and has five main responsibilities which are financed by the 20% retained from the central IS/IT budget known as the Corporate Pool. The Unit:

- identifies authority-wide IT standards;
- offers departments guidance and support in developing their ISS;
- distributes the IS/IT budget to service departments in the form of CIS development hours;
- develops a corporate ISS identifying possible corporate-wide systems (*e.g.*, CHESHIRElink which is the county-wide communications system);
- produces a County ISS comprising departmental and corporate ISS.

The Corporate Pool is also used to finance major projects that can not be financed by departmental IS/IT budgets alone.

5.2.4 *The Business Planning Environment*

The need for strategic planning within LAs has arisen from the desire not only to predict and influence the future but also to put in place a target-setting culture that helps to ensure value for money at a time of cash-limited budgets and firm expenditure controls.

Business planning within CCC is a top down process. Three types of plans are produced:

- A County plan, known as the Medium Term Strategy (MTS), which is a financial management device to help ensure against rate capping and to enforce some long term financial planning. It is the County's business plan defining CCC 'mission' statement, identifying general business objectives, trends in the environment over the next three years⁷, how CCC aim to address these and how solutions will be financed.
- Departmental plans which are produced annually within the framework of the MTS clearly identifying departmental business objectives and how these relate to those identified in the MTS.
- Resource centre plans which identify how they aim, through the provision of service and within the budget available, to satisfy departmental business objectives. Resource centre plans (RCP) are usually developed in August of each year, presented to the appropriate service committee around November/December and the funding voted through by the County Council around February, ready for the new financial year in April.

5.2.5 IS Planning

ISS are also developed at various organisational levels: Corporate, Departmental, Service and Unit. Departmental ISS together with the Corporate ISS form a consolidated County ISS reflecting the MTS, departmental and RCP.

At the *corporate level*, the ISSU develop a bi-annual corporate ISS which not only identifies potential corporate-wide systems but also provides the IT framework within which individual departments are expected to work. An IS steering panel, chaired by the Personnel & Management Officer and attended by each departmental head and their departmental IS co-ordinators, deals with corporate level issues such as potential corporate-wide systems, which are financed from the Corporate Resource Pool (e.g., CHESHIRElink which is the County's information retrieval and electronic office support system. CHESHIRElink is changing not only the way communications are handled, but also the working practices of many Officers previously locked out of technology.

While the corporate ISS allows service departments to have maximum authority and responsibility for their IS, this must be done within the corporate IT framework. This framework is in effect an information management strategy (*c.f.*, Earl, 1989) identifying IT, data management standards and system design standards.

The first County IS strategy, produced in 1990, concentrated on corporate issues since not all departments had IS plans at that time. In 1991, all departments were required to produce IS plans based upon their RCP; these were consolidated to produce the first real County ISS in 1992 for which CCC won an external award⁸.

Departmental level ISS focuses on the general management issues surrounding IS delivery within the departments. It provides a summary of the ISS produced by the different resource centres together with a review of the current departmental IS management structure, IS resource issues, and information management and technology strategies. The departmental IS plan is updated each year and feeds into the County ISS.

The ISSU provide guidelines to departments as to what the content of the document should be and ISSU planners work with departmental IS co-ordinators and service managers to produce plans within the corporate context. Guidelines stress the need to develop clear business objectives on which the departmental IS strategy should be based, ownership and commitment of the individual strategies, and a general IS/IT awareness (*c.f.*, CCC#1⁹: p29). These are the same type of issues being addressed by private sector organisations.

⁸ Excellence in IT Management awarded by The BCS and Hay Management Consultants.

⁹ References to case study documents details of which can be found after the general references.

Departmental IS plans are now produced annually in October of each year (in parallel to the RCP) and finalised around January/February when corporate and departmental resources are allocated. This means that by the end of each year, the ISSU will have some indication as to the development requirements of each department for the following financial year and can divide the central IS/IT budget accordingly.

At the *service level*, strategic and *tactical* IS planning meet. At this level, the service business plan is tactical in nature clearly identifying how the known objectives of the department will be met through service delivery. Typical service level IS planning includes: reviewing current IS/IT in the light of business objectives and priorities; system portfolio planning; attaining senior management commitment for IS through justification studies; IS procurement; systems specifications; feasibility studies and requirements analysis. In addition, possible IS to attain particular service objectives are also identified and provide the strategic element of IS planning at this level.

At the *unit level*, *tactical* IS planning and *project management* meet. At this level, the focus is on specific systems and the work involves procurement, application software selection or development, and training issues.

5.3 Cheshire Fire Brigade

The first case study was carried out in Cheshire Fire Brigade (CFB). It was chosen as an example of a direct service department which had only relatively recently started to plan their IS/IT provision.

ISP is conducted at the departmental level only, is led primarily by two people and at present no formal, documented methodology exists. There is some evidence of planning at service level but this is predominantly tactical in nature (*i.e.*, systems development).

5.3.1 Participants

A total of four people were interviewed for this case: the Operational Support Department Manager (OSDM) and the recently appointed non-uniformed IS Manager who are the two main people actively involved in the IS plans formulation; a user involved in the commissioning and implementation of one of the major operational systems (*i.e.*, Fire Safety), and the ISSU Planner who provided general guidance for the ISP activity.

5.3.2 The Internal Environment

5.3.2.1 The Services Provided

The Fire Brigade (FB) has two principle roles: the enforcement of the Fire Precautions Act 1971 and provision of advice required by the Fire Services Act.

The Fire Precautions Act requires the FB to enforce fire safety legislation through the issuing of fire certificates, safety certificates, petroleum licenses, explosives registrations and licences to store explosives. At the present time, there are approximately 14,500 premises in Cheshire accountable in terms of fire precautions to CFB.

The Fire Services Act covers the provision and deployment of fire-fighting resources together with a substantial statutory consultation role to other governmental organisation around the County such as the other council departments, district councils, licensing Justices, and the Health and Safety Executive. The FB also provide public fire safety advice.

CFB employs 600 full-time, 200 part-time and approximately 100 non-uniformed personnel, and occupies 26 sites across the County including four main fire stations which oversee an additional 20 smaller fire stations, CFB control (where the mobilising system is based) and CFB Head-quarters. They deal with approximately 30,000 emergency calls ('999' calls) and 14,000 other incidents each year.

5.3.2.2 Organisational Structure

Figure 5.3 shows the organisational structure of CFB. The Chief (County) Fire Officer (CFO) is the Service Director and while he is ultimately responsible for service delivery, the Deputy Chief Officer (DCO) runs CFB on a day-to-day basis. The CFO, DCO and Assistant Chief Officer (ACO) make up CFB Management Board (BMB).

There are six departments within CFB. The DCO is responsible for two which provide the day-to-day management & control, transport scheduling and responding to incidences. The ACO is responsible for two which provide fire safety services (*e.g.*, enforcing fire safety legislation, goodwill advice, training and fire safety education) and operational support services to the rest of CFB. The other two departments, Central Services and Emergency Planning, are not run by uniformed Brigade Officers. The Central Service Department looks after CFB finances and administrative duties and is run by the Principle Administration Officer (PAO) who also co-ordinates policy between CFB and County Hall. The Emergency Planning Department comes under the umbrella of CFB although, in reality, it is an autonomous group. It is run by the Chief Emergency Planning Officer (CEPO), who under normal conditions, reports to the CFO but under emergency situations reports directly to the CEO of the County Council.

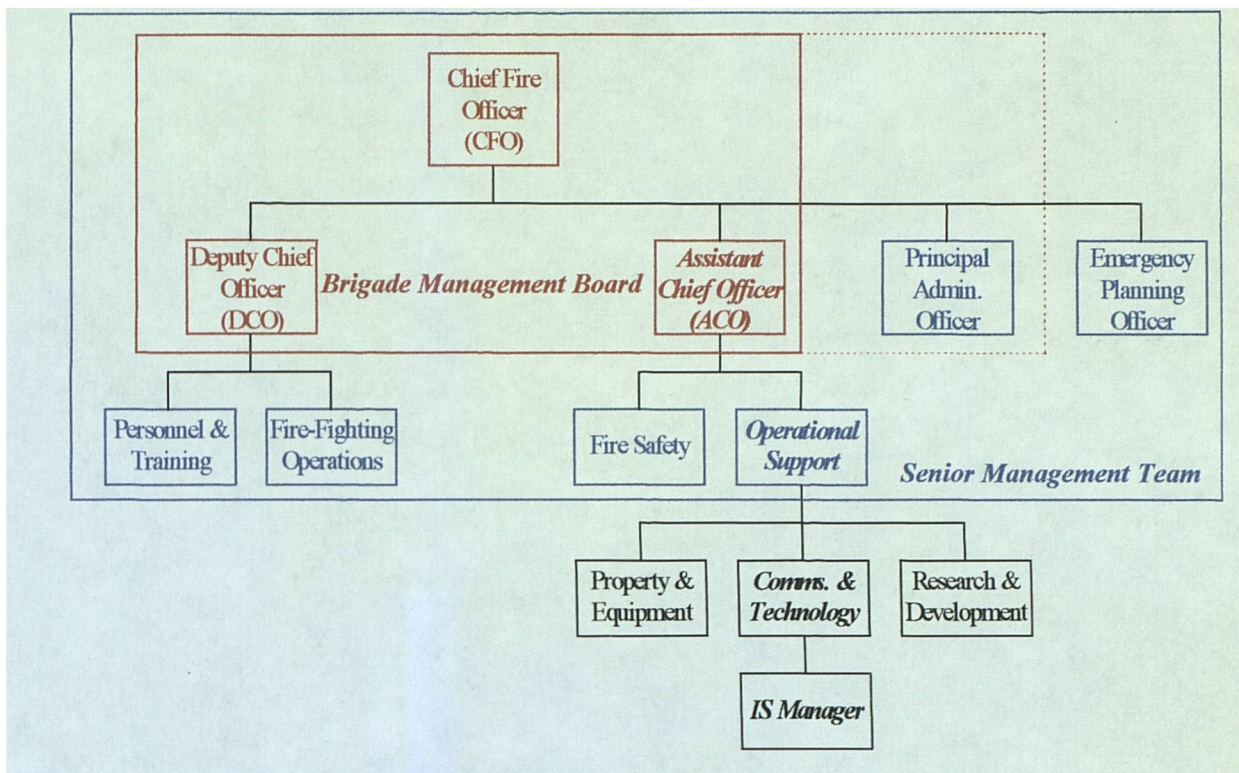


Figure 0.2 - Cheshire Fire Brigade's organisational structure

The BMB³ together with the six departmental managers form the Senior Management Team (SMT). All of the SMT, with the exception of the PAO and CEPO, are hands on fire-fighters bringing first hand operational knowledge to the management position.

Organisational Culture

In terms of organisational culture, CFB could be categorised as a bureaucracy (Handy, 1985) since the organisational strength lies in the functions or specialities co-ordinated at the top by a narrow band of senior management.

Decision Making Structure

Over the last few years there has been pressure for CFB to change its decision making structure in line with the general changes occurring within CCC as a whole. In particular, the devolution of budgets and the need to provide better 'customer' service has led CFB to rethink its decision making structure. Traditionally, most of the tactical decisions have been made by divisional (senior) management level where resources, skills and information combined. Tactical decision are now taken as close as possible to the point of delivery (*i.e.*, the fire station or within the Fire Safety team) while senior management now concentrate on decisions relating more to policy and strategic planning.

3 The PAO is not strictly a member of the BMB but sits on it in an informative capacity only.

Figure 5.3 shows the new management structure implemented to enable these changes. The effects of the new management style have been noticeable through a marked improvement in morale and understanding throughout CFB which has in turn led to greater quality of service (FB#7).

5.3.3 Organisational Strategy

CFB's first business (organisational) plan was produced at the end of 1991 in response to County Hall's request to show how their business objectives fitted with the County's MTS. These are now produced annually having become an accepted mechanism for adding focus to each years activities.

Business planning is carried out as described in §5.2.4, taking between four and five weeks to do the majority of the work. While SMT set the business objectives, this is done in consultation with lower management levels.

The business plan is reviewed on an ongoing basis during SMT meetings, and target achievements are regularly reported to the service committee. At SMT meetings, which take place every 4-8 weeks, a report is made regarding the degree to which business objectives have been achieved. In addition, a routine report is produced quarterly, identifying whether the projects being implemented to achieve the objectives are *on time*, *on target*, *achieved*, *delayed* or *deferred*.

Business Objectives

The current business plan includes a 'Service Quality Statement' (*i.e.*, a mission statement) and eleven business objectives grouped under four main headings of: service delivery; improvement in operational procedures; empowerment, and monitoring of operational equipment. These and three ongoing corporate initiatives (*i.e.*, quality of service, economic and social disadvantages and service standards of relevance to users (FB#6: p 46)), are incorporated into the appropriate RCP. Each RCP provides a statement of purpose and it's activities, an action plan identifying the key actions to be carried out during the year and how these relate to the eleven business objectives identified, corresponding measures of performance on these key actions, and an income and expenditure account for the year.

5.3.4 The IS/IT Environment

5.3.4.1 The IS/IT Function

The Communication & Technology Unit (CTU), which is part of the Operational Support Department (OSD), is in effect CFB's IS/IT function. It is staffed by five people, two of whom are non-uniformed, and has a budget of approximately £0.5m p.a. At present, the majority of this budget is spent on CFB's communication structure.

The aim of the CTU as identified in their RCP (*c.f.*, FB#6), is to determine (*i.e.*, plan), provide and maintain an integrated IT system for CFB, to meet all foreseeable fire-fighting and non-fire-fighting needs. Unlike the Operations Department who work on a day-to-day basis, the delivery time of OSD (which includes CTU) is anything from three months to three years.

5.3.4.2 History of IS/IT Usage

Before 1984, no computer-based applications existed in CFB beyond word processing and terminal access to the County's mainframe for payroll and finance purposes. At that time mobilisation of fire-fighting resources (the most information and people intensive activity in the organisation) was done using a telephone, blackboard, card index system and radio. This manual system was replaced in 1984 by the first generation computerised mobilising system named the Command & Control (C & C) System, the first of its kind in the UK.

There was no further IS/IT usage up until 1989 when, after a bid to the County Council for an administration IT network failed, a number of end-user systems began to spring up. CFB processes were often adapted to exploit the perceived advantages of a piece of hardware or software which meant acquisition was therefore predominantly IT-driven. No IS/IT function or IS/IT/IM standards existed at the time.

At the beginning of the 1990, due to reforms (in particular the devolution of budgets to the resource centres), CFB were required to submit not only a business plan but also an IS plan specifying how budgets were to be spent. It was about this time that CFB asked the ISSU at County Hall to help them review the effectiveness of current CFB IS policies and to outline the structure of a future ISS. The report (FB#1) identified several problems with the existing situation as being:

- too much senior officers involvement with detailed aspects of IS/IT which was seen as a misuse of their time;
- poor quality information flow between functions where there were interdependencies, resulting in the duplication of information due to multiple points of entry;
- the current systems did not support MIS requirements;
- hardware and software were incompatible between systems;
- a lack of data communication between CFB sites;

In general it was reported that CFB used IS in a '*disparate, uncoordinated and incompatible manner*' (p 1) and the recommendations made were:

1. CFB adopt a central IS management structure including a permanent Brigade IS Unit;
2. an IS Manager should be appointed;
3. a set of technical standards should be established for the purchase of IT equipment to help ensure compatibility;
4. the implementation of multi-functional project teams for system development;

5. IS strategy should focus on four areas: *data communications* to enable main stations to communicate with the administrative centres and to improve the distribution of information in key areas of operation; *station-end computing* enabling processing and data input at the point of creation; *system development standardisation* with respect to the centrally located systems, and *intra-organisational communication* with County Hall and national systems in order to provide cost effective solutions to information processing needs.

In response to the recommendations made by the report and as part of the reorganisation that was taking place at the time, the OSD (of which CTU is now part) was established at the beginning of 1993.

In addition, a non-uniformed IS¹¹ Manager, was seconded from CIS, and given responsibility for the technical side of service delivering (including IT procurement) as well as maintaining and developing existing IT-based solutions. In practice, however, the IS Manager provides more services than delivering, maintaining and developing IT-based solutions. He is the focal point for anything to do with IT, from high level long range (2-3 years) planning down to on-site technical support. He reports to the CTU Manager¹² who ensures that IT-based solutions are organisationally and not IT-driven.

In response to the third recommendation for the formulation of technical standards, a SMT Discussion Paper (FB#3: p 4) set out a framework of general principles to use when defining the IT strategy.

In response to the fourth recommendation regarding systems development, CFB began to question the whole idea of self sufficiency in terms of delivering (end-user) systems. As a consequence, it was decided that while internal expertise (*i.e.*, cross-functional project teams) should still be used to develop a broad user specification, delivery should be left to external IS/IT specialist and managed by the IS Manager. It was hoped that by divorcing system specification from delivery that solutions would be needs (organisationally) rather than IT-driven. While organisational processes are still being changed during the systems development activity, the alterations reflect the changes in organisational requirements rather than the requirements of the IT-based solution. In effect, CFB are 're-engineering' their organisational processes to suit the need of the modern day Brigade on the back of IT-systems development cycle.

The extent to which the last recommendation (*i.e.*, IS strategy focus) was implemented, is discussed in more detail in §5.3.4.5.

¹¹ In reality the position is more IT than IS related.

¹² The CTU Manager is a uniformed officer who has a working knowledge of CFB operations and communication systems (*e.g.*, telephone systems).

The Evolution of IT

Using Nolan's stages of growth model (*c.f.*, Figure 5.4 taken from Ward *et al.*, 1990: p 4) to chart CFB's IT growth, between 1984 and 1989, due to the C & C system being the only IT-based IS, that CFB was in the *initiation* state (*i.e.*, stage 1). From 1989 to 1992, end-user stand-alone systems started to spring up to accommodate the changing needs of the organisation, placing CFB in the *contagion* stage (*i.e.*, stage 2). At the beginning of 1992, CFB were required by County Hall to produce business and IS plans for the first time. Developing the IS plan enabled CFB to gain better *control* over their IS/IT investment (stage 3).

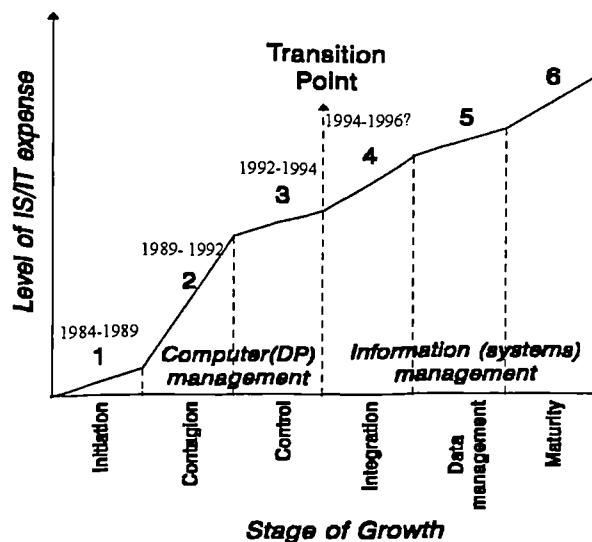


Figure 5.4 - The stages of growth model (Nolan, 1979)

At present CFB are between stage three (control) and stage four (integration). The current CFB IS strategy (*c.f.*, §5.3.4.5) is focused on integration.

5.3.4.3 Current IS

CFB have six major IS, all of which are centralised. County Hall handle all CFB's Exchequer Services (*e.g.*, payroll, finance and payment) of which the payment system is the only one that CFB has input into. While fire stations generate the majority of operational data there is currently no IS at station-ends, all data is paper-based. In terms of IT, all fire stations have a terminal connecting them to the C & C system solely for mobilising purposes and some have access to word processors facilities.

The C & C system is the main operational system which not only mobilises fire-fighting resources but collects vital data used to manage, control and plan for the future deployment of resources. The Fire Safety system is another operational system holding fire safety information on approximately 25,000 premises around the County and is used primarily to keep track of premises due for inspection. Hard copy lists of these premises are produced each month and sent to the relevant fire station. After inspection, information relating to the inspection is then sent back (manually) to be recorded on the system.

Data generated from these operational systems are used to produce management information and Home Office (HO) returns. The system currently used to produce this information is the operational incident database (known as FARMS) which interfaces with the C & C system, pulling off incident and resource history data to provide management information and statistics required by the HO.

CFB also use several systems to support other (non-operational) activities within the organisation. These are: the personnel system (PAMMIS) on which all CFB personnel and training data is kept, the transport management system (Vapcis) which tracks stock level and maintenance of the vehicles used by CFB, and the stores system (Terrian) which comprises several stand-alone applications and is used for stock control and reordering supplies.

Categorisation of IS

McFarlan's (1984) strategic grid is used to categorise CFB's major IS (*c.f.*, Figure 5.5). The C & C system and the Fire Safety system, while operational systems, help to achieve what is described by CFB as one of the ongoing corporate initiatives, that of service quality. As a consequence they may be regarded as important to achieving the business strategy now and in the future, thus placing them in the STRATEGIC quadrant.

FARMS, at present, provides operational performance statistics to management and the HO. While this system provides information which helps identify problem areas, it does not itself help to improve these areas. However, this system is currently being modified to include the Fire Cover Model which will be used to optimise operations (*e.g.*, where to locate fire stations, optimum number of fire engines needed, number of people that need to be in attendance). This new system will therefore help to improve operational procedures, one of the four business objectives categories identified in §0. Since the Fire Cover Model is still under development, it has been placed in the TURNAROUND quadrant.

A Gas Plume (evacuation) Model is also currently being developed and has the potential for improving service quality which is one of the business objectives. As a consequence, this application can also be placed in the TURNAROUND quadrant.

The Transport Management and Personnel & Training systems are important to achieving the business strategy now since they help to achieve two of the four main business objectives identified in §0: monitoring of operational equipment and empowerment, respectively. As a consequence they can both be categorised in the FACTORY quadrant.

Other IS such as Payroll, Payment, Stores, the operation database (FARMS) and miscellaneous administrative applications can be categorised in the SUPPORT quadrant.

Strategic Impact of Future Systems	H	Turnaround	Strategic
		<ul style="list-style-type: none"> • FARMS (Fire Cover Model) • Gas Plume Model 	<ul style="list-style-type: none"> • Command & Control • Fire Safety
		Support	Factory
	L	<ul style="list-style-type: none"> • Payroll • Payments • Stores • Admin. Applications • FARMS (operational incident database) 	<ul style="list-style-type: none"> • Transport Management • Personnel & Training
		Strategic Impact of Existing Systems	
		L	H

Figure 5.5 - Categorisation of CFB IS in the strategic grid

5.3.4.4 Current IT Infrastructure

CFB is moving away from stand-alone IT-based systems towards networked ones. As a first stage in this strategy, all IT-based IS currently under development or being modified/enhanced are developed to the point at which they can be networked together.

All the major systems (except for the C & C system) are currently or will, in the future, be based on database/spreadsheet software running on PC technology across a LAN. The C & C system is based on a distributed processing database running on an Unix machine which will, once integration is complete, be able to down-load data to the PC-based systems.

5.3.4.5 The Vision

5.3.4.5.1 The Information Systems Strategy (ISS)

The long term **IS strategy** addresses the issue of development/modification and integration of current and future IS. CFB hope their ISS will enable them to deliver accurate, relevant and timely information through user-friendly, cost-effective systems, which will be integrated throughout CFB (from stations to HQ Departments) therefore enabling single point data entry and reducing data duplication.

As part of this strategy, fire stations must be connected to the central systems. Stations are not only end-users of the information provided by HQ, they are also the main creators of the data used in its generation. Since single data entry at the point of creation is one of the long term aims of CFB, stations will need to be brought on line. An administration review (recently commissioned by the PAO) is the first step to making station-end computing a reality. While this review is taking place outside the ISP

activity¹³, it is being conducted within the framework of CFB's overall IT strategy. The aim of the administration review is to establish the feasibility of creating a paperless administrative system (which, at present, is mainly paper-based) using single data entry at the point of creation (e.g., station-ends).

The move towards IT integration (c.f., Figure 5.4) implies a change in the organisation's IS focus from operational to managerial. While CFB's ultimate desire is 'to develop a MIS to take data from each system and analyse it...to produce a broad management overview for CFB's management' (FB#5: p 10), CFB recognise the need to get their existing systems in order first. The short-term IS strategy, therefore, focuses on improving existing systems to the point at which they can be integrated.

Figure 5.6 provides a summary of the changing focus of CFB's ISS. From 1984 to 1991, the majority of IS needs were identified and the necessary IT acquired by end-users to solve specific problems. Solutions were pre-dominantly technology-led and often involved changes in CFB's operating procedures to accommodate the technology. In 1991, CFB began to plan their IS/IT provision. While planning helped to ensure the identification of more business-led IS/IT, applications tended to focus on issues of the day. From 1993 until now, CFB have been proactively seeking IS/IT integration, developing all new/modified/enhanced systems to the point at which they can be networked. In other words CFB are now in the proactive, future opportunities quadrant of the grid.

Goal Seeking/Strategy Formulation	PROACTIVE <i>Future Opportunities</i> 1993-now	PROACTIVE <i>Serendipity</i>
	REACTIVE <i>Current Issues</i> 1991-1993	ISOLATED <i>IS Bounded</i> 1984-1991
Issue- based/Problem Solving	Business-Driven "Top Down"	IT-Driven "Bottom up"

Figure 5.6 - The changing focus of IS/IT strategy (Galliers, 1987c)

5.3.4.5.2 The Information Technology (IT) Strategy

CFB's long term *IT strategy* (i.e., 1995/96) is to provide an infrastructure which allows effective connectivity, the adoption of open standards, and the development of IT/infrastructure standards such as network and cable strategies (see FB#5: p 8). In order to achieve this strategy, CFB are moving towards an integrated network to support the delivery of all their IT-based IS applications.

13 Cheshire Management Consultants, the internal consultancy arm of the County Council, have been commissioned to conduct this review.

This will enable cross-departmental communication of data, Brigade-wide access to all IS and single data entry at the point of creation, reducing duplication and improving data integrity.

In order to deliver this vision of integration, the shorter term IT tactical strategy is described as a 'portacabin' strategy¹⁴ which focuses on developing/enhancing all stand-alone systems to the point at which they can be integrated across a network.

5.3.4.5.3 The Information Management (IM) Strategy

CFB recognise that uniformed personnel lack the necessary IT skills to *manage* the information, applications development and technology. CFB's longer term IM strategy is to employ non-uniformed staff to develop applications, manage data and co-ordinate the acquisition and maintenance of IT systems. This will help to ensure that CFB are technically well supported and, through the use of contract mechanisms, a particular level of IT service is achieved.

5.3.4.6 The Organisation's Perceptions of IS/IT

CFB are at present going through a period of transition. The move between stages three and four (*i.e.*, IT control and integration, respectively) on the Stages of Growth Model (*c.f.*, Figure 5.4), represents a fundamental change in how IS/IT is perceived within the organisation and as a consequence how the IS/IT resources should be managed. This transition between stages is reflected in CFB's most recent business plan (FB#6) which calls for an investigation into the potential ways in which IT can be used to provide management information.

Expectations of IT within the organisation are high but there is a lack of an intuitive feel as to what can practically be done within time-scales. Moving from the stages of IT contagion through control to integration has slowed down the whole process of acquiring IS/IT. During the contagion stage users defined and acquired/developed their own IS/IT applications. During the control stage, this process has been slowed down by the implementation of a more centralised planning procedure which actively discourages end-user developments. This has caused some disappointment due to longer delivery time. In addition, while CIS (who are the main IS developers) are seen to deliver good quality systems, they sometimes fail to deliver to timetable causing further user discontentment.

Generally, people within CFB seem happy using IT-based IS. Even station-ends are eager to embrace IT-based IS although none exist there at present. The acceptance of IT-based IS is critical to the implementation of the current ISS as the majority of the work force will be expected to use them.

14 Portacabin strategy was introduced to the OSDM by Catherine Griffiths of Kobler Unit, London, as part of the series of IS briefing seminars run by the ISSU at County Hall.

5.3.5 ISP Environment

During 1991, an audit of all CFB systems was undertaken in response to the need to produce an IS strategy for County Hall. This audit led to a review of four CFB 'priority' (major) systems during 1992 and the development of an IS 'wish-list' based plan (*c.f.* FB#2) at the end of that year.

A summary of this IS plan (including IS objectives, IS/IT needs and a summary of existing systems) was submitted to the ISSU for inclusion in the first County IS strategy document (*c.f.*, CCC#1). However, with no-one to take responsibility for system delivery, few of the systems mentioned in the document were actually implemented.

The first 'proper' IS strategy was developed in August 1993 by the newly appointed IS Manager. It reported the status of the projects appearing in the previous 'plan' and identified the major projects CFB planned for the next three years. In December 1993, an additional report provided 'a further level of refinement to the IS strategy so enabling the construction of plans for the effective provision of IS within CFB for the next three years' (*c.f.*, FB#5: p 1). This document described the tentative development schedule of potential systems for 1995/96 and provided 'best-guess' systems for 1996/97.

The ISP process is now initiated in August of each year in line with the business planning cycle. Those IS/IT delivered during the previous financial year are assessed together with the current IS/IT schedule in order to build the following years IS/IT programme. There is no budget specifically set aside for the development of an IS plan.

5.3.5.1 ISP Methodology

While ISSU have produced guidelines as to what departmental IS plans should contain (*c.f.*, CCC#2), they have not provided advice on *how* planning should be carried out in order to achieve these outcomes. The IS Manager (who is also the IS Planner) has used his own experience to initiate planning and to derive the desired outcomes. He has a close working relationship with CFB's top management and has the credibility within the organisation to carry out ISP effectively.

CFB do not have a formalised documented ISP methodology although a set of informal planning mechanisms are in place. Few people are involved in the *implementation* (*i.e.*, facilitation) of the planning process itself although a number of stakeholders participate. CFB are, however, seeking to formalise the ISP process not only in order to gain commitment from the management team in securing the necessary resources, but also to be more objective and consistent in the production of deliverables.

CFB's general approach to ISP may be categorised, at present, to be mainly technology-led¹⁵ (*c.f.*, Earl, 1993). While their ISP approach also exhibits characteristics of the business-driven approach¹⁶ in that business issues are addressed by the IS plan, the *major* focus/drive is on IS/IT integration.

5.3.5.2 The Process of Planning (Implementing Planning)

Planning takes place during the day-to-day running of the organisation and is driven by four main information gathering/reporting tools: interviews, formal meetings (*i.e.*, those with agendas), informal meetings (*e.g.*, networking, word of mouth), and report production (*c.f.*, Figure 5.7).

Formal meetings play a major role in ISP followed by reports, interviews and informal meetings. All stages, except for the intelligence stage of ISP, are fairly well covered by two or more of the information gathering/reporting tools.

According to participants, the ISP process is not good at anticipating potential problems before they arise or dealing with sources of conflict. In addition, it is not flexible enough to allow new information to be incorporated at every stage of planning.

Gathering/ Reporting Tool	Stages of Planning					
	Pre-planning	Intelligence	Design	Choice	Implementation	Review
Interviews.						
Formal meetings						
Informal meetings						
Reports.						

Figure 5.7 - Information gathering/reporting tools used in ISP

Key: Not used  Minimal  Moderate  A Lot 

5.3.5.3 Support Structures

There is no IS steering committee, no team or permanent group set up for ISP and no ISP support team to collect, synthesise and analyse data for input into the planning process. There is, however, a liaison role undertaken by user group representatives who meet with the IS Manager or the OSDM on a regular basis.

15 Focused on developing IT architecture as a foundation for expected application needs (*i.e.*, building 'portacabins' to enable integration across a network).

16 Business plans are analysed to identify where IS/IT is most critical to meeting those plans.

5.3.5.4 The Planning Participants

ISP participants represent the major stakeholder¹⁷ groups within CFB. None of these stakeholders understand *how* the planning is to be done (maybe due to the informality of the current process), nor do they have a clear idea of what the ISP objectives are.

ISP participants are 'seasoned' fire-fighters and as a result have experience of taking onboard a lot of information at one time and quickly arriving at a course of action. Consequently, ISP participants have the necessary skills for general problem solving, decision making and crisis management but are less skilled at long-term planning. This has, in the past, led to the identification of IS/IT to address today's business issues. However, with the help of the IS Manager, longer-term plans are now being produced.

Figure 5.8 provides a summary of the extent to which ISP participants take part. The IS Manager/Planner plays the largest part in the planning activity followed by the users, the SMT, the suppliers and then the BMB. All stages are well covered with three or more stakeholder groups participating in each.

ISP Participants	Stages of Planning					
	Pre-planning	Intelligence	Design	Choice	Implementation	Review
The BMB						
The SMT						
IS manager/planner						
Users						
Suppliers (e.g., CIS)						

Figure 5.8 - Extent of participation by stakeholders in ISP

Key: None  Minimal  Moderate  A Lot 

5.3.5.5 Management Commitment & Involvement

Top management in general perceive the need to keep abreast of developments in technology, recognising that if CFB fails to adopt the appropriate technology now, the efficiency and effectiveness of future operations could be jeopardised (*c.f.*, FB#3). They recognise the potential of IT and are committed to ensuring the best possible decisions are taken with respect to IS/IT investment.

While the ACO is the top management ISP sponsor, all members of the SMT are involved in the IS plans formulation. The IS Manager acts as ISP champion, under the direct supervision of the OSDM, and takes on *primarily* a process role during ISP (*i.e.*, facilitator of the planning process as opposed to identifier of potential IS).

5.3.6 The IS Planning Activity

As discussed in Chapter 4, for the purpose of this thesis the ISP activity has been typified as comprising six stages: pre-planning, intelligence, design, choice, implementation and review. Each stage will be discussed in turn with respect to the ISP practices of CFB.

5.3.6.1 Pre-planning

There is no formal pre-planning as such in that no time is spent deciding on how the ISP activity should be done, no plan of work is written down and no assessment is made as to whether or not the organisation has the necessary resources to conduct ISP.

However, the IS Planner does notify stakeholder groups in advance that the ISS is due to be updated. This initiates the generation of proposal about possible new IS and/or modification/enhancements to existing systems for the next financial year.

5.3.6.2 Intelligence

There is no formal planning procedure that sets out to identify environmental changes calling for decisions to be made. The bi-monthly SMT meetings, however, are likely to highlight any major changes that are on the horizon in terms of local, county and/or national initiatives.

Members of the SMT (who are also Resource Centre Managers) are expected to assess the impact of these changes on their particular service area and to plan for them appropriately. If actions require changes in IT-based information, it is the Resource Centre Managers responsibility to notify a representative from OSD (*i.e.*, IS Manager, CTU Manager or OSDM).

While the IS Manager does not participate in the resource centres business planning process (except that of OSD), he is kept fully informed (by the OSDM) of changes in CFB's environment which may have an impact on the organisation's IS/IT requirements. In addition, the IS Manager with the help of CIS, monitor changes in the IT environment which enable CFB to keep abreast of technological changes.

User groups may also identify smaller environmental changes which may affect their own particular system. In this case, a representative from the user group will notify their Resource Centre Manager or a representative from OSD.

CFB do not have a formal documented IS, IT and/or information audit. There is network and system documentation but this is not held centrally. While the IS Manager knows what IS/IT exists, he does not know the full capability of each IT-based system within CFB. The users and system's developers are the ones who have knowledge of this.

Information requirements are identified alongside the development of the business (resource centre) plans by the Resource Centre Manager and their staff. Since business plans identify both internal and external environmental changes together with potential opportunities, it is assumed that information requirements will reflect these.

5.3.6.3 Design

Resource Centre Managers, in consultation with their staff (users and user managers) and in parallel with the RCP development, will identify the information needed to support/enable their business plans. They will then talk to the IS Manager, OSDM or CTU Manager who will add their requirements to the list of potential IS developments.

In addition to those identified by the Resource Centre Managers, possible IS/IT projects are identified from other sources too. The IS Manager may make recommendations regarding an existing system, or the OSDM or CTU Manager, because of their general experience of CFB operations, may identify an IS/IT project. Potential projects may also arise out of issues discussed at the bi-annual Officer Briefing.

The IS Manager, CTU Manager or OSDM may also be approached informally by members of the SMT (including the CFO) about possible IS developments. In addition, the R & D Unit may identify innovative IT-based systems which help CFB satisfy their business objectives.

The CFO has, on occasions, made specific requests for information (*e.g.*, information made available at the fire ground¹⁸). For example, he has recently commissioned CCC Management Consultants to develop a Gas Plume Model, initiated as the result of an actual incident. This project, however, is not part of the ISS and is not mentioned in the business plan even though it has the potential of becoming a bigger project than the C & C system in terms of finance. While the majority of the money will probably be spent on IT equipment, the CTU has had minimal involvement up to now.

5.3.6.4 Choice

For all the IS/IT projects identified, a '*request for service*' outlining the business case for each project, needs to be submitted by the system's sponsor. There is no set format for this '*request for service*' but it does not have to be technical or very detailed, just one page outlining what is required, why it is needed, advantages and disadvantages of having the system, *etc.*

18 Fire-fighting is an information intensive activity, every piece of information communicated between control staff and the fire-fighters and/or headquarters has to be logged in an incident log. Classe (1994) found that an on-board system of a response vehicle can log as many as 2,500 transactions at a major fire.

Acceptance of bids depend upon how they fit with the overall business objectives, the longer-term strategy of IS/IT integration, the resources available and how easy the applications are to deliver (minor works that can be deliverable at little cost and effort won't need to go through this process).

For those bids accepted, a 'strategy' wish-list is put together by the OSDM, the CTU Manager and the IS Manager. The 'wish list' is then prioritised through a process negotiation and consultation with the system sponsors. The criteria used to prioritise are simple measurements¹⁹ based on the relevance each proposed IS has to the business objectives, it's criticality, financial implications, and practicality. In addition, possible IT and non-IT-based solutions are discussed which the IS Manager will then cost with the help of CIS.

Once the 'wish list' has been initially prioritised, a one page summary identifying the objectives of each proposed IS/IT project is presented to the SMT. The items on the 'wish list' are then discussed in turn after which the SMT may decide to re-prioritise. Reprioritisation is carried out on the basis of qualitative and political judgements which are agreed upon through a process of debate, bargaining and consensus. The CFO has the final veto over the IS/IT projects accepted and the order in which they are implemented.

5.3.6.5 Implementation (Project Management & Systems Development)

Once the IS plan has been agreed by SMT, the sponsor's of the projects chosen nominate an IS Project Manager (champion) who is responsible for its implementation. Major stakeholders are both committed and involved in the IS plan's implementation and there is resource commitment.

Depending on how large the project is, a user group (project team) made up of users and user management²⁰ is set up to develop a specification²¹. This identifies the desired outcomes of the system, each of which are broken down into detailed specifications. The process of data creation, validation, manipulation and reporting are also discussed in these meetings. In some situations, a specification from another Fire Brigade may be bought and adapted²².

User groups are chaired by the IS champion. Support in developing specifications (particularly the detailed specification) is provided by the IS Manager²³ who also attends these meetings.

CFB have consciously taken the decision not to simply automate current manual information systems. During the development of the specification, the organisational process, which the proposed IS

19 Since the original interview, a more formal cost-benefit exercise is now carried. At the time of the original study any change to the old systems was regarded as an improvement.

20 If the project is large (normally above £140,000), representatives from Legal and Member Services at County Hall will also take part in the user group to provide contractual and financial regulations support.

21 For smaller projects (e.g., modifications/enhancements), only the user of the existing system will be consulted.

22 It is normal to find another Brigade who are already tendering, currently installing or have already installed a similar system, the specification of which can be bought from them.

23 CIS may also take part in the group, providing necessary technical expertise.

aims to enable/support, is reviewed to ensure it is still appropriate for the current organisational context. Processes are modified in line with changes in the environment before the new information needs are identified. In this way, CFB are slowly re-engineering their organisational processes to better satisfy the needs of the organisation.

While the majority of system developments are financed by the CIS development hours budget, some system specifications, depending on the type and/or cost of the system, are put out to tender and financed by other means such as the Corporate Pool.

IS Implementation & Evaluation

Once the detailed specification has been developed, the IS Manager normally²⁴ takes on the role of Implementation (Systems Development) Manager to ensure the appropriate system is delivered. While users and user management are responsible for identifying their own information needs and developing a detailed specification, it is the responsibility of the CTU to organise the system's development and the purchase, delivery and installation of the appropriate IT. CFB actively seek 'off-the-shelf' solutions rather than develop bespoke systems.

Each user group meets approximately once a month, and more regularly when the system's implementation is imminent. The IS Manager also has a monthly review meeting with CIS in which the status of all CFB systems currently under development by CIS are discussed.

At present, CFB have no 'in-house' system developers. While they do have a few end-users who develop their own applications, this is actively discouraged because of the drive towards integration. Uniformed staff in the R & D Unit, however, are currently involved in developing the Fire Cover Model application of the Fire Safety System.

While OSD monitor the effectiveness of individual systems delivery there is no formal IS evaluation once it has been implemented. However, feedback is received informally from users before the contract on a particular system is ready to be signed off. It is the users responsibility to identify any deficiencies with the system and to notify the Implementation Manager.

5.3.7 Feedback²⁵

5.3.7.1 The IS Plan

CFB claims their ISS is 'flexible and responsive to the changing demands placed upon CFB, whilst providing a framework around which the organisations IS and IT demands can be serviced' (c.f. FB#5).

²⁴ If the IS/IT project is comms. rather than technology focused, the CTU Manager will take on this role.

²⁵ Feedback, according to the author's conceptualisation of it, comprises three main activities monitoring, reviewing and updating.

While the IS plan is not regularly reviewed, it is annually reviewed at SMT as part of the business plan, and by exception if an IT issue arises (*e.g.*, a significant delay in system development or a crisis occurs). If an IT issue can not be resolved easily and has an effect on achieving a target within the time scales set, then it will be discussed at the Service Committee.

There are no formalised procedures to identify environmental changes that could effect the IS plan. Resource Centre Managers and the IS Manager are expected to maintain a certain degree of awareness about business and IT issues which may make IS identified by the current plan inappropriate. CFB also have access to knowledge of emerging technologies and broader management issues through CIS and Management Information Services located at County Hall.

There is no time set aside to *formally* discuss and make recommendations about what impact these changes may have on the IS plan, and no formal or informal process in place to ensure that the IS plan is updated in-line with these changes. This is interesting especially since CFB comment that 'the IS strategy is not a static document, as systems are developed or enhanced, legislation decrees or any other factor effects the direction or speed with which CFB utilise IT, the strategy document will be modified' (FB#5). The discrepancy may be explained if changes in the environment happen slowly and are therefore taken into consideration during the next planning cycle.

5.3.7.2 The ISP System

With respect to the planning system itself, no formal or informal process exists to monitor environmental changes, allow time to discuss the impact of these changes on the ISP system or to update the ISP system in line with these changes. This may be due to the lack of a formalised planning process.

5.3.8 Output: The Plan's Contents

The first formal IS plan (*c.f.*, FB#4) was a one year strategy document covering the work to be done in the proceeding 12 months. This document was supplemented by another (*c.f.*, FB#5), a few months later, which set the boarder scene for future IS developments thus laying down the foundation of CFB's future (longer-term) ISS (*i.e.*, 1994-1997).

The longer-term plan identified three categories of projects being or to be undertaken by CFB. These are:

- **Category 1:** Responses to day-to-day request. These are projects where a business plan has been developed by the user to meet a critical need within their sphere of interest but one which does not directly contribute to CFB's ISS ;
- **Category 2:** Provision of Portacabins. These projects are deemed to be strategic in nature. The work undertaken will enable the systems to be developed to a point where they can enter the mainstream of the ISS as per category 3 projects;

- *Category 3: Provision of Infrastructure.* These projects deal with the provision of new systems and network infrastructure to enable the implementation of the ISS.

The main focus of the current IS/IT short-term strategy is on replacing/enhancing existing systems. If the types of projects identified are broadly categorised, three-quarters are IT-related providing evidence of a more technology-led strategy. In addition, half of them have been initiated by CTU providing further evidence of a technology-led approach.

While the IS plan is used as a working document it does not include management of change or human resourcing implications of each project identified. Instead, these issues are dealt with at the development level.

5.3.9 Management of Change

5.3.9.1 Communicating the ISS

The ISS has not been explicitly communicated to the rest of the organisation although it is an open document which every one has access to via the business plan. The ISS has also been 'passed through' bi-annual Officer Briefings, which are attended by all Unit Managers.

5.3.9.2 Resistance

There has been some resistance to ISP. This has predominantly been from those end-users who had evolved into 'system managers' during the initiation and contagion stages of IT growth (*c.f.*, Figure 5.4). During the early stages of planning, and even now to a certain extent, these system managers have tried to circumvent ISP by commissioning system development projects themselves.

There has also been some resistance to implementing IT-based solutions in general although this has been minimal. Most of the CTU's work at the moment is behind the scenes preparing for major projects, consequently enhancements to stand-alone systems are not being delivered fast enough and this is a source of discontentment among the users. This may have been partly circumvented had the ISS been explicitly communicated to the lower organisational levels.

Potential resistance is managed through user groups. It is assumed that participants of these groups are committed enough to sort out any potential problems and to accept ownership of the system. Users are clearly told what is expected of them and what they should expect from other members of the project team (*e.g.*, the IS Manager, CIS). It is made clear to them that the contents of the system specification is their responsibility while the delivery of the system is the CTU's responsibility.

5.3.10 Human Resourcing Issues: Training

During the IS development stage, training issues are addressed in detail. Once the necessary training has been identified it is left to CFB's Training Department to deliver it either via 'in-house' staff or external contractors.

A general steering committee which evaluates all requests for training from individuals within the organisation (some of which includes IT-based training), has also recently been established. One of the main aims of this committee is to identify common training requirements and to implement courses tailored to the needs of individuals. The types of IT-related training identified has ranged from introduction to computing which provides an overview of IT with respect to CFB's systems, through to applications training (*e.g.*, Lotus, dBASE, CHESHIRElink).

5.3.11 Summary

CFB started to plan their IS/IT provision two years ago (1992) in response to the request from County Hall to produce a IS strategy in line with the CFB's organisational objectives.

Top management recognise the importance of IS/IT in delivering operational services and the role it has to play in providing management information to enable better decision making. There is senior management commitment to and involvement in the ISP activity, with final IS/IT decisions being made by the SMT (there is no separate IS Steering Committee).

While no formal planning methodology exists the ISP approach taken by CFB can be categorised as what Earl (1993) terms 'technology-driven', focusing on the development of IT architecture as a foundation for expected application needs. The over-riding strategy is one of IT integration, ultimately enabling access by all employees to a variety of different systems across the organisation. The drive towards IT integration rather than IS integration is further confirmed by the lack of any organisational *information* audit and the predominance of IT-related projects in the IS plan itself.

The IS strategy has not been explicitly communicated to the rest of the organisation which may be the cause of some resistance since users, at present, are 'suffering' the short-term cost of integration due to the centralisation of the IS planning activity and the slowing down of systems delivery, without being aware of the ultimate goal.

Business planning inputs into ISP. Resource Centre Managers are required to identify information needs that help to satisfy their business objectives which are then passed onto a CTU representative (*i.e.*, IS Planner, CTU Manager or OSDM) to translate into IS/IT requirements. However, in practice, given the majority of projects are identified by the CTU, projects may not be as 'business' oriented as they could.

Figure 5.9 provides an overview of CFB informal ISP process while Figure 5.10 shows the type of ISP information flowing between individuals and groups within the organisation.

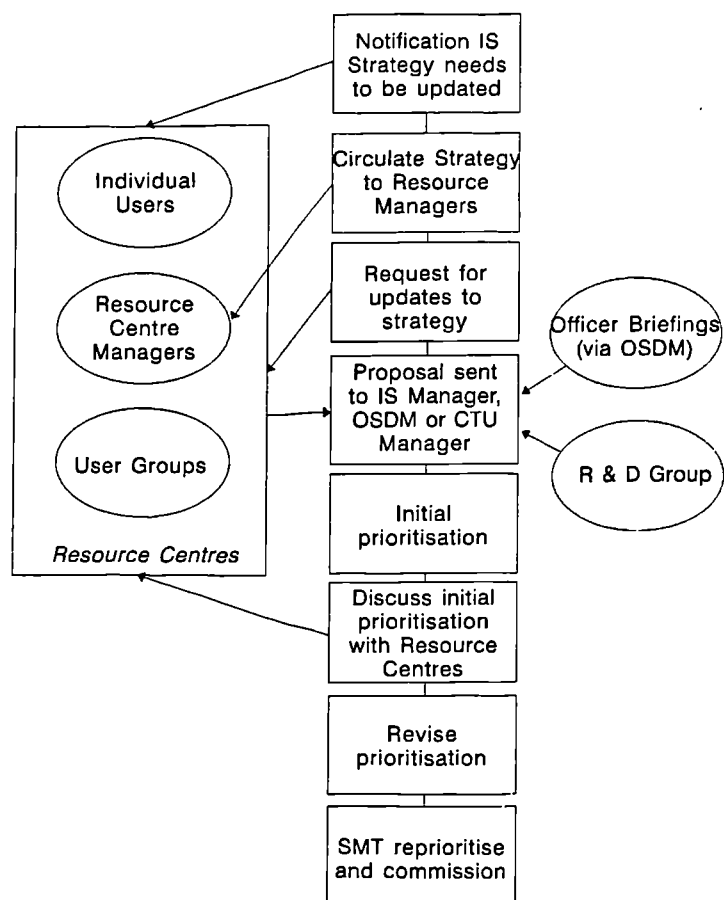


Figure 5.9 - Overview of CFB ISP process

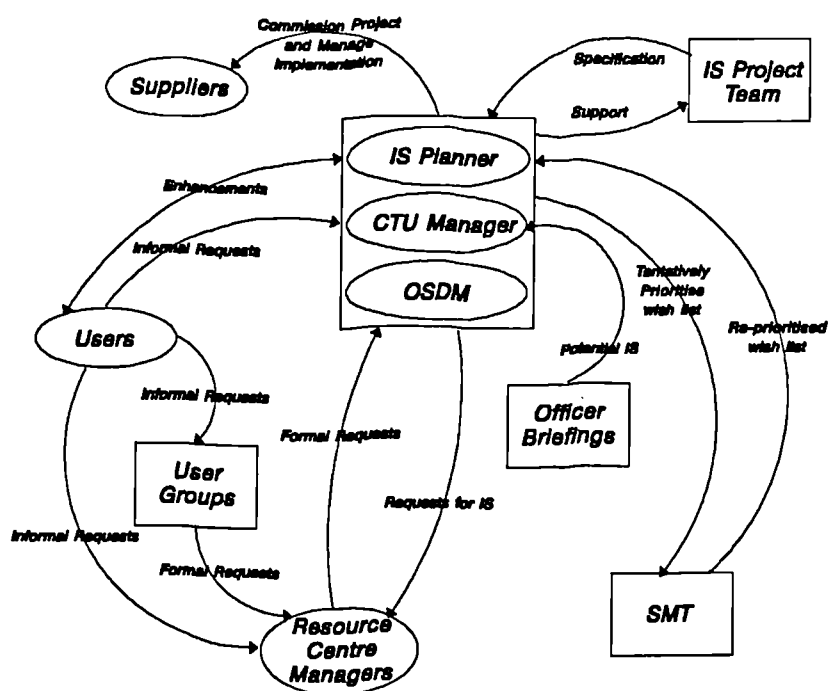


Figure 5.10 - The information flow of ISP

The ISP cycle mirrors the business planning cycle, which is initiated periodically in August of each year. ISP takes place during the day-to-day running of the organisation, implemented mainly through the mechanism of formal meetings.

Using Earl's three-legged ISP framework (Earl, 1989: p 71), summarised in Figure 5.11, CFB cover all three of the legs in their ISP approach. The BMB, Resource Centre Managers (including the OSDM) and the CTU Manager provide top-down input by identifying IS to support the business objectives. The users, user groups and IS Manager provide bottom-up input in the form of suggestions to improve existing IS/IT. The R & D Unit and, in the past the CFO, identify leading-edge IS/IT applications (e.g., the Fire Cover Model and the Gas Plume Model, respectively).

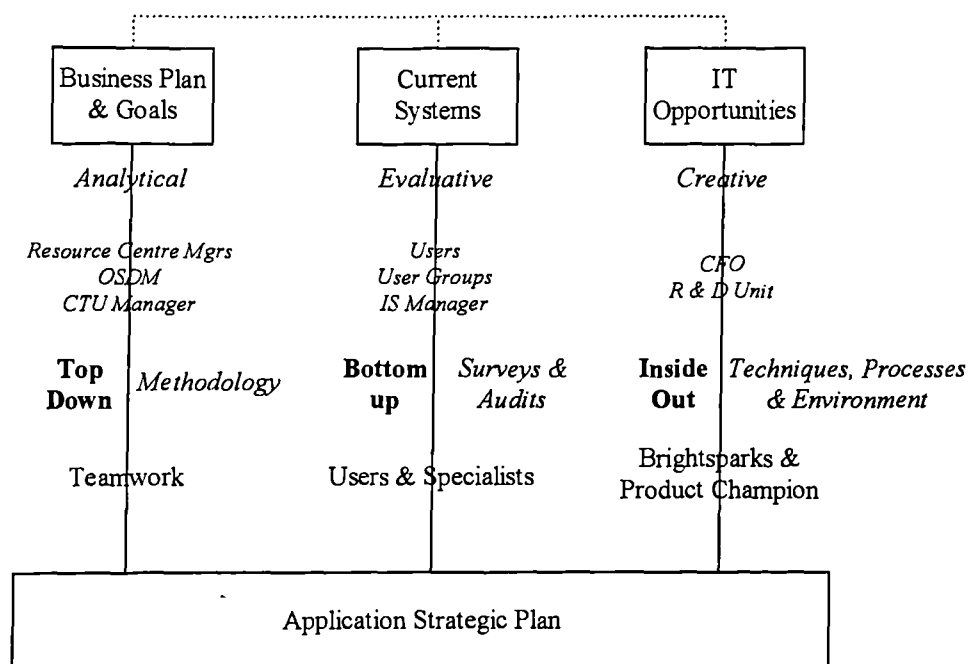


Figure 5.11 - Earls ISP framework (Earl, 1989: p 71)

Inside-out applications, however, do not formally appear in the IS strategy. In addition, other IS/IT-related activities have taken place outside the ISP activity, such as the administration review, which may have an impact on the IS strategy. Failure to co-ordinate these activities with ISP could lead to the acquisition of hardware and/or software incompatible with the longer term IS strategy of integration.

At present, ISP is under the control of the CTU which is more of an IT than IS department. As a consequence, the focus of planning up to now has been IT rather than IS focused. While the IS strategy identifies some IS and even IM projects, the drive towards technological integration is dominating the IS/IT budget. CFB are predominantly in stage three of the planning stages of growth model (c.f., Figure 5.12).

<i>Factor</i>	<i>Stage</i>					
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<i>Task</i>	Meeting demands	IS/IT audit	Business Support	Detailed planning	Strategic advantage	Business-IT strategy linkage
<i>Objective</i>	Provide service	Limit demand	Agree priorities	Balance IS portfolio	Pursue opportunities	Integrate strategies
<i>Driving Force</i>	IS reaction	IS led	Senior Management	User/IS partnership	IS/executive led; user involvement	Strategic coalitions
<i>Methodological Emphasis</i>	Ad hoc	Bottom-up survey	Top-down analysis	Two-way; prototyping	Environmental scanning	Multiple methods
<i>Context</i>	User/IS inexperience	Inadequate IS resources	Inadequate business/IS plans	Complexity apparent	IS for competitive advantage	Maturity, collaboration
<i>Focus</i>	IS department		Organisation-wide		Environment	

Figure 5.12 - Planning stages of growth (after Earl, 1989; Galliers & Sutherland, 1991)

Galliers (1991) identifies five important components of an IS strategy (*c.f.*, Figure 5.13), all but one of which (*i.e.*, *management of change strategy*), are addressed by CFB's ISP activity.

- Resource Centre Managers and users (at the system development stage) translate business requirements into information needs, providing a semblance of an *information strategy* (although no explicit *organisational* information strategy exists).
- CTU supports the delivery of these information needs via IT if IT is judged to be the appropriate medium (*i.e.*, the *IT strategy*).
- CTU supports IS implementation by providing guidelines on how the data should be managed and the type of IT that may be bought (*i.e.*, the *IM strategy*).
- IS project teams identify the appropriate human resourcing implications associated with an particular IS/IT development (*i.e.*, the *human resourcing strategy*). However, lack of a top down human resourcing strategy may result in missed opportunities for exploiting potential synergies.

While CFB annually review their IS plan at the Senior Management Meeting as part of the business plan, they do not have any formal mechanisms in place to update the IS plan as changes in the environment occur. In addition, there is no formal feedback on the ISP system.

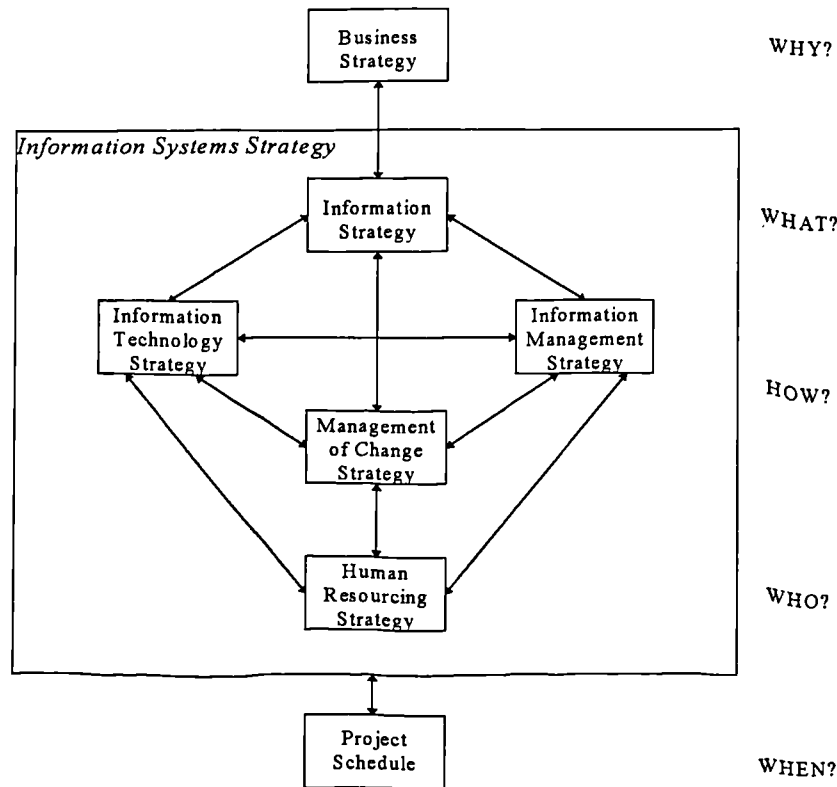


Figure 5.13 - Components of IS strategy (after Galliers, 1991)

In summary, CFB are currently in the control stage of IT growth but their IS strategy is aimed at moving them into the integration stage (*c.f.*, Figure 5.4). While there is top management commitment to and involvement in ISP, there is some resistance at the lower levels of the organisation which may be the result of not communicating the IS strategy effectively enough to these levels.

No formal ISP methodology exists but the general approach taken by CFB can be categorised as 'technology-driven', that is, the majority of projects identified by the IS plan are focused on the development of IT architecture as a foundation for expected application needs. This is further validated by the absence of an organisational information audit which would provide a helicopter view of CFB information requirements.

While nearly all the projects identified by the current IS plan have been initiated by the CTU, CFB's ISP approach addresses all three elements of ISP: top-down; bottom-up and inside-out. Business planning inputs into ISP via Resource Centre Managers, OSDM and CTU Manager (*i.e.*, top-down aspect). Enhancements and modifications to existing systems are identified by users, user groups and/or the IS Manager providing the bottom-up aspect to ISP. Creative/innovative IS/IT opportunities have been, in the past, identified by the R & D unit and CFO providing the inside-out element of ISP. However, the more innovative applications do not seem to appear in the IS plan which could lead to problems of co-ordination and ultimately integration.

5.4 Cheshire Social Services

The second case study was carried out in Cheshire Social Services (CSS) and was chosen because it is one of the biggest (if not the biggest) users of information in the County.

5.4.1 Participants

A total of six people were interviewed for this case: the IS Planner, a District Manager with lead responsibility for one of the three service areas, the Group Development Officer, a Business Manager, the Principal Officer of Development responsible for the development of the County Community Care Plan and the Community Care Project Co-ordinator who is responsible for the information required to put the County Community Care Plan together.

The CIS-seconded IS planner is responsible for the Group's IS/IT and champions ISP at group level. She reports to the Group Finance & Information Systems Officer who is a member of the Group Management Team (GMT). The Group Development Officer, also a member of the GMT, is responsible for providing service planning and development support to the six District Managers. In addition, she co-ordinates and aggregating the output from these planning processes to produce a corporate strategy.

District Managers are ultimately responsibility for delivering the three main services in their District and are members of the GMT. In particular, the District Manager interviewed also has lead responsibility for child care policy development and service planning for children services throughout Cheshire. This involves working with each district Children Services Principle Officer to develop, formulate and implement Child Care policies across the County. As part of his lead responsibilities for Child Care Policy, he is also the IS sponsor for all Child Care systems.

A recent reorganisation has seen the creation of a Business Management function in each district which is in effect an amalgamation of all support services. The Business Manager position is therefore a relatively new one, the roles and responsibilities of which are still being established. The Business Management function has primarily been set up to support practitioners in assessing client needs across the three services areas, establishing and purchasing the appropriate care package and to monitor the quality of service delivery by specifying, collecting, analysing, interpreting and presenting the relevant information to Service and District Managers. Business Managers report directly to their District Managers.

The Acting Principle Officer (PO) responsible for the development of the County Community Care Plan and the Project Co-ordinator who provides information for it, were interviewed together. Both are located in the Development Branch of Social Services headquarters in Chester and report to the Group Development Officer.

5.4.2 The Internal Environment

5.4.2.1 The Services Provided

CSS provide three main services children²⁶, adult²⁷ and old people²⁸. At present, about 15% of Cheshire's population currently receive some form of social service accessed through district and sub-offices. Each month around 8000 requests for help are received from individuals and agencies. Approximately 2000 full-time and 5000 part-time permanent staff help in the provision of social care.

Two recent pieces of legislation have had a significant impact not only on the operations of CSS but also on the underlying philosophy of the provision of social care. These are the NHS & Community Care Act of 1990 and the Children Act of 1989.

5.4.2.1.1 Community Care

The delivery of both Adult and Old People Services are covered by the recent community care legislation. Individual packages of care are derived through the assessment and care management process where client needs are matched to services. Implementation of an agreed care plan may result in the delivery of a complex package of care combining aspects of domiciliary care (*e.g.*, home care, meals on wheels, tele-shopping), day care (*i.e.*, regular or occasional use of a day centre together with other services which may be provided on site), and/or residential services (*i.e.*, regular or occasional short stays in either a residential home or with a family). These services may be delivered by a variety of 'in-house', private and/or voluntary sector providers.

5.4.2.1.2 Children Services

CSS also provides a wide range of services to children in need and their families. Care planning for children services is conducted in a similar way to that of community care and implementation of an agreed care plan may involve not only close liaison with other council services such as the Police and Education Police but also agencies such as Health, the Probation Service and a range of voluntary organisations.

5.4.2.2 The Organisational Structure

Figure 5.14 shows CSS' organisational structure. The Chief Social Service Officer is the Director of Service and has overall responsibility for three departments: Operations, Support & Development and the Inspection Unit.

26 Services for deprived children, young offenders and ill-treated children.

27 Services comprise mental health needs, severe learning difficulties, physical disabilities, HIV/AIDS and/or other problems related to substance misuse.

28 Services include domestic help, centres and clubs, recreation workshops, meals services, sitters-in, incontinence supplies, visiting, holidays and transport.

The Head of Operations is responsible for running CSS on a day-to-day basis. He oversees six District Managers who, in turn, manage three (four¹) Principal Officers each responsible for the purchasing activity in one of the three service areas, and up to ten Service Managers whose role is to provide 'in-house' easily accessible locally-based services (*i.e.*, residential, day and domiciliary care).

The Head of Support & Development is responsible for operational support and development activities within the organisation. The Group Finance & Information Systems Officer is responsible for the day-to-day organisational support while the Group Development Officer is responsible for the longer term (strategic) service co-ordination and development.

The Inspection Unit Manager is responsible for monitoring service quality and handling complaints under the watch of the Social Services Inspectorate. While the Unit is an independent arm of CSS, the Unit Manager is a member of the Group Management Team (GMT)² and reports directly to the Chief Social Service Officer.

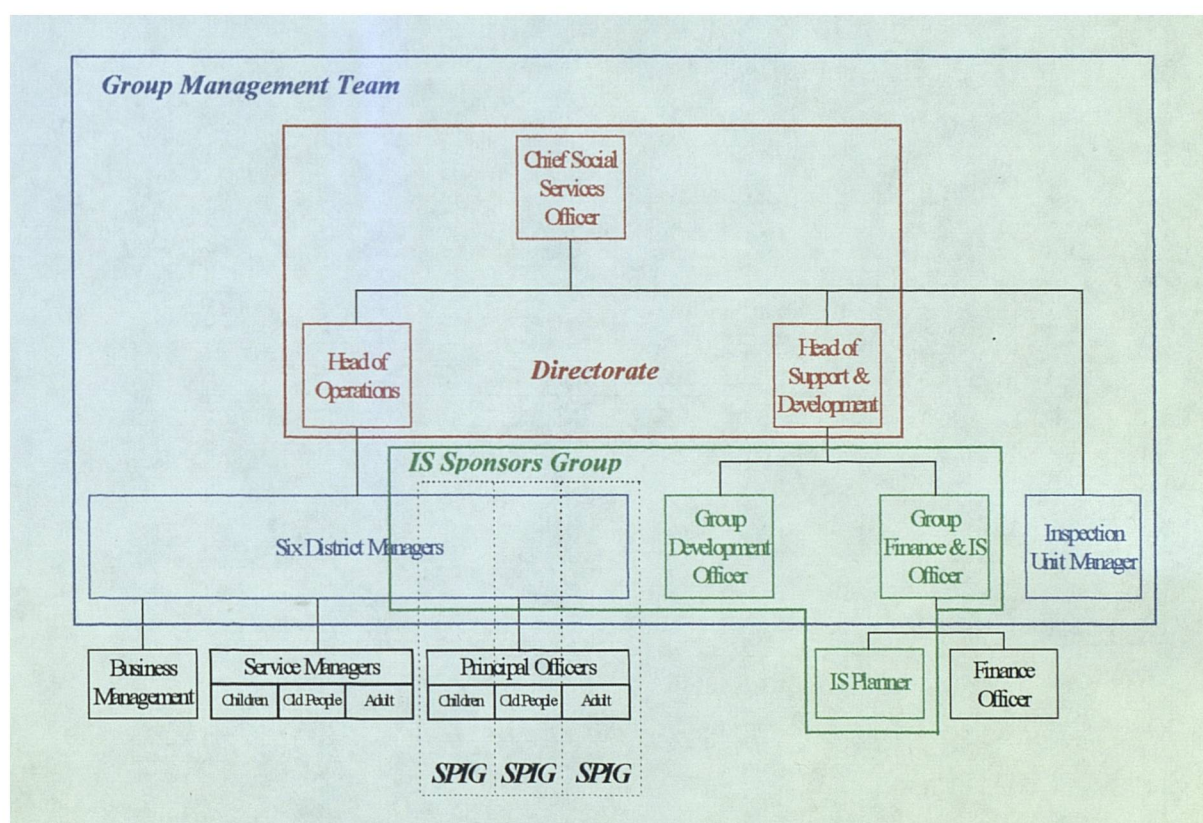


Figure 0.1 - Cheshire Social Services organisational structure

- 1 The role of Principle Officer of Business Management (*i.e.*, Business Manager) is in the process of being established. Business Managers will externally validate and support the purchasing activity within each district, reporting directly to the District Manager.
- 2 Comprising the Directorate, the District Managers, the two senior managers located at H/Q and the Inspection Unit Manager.

5.4.2.3 The Organisational Culture

CSS's strength lies in the functions/specialities which are co-ordinated at the top by a narrow band of senior management, what Handy (1985) calls a bureaucracy. While procedures are important to CSS, there is resistance to formalising these due to the perceived inflexibility in resultant working practices. While individuals not groups have decision making responsibility, in reality decisions are always open to debate and modification. Innovative solutions to problems are actively encouraged and an individual's intuition is accepted as a valid tool in decision making.

The organisation is committed to an open management style (*e.g.*, open-door policies, all top management known by first names) and people are actively encouraged to question underlying organisational policy and goals.

Decision Making Structure

At the monthly Group Management Meeting (GMM) policies developed by the three Service Planning and Implementation Groups (SPIGs) are discussed and agreed by the GMT. These SPIGs are each chaired by a District Managers, with lead responsibilities for a specific service area, and are attended by the appropriate PO from each of the six districts. The groups remit are to develop service policies and to ensure their implementation.

The organisation embraces the notion of loose-tight management (Peters & Waterman, 1982). While CSS policies are defined at the group level through SPIGs, it is the responsibility of the District Management Team (DMT)³¹ to translate these policies into meaningful working practices within their local context, and the responsibility of the District Implementation Groups (DIGs) to implement them.

5.4.3 Organisational Strategy

As of April 1992, Social Services have had a statutory duty to produce a county community care plan identifying how they intend to deploy resources in the provision of adult and old people services. By April 1996, Social Services will also need to produce a county children plan.

In partnership with the six Cheshire Health Authorities, the Group Development Unit of CSS drafted their first county community care plan during 1991. This was subjected to wide-ranging consultation with the people of Cheshire and local organisations before being submitted to the Secretary of State in April 1992 (*c.f.*, SS#5). In addition, a county children plan has been developed alongside the community care plan, in partnership with the Police, Probation Services, local Health and Education authorities. This is, at present, incorporated into the community care plan. While both plans have evolved in a context of resource uncertainty and limited planning experience, CSS is currently in the process of making them a product of a formal planning process. Previous to 1992, some ad-hoc organisational planning had been carried out but these plans had little creditability within the organisation.

31 Comprising the District Manager, POs and Service Managers.

County plans provide a strategic overview of the main community care/child care policies and strategies, clearly identifying how these link in with the MTS and providing a framework for the development of individual district community care/children plans. In a similar way to how the county plans are produced, the district plans are developed by joint strategic purchasing teams comprising District Manager and appropriate representatives from the district (*e.g.*, local Health Authority Director). In consultation with voluntary organisations, other council departments, external agencies as well as clients and carers, a joint strategic purchasing plan is developed that aims to satisfy the strategic objectives set out in the county plans.

District community care/children plans are more tactical in nature identifying what the needs of the district are, the current levels of service provision, the gap between the two and what will be done to reduce this gap in terms of purchasing and development intentions. Resource centre plans (RCP) are developed within this framework, identifying in detail actions to be taken, the purpose of those actions and the targets to be achieved.

Business Objectives

Community care implementation is the major focus of current business strategy and therefore the business objectives while the County's children plan identifies shorter term tactics rather than longer term objectives (*c.f.*, SS#4: p 3).

The business objectives of community care seek ultimately to address the major thrusts of governmental reform. In essence, this is to treat the client as a holistic person through the provision of transparent co-ordinated intra-organisational services, in consultation with the client and their carers, aimed at keeping clients, if possible, within their own homes and developing new/alternative services that best suits their needs.

5.4.4 The IS/IT Environment

5.4.4.1 The IS/IT Function

Until quite recently CSS had an internal central IS services group called Information Systems for Social Services (ISYSS). This comprised a small team of four CIS programmers dedicated to AS400 based solutions, and four CSS (in-house) programmers dedicated to PC-based ones. As a consequence, solutions tended to be led by one of the two types of technology depending on which part of the group were consulted.

Due to the external pressures to create an internal market for support services, ISYSS have recently become part of the new IS Support Unit which aim not only aggregate (although not interpret) information about staffing, budgets and client finance on behalf of Business and District Managers, but also provide an in-group help desk.

5.4.4.2 History of IS/IT Usage

The first large IT-based IS, now known as CRRIS, was implemented in 1987. At the time, CRRIS was an automated filing system which held client and resource details, running on a mini-computer. Previous to this, end-users had purchased stand-alone PC-based software for individual applications, and some enthusiast amateurs had started to design and implement end-user applications.

While CRRIS was centrally developed, controlled and maintained by CIS developers, PC-based applications were left unchecked and began to spring up throughout the organisation. Some of these systems were developed by end-users to answer 'one-off' queries made by elected members and stored in case the same type of query came up again. This seldom happened, resulting in many redundant end-user systems.

Up until the enactment of the NHS & Community Care Act, applications had been purely support in nature (*c.f.*, Figure 5.20). The new legislation increased the need to collect financial, client, service and control information so that care needs could be effectively assessed, purchasing decisions more informed and service provision effectively monitored. It soon became clear to management that without the appropriate IS/IT in place, it would be difficult to effectively manage the implementation of community care legislation (*c.f.*, SS#5: p 77). This was the turning point of how IS/IT was perceived and subsequently managed within CSS.

With the increasing need to share information within and between districts, came problems of compatibility with the existing PC-based systems. In addition, it was discovered that both AS400 and PC programmers were separately developing the same system. These problems together with the requirement to produce business and IS plans for County Hall for the first time, initiated a review of CSS's IS/IT by the CIS Planning Unit, the main aim of which was to identify how CSS could best organise staff and equipment to get the most from IS/IT at the time and in the future.

The review revealed CSS had no long term vision for IS/IT investment (*i.e.*, no IS/IT strategy). Solutions tended to be IT-driven and focused on meeting the current demands which meant systems evolved rather than being proactively planned for. While CSS were strong in terms of technical expertise, they were weak in delivering a comprehensive (and comprehensible) IS/IT service. The review identified that the drive to develop new systems seemed to constrain other IS/IT related activities (*e.g.*, information and IS/IT audits, developing an information strategy and medium term plan for information, developing an IT strategy and tactical plan). In addition, a lack of 'off-the-shelf' solutions indicated a potential over-emphasis on the more expensive and time consuming bespoke programming activities.

As a result of this review, an ISP Manager was seconded from the CIS Planning Unit to help CSS develop an IS strategy.

The Evolution of IT

Nolan's stages of IT growth model can be used to chart the evolution of CSS's IT usage (*c.f.*, Figure 5.15 taken from Ward *et al.*, 1990: p4). Between 1982 and 1988, CSS were in the *initiation* stage as only a few end-user PC-based developments existed. It was not until the implementation of CRRIS, did IT usage begin to escalate (*i.e.*, *contagion* stage). This continued until 1991 when GMT commissioned the CIS Planning Unit to conduct the IS/IT review.

At present CSS are between stages three (control) and four (integration). The current IS/IT strategy (*c.f.*, §5.4.4.5) focuses on systems integration.

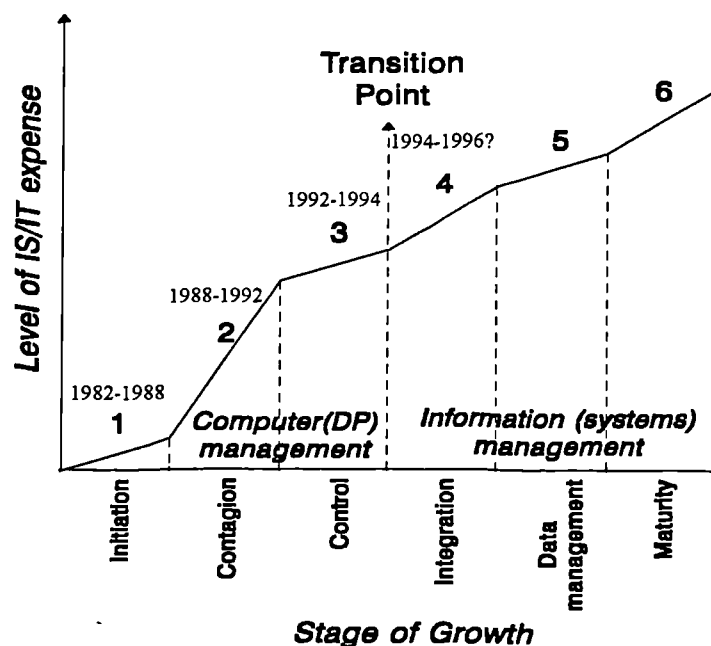


Figure 5.15 - The stages of growth model (Nolan, 1979)

5.4.4.3 Current IS

No organisational IS/IT audit exists so it is not possible to provide an overview of all the IS used by CSS. However, there are a number of major systems used across the organisation. Most of these systems were originally developed without a clear understanding of the other information resources within CSS. The majority of these are now under review or in the process of being updated and/or integrated. These systems can be divided into five broad categories:

- Community care (client/contractor) systems including CRRIS (see below for more detail), Care Management, Residential Homes Management Package, Home Care, Inter-organisational³² system and the Resource Directory;
- Adult systems not covered by community care;
- Old people systems not covered by community care;

32 Inter-organisational systems include joint databases with other agencies to aid joint Community Care Planning and IS (both manual and IT-based) which provide the consumer with information about the services available and how to obtain them.

- Children systems including CHIPS³³, Children in Care, Child Protection Register and Youth Justice;
- Support Systems including Personnel, Performance Measurement, Exchequer, Financial & Personnel Management and Corporate Office Systems.

Legislation is accountable for some of the largest single IS/IT developments within LAs (Shaw *et al.*, 1994). The enactment of community care is monopolising the bulk of new systems development/enhancements. The area of purchasing, in particular, has seen the biggest changes with the need to integrate data from many sources (*e.g.*, personal details of clients, staff's assessments of the clients' needs, information about what is on offer from providers - both inside and outside the department), and to make available enough financial data to allow confident budget management at the operational level and performance review. While there is a current drive within CSS to integrate/co-ordinate children systems within and between districts, priority has been given to systems which enable the implementation of community care.

5.4.4.3.1 Client Records and Resources Information System (CRRIS)

An IS worth a special mention is CRRIS. When first implemented in 1987, CRRIS was used primarily as a tool for the storage and maintenance of client records and resources available (*e.g.*, availability of childminders, foster parents, adoption clients, approved carers and those clients with equipment on loan are also accessed through the system). The NHS & Community Care Act, which initiated a significant growth and change in the business requirements for handling service and client information, prompted management to make CRRIS the back-bone of community care. This initiated the transformation of CRRIS from a system that held data purely for reference purposes (*i.e.*, an operational system) to one that produced management and financial information (*i.e.*, a management IS) to support day-to-day decision making within the organisation.

The transition from operational to management IS has not been smooth. Following the decision to make CRRIS the central repository of community care information, a review of the system was undertaken in order to qualify/quantify the perceptions of CRRIS in the eyes of the different stakeholders³⁴ groups within the organisation. This review focused on business and technical issues, the outcome of which it was hoped would allow the GMT to plan for future CRRIS developments. Questionnaires were sent to all 2000 CRRIS users of which 650 were returned.

33 CHIPS is primarily a MIS used to monitor Child Care systems and produce performance indicators. It is the only PC-based system that is common between districts being run on a standalone PC within each district. Information is pulled periodically off each machine (which is now done electronically via CHESHIRElink but previously done via diskette) and a full-time member of staff aggregates this with information from other districts to supply, for example, the Department of Health with Child Care statistics each year. It is planned to integrate CHIPS into CRRIS later on in the year.

34 The key stakeholders are practitioners, support workers (Team Secretary, Finance Staff, Customer Services), in-house service providers (*e.g.*, Community Meals, Home Care Service), social work teams, operational managers (Team Leaders, Service Managers), purchasers (Principle Officers), and strategic managers (*i.e.*, those attending GMT).

Responses revealed that users found CRRIS cumbersome, inflexible and unfriendly, that the data held by the system was not up-to-date, there were not enough access points, the system enforced procedures rather than supporting them, significant training and support was required to use it, there was a lack of user guidelines and accompanying procedures (leading to inconsistent use), and there was a perceived lack of user involvement with the development of system. Concern was also expressed regarding the slowness of the hardware (AS400) on which the system was run (*c.f.*, SS#1).

As a result of findings, and due to the commitment by top management to make CRRIS central to CSS IS strategy, a series of Roadshows (workshops) were staged at headquarters and district levels. The aims of the Roadshows were three-fold: to communicate the management vision of CRRIS; to provide stakeholders with the opportunity to voice their frustrations about community care and the implications this had in terms of systems (not just IT-based ones), and to address these and other problems identified by the CRRIS review. The Roadshows took place during May/June 1994 and involved all major stakeholders from each district and headquarters. Initial feedback suggested these Roadshows helped to effectively communicate the management vision for CRRIS and fostered the necessary commitment to make it work.

Today, CRRIS is more than a database of client and resource data. It encompasses virtually every sphere of CSS activity comprising several modules designed to interrogate, manipulate and present data supporting the implementation of community care. It not only maintains approximately 250,000 client records but provides internal communication, accountability for work done, information (at client, service and corporate level), and feedback for monitoring and review purposes (at client, team, service and corporate level). In addition, each district now receives standard reports from the system each month (*e.g.*, referrals, registers, caseloads, access reports, disposal of records).

5.4.4.3.2 Categorisation of IS

McFarlan's (1984) strategic grid (*c.f.*, Figure 5.16) has been used to categorise the general type of IS as identified in §5.4.4.3. Since the focus of the current and future business strategy is on the implementation of community care, community care systems are in effect STRATEGIC. Children systems, while achieving today's business strategy, do not help to achieve the community care objectives and therefore may be regarded as FACTORY. Old people and adult systems falling outside the implementation of community care are also placed in this quadrant.

<i>Importance to Future Business Strategy</i>	H	<i>Turnaround</i>	<i>Strategic</i>
			<ul style="list-style-type: none"> Community Care Systems
	L	<i>Support</i>	<i>Factory</i>
		<ul style="list-style-type: none"> Support Systems 	<ul style="list-style-type: none"> Children Systems Old People Systems Adult Systems
		<i>Importance to Current Business Strategy</i>	

Figure 5.16 - Categorisation of CSS' IS in the strategic grid

5.4.4.4 Current IT infrastructure

CSS have three main types of technology to deliver its' IS:

- an AS400, which is owned by CSS, located at CIS Operations in County Hall, maintained by 'seconded' CIS development staff, and facility managed by CIS;
- PC-based technology which is in use in all districts and is normally purchased from a discretionary budget held by local managers. There are no local area networks connecting PCs within districts nor wide area networks linking them between districts resulting in replication of software and data. Data has periodically to be collected from different districts in order to provide a County view which, with the current IT infrastructure, is labour intensive;
- IBM mainframe technology which is managed by the Finance & Management Services Group³⁵ at County Hall. This houses CSS financial systems and some of the older children and community care systems.

Table 5.1 provides a summary of the main CSS IS and the technology used to enable them.

<i>Technology Type</i>	<i>Type of System</i>		
	<i>Community Care</i>	<i>Children</i>	<i>Support</i>
AS400	CRRIS Care Management Resource Directory		
PC-based	Residential Homes Management Package; Registration of Private and Voluntary Homes INCHES ³⁶ MIS for Home Care Service	CHIPS Youth Justice Child Protection Register	Personnel Performance Measurement Inter-organisational
Mainframe	Home Care (contractor side)	Children in Care	Exchequer Systems Financial & Personnel Management Corporate Office Systems

Table 5.1 - Overview of IS/IT

35 Recently merged into the Resource Group.

36 Information for People with Disabilities in Cheshire.

5.4.4.5 The Vision

5.4.4.5.1 The IS Strategy

The major objectives of the *information strategy* is to provide managers and operational staff with information which will enable them to plan, develop and target the delivery of efficient and cost effective services, and to improve communications thereby enabling CSS to respond to its major challenges (*c.f.*, SS#3).

In order to achieve this information strategy, CSS have identified a broad vision for future systems developments (*c.f.*, SS#2: §2.2). Compiled by the District Manager with lead responsibility for old people and community care, the vision states that systems should:

- be integrated so that a high quality focused response can be given without conflict within the management process;
- promote the effective use of resources by minimising duplication of effort or undue delay in decision making or problem solving;
- be open and clear to users and carers and provide quick and easily understood information;
- provide a range of appropriate information to managers and staff as well as users and carers;
- define accountability clearly and the standards and procedures that will define its use;
- provide the means to collect, monitor, review and act upon information to ensure consistent delivery;
- provide information which will help develop new, creative and sustainable use of allocated resources.

While this list of statements provides a framework for future IS developments, there is no evidence to suggest these guidelines are explicitly referred to during the ISP activity.

The main focus of the IS strategy, as with the business strategy, is the implementation of community care. The IS strategy aims to identify IS that will enable the efficient and effective delivery of community care services using CRRIS as the foundation stone for future developments. A vision paper entitled 'Systems to Support Social Services Practices' (SS#2) provides the longer term view of CRRIS and its part in the implementation of community care. In addition, the ISS includes shorter term tactics to address specific issues raised by the CRRIS review (*e.g.*, user-friendly interface), issues that need to be resolved in order to provide a firm foundation for future applications (*c.f.*, SS#1: §5.0).

Driven by the need for management information, the IS strategy also reflects the move towards IS/IT integration (*c.f.*, SS#2) by ensuring that new and existing IS are being integrated into CRRIS. While the organisation is some way off IS/IT integration, management information is currently being provided, on request, by IS Support Unit staff. It is envisaged in the longer term, once integration is complete, that management will be able to gain access to relevant management information at the 'touch of a button'. In the shorter term however, the newly established Business Management Function will

provide management information to their own DMTs by periodically³⁷ downloading the appropriate data from CRRIS and using PC-based tools to interrogate it.

While CSS believe IT to be critical to the implementation of their business strategy, they explicitly recognise that not all systems will necessarily be IT-based by saying ‘although our systems are becoming increasingly automated, a key message for the group [CSS] is that systems are, and will continue to be, a composite of procedures, manual systems, paper documents and computer systems’ (*c.f.*, SS#2: §2.1). In reality, however, the Roadshows highlighted the problem users had in separating information requirements from IT-based solutions.

While the majority of systems being developed/enhanced or planned are community care related, work has recently been commissioned to integrate a children system, named CHIPS, into CRRIS (*c.f.*, SS#1: §5.6). This management information system is currently installed on up to ten different *stand-alone* machines in each district making the comparison of data, especially across districts, labour intensive.

Children systems have, in general, evolved rather than being proactively planned for. Each district has developed its own range of children systems with no element of integration between them nor co-ordination between similar systems in different districts. While the lack of integration between systems *within* districts has led to multiple data entry, the lack of co-ordination of similar systems *between* districts has led to problems of compatibility when making comparison across the County. Except for CHIPS, the current IS strategy is focused on the integration of community care rather than children systems.

5.4.4.5.2 The IT strategy

CSS are seeking to integrate new and existing systems through the centralisation of the organisation’s data, subsets of which will then be downloaded to local (district) level for detailed analysis. The IT strategy to support this involves the AS400 becoming the central data repository and the use of PCs at the local level for high quality analysis and detailed interrogation.

AS400 response times for key functions/transactions will be routinely measured and a minimum service level specified in order to monitor performance and manage expectations (*c.f.*, SS#1: §5.9). In addition, current/future system volumes will be defined/predicted every three months to enable ongoing capacity and capital investment planning thus ensuring that the effect on systems performance of, for example, additional users and new systems developments, is minimised (*c.f.*, SS#1: §5.10).

37 There is currently no perceived need for real time enquiries since managers are only interested in historical data from the previous three months, not data relating to the current month.

The shorter term IT strategy is concerned with improving the terminal access to CRRIS. At present, although CRRIS is accessed via the County network via dumb terminals and PCs (for enquiry purpose only), not enough terminals exist for the expected increase in system usage.

At the district level, an IT audit of existing PC, dumb terminals and their usage has recently been commissioned, the aim of which is to provide a basis on which to assess further needs (*c.f.*, SS#1: §5.7). It is envisaged that additional communication links with CRRIS may be required in order to cope with the growth in expected usage.

Figure 5.17 provides a summary of the changing focus of CSS's IS/IT strategy. From 1988 to 1991, apart from CRRIS, IS/IT acquisition was ISOLATED with users buying and/or developing end-user systems to solve their own problems. Solutions implemented by ISYSS system developers were driven by one of two types of technology (*i.e.*, AS400 vs PC-based solutions) and were developed in isolation from other IT-based systems. Both end-user and ISYSS systems were bottom-up aimed at solving existing operational needs rather than supporting higher level policy making.

In 1991, two factors initiated the move from the ISOLATED to the REACTIVE quadrant. Firstly, new legislation changed management perception of IS/IT when it soon became apparent that without the appropriate IS/IT in place, implementation of the new legislation would be difficult. Secondly, County Hall requested CSS to produce business and IS strategies for the first time, clearly showing how IS/IT acquisition tied in with CSS objectives and how these objectives linked in with the MTS.

CSS are currently in the REACTIVE quadrant, concerned with IS/IT to satisfy the current 'business' issue of community care implementation. While the IS/IT strategy is more business-driven than before it still deals solely with current organisational issues.

<i>Goal Seeking/Strategy Formulation</i>	<i>PROACTIVE</i> <i>Future Opportunities</i>	<i>PROACTIVE</i> <i>Serendipity</i>
	<i>REACTIVE</i> <i>Current Issues</i>	<i>ISOLATED</i> <i>IS Bounded</i>
<i>Issue-based/Problem Solving</i>	1991-1994	1988-1991
	<i>Business-Driven</i> <i>"Top Down"</i>	<i>IT-Driven</i> <i>"Bottom up"</i>

Figure 5.17 - The changing focus of IS/IT strategy (Galliers, 1987c)

5.4.4.5.3 The IM strategy

In order to ensure integrated information provision, CSS identify five main principles that any information held by CSS should conform to (*c.f.*, SS#5: p 77). They believe information should be: shareable; standardised to avoid duplication and inconsistency; entered only once into systems; flow from and be of direct use to operational activity, and comply fully with the data protection act. This statement provides the basis of the organisation's information management strategy.

The CRRIS review revealed that data held by the system was unreliable. While procedures had been in place for some time to ensure correct data entry, these had not been reinforced and consequently the data's integrity was compromised. In addition, since CRRIS evolved rather than being proactively planned for, situations arose where data requirements changed and users coped the best they could with the existing system which led to inconsistent use. Users perceived no real benefit in ensuring the data was correct since in their view 'the system was good at sucking data in but not good providing information in return'. It was not until the implementation of the first financial IS (*i.e.*, the client billing system) that the scale of the problem was finally realised. As part of the short term IM strategy, the data is currently in the process of being 'cleaned'.

CSS now recognise the need to have procedures in place to ensure that the data remains reliable and valid (SS#1: §6.4). Documentation is currently being developed to ensure that good practice standards are maintained and basic procedures followed. In addition, the possibility of on-line narrative/procedural guidelines are being investigated as part of new systems implementation (*c.f.*, SS#1: § 5.4).

There are other IM related projects that have been proposed but have not yet been commissioned. These projects include reassessing current backup and contingency plans, improving the accuracy of the data by running random checks of client files, and strengthening housekeeping/policing function of district IT staff (SS#1: §6.3; §6.4).

New system development procedures have also recently been implemented. Sponsors now nominate project managers (champions) who head a mixed disciplined project team to develop the necessary IS. Other improvements to this IS development process such as the use of more active prototyping techniques, have also been identified but have yet to be implemented. Project teams are being encouraged to keep the systems simple, slow the pace of developments down, and have realistic time-scales for testing, training and implementation. However, at the present time there are no guidelines on IT acquisition.

5.4.4.6 The Organisation's Perception of IS/IT

Organisational perceptions of IS/IT have been tainted with the experiences of CRRIS. The issues raised by the CRRIS review led to the series of Roadshows which sought to gain commitment from the users to make CRRIS work. While there are problems still to be solved, the majority of users now believe management are committed to sorting these out as quickly as possible and that the system is worth keeping.

IS/IT is beginning to be viewed quite positively now that co-ordinated, more user-friendly systems are starting to appear. There is, however, some difficulty in capturing the 'absolute' benefits of systems as user's expectations have increased incrementally with each system enhancement/development. For example, when CRRIS was first implemented many of the benefits were recognised early on, benefits which are now taken for granted by present users who, in addition, have even higher expectations than previous users as to what technology should be able to deliver. Consequently, new applications or enhancements to existing systems have higher levels of expectations to satisfy.

The way in which IS/IT is delivered can also affect the organisation's perception of IS/IT. There are mixed feelings with regards to the delivery of IS/IT within CSS which is tainted by the lack of a real choice with regards to the supplier. CSS are currently required to spend their IS/IT budget with CIS, raising real concerns in the minds of management regarding value for money. However, separation from CIS might prove difficult even when the internal market is fully operational. CSS may find themselves locked into CIS who have been the main provider of CRRIS applications for the last ten years. The steep learning curve other software houses would have to climb could introduce high switching costs for CSS.

5.4.4.6.1 Operational Staff

While the perception of IS/IT within the organisation is generally improving, there is still some concern that IT-systems are being used to control rather than support the way in which people work. For example, a recent modification to CRRIS had, in the eyes of users, introduced too many mandatory fields and not enough escape routes, alienating many staff. Operational staff felt the system was forcing them to comply to procedures that constrain rather than supported the way in which they work. While this system has since been adjusted, there is still concern that other systems seek to do similar things.

Of those operational staff on the front-line of social services (e.g., social workers), there is concern about the amount of time they will be expected to spend inputting care plan extract information onto the computer. At present only a minimal amount of data from these extracts are entered, enough to support the billing process. While operational staff have the responsibility of ensuring this data is entered into CRRIS by a specific date so reports and invoices can be generated, administration staff are currently doing the data entry for them. Once the complete community care system is up and running,

operational staff will be required to enter the data themselves and as a consequence there are concerns regarding the reduced amount of time they will be able to spend in the field, resulting in a possible drop in service quality. However, solutions to this problem are currently being sought.

5.4.4.6.2 Management

While managers perceive a need for certain information at their fingertips, there are different levels of IS/IT awareness. Generally, managers believe that while they do not necessarily have to understand how to use CSS IT-based IS, they do need to know what the systems can currently produce and what the potential of these systems are.

5.4.5 ISP Environment

The CSS environment is not highly conducive to ISP. In fact, planning in general is not well accepted because of the historical way in which resources have been allocated and the traditional view that service provision is an immediate response to people needs. In addition, planning represents another step towards the adoption of private sector values and a step away from the public service ethic. This is probably harder for CSS than for any other LA department due to the very nature of their service activity. However, the ever decreasing CSS budget has meant that only through planning can the organisation more efficiently and effectively target the now limited resources. CSS are being forced to be clearer about what their objectives and priorities are and where to spend their budget accordingly.

While the strategic planning horizon for IS plans should be the same as that of the MTS (*i.e.*, 3 years), CSS are finding it a problem planning this far ahead due to the uncertainty of LGR and the difficulty in keeping up with the implementation of community care legislation. Consequently, planning beyond the implementation of the community care is proving to be difficult both in terms of time and money. This combined with the fact that the organisation itself finds it difficult to embrace the philosophy which is making strategic (long-range) ISP (or indeed business planning) necessary, means the IS being identified and implemented are only addressing the current business needs/issues.

The ISP sponsor is the Group Finance & Information Officer. The ISP Champion is the IS Manager who reports to the ISP Sponsor and has the responsibility for both identifying (*i.e.*, expert role) and facilitating (*i.e.*, process role) the identification of appropriate IS for the whole organisation as well as providing advice on IS implementation. The IS Manager has the expertise and seems to have the necessary credibility within the organisation to carry out effective ISP.

5.4.5.1 ISP Methodology

While a formal IS plan exists, a formalised, documented ISP process does not. The production of an annual IS plan is driven by the need to input into the County's ISS document which is used as a primary mechanism to allocate the central IS/IT budget (*e.g.*, SS#3). The IS plan presented to the IS Strategy Unit at County Hall summarises the IS developments planned for the following financial year, indicating how each will be financed.

Senior management have recently taken on ownership of both business and IS planning activities, and are currently seeking to formalise these processes. They hope formalisation will not only explicitly establish how each of the organisational planning activities relate to each other and the MTS but also identify what activities should inform the planning process. The Group Development Officer has the responsibility for this.

While no formal ISP methodology exists the general approach to ISP can be categorised as what Earl (1993) terms the 'organisational' approach, that is key themes are used for IS/IT investments which are derived from a consensus view of priorities established by a group of senior executives. The over-riding theme for IS/IT investment at present is the development of systems to efficiently and effectively implement community care. This has led to the identification of a number of management information systems and the need for system integration.

5.4.5.2 The Process of Planning (Implementing Planning)

While the act of producing a plan within CSS is a periodic activity, the act of planning is more continuous in nature. The IS Sponsors meet approximately bi-monthly to discuss the identification, prioritisation (or reprioritisation) and development of IS. The main decision making stage of ISP takes place on-site but away from the day-to-day running of the organisation.

Open-ended questionnaires play a major role in ISP followed by informal meetings, workshops, reports, formal meetings, interviews and finally closed-ended questionnaires (*c.f.*, Figure 5.18). All stages except the choice stage is moderately to well covered by five or more information gathering tools.

Gathering/ Reporting Tool	Stages of Planning					
	Pre-planning	Intelligence	Design	Choice	Implementation	Review
Workshops.						
Interviews.						
Open-ended Questionnaire.						
Closed-ended Questionnaire.						
Formal meetings						
Informal meetings						
Reports.						

Figure 5.18 - Information gathering/reporting tools used in ISP

Key: Not used  Minimal  Moderate  A Lot 

While the decision making process seems to be good at anticipating potential problems before they arise, encouraging debate among participants and dealing with sources of conflict, participants do not think that it is flexible enough to adapt to the needs of the participants, resources, information and/or changes in the environment. In particular, it is difficult to incorporate new information into the later stages of the process.

5.4.5.3 *Support Structures*

CSS uses several ISP support structures. The most important is the IS Sponsor Group which acts as the steering committee. The IS Sponsors Group comprises the Group Finance & Information Officer (Chair), the three SPIG chairs who are also the IS Sponsors for the service area in which they have lead responsibility, the Group Development Officer who is the IS Sponsor for support & development systems (and in particular CRRIS), and the IS Manager who acts as facilitator. In addition to discussing, choosing and (re-)prioritising IS applications, these meetings include discussions with CIS about the current status of existing development schedules.

Other support structures in use are task forces (*i.e.*, temporary groups set up to support an activity) although this is primarily during the investigation/development of a particular application, liaison roles where representatives from user groups liaise with IS/IT staff, and the new IS Support Unit which helps to collect, synthesise and analyse data for input into the planning process.

5.4.5.4 *The Planning Participants*

The ISP participants represent the major stakeholder groups within the organisation. Commitment by stakeholders to ISP is questionable at present although this may be partly due to the antipathy towards planning in general (*c.f.*, §5.4.5) and partly due to the fact that the ISP process is still evolving. In addition, ISP objectives/goals are not explicitly stated and there is no clear understanding of stakeholders' role and responsibilities in ISP. However, planning participants do believe they have the necessary skills required for planning and that they are quite effective at problem solving and decision making in general.

The degree of participation in ISP varies between different stakeholder groups (*c.f.*, Figure 5.19). Senior and District Managers dedicate the most time to ISP followed by IS staff, users and the IS Manager. The Directorate play a minimal part, only providing moderate input at the choice and review stages of planning. Customers and suppliers both provide some input to the design and review stages, with suppliers providing a lot of input during the implementation stage. The major concentration of effort is during the design stage where there is a lot of participation from all six sets of stakeholders. This is followed by the implementation, review and intelligence stages, and finally the pre-planning and choice stages where there is the least amount of total participation.

ISP Participants	Stages of Planning					
	Pre-planning	Intelligence	Design	Choice	Implementation	Review
The Directorate						
Senior & District Managers						
Principle Officers						
IS Manager						
IS staff						
Users						
Customers						
Suppliers						

Figure 5.19 - Extent of participation by stakeholders in ISP

Key: None  Minimal  Moderate  A Lot 

5.4.5.5 Management Commitment & Involvement

The GMT have recently taken on ownership of both the business and IS planning processes within the organisation (*c.f.*, §5.4.5.1) so there is certainly *commitment* from top management to make planning work. In addition, it is evident from Figure 5.19 that Senior and District Managers are actively involved in the ISP process. The Directorate, however, have relatively less input.

5.4.6 The IS Planning Activity

5.4.6.1 Pre-planning

The IS Planner puts some time aside to decide how ISP should be done (*i.e.*, planning to plan) by identifying stages, time scales and checkpoints (although not in great detail as the ISP methodology is still evolving). Broad criteria by which competing projects are prioritised are also agreed upon at this stage. For the last couple of years, the GMM have agreed that community care developments should be top priority.

5.4.6.2 Intelligence

Changes in the environment (internal and external) with respect to a range of issues not just IT-related ones, are discussed by the 'Networking' Group³⁸ which was set up 18 months ago specifically to co-ordinate the implementation of community care. The group writes vision papers covering different issues which are presented to GMT for further discussion and, if appropriate, are incorporated into the business plans. In addition, external information is gathered from the national census and analysed to learn more about the communities in Cheshire. External reports are also reviewed and used to identify implications in terms of future social care needs.

38 Comprising the District Manager with lead responsibility for Old People & Community Care, POs from each of the different districts, a PO of Development and the Community Care Project Co-ordinator from headquarters.

While there is some evidence of information and IS/IT auditing taking place within CSS, these seem to be done outside the ISP activity. For example, districts have recently been required to make an audit of their IT (*c.f.*, §5.4.4.5.2) in order to identify deficiencies in current technological requirements. The GMT have also recently commissioned a sub-group to undertake an information audit, triggered by the need to understand the purchasing activity better.

None of these audits, however, have been initiated by the ISP activity. As a consequence this audit information does not seem to feed formally (directly) back into the ISP activity although it may do informally (indirectly) through the IS Sponsors. There are no organisational information, IS and IT audits and therefore no 'helicopter' view of where the organisation is currently in terms of its information, IS and IT provision. Such organisational audits provide a firm foundation on which to integrate new and existing systems, especially those to be implemented across districts and/or different service areas.

5.4.6.3 Design

While SPIGs are the main way in which information and IS requirements are determined, there are other ways in which information needs are identified.

5.4.6.3.1 SPIGs

There are three SPIGs in all, each planning and developing services for one of the three service areas (*i.e.*, adult, children, old people). Each is chaired by a District Manager who also acts as the IS Sponsor for that service area.

The majority of information requirements should fall out of the policy making activity of the SPIGs. A three level model is used by the groups as a framework for information requirements determination. The first level identifies data to be collected by the primary data collectors (*i.e.*, the practitioners) regarding cases and contacts, and according to the principle that data will only be computerised if it adds value to that data; the second level identifies management and control information about the use and effect of resource deployment which is derived from the operational data, and the third level identifies planning information (*e.g.*, trends analysis) which is derived from the two lower levels.

The Group Development Officer provides service planning support to District Managers with lead responsibilities. If the information requirements associated with a new policy involves alterations to CRRIS, then the Group Development Officer, in her role of IS Sponsor for CRRIS, ensures that these needs are addressed. If the information requirements are, however, more specific to the service areas, then the District Managers are responsibility, in their role as IS Sponsor for that service area, to ensure these needs are satisfied.

SPIGs identify common information requirements across districts for the same service area. In other words, they provide a cross-district, service-oriented view of what information and IS are needed.

5.4.6.3.2 DIGs

District Implementation Groups adapt policy formulated by the SPIGs for implementation in their own district. Additional information requirements may be identified during the implementation of the new policy which was not identified at the higher level of policy formulation. Requests for potential IS to satisfy these requirements or enhancements to those IS already suggested are made through the appropriate IS Sponsor.

DIGs identify information requirements relating to the implementation of a particular service policy within a specific district. In other words, they provide a within-district, service-oriented view of what information and IS are needed.

5.4.6.3.3 Users & User Groups

Users may provide feedback on particular systems directly to the appropriate IS Sponsor, the IS Planner or through user groups. These user groups comprise representatives from each of the districts and meet on a regular basis.

If the IS/IT issues identified by these groups require a *small* investment, the solution may be financed from the districts discretionary fund. For bigger investment (over £500) requests must go to the IS Sponsor Group

If the IS Planner is approached directly about a potential IS, she will discuss it with all the appropriate stakeholders to gauge their commitment. If stakeholders wish to go ahead with the IS, then they may either finance it from their own discretionary funds or table it for discussion at the next IS Sponsor Group if they wish to finance it from the central IS/IT budget.

Individual users and/or user groups may identify information requirements relating to both within and/or between services areas, and within and/or between districts. In other words, they may identify all types of possible information requirements the organisation may have.

5.4.6.3.4 Networking Group

The Networking Group was established to implement community care legislation which addresses the common activities between old people and adult services. Among other things, they determine the information requirements of community care implementation which are then interpreted by the Project Co-ordinator into system requirements. These system requirements are then passed onto the IS Sponsor Group through the Networking Group's Chair who is also the IS Sponsor for old people services.

Members of the Networking Group co-ordinated the one-off district Roadshows where both community care issues and the systems (both manual and IT-based) needed to enable its implementation, were discussed. The half-day workshops were structured around the idea of comprehensive care packages and the integration of cross-agency services. Participants were asked firstly to identify the processes needed to deliver CSS basic business and then the type of information needed to enable these processes.

The Networking Group identify cross-district information requirements to support the implementation of community care. In other words, they provide a between-district, between-service (*i.e.*, Old People and Adult services) oriented view of what information and IS are needed.

5.4.6.3.5 GMM

The GMM, on occasions, discuss potential control and planning information requirements which lead to the identification of IS that are likely to be cross-district in nature. These will then be passed onto the IS Sponsors Group for acceptance and prioritisation within the context of other system developments.

5.4.6.3.6 DMM

The District Management Meeting may also discuss potential management information requirements which lead to the identification of IS which are cross-service in nature.

For example, District Managers not only have accountability for effective delivery of the care management process, but also for making sure that appropriate performance measurements are in place for service delivery. The assessment and care management process has been used 'to set a range of quality standards against which consumers can measure their receipt of services and against which staff can measure their delivery of services.' In order to measure the quality of services being delivered, each unit of service are required to set clear objectives, performance outcomes, indicators, target and ways of measuring them which are discussed and agreed with service users. The county community care/children plans and the detailed district community care/children plans highlight these objectives, action plans and targets.

At present, information requirements resulting from activities such as these are passed onto the IS Sponsors Group but will, in the future, be the responsibility of the Business Management Function to address.

5.4.6.3.7 IS Sponsors Group

The IS Sponsors Group is the main way in which large IS developments (*i.e.*, those over £500) get accepted, prioritised and commissioned. During the meeting, the group may identify a way to bring together a range of different requirements under one project which satisfies the information needs of several separately identified IS projects, or at least provide a good enough compromise for conflicting requirements.

5.4.6.3.8 The Business Management Function

Once the newly formed Business Management function is properly established, it is expected to identify potential IS. It is envisaged that the Business Managers in each district will meet periodically and that a representative of this group will attend the IS Sponsors meeting.

At present, the newly appointed Business Manager is currently meeting monthly with the Head of Operations, the Principle Officer of Development and the Project Co-ordinator responsible for the information determination with respect to community care. At these meetings, the role and responsibilities of the Business Management function is discussed including what type of information they should be providing to their local management teams.

The new Business Management function are likely to identify both common information needs for the same service area across districts and common information needs across service areas.

5.4.6.3.9 Others

The identification of innovative IS/IT projects may come via the SPIGs, workshops or informal contacts within the organisation. While there is a suggestion scheme, the organisation is such that people directly approach the relevant IS Sponsors about any ideas they may have.

Reports are also periodically assessed to identify whether they still satisfy the information needs of the organisation. If they do not then the information needs are reassessed, changes to current systems identified and the appropriate IS Sponsors or IS Planner contacted.

5.4.6.3.10 Summary

In summary, there are four main types of operational information flows within CSS. These are within and between districts, and within and between service areas. Figure 5.20 summarise the type of information requirements identified by each of the sources above.

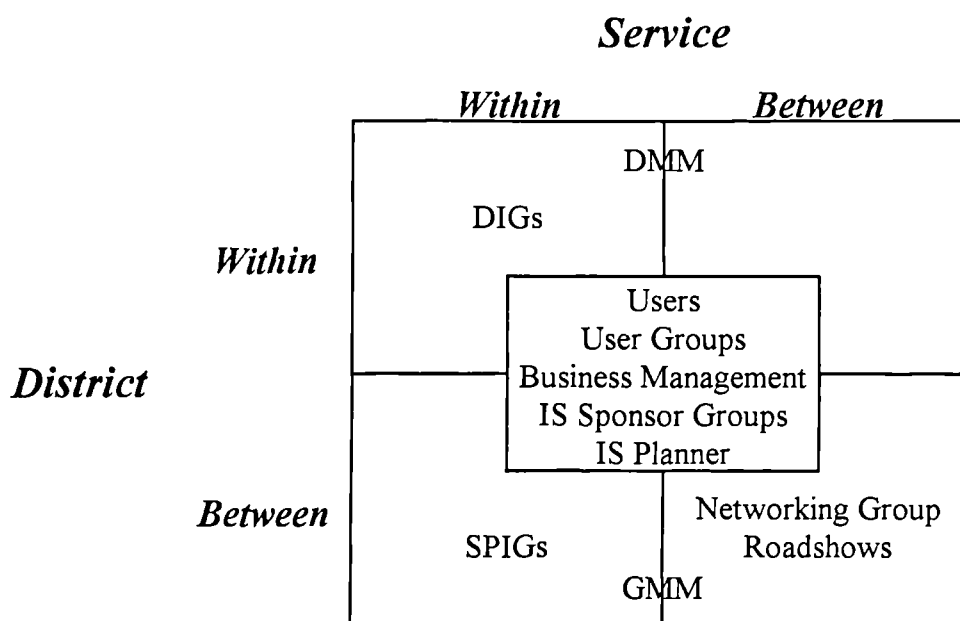


Figure 5.20 - Categorisation of types of information

5.4.6.4 Choice

The IS Sponsors meeting is the forum in which IS are normally discussed and (re)prioritised so to match the demands of CSS with CIS capabilities. All system developments costing over £500 will be referred to this group to be accepted and prioritised.

Before the meeting, the IS Planner talks individually to the members of the IS Sponsor Group to put together an agenda of the IS that will be discussed at the meeting. Together with the IS identified through other channels, the IS Planner asks CIS to provide rough estimates of the CIS resources needed for each potential IS. This provides the IS Sponsors Group with some indication of the relative size of each development in general terms. Some of the proposed IS are large but some may be broken into component parts (modules) which can then be developed separately. Any 'spare' CIS resources, not enough to commission a complete system, may be used to commission part of a system instead.

The IS Planner then provisionally prioritises the list based on general organisational priorities, her knowledge of the general situation and conversations with IS Sponsors. This prioritised list consists of IS 'to do' together with a list of 'doings' (*i.e.*, those systems currently under development) and is used as a basis for discussion at the IS Sponsors meeting.

Proposed IS are judged on whether they fit with the current business priorities of community care implementation. If it does, then it will be added to a 'wish list' where it may spend some time before actually being commissioned depending on its relative priority compared with other IS on the list. In order to get IS proposals on the 'wish list', the IS Sponsors will argue each case in turn.

Once a system appears on the list, the criteria by which it is prioritised in relation to other systems on that list are vague. A whole range of factors seem to come into play (*e.g.*, competing demands across client groups, needs of practitioners, managers and planners) but there is no set of formalised (weighted) criteria. Such formalisation, it is feared, will lead to a loss in flexibility particular in being able to take advantage of opportunities that do not fit within the set criteria. Indeed, it is believed that such formalisation may not be necessary as the IS Sponsors Group have a common understanding of what the corporate issues and general priorities of the organisation are. Since IS Sponsors are first and foremost District Managers who have ultimate responsibility for the delivery of all three service areas within their own district, they understand why IS needs for their particular lead responsibility may not be as high a priority as the other.

Prioritisation of the list is determined through a process of debate and consensus although, in reality, there is little real argument. Once priorities have been agreed, the IS Planner commissions the systems in partnership with the IS project manager (champion) who is chosen by the IS Sponsor.

While broad IT requirements may be discussed at these meetings, in general the discussion focuses around what information is required and the information system needed to deliver it rather than by what means it will be delivered. It is the IS Planner's responsibility to recommend appropriate ways of delivering the systems.

Priorities can, however, change outside the IS Sponsor meetings. If a scheduled system development becomes a higher priority between meetings the IS Planner consults the programme of scheduled developments and identifies whether some other development higher on the list can be put back. The IS Planner will then negotiate with the appropriate IS Sponsor before altering the schedule. Other members of the IS Sponsors Group, not directly involved with the decision, may not be notified of the decision until the next IS Sponsors meeting.

5.4.6.5 Plan Implementation (Project Management & Systems Development)

CSS moves quickly from planning to implementation. Each stakeholder has a clear understanding of the role and responsibilities they have with respect to the implementation of the IS plan. For each of the major systems commissioned, the IS Sponsor nominates a project manager (*i.e.*, champion) to head up a mixed discipline project team of major system stakeholders (*e.g.*, Principal Officers, Service Managers, other Social Services staff, internal/external IT contractors and external consultants). The role of project manager is given to a PO or Service Manager who knows the business well and has enough authority to get the job done.

The IS Planner provides support to IS project teams by helping them identify an appropriate systems specification. Once the specification has been agreed upon by the team, the IS Planner will make a search of all users to identify whether or not an appropriate end-user development exists, or an 'off-the-shelf' package can be taken and adapted to satisfy the systems specification. If no such solution exists, CIS will be commissioned to provide a bespoke solution.

The implementation of the IS plan is reviewed at the IS Sponsors meeting. The IS Sponsors Group meet with CIS to discuss the CIS's performance in terms of the plans implementation. At each meeting, CIS provide a progress report of the IS projects commissioned. Priorities may be reassessed at this point.

IS Implementation & Evaluation

There are regular meetings between the IS project teams, the IS Planner and CIS, where work loads are discussed and project plans agreed upon.

This implementation process aims to gain commitment from users by involving them in the specification and development of the systems commissioned. It is the responsibility of the users to ensure the system has been delivered to the required specification.

Once the IS system is implemented, user groups are set up (depending on how large the system is) to ensure that the system adapts to changes in the environment. Requests for any further developments and support not covered by the service level agreement/maintenance contract, need to be made through one of the channels identified above (*c.f.*, §5.4.6.3).

Users are expected to continually evaluate the IS they use, reporting any problems/modifications/ enhancements to the appropriate IS Sponsor or the IS Planner.

5.4.7 Feedback

5.4.7.1 The IS Plan

Monitoring changes in the internal/external environment, reviewing the plan's contents in relation to these and ensuring that any IS identified by the plan are updated in accordance with these changes, is all done by the IS Planner on an informal basis. The IS Planner relies on the IS Sponsors, or other members of the GMT, to inform her if there are any environmental changes in the short term that could have an effect on the IS planned for development. Longer term issues should be picked up in the IS Sponsors meeting.

5.4.7.2 The ISP System

There is no evidence that the planning process is being monitored, reviewed or updated in line with changes in the environment. However, ISP as with the other planning processes within the organisation, is currently being formalised. In order to do this, current planning practices will have to be made explicit. Whether the activities identified are reviewed first to see whether they are appropriate *before* they are documented, will depend on those doing the formalisation.

If the process is formalised by those currently involved in ISP, it is more likely to be formally/informally *reviewed* because of their first hand experience and knowledge of what did and did not work. This, in turn, is more likely to lead to an *updated* documented ISP process.

5.4.8 Output: The Plan Contents

A formal IS plan is produced annually which provides a brief overview of general management and information systems objectives together with the major developments proposed over the coming year and how much budget (in terms of CIS development hours) is required (*c.f.*, SS#3). The internal IS plan used by CSS is a 'wish list' of systems to be developed in the immediate future which is primarily focused on modification/enhancements to existing systems. Neither of these plans look at the long-range IS objectives (beyond the implementation of community care) and the strategies needed to achieve these.

5.4.9 Management of Change

While management of change issues are not discussed during the ISP process, via stakeholder participation at both the planning and development levels, commitment and ownership of individual IS is normally achieved.

5.4.9.1 Communicating the ISS

The primary vehicle for communicating the IS strategy has been the series of Roadshows run throughout the County during the last two months. The main focus of these were on community care implementation and the systems (both manual and IT-based) needed to support it. They also provided an opportunity to market the new management vision of CRRIS to the major stakeholder groups, and to explain in more detail why certain changes are necessary.

5.4.10 Human Resourcing Issues: Training

Human resourcing issues relating to training are discussed during the ISP process but not in any great detail. The IS project manager is responsible for identifying in detail what training is required and ensuring that it is delivered.

Training needs are also identified outside the ISP activity. The user groups may express certain training needs and the line management process identifies people struggling with various aspects of a system.

A limited amount of training is done centrally, instead most of the training is left to individual districts. The organisation provides training on specific systems which also covers a little on what computers can generally do.

5.4.11 Summary

CSS started to plan their IS/IT provision two years ago (1992) in response to two major environmental changes: community care legislation and a request from County Hall to produce an IS strategy in line with the organisational (CSS) objectives and the MTS. Previous to this, the identification and acquisition of appropriate IS/IT had been reactive, focused on meeting existing demands not future needs.

Changes in legislation forced management to re-evaluate their view of IS/IT as purely an operational tool; they began to see IS/IT as a major management tool in the implementation of the new legislation. As a consequence, there is senior management commitment to and involvement in the ISP activity even though the environment in general is not conducive to organisational planning. A senior management IS steering committee (called the IS Sponsors Group) now take the final decisions with respect to major investments in IS/IT (over £500).

While no formal planning methodology exists, the ISP approach taken by CSS can be characterised by what Earl (1993) terms an 'organisational' approach, focusing on developing key themes for IS/IT investments derived from a consensus view of priorities established by a group of senior executives. The key theme in this case is the identification of IS to support the implementation of community care legislation.

ISP is more continuous than periodic in nature although a plan is produced periodically for budgetary purposes. The IS Sponsors Group meets approximately bi-monthly to discuss potential IS, the progress of current developments and changes in the development schedule. The group comprises District Managers who are not only responsible for the delivery of all three service areas (*i.e.*, adult, old people and children services) within their own district, but also have lead responsibility for policy development (and the identification of the necessary IS) for one of these three service areas. As a consequence, while providing sponsorship for one group of systems, they have a shared vision of CSS's priorities as a whole.

Business planning is undertaken separately but inputs into ISP via the IS Sponsors. ISP takes place on-site but well away from the day-to-day running of the organisation. All major stakeholder groups are represented in the identification of potential IS/IT investments. Figure 5.21 identifies the type of ISP information flowing between individuals and groups within the organisation.

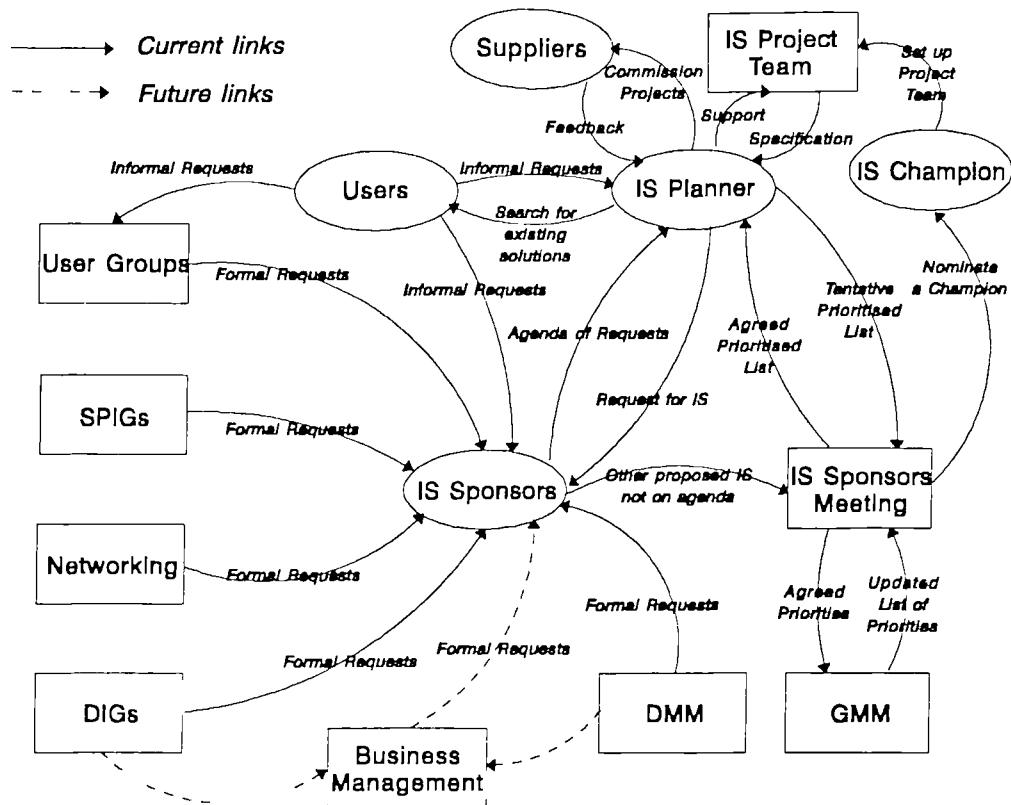


Figure 5.21 - Overview of CSS ISP process

Using Earl's three-legged ISP framework summarised in Figure 5.22, CSS cover all three of these in their ISP approach. The IS Sponsors, GMT, DMT and Networking Group all provide input to the ISP process, identifying relevant IS to support the business objectives (*i.e.*, *top-down*). The users, user groups, IS Planner, Roadshows and Business Management function provide bottom-up input, while suggestion boxes and informal request made to IS Sponsors or IS Manager help identify IS/IT associated with inside-out approach.

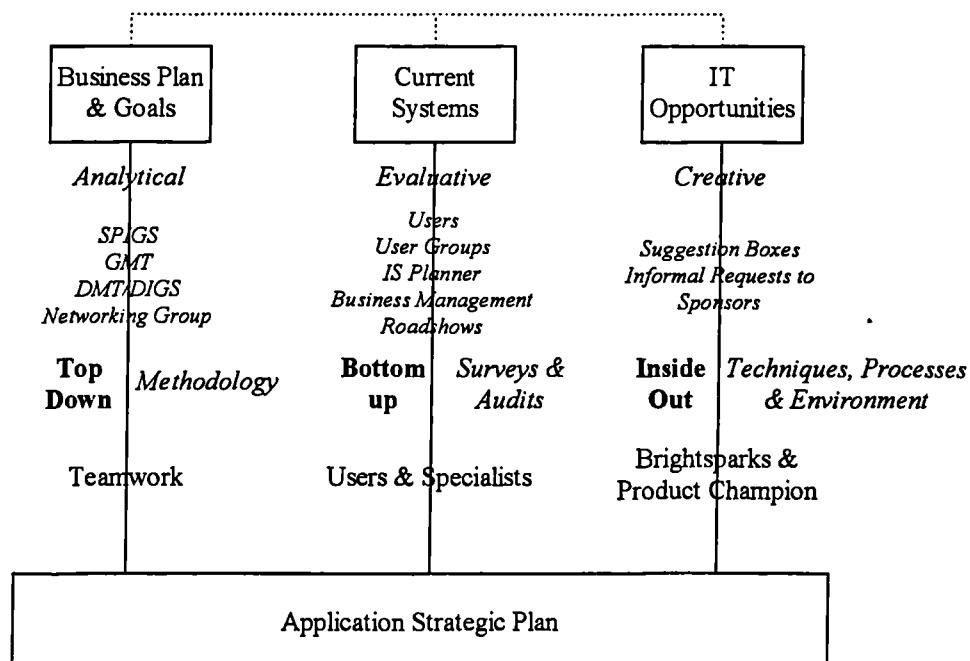


Figure 5.22 - Earl's ISP framework (Earl, 1989: p71)

The NHS & Community Care Act has forced Social Services to become less service-driven (*i.e.*, internally focused) and more needs-led (*i.e.*, externally focused). As a consequence, new financial, management and information systems have been implemented to ensure efficient and effective service delivery. CSS are now predominantly in stage three of the planning stages of growth model (*c.f.*, Figure 5.23) which reflects the transition from IS/IT control to IS/IT integration.

<i>Factor</i>	<i>Stage</i>					
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
Task	Meeting demands	IS/IT audit	Business Support	Detailed planning	Strategic advantage	Business-IT strategy linkage
Objective	Provide service	Limit demand	Agree priorities	Balance IS portfolio	Pursue opportunities	Integrate strategies
Driving Force	IS reaction	IS led	Senior Management	User/IS partnership	IS/executive led; user involvement	Strategic coalitions
Methodological Emphasis	Ad hoc	Bottom-up survey	Top-down analysis	Two-way; prototyping	Environmental scanning	Multiple methods
Context	User/IS inexperience	Inadequate IS resources	Inadequate business/IS plans	Complexity apparent	IS for competitive advantage	Maturity, collaboration
Focus	IS department		Organisation-wide		Environment	

Figure 5.23- Planning stages of growth (*c.f.*, after Earl, 1989; Galliers & Sutherland, 1991)

Galliers (1991) identifies five important components of an IS strategy (*c.f.*, Figure 5.13), all but one of which (*i.e.*, *management of change strategy*), are addressed by CFB's ISP activity.

- The IS Sponsors identify information requirements for their own area of lead responsibility through the different policy, implementation and user groups identified in §5.4.6.3 (*i.e.*, the *information strategy*);
- The IS Planner and CIS identify appropriate IT to support the delivery of these information requirements (*i.e.*, the *IT strategy*);
- The IS Planner supports the implementation of IS by providing guidelines on how the information should be managed and what type of IT should be implemented (*i.e.*, the *IM strategy*);
- IS project teams identify the appropriate human resourcing implications during the system development cycle. However, lack of a top down human resourcing strategy may result in missed opportunities for exploiting potential synergies.

While management of change is not explicitly mentioned by the ISP process for individual IS/IT investments, CSS's IS/IT vision of using CRRIS as the foundation stone on which to build integrated IS/IT that enable the implementation of community care, has been communicated to the rest of the organisation via a series of Roadshows run in each district and at head-quarters. This has gained a level of commitment to change which had previously not been present. *Proactive* consideration of

issues associated with the impact of proposed IS/IT on organisational members should help to make CSS's transition from IS/IT control to integration (and beyond) a smooth one.

Finally, in terms of providing feedback on the IS plan, between IS sponsor meetings the IS Planner informally monitors changes in the environment, reviewing and updating the IS plan in accordance with these changes. However, there are no formal or informal mechanisms in place to monitor, review and update the ISP system which could be due to informal nature of the planning activity at present.

5.5 Conclusion

This Chapter has sought to provide evidence that the research instrument developed in Chapter 4, which is based on private sector research, is applicable to public sector organisations, and in particular LAs. It has attempted to provide proof in three ways:

1. Discussing how changes in the public sector environment has forced them to become more like private sector organisations in terms of operating philosophy;
2. Structuring the case discussion around the research instrument to show that the same types of activities and issues are now being faced by both private and public sector organisations;
3. Applying IS models and frameworks developed from research conducted in the private sector to a public sector environment.

As a final justification as to the applicability of the research instrument within the public sector, the questionnaire was pre-piloted by case study participants and was found, with minor alterations, to be applicable within their context.

The research instrument was then piloted on a sample of both public and private sector organisations, revised based on the responses received and then distributed via mail to the remaining organisations who expressed a willingness to participate in the research. The results of the survey are reported in the following chapter.

6. Results of the Survey

This chapter describes the analysis carried out in order to provide answers to the research questions identified at the end of Chapter 2. The chapter is divided into three main sections: data collection/preparation, reliability and validity of the measurement scales, and data analysis. Specific details of the analyses carried out in each section can be found in Appendix D.

6.1 Data Collection/Preparation

A total of 90 different organisations responded to the survey giving a response rate of 60%. Of these, 16 (18%) organisations returned two non-IS respondent questionnaires and a further 23 (26%) returned one non-IS respondent questionnaire making a total of 39 (43%) different organisations returning both IS Planner and non-IS respondent questionnaires.

The returned questionnaires were checked for non-response bias using the surrogate test of rank correlation as suggested by Ferber (1948-49). The order of return of responses was correlated with the measure of average ISP effectiveness and feedback to establish whether responses given by late returns were the same as those given by earlier ones (*c.f.*, Table 6.1). Only one correlation is significant^{0.05} providing evidence that the reporting of ISP system feedback by non-IS respondents is lower for late returns than for earlier ones.

	<i>Spearman's Rank Correlation (r)</i>	
	<i>IS Planner</i>	<i>Non-IS respondent</i>
Average ISP effectiveness. ¹	0.0327 (n=79; prob=0.775)	-0.0074 (n=38; prob=0.965)
IS plan feedback.	0.0829 (n=78; prob=0.471) ²	-0.0147 (n=38; prob=0.930) ³
ISP system feedback.	0.0021 (n=78; prob=0.985) ⁴	-0.3302 (n=38; prob=0.043) ³

Table 6.1- Testing non-response bias using the Order of return

Data were checked for general reliability (*i.e.*, correct data entry), missing values and outliers through tabulation and graphical analysis. Missing values were checked to ensure they were randomly distributed in the data. All but one variable (centralised vs decentralised organisation: Q8c) were randomly distributed (*c.f.*, Appendix D: §D.1.1). There was evidence to suggest^{0.05} that average ISP effectiveness was higher in organisations that did not respond to this question than in those organisations that did. This variable therefore was dropped, where appropriate, from the analysis. Data were screened for outliers before each analysis and dealt with accordingly.

0.05

At the 5% significant level.

1

Average of composite single-items measuring ISP effectiveness.

2

Composite of all six items measuring feedback on IS plan.

3

Single item measure used.

4

Composite of all six items measuring feedback on ISP system.

6.2 Reliability and Validity of the Constructs

In addition to gaining a general feel for the data through preliminary data analysis, the ‘goodness’ of the ISP effectiveness and feedback measurement scales were tested through reliability and validity analysis (*c.f.*, §D.2 and §D.3). Chapter 3 provides a more detailed discussion of the reliability and validity issues addressed below.

6.2.1 Reliability

The reliability of the measurement scales was investigated using Cronbach’s alpha. All three alpha values (*c.f.*, Table 6.2) were well above the cut-off value of 0.6 commonly recommended for empirical studies (Nunnally, 1978), thus providing a measure of each scale’s reliability.

<i>Measurement Scale</i>	<i>No of Items</i>	<i>No of Cases</i>	<i>Reliability (Cronbach’s Alpha)</i>
ISP effectiveness.	13	82	0.9065
IS plan feedback.	6	85	0.7865
ISP system feedback.	6	84	0.9039

Table 6.2 - Reliability assessment of measurement scales

The reliability of the ISP effectiveness measurement scale was *marginally* improved by the removal of two items: whether ISP has improved since the last time it was carried out (Q66B/Q19B) and whether only those IS identified during ISP were subsequently implemented (Q68/Q21). The marginal increase in reliability due to the removal of these items suggest respondents do not as strongly associate these with ISP effectiveness as they do the other items in the scale.

6.2.2 Construct Validity

Convergent and discriminant validity were tested in order to establish the construct validity of the measurement scales.

6.2.2.1 Convergent Validity

Convergent validity is the extent to which multiple attempts to measure the same concept through different methods are in agreement. This can be established either by measuring the degree of correlation between two *different* measurement instruments used to measure the same construct (*i.e.*, multi-method) or more commonly one measurement instrument used to measure the same phenomenon in two separate ways (*i.e.*, mono-method), such as two questionnaire-based measures of the phenomenon as used in this research.

Correlating responses of the first twelve ISP effectiveness items (*i.e.*, Q66a-i, Q19a-i; Q67/Q20; Q68/Q21; Q69/Q22) with the last (which provides an overall measure of ISP success (Q70/Q23)), on each questionnaire independently, reveals that one item (Q66b) based on IS Planner responses and

three items based on non-IS respondent responses (Q19g, h, I)⁵ are not significantly correlated with the underlying concept of ISP success. The lack of significance implies that while IS Planners do not associate improvement in the ISP from one planning cycle to the next as a measure of ISP success, non-IS respondents do not regard the three financial performance indicators as measures.

In order to provide an evaluation tool which takes into consideration multiple perceptions of ISP success, all responses were taken together and the same analysis conducted. This time all correlations were significant^{0.001} (*c.f.*, §D.3.1.1) indicating that all items measure, albeit different aspects, of the underlying concept of ISP success.

All thirteen items (equally weighted) were then used to compute a measure of average ISP effectiveness. An average score of ISP effectiveness rather than a total score was used since three items, those relating to the measurement of financial performance indicators (Q66/19G, Q66/19H, Q66/19I), were more applicable to private sector organisations than private sector ones. This composite measure of average ISP effectiveness (excluding Q70) was also tested for convergent validity against the overall measure of ISP success (Q70), as recommended by Churchill (1979).

In order to check the convergent validity of ISP system and IS plan feedback⁶, each were correlated against two different questions relating to the same underlying concept (*c.f.*, Appendix B: Q51D and Q56F). Table 6.3 summarise the results on the convergent validity of the composite measurement scales and shows that all three exhibit significant convergent validity.

<i>Construct</i>	<i>n</i>	<i>Correlation (prob. 2-tailed =)</i>
Average ISP effectiveness.	138	0.7375 (0.000)
IS plan feedback.	77	0.2658 (0.019)
ISP system feedback.	84	0.2480 (0.023)

Table 6.3 - Convergent validity of the composite measurement scales

An additional test normally applied when the mono-method of analysis is employed (Premkumar & King, 1994a: p 100) is unidimensionality which examines whether each item converges onto a single dimension. Unidimensionality of each construct is established through the use of factor analysis (FA). The unrotated matrices of each individual measurement scale must satisfy four criteria used to judge the unidimensionality. All three composite measurement scales exhibit unidimensionality (*c.f.*, Appendix D: §D.3.1.3).

⁵ The lack of significance may be due to the small sample size (*i.e.* n=22).
^{0.001} At the 0.1% significance level.

⁶ Comprising all six items relating to the three major components of feedback (*i.e.*, both informal/formal elements of monitoring, reviewing and updating) since any one element/component on its own does not sufficiently address the concept of feedback.

6.2.2.2 Discriminant Validity

Discriminant validity is established when, based on theory, two variables are predicted to be uncorrelated, and the scores obtained by measuring them are indeed empirically found to be so. Factor analysis provides evidence that each pair of constructs exhibit discriminant validity (*c.f.*, Appendix D: §D.3.2).

6.2.3 Criterion-related Validity

Criterion-related validity establishes whether a measure differentiates individuals on a criterion it is expected to predict. There are two types of criterion-related validity: *concurrent* and *predictive* validity but only concurrent is appropriate here, as argued in Chapter 3.

Concurrent Validity

Concurrent validity is established when a scale discriminates individuals who are known to be different (at the same point in time) and therefore score differently on that scale. Results from previous ISP research enables concurrent validity to be tested for the ISP success scale; however this is not possible for the feedback measurement scales since no previous empirical data exists.

Previous studies have found certain characteristics differentiate those organisations that have success with their ISP from those that do not. Two such characteristics were used to test the concurrent validity of the ISP success measurement scale. These were level of support for ISP (Galliers, 1987c; Lederer & Sethi, 1988a; Edwards, 1989) and relationship between ISP and business planning (Galliers, 1987c, Wilson, 1989; Premkumar & King, 1992).

This research provides evidence that average ISP effectiveness is higher in organisations where top management rather than IS management provide the highest level of support^{0.01}, and in those organisations where ISP and business planning are intertwined rather than in those where they are treated as totally independent activities^{0.1} (*c.f.*, Appendix D: §D.3.3). These results support previous research findings suggesting that the ISP success measurement scale exhibits significant concurrent validity.

6.3 Data Analysis

This section is divided into six parts: a general overview of the respondents and a profile of their respective organisations; a detailed description of IT/IS and the ISP activity within organisation; a descriptive summary of ISP success, the existence of feedback and the relationship between the two; identification of important ISP system characteristics providing the foundations of a diagnostic tool (*i.e.*, the informational input of ISP feedback); identification of contextual factors related to ISP system feedback, and a summary of the results.

^{0.01} At the 1% significance level.
^{0.1} At the 10% significance level.

Data analysis was performed using univariate statistics, t-test, analysis of variance, correlation, regression and factor analysis (*c.f.*, Appendix D).

6.3.1 Profile of Respondents and their Organisation

The management level of the respondent and the number of reporting levels between them and the CEO are summarised in Figure 6.1 and Figure 6.2, respectively. The majority of respondents are divided fairly evenly between top and middle management levels for both questionnaires with 77% (75%)⁷ reporting either directly or via one level to the CEO. Based on the sample, it would seem that IS/IT is now regarded as a top management concern.

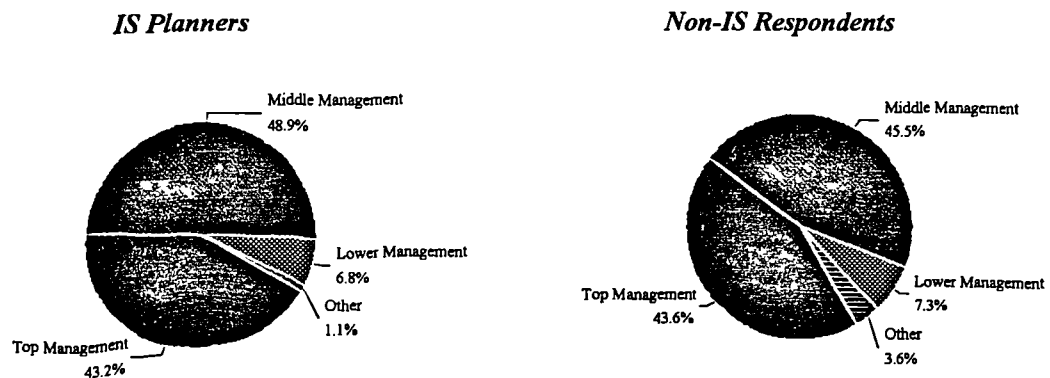


Figure 6.1 - Management level of respondent

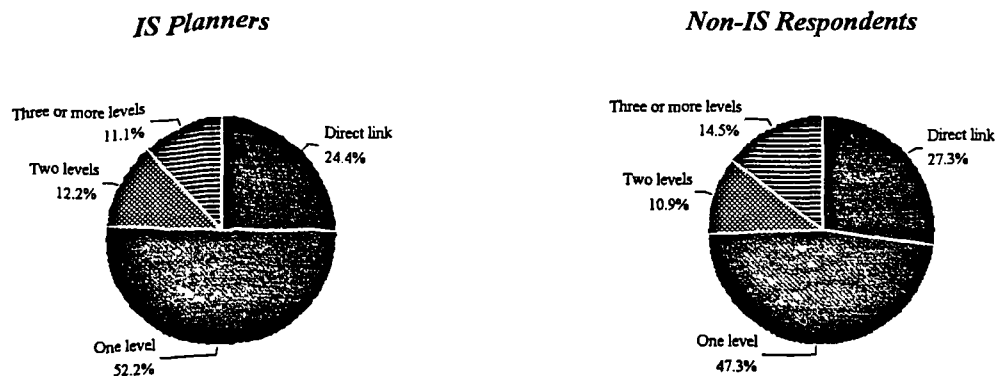


Figure 6.2 - Number of reporting levels between respondent and CEO

⁷

IS Planners (non-IS respondents): Significant differences in responses are identified where they occur and are summarised in the concluding section of this chapter

The organisational level of the respondent and the level at which they are involved in ISP are shown in Figure 6.3 and Figure 6.4, respectively. The majority of IS Planners (60%) are located at the corporate level of the organisation whereas the majority of the non-IS respondents (38%) are located at the divisional level. These results are also reflected in the level at which both sets of respondents are involved in ISP.

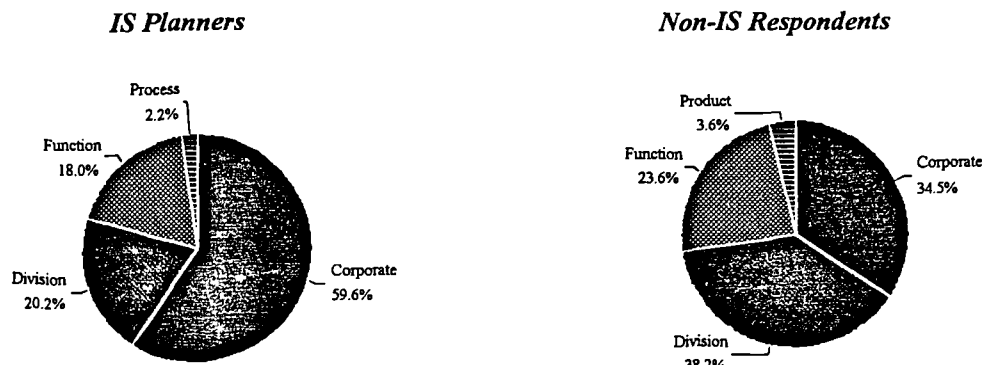


Figure 6.3 - Organisational level of respondent in the organisation

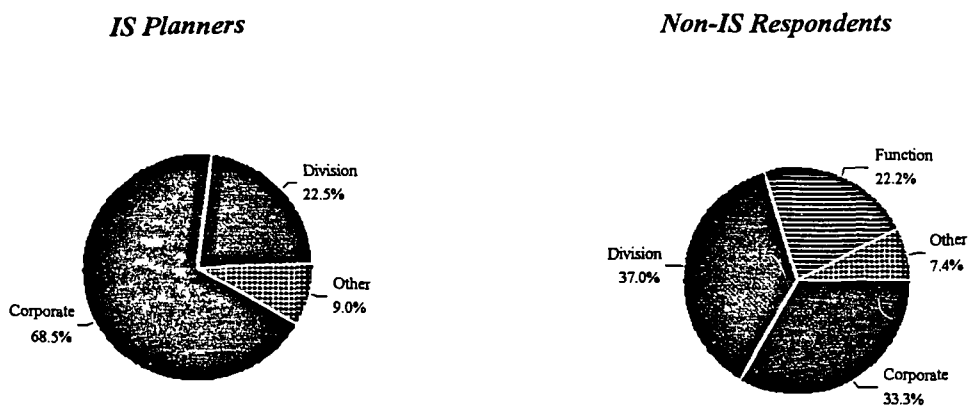


Figure 6.4 - Level at which respondent is involved in ISP

Figure 6.5 provides a summary of the *main* role of the respondent in the ISP activity. While the IS Planner questionnaire was answered mainly by the IS Planner/Champion (75%), in 20% of cases it was answered by either planning participants or internal/external consultants. The non-IS respondents questionnaire was answered mainly by planning participants (40%) or ISP champions (29%).

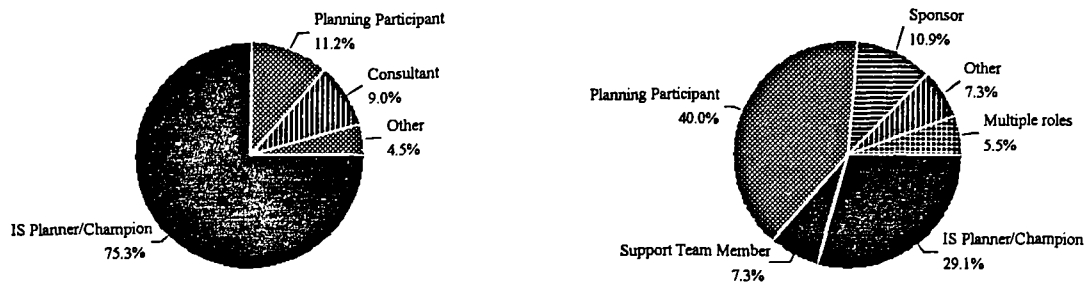
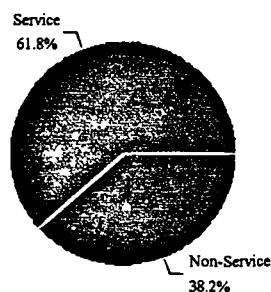


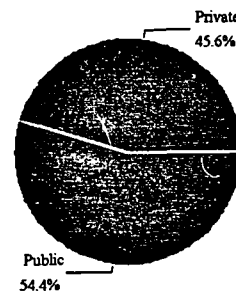
Figure 6.5 - Main role of respondent in ISP

The IS Planner questionnaire was used to gather factual information regarding their organisation and its use of IS/IT. Of the 90 different organisations participating in the survey, the largest single classification of organisation in terms of industry type was the community service sector (43%). All the non-community service organisations were spread fairly evenly throughout the remaining eleven categories (*c.f.*, Appendix D: §D.4.2). Figure 6.6 summarises the type of organisations participating in the research along four dichotomous dimensions (*i.e.*, service vs non-service, private vs public, diversified vs specialised, and centralised v decentralised).

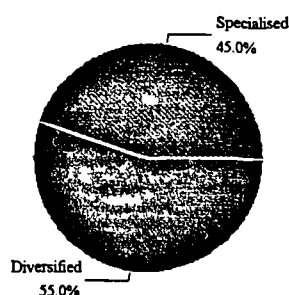
Service vs Non-Service



Public vs Private



Diversified vs Specialised



Centralised vs Decentralised

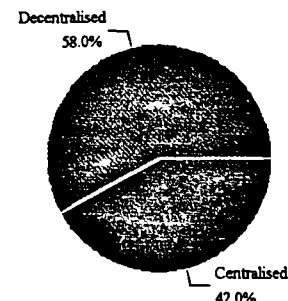


Figure 6.6 - Type of organisation

Just under two-thirds of IS Planners (*i.e.*, 62%) categorise their organisation's primary activity as service-oriented. Organisations are fairly evenly divided between the other three dichotomous dimensions.

Figure 6.7 summarises the size of the organisations participating in the study using the surrogates of total number of employees and annual turnover/budget.

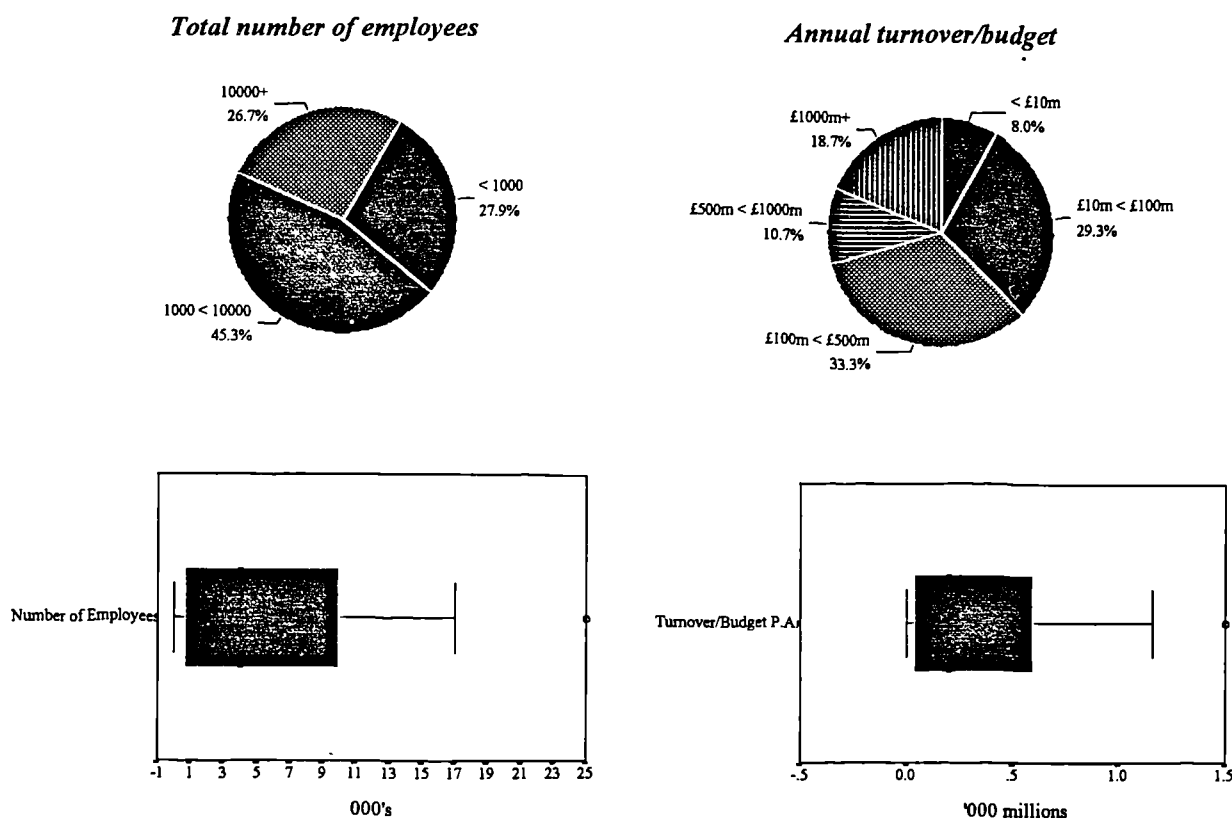


Figure 6.7 - Organisation size

The average number of employees (annual turnover/budget) of organisation is 8,466 (£416m)⁸ with a standard deviation of 38,794 (£2.5bn). The minimum number of employees (annual turnover/budget) is 13 (£1.8m) and the maximum number of employees (annual turnover/budget) is 250,000 (£20bn). There are 4 (2) outliers (organisations with values between 24,500 (£1.44bn) and 39,000 (£2.28bn)) and 8 (4) extremes observations (organisations with values over 39,000 (£2.28bn)) in the employee (annual turnover/budget) data⁹. Figure 6.7 summarises the spread of the majority of the data (excluding outliers and extremes). Both distributions are highly positively skewed indicating the median and interquartile range may be a more appropriate measure of central tendency and spread¹⁰. The median number of the employees (annual turnover/budget) is 4000 (£200m) and the inter-quartile range is 9563 (£560m).

⁸ The trimmed mean has been used due to large outliers in the data.

⁹ Outliers are cases with values that are between 1.5 and 3 x inter-quartile range, above or below the upper/lower quartile, respectively, and are shown as 'o' on the boxplot. Extreme observations are cases with values that are more than 3 x inter-quartile range and are shown as '*' on the boxplot.

¹⁰ Median and the inter-quartile range are unaffected by outliers and extremes in the data unlike the mean and standard deviation.

In terms of the internal organisational environment, Figure 6.8 summarises the type of culture exhibited by the sample (*c.f.*, Handy, 1985). Approximately four-fifths (81%) of organisation exhibit either a role (53%) or task (28%) culture.

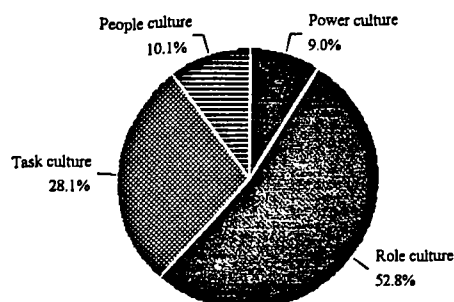


Figure 6.8 - Organisational culture

6.3.1.1 The External Organisational/IT Environment

Approximately half (48%) the organisations operate in a *heterogeneous* environment¹¹, 29% in a *dynamic* environment¹² and 41% in a *hostile* environment¹³. Only around a third (32%) of organisations have difficulty in finding the necessary resources and skills in the external IS/IT marketplace to do what they want with IS/IT.

Figure 6.9a provides a summary of the organisations in terms of the information intensity matrix developed by Porter & Millar (1985). Only a fifth of organisations operate in an industry sector where information is sold as a product and/or service, while approximately two-thirds (65%) operate in an industry sector where information is used to add value to the principle services and/or products being supplied. Nearly half (48%) of organisations operate in an industry sector where information is used to add value but is not sold as a product and/or service, while a further third operate in a sector where information is not used in either way.

Figure 6.9b summarises the major use of IT in each organisation's industry sector. Approximately 90% of organisations operate in a sector where business strategies are increasingly dependent on IT for their implementation (*i.e.*, dependent) or where IT is the means of delivering goods and services (*i.e.*, delivery). There is evidence^{0.01} to suggest that sectors exhibiting either of these modes of IT usage, use information to add value to products/services more than those sectors where IT has no strategic impact (*i.e.*, delayed). There is no significant difference in the use of information as a product/service across these four categories.

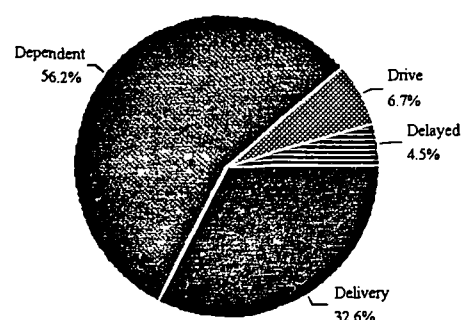
¹¹ A high degree of diversity in marketing and/or production orientations.

¹² Customer tastes and competitors' actions are highly unpredictable.

¹³ Intense competition.

Information content of product	H	2 (2%)	15 (17%)
	L	28 (33%)	41 (48%)
		Information content of value chain	
		L	H

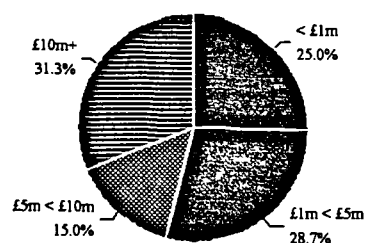
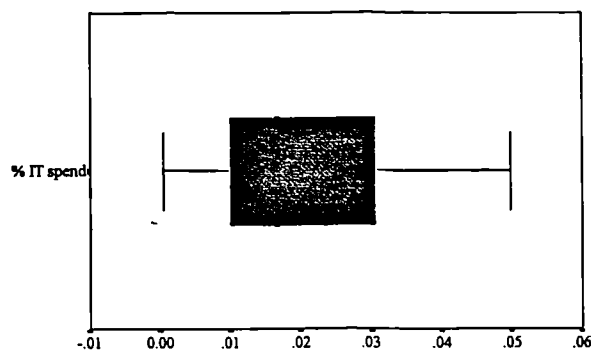
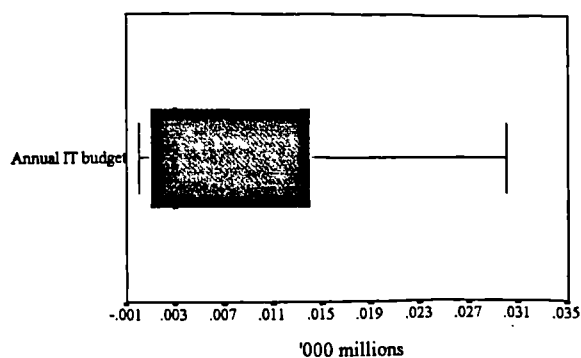
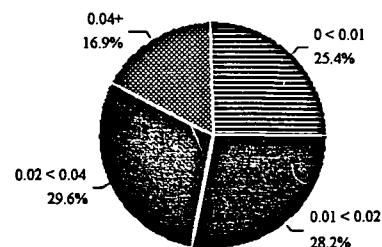
(a) Major use of information in sector



(b) Major use of IT in sector

Figure 6.9 - Industry sector use of information and IT**6.3.1.2 The Internal IS/IT Environment**

Figure 6.10 summarises the amount spent by organisations on their IT during 1993/1994. Just over a half (54%) have an annual IT budget of less than £5m and a quarter have one of less than £1m. This translates to just over half (54%) of organisations spending less than 2% of their total turnover/budget on IT and a quarter spending less than 1%.

Annual IT Budget**Annual IT Budget as a % of Total Turnover/Budget****Figure 6.10 - Amount spent on IT**

Organisations spent, on average, £11.5m⁸ with a standard deviation of £100m, a minimum expenditure of £15,000 and a maximum of £700m. Average IT spend as a percentage of the organisation's annual turnover/budget was 2%⁸, with a standard deviation of 4%, a minimum of 0.1% and a maximum of 25%. This average IT spend is similar to Willcocks & Margetts' (1994) findings of 1.5% for private sector organisations and 1.7% for public sector ones.

There are 2 (4) outliers (values between £36m (5.25%) and £57m (8.4%)) and 7 (2) extreme observations (values above £57m (8.4%)) in the annual IT budget (IT budget as a % of turnover/budget) data⁹. The boxplots shown in Figure 6.10 summarise the distribution of the majority of the data (excluding outliers and extreme values). While both distributions are positively skewed, annual IT budget is highly so and as a consequence the median and inter-quartile range may be a more appropriate measure of central tendency and spread¹⁰. The median annual IT budget is £3m with an inter-quartile range of £14m which is a lot lower than the mean and standard deviation.

Figure 6.11 summarises the structure of the IS organisation. In 69% of organisations a federal structure (*i.e.*, decentralised or centralised federal) exists whereas 26% of organisations have a totally centralised structure and 4% have a totally decentralised one. The IS function is run as a cost centre in 84% of organisations and a profit centre in the remaining 16%.

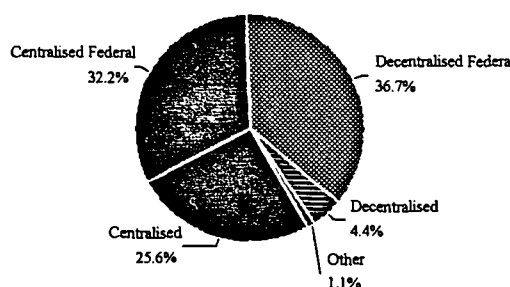


Figure 6.11 - Structure of the IS organisation

Figure 6.12 shows the number of reporting levels between the organisation's top IS Manager and the CEO¹⁴. In 88% of the organisations, the top level IS Manager reports directly or via one level to the CEO providing further evidence that IS/IT issues are being discussed at board level. In 75% (82%)⁷ of organisations there is a close working relationship between top IS Manager and the CEO suggesting a certain amount of credibility. This, however, is not reflected at the lower levels of the organisation where IS staff have 'a lot' of credibility in only 32% (34%)⁷ of organisations.

¹⁴

Note this is a different measurement to that summarised in Figure 6.2.

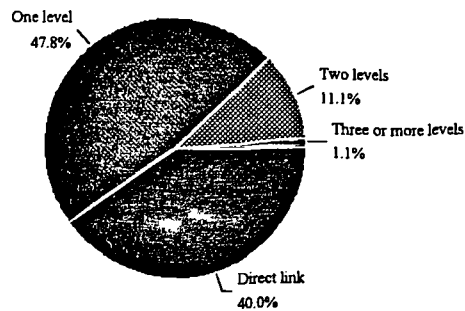


Figure 6.12 - Number of reporting levels between the top IS Manager and CEO

Despite the lack of IS staff credibility, in 48% (53%)⁷ of organisations, IS/IT is well received by non-IS staff. However, in only 20% (18%)⁷ of organisations do non-IS staff have an appropriate shared vision of IS/IT's organisational role. This is perhaps not so surprising when only 33% of organisations communicate their final IS plan to the rest of the organisation! There is evidence to suggest^{8,9} a positive relationship between communicating the IS plan and non-IS staff having an appropriate shared vision.

Figure 6.13 summarises the main focus of existing and planned systems. Just over two-thirds (69%) of existing systems are focused on *factory* applications (*c.f.*, McFarlan, 1984) which are critical to current business operations, whereas just under two-thirds (64%) of planned systems are focused on *turnaround* applications which are critical to achieving business strategy *in the future*.

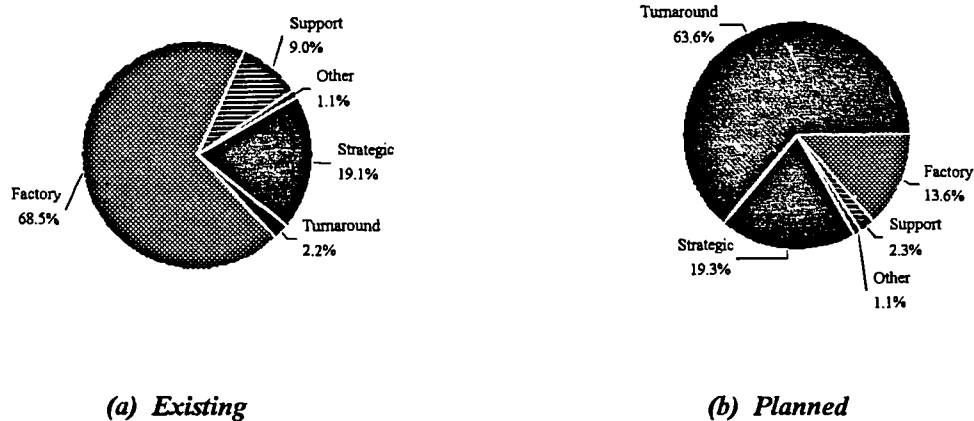


Figure 6.13 - Main focus of information systems

In 90% of organisations existing systems are critical now and/or in the future while in 97% of organisations, planned systems are critical now and/or in the future. Over four-fifths (83%) of organisations are in a state of transition between quadrants on the strategic grid with approximately three-quarters (76%) of these moving from the support/factory to the turnaround/strategic quadrants. This provides some evidence that the majority of organisations are currently or planning to use IS/IT for more than purely data processing purposes.

Figure 6.14 summarises the type of IS developments identified by the current plan. Of those systems planned, just over one-third (36%) represent replacements to existing ones, approximately a third (34%) represents enhancements, modification or sustaining current systems and approximately a quarter (26%) represent new developments.

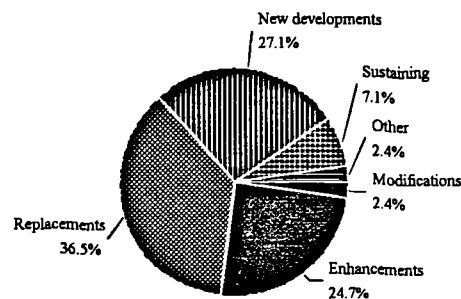


Figure 6.14 - Main focus of current IS plan

Of those *strategic* and *turnaround* systems planned, 29% and 24% represent new developments, respectively, while 42% of *factory* systems planned are new developments. This provides some evidence to suggest that strategic/turnaround systems are mainly built on systems already in place, as argued by Senn (1992).

In order to gauge the importance of IT-based systems to the organisation, respondents were asked to rate on a scale of 1 to 5¹⁵ the amount of disruption caused to the organisation if all their IT-based systems were to shutdown for 1 hour, 1 day, 1 week and indefinitely.

If all IT-based systems were to shutdown for 1 hour, 37% of organisations would experience moderate or major disruption. This increases to 91% if shutdown was to last one day and 100% if it was to last a week (including 9% of organisations who would go out of business as a result). If systems were to shutdown *indefinitely* this would cause major disruption to 56% of organisations and organisational closure to the remaining 44%.

The importance of IT-based systems to the organisation was calculated by taking the average of the amount of disruption across all time periods. While all organisations regard their IT-based systems to be very important in the *long run*, this average measure provides some indication of importance independent of time.

On average, 14% of organisations regard their IT-based systems as *fairly important* (i.e., between little/some and moderate disruption), 78% as *important* (i.e., between moderate and major disruption) and 8% as *very important* (i.e., between major disruption and organisational closure). There

¹⁵

1=no disruption; 2=little/some disruption; 3=moderate disruption; 4=major disruption; 5=organisational closure.

is no evidence that the degree of importance is related to the type of organisation nor to the focus of an organisation's existing systems (*i.e.*, strategic, turnaround, factory, support). In summary, IT is regarded by the majority of organisations as an important if not integral part of their business operations.

Figure 6.15 summarises the extent to which the five information management environments identified by Davenport *et al.* (1992) exist within organisations (*c.f.*, Chapter 4). Almost all (98%) of organisations exhibit one or more of these environments, with a fifth exhibiting one, just over a third (37%) exhibiting two and another third exhibiting three. No organisation exhibits all five environments.

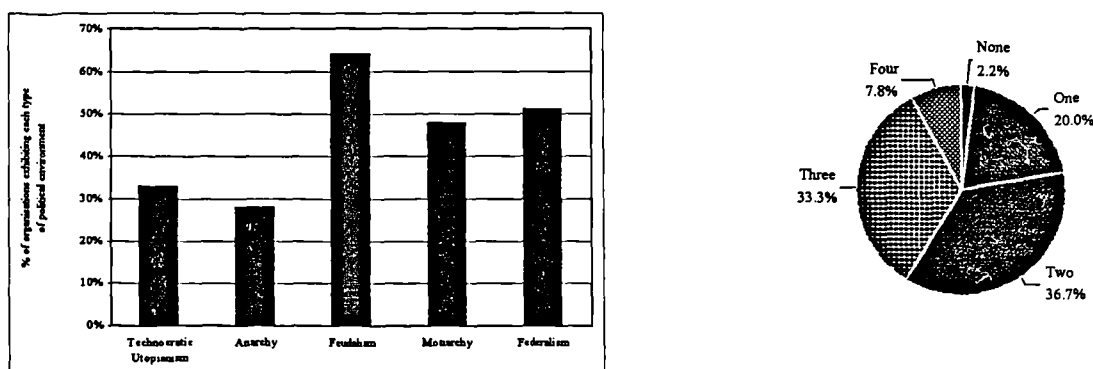


Figure 6.15 - Number of organisations exhibiting different political environments

Just under two-thirds (64%) of organisations exhibit a *feudal* environment, approximately a half exhibit either a *federal* (51%) and/or a *monarch* (48%) one, a third exhibit a *technocratic* one, and approximately a quarter (28%) exhibits an *anarchic* one. There is evidence to suggest the more diversified^{0.05} or decentralised^{0.01} an organisation is, the more likely it will exhibit a *feudal* environment. In addition, organisations exhibiting a people culture have, on average, a higher level of 'anarchy' than those exhibiting a task one^{0.05}. There are no other significant differences between culture and the type of information political environment.

6.3.1.3 The General ISP Environment

Only in 19% (32%)⁷ of organisations is the environment highly conducive to ISP although in 48% (61%)⁷ there is commitment to ISP by major stakeholders. There is evidence^{0.1} to suggest that more non-IS respondents than IS Planners believe the environment is highly conducive to ISP and/or there is commitment to ISP by major stakeholders

Figure 6.16a summarises the extent to which organisations have a formalised IS plan. In 91% of organisations, an IS plan exists either formally (60%) or informally (31%), whereas in 9% organisations no IS plan exists at all.

All organisations who regard their IT-based IS to be *very important* have either a formal or informal plan. Of those organisations who regard them to be *important*, 93% have either a formal or informal plan while those organisations which regard their IT-based IS to be *fairly important*, 77% have either a formal or informal plan.

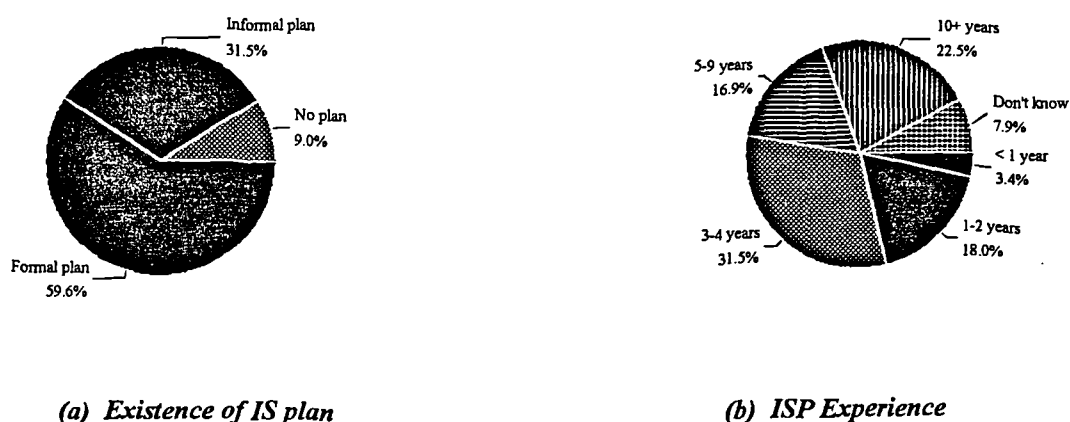


Figure 6.16 - Existence of IS plan and ISP Experience

Figure 6.16b summarises how long organisations have been preparing IS plans thus providing some indication of the organisation's planning experience. Approximately half (53%) of organisations have been planning for less than five years, just under fifth (17%) for between five and ten years and just over a fifth (22%) for more than ten years.

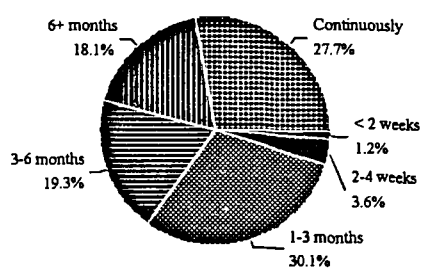
The large increase in ISP over the last five years maybe due to the spate of competitive advantage applications that began to appear around the late-1980s early 1990s raising organisational awareness of IT's potential. While one might expect larger organisations to have more planning experience than smaller ones, there is no evidence of a relationship between organisational size and ISP experience.

Of those organisations planning for less that five years, 57% have a formal plan, 36% have an informal plan and the remaining 6% have no plan at all. Of those organisations planning between five-nine years, 87% have a formal plan and the remaining 13% have an informal one. In those organisations conducting ISP for more than ten years, 60% have a formal plan, 30% have an informal plan and the remaining 10% have no plan at all. These results may indicate a swing from informal to formal and back to informal ISP as an organisation becomes more experienced at ISP.

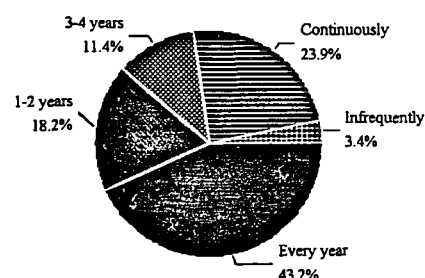
Figure 6.17a and Figure 6.17b summarise the length of the planning cycle and time between cycles, respectively. In just over a third (35%) of organisations the ISP cycle is three months or less, in approximately a fifth (19%) ISP takes between three and six months, in just under fifth (18%) it takes more than six months while just over a quarter (28%) plan continuously.

In just over two-fifths (43%) of organisations ISP is conducted annually, just under a fifth (18%) conduct theirs approximately bi-annually and a further 11% conduct planning every 3-4 years. Of the remaining organisations, approximately a quarter (24%) plan continuously while the other 3% plan infrequently.

Of those organisations that conduct ISP annually, 5% of organisations have planning cycles of less than 1 month, 46% take 1-3 months, 19% take 3-6 months and another 13% take six or more months.



(a) Length of planning cycle



(b) Time between planning cycles

Figure 6.17 - IS planning cycle

Figure 6.18 summarises the strategic planning horizon of IS plans. In just under three-quarters (73%) of organisations the planning horizon is between 3-5 years while in a fifth it is two or less years and in very few organisations (3%) it is 6-10 years. These results are similar to Galliers' (1987a) findings. Only 16% (29%)⁷ of organisations *actively* encourage their managers (through, for example, the organisation's reward system) to do effective *strategic (long range)* IS planning. There is evidence^{0.05} that more non-IS respondents than IS Planners believe their organisation actively encourages managers to do effective strategic ISP.

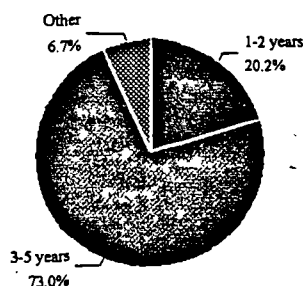


Figure 6.18 - Strategic planning horizon of IS plans

Figure 6.19a and Figure 6.19b summarise, for both sets of respondents, what the major objective/focus of ISP currently is and what they believe it should be, respectively. At present, 39% (35%)⁷ of respondents believe their organisation's ISP objective/focus is on efficiency (*i.e.*, the better use of resources through IS/IT), 28% (17%)⁷ believe it to be on strategic and competitive systems, 17% (31%)⁷ on effectiveness, 11% (10%)⁷ on technical/output related outcomes and 5% (7%)⁷ on intangible outcomes.

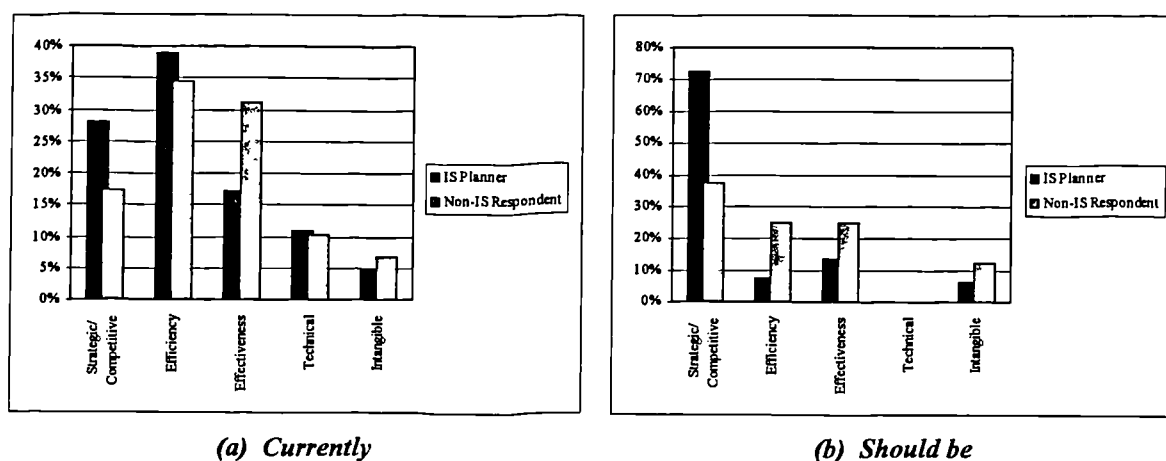


Figure 6.19 - Major objective/focus of ISP

However, 73% (38%)⁷ of respondents believe the ISP objective/focus should be strategic/competitive, 14% (25%)⁷ believe it should be on effectiveness, 8% (25%)⁷ believe it should be on efficiency and 6% (12%)⁷ believe it should be on intangible outcomes. No respondents believed that the focus should be technical/output. In total, only 28% (26%)⁷ of respondents believe the current ISP objective/focus of their organisation is the one it should be.

While 63% (61%)⁷ of organisation set realistic ISP objectives and 61% (63%)⁷ of ISP participants agree on these, only 43% (45%)⁷ of organisations make these ISP objectives explicit. Of those organisation where the ISP participants agree on the ISP objectives, only 48% (58%)⁷ of them make these objectives explicit raising questions as to what ISP participants are exactly agreeing upon.

Figure 6.20 summarises the relationship between ISP and the business planning activity. In 42% of organisations business planning is undertaken separately but inputs into ISP (top-down approach), in 20% ISP inputs into business planning (bottom-up approach), in 12% ISP and business planning is totally independent and in the remaining 27% they are completely intertwined. In comparison, Galliers (1987a) found that 27% of the organisations in his study took a top-down approach, 2% took a bottom-up approach, 30% had no link between IS and business planning while in 41% they were intertwined. There would therefore seem to be some initial evidence to suggest that more organisations are now linking their business and IS planning activities together.

Of those organisations taking a top-down ISP approach or where ISP and business planning are intertwined, only 30% (48%)⁷ claim to have a good quality business plan. There is evidence^{0.05} that more non-IS respondents than IS Planners believe a good quality business plan is produced.

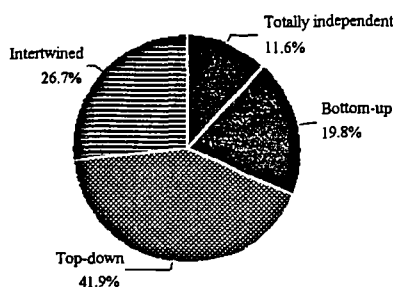


Figure 6.20 - Relationship between ISP and business planning

In approximately half of organisations, the IS Planner participates in business planning (52%) and/or is kept fully informed of changes in the business (51%). Figure 6.21 provides an overall picture of how well the IS Planner is kept informed about business changes. In 31% of organisations the IS Planner neither participates in business planning nor is kept informed of changes in the environment while in 36% of organisations the IS Planner is both involved in business planning and is kept fully informed.

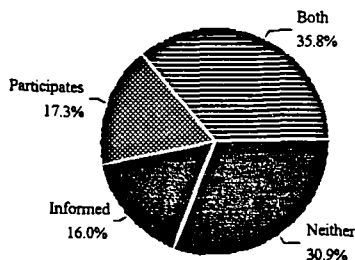


Figure 6.21 - Is the IS Planner well informed of changes in the environment?

Figure 6.22a and Figure 6.22b summarises the management level of the ISP sponsor and champion¹⁶, respectively. In 78% of organisations, a member of the top management team provides ISP sponsorship while in 45% of organisations they provide ISP championship. The IS Planner takes on the role of ISP sponsor in 12% of organisations and/or the role of ISP champion in 32%.

¹⁶

The sponsor secures funding for ISP while the champion is responsible for its success.

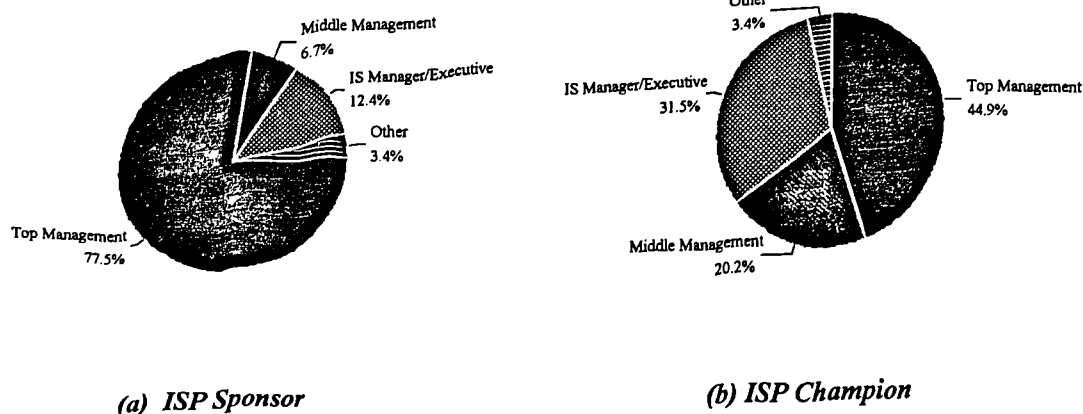


Figure 6.22 - Level of management support

Figure 6.23a and Figure 6.23b summarise the major role of the ISP champion and the internal/external consultant during the ISP activity, respectively. In just over half (52%) of the organisations the ISP champion takes on primarily a process role while in 43% of organisations they adopt an expert one. Of the 44% of organisations using internal/external consultants, 54% require the consultant to take an expert role while 31% require them to take on a process one.

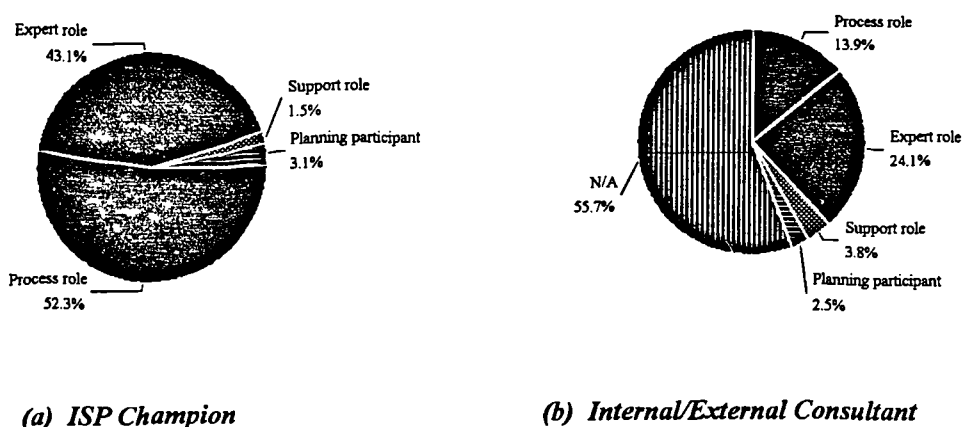


Figure 6.23 - Role in the ISP activity

The ISP Activity

This section provides a detailed description of how organisations conduct their ISP. Unlike previous ISP surveys, respondents were asked to respond to a set of questions applicable to both bespoke/proprietary and/or formal/informal ISP methodologies.

Figure 6.24 summarises the general ISP approach taken by organisation using Earl's five approaches (Earl, 1993). The business-led approach to ISP predominates (36% of organisations), closely followed by the organisational led approach (33%). Of those organisations adopting a business-led approach, only 32% (40%)⁷ claim to have a good quality business plan indicating that approximately two-thirds of organisations using a business-led approach are basing their IS plan on what may be poor quality information.

In only 9% of organisations do IS Planners believe their methodology to be too complicated or bureaucratic. The methodology is adequacy documented to provide an overview of the study and the steps to be taken in only 39% of organisations.

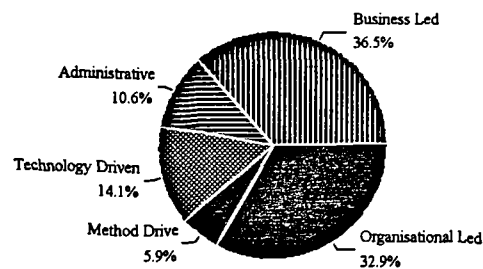


Figure 6.24 - General approach taken to ISP

Figure 6.25 summarises the different process management characteristics of ISP. Only in approximately a third of organisations is the ISP process good at anticipating potential problems (39%), good at dealing with sources of conflict (34%), and/or meeting individual participants needs (30%). However, in approximately two-thirds of organisation the ISP process is good at encouraging debate (67%) and seeking consensus (63%), and in just over half (56%) it is good at making use of ISP participants skills/abilities.

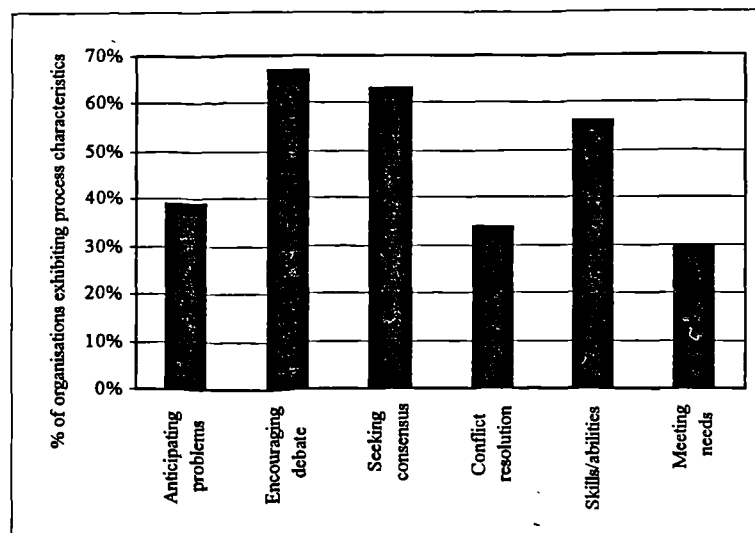


Figure 6.25 - Process management characteristics

While in 63% of organisation the ISP process is good at seeking consensus, only 43% (34%)⁷ equally involve all ISP participants in the decision making. However, in 63% (63%)⁷ of organisation, ISP participants can openly expressed their feelings/fears during the activity.

In 94% of organisations the main ISP decision making stage is conducted on-site either during (43%) or away from (51%) the normal day-to-day running of the organisation while the remaining 6% conduct it off-site.

Figure 6.26 and Figure 6.27 summarise the total amount of participation of each stakeholder group relative to each other, and the amount each stakeholder group participates in each stage of ISP, respectively.

As one might expect the IS Manager/Executive spends the most amount of time doing ISP (19% of the total participation) while customers are involved the least (5% of total participation). Of the total time spent by different stakeholder groups doing ISP, top management and the IS Manager/Executive spend most of their time (*i.e.*, 27% and 18%, respectively) in the choice stage while middle management, lower management, IS staff, users and suppliers spend most their time in the implementation stage, and consultants and customers spend most of their time in the intelligence stage.

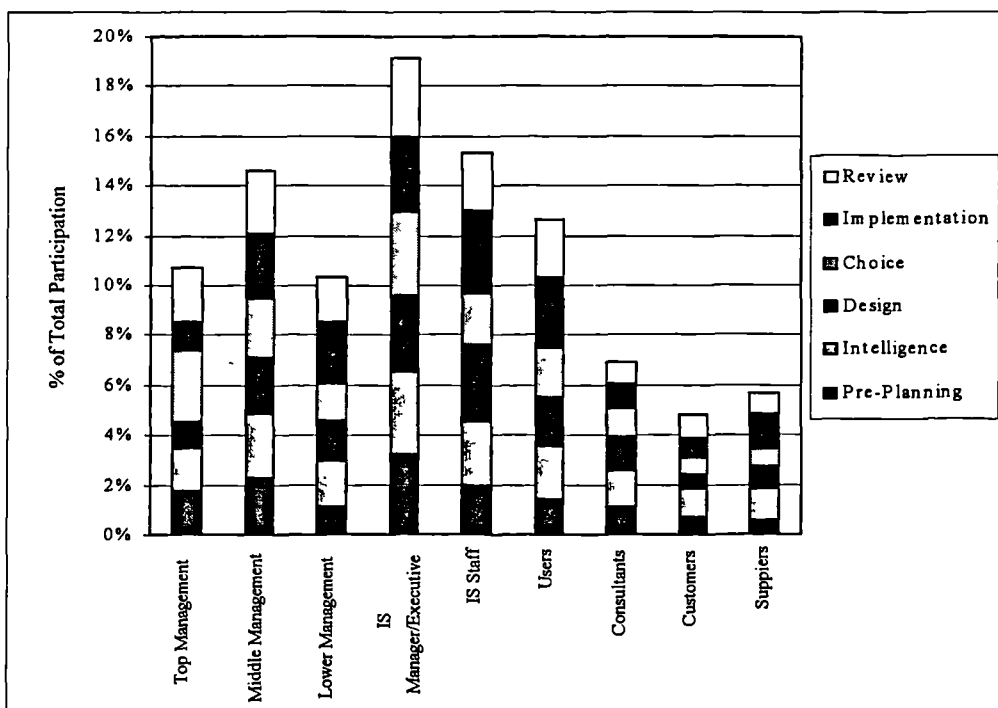


Figure 6.26 - Total amount of participation by stakeholder group

The IS Manager/Executive spends more time than any other stakeholder in pre-planning, intelligence, choice and review stages while IS staff spend more time than any other stakeholder in the design and implementation stages of ISP. This provides some evidence that ISP is still largely seen to be the role of the IS department.

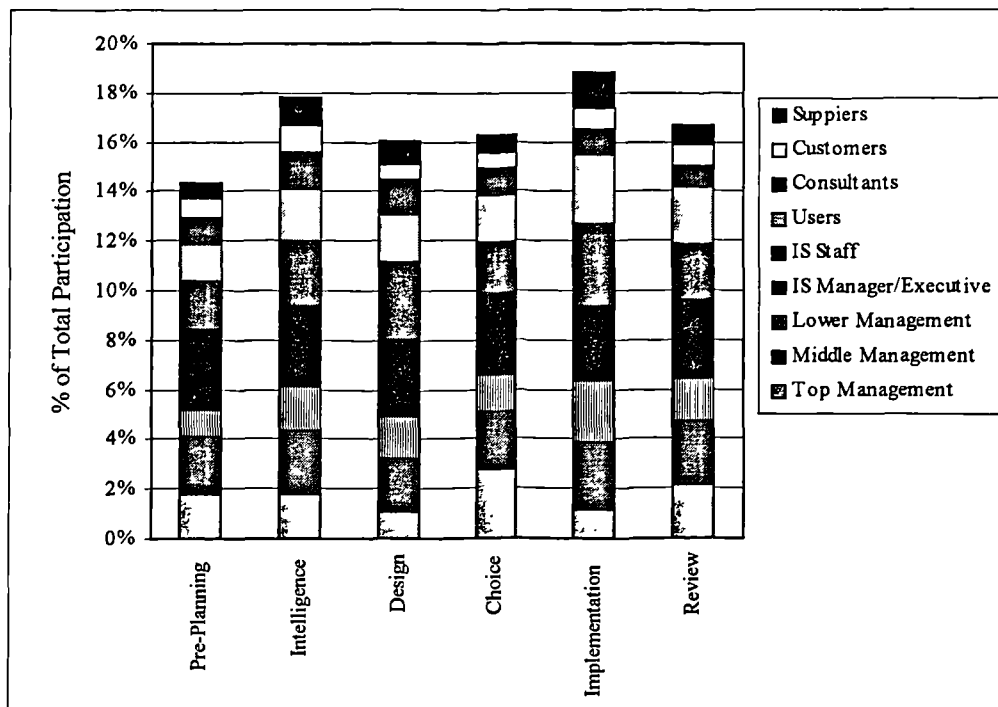


Figure 6.27 - Total participation in each ISP stage

The most amount of participation occurs in the implementation stage (19% of the total participation) while the pre-planning stage is where the least amount of participation occurs (14%).

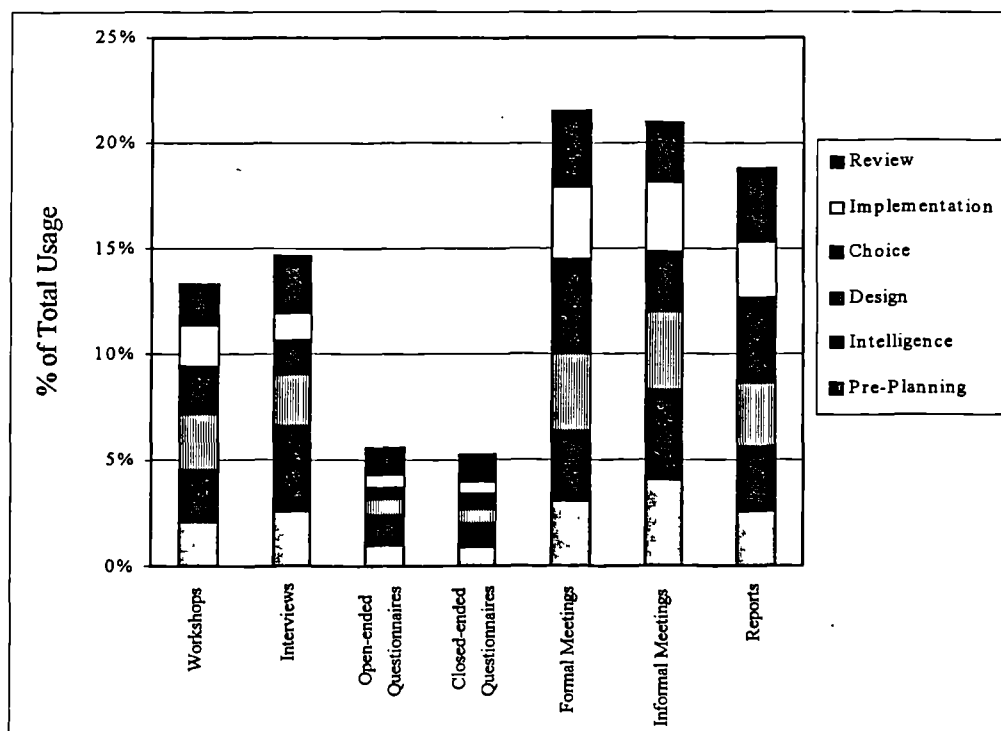


Figure 6.28 - Total amount of usage by tool

Figure 6.28 and Figure 6.29 summarise the total usage of different tools relative to each other, and the amount each tool is used in each stage of ISP, respectively.

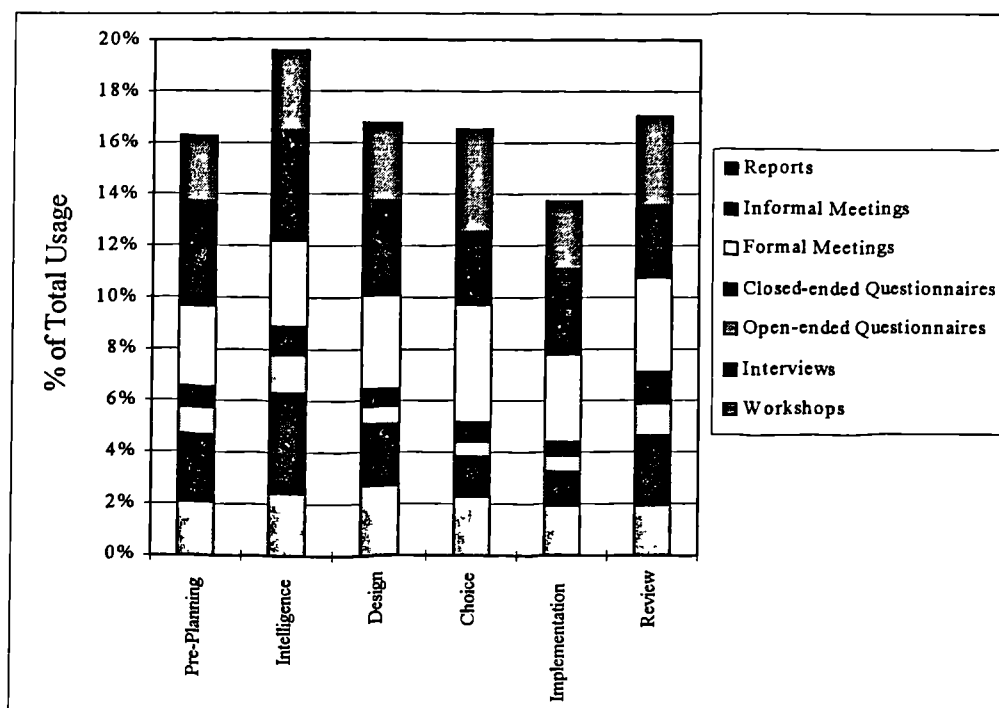


Figure 6.29 - Total amount of tool usage in each ISP stage

The most used tool is formal meetings which account for 22% of total tool usage while the least used is closed-ended questionnaires which accounts for only 5%. Workshops are most used in the design stage of ISP, interviews, open-ended questionnaires and informal meetings are most used in the intelligence stage, formal meetings and reports are most used in the choice stage, and closed-ended questionnaires are most used in the review stage.

The main tool used in pre-planning, intelligence and design stages is informal meetings while the main tool used in choice and review stages is formal meetings. Both informal and formal meetings are the most (equally) used in the implementation stage. The intelligence stage is the best covered stage accounting for 20% of total tool usage while the least covered stage is implementation, accounting for only 14% of total tool usage.

Respondents were also asked questions relating to the availability and quality of the information used in planning. Only 21% (18%)⁷ of respondents believe it is easy to obtain the necessary information needed to plan effectively and 17% (18%)⁷ believe the information used to generate the plan is reliable. In addition, only 23% (24%)⁷ of organisations found it easy to translate the business needs into information requirements. These and previous findings relating to the quality of the business plan cast serious doubts over the final quality of the IS plan.

Figure 6.30a and Figure 6.30b summarise how effective respondents believe each stage of ISP to be and whether effective methods are available for each of these stages, respectively. For all stages except pre-planning, the IS Planner rated the effectiveness as higher than non-IS respondents. These differences are significant for pre-planning^{0.05}, intelligence^{0.05}, choice^{0.1} and review stages^{0.05}. That is,

there is evidence to suggest more IS Planners than non-IS respondents believe that intelligence, choice and review stages are effective, and more non-IS respondents than IS Planners believe that the pre-planning stage is effective. The choice stage is rated by IS Planners as the most effective stage while the pre-planning is rated the highest by non-IS respondents. Both set of respondents rate the review stage as the least effective.

For all stages except pre-planning and design, the proportion of IS Planners rated the availability of effective methods higher than non-IS respondents. The difference in responses across all six stages, however, is only significant for the implementation stage^{0.05}. That is, there is evidence to suggest more IS Planners than non-IS respondents believe that effective methods are used during the implementation stage. There is also evidence^{0.001} to suggest a positive relationship between the methods available and perceived effectiveness of each stage.

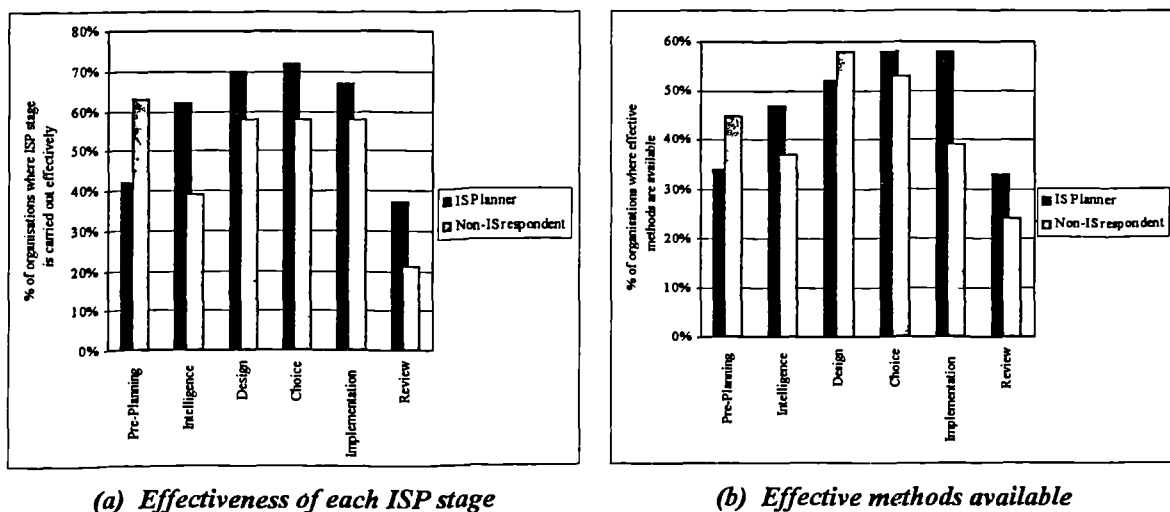


Figure 6.30 - Overall effectiveness of each ISP stage and methods available

In only 21% (11%)⁷ of organisations is the time spent on each ISP stage regarded as appropriate. There is evidence^{0.1} that more IS Planners than non-IS respondents believe an appropriate amount of time is spent on each ISP stage.

There is also some evidence^{0.001} to suggest that management of expectations (*i.e.*, ensuring participants have a clear understanding of how the planning is to be done) is positively related to perceptions of whether an appropriate amount of time is spent in each ISP stage. While these expectations are managed in 43% (50%)⁷ of organisation, in only 43% (39%)⁷ do ISP participants have a clear understanding of the role and responsibilities each of them have with relation to ISP. In addition, only 56% of these organisation have an adequately documented overview of the study and the steps to be taken raising the question as to how exactly expectations are managed.

In 51% (63%)⁷ of organisations, expectations are managed regarding the contents of the IS plan. As one would expect, there is evidence to suggest a positive relationship^{0.001} between management of expectations and whether the final IS plan meets stakeholder expectations.

While approximately two-fifths (41%) of organisations have a budget specifically put aside for ISP, only approximately a fifth (19%) of IS Planners believe there to be adequate resources made available for ISP within their organisation.

In terms of those participating in ISP, only a third of organisations make the best people available during ISP, just over a third (36%) have an appropriate number of people taking part in the ISP activity and 71% (53%)⁷ involve all major stakeholder groups in ISP. There is evidence^{0.05} that more IS Planners than non-IS respondents believe the major stakeholder groups are represented in ISP.

In 72% (79%)⁷ and 70% (63%)⁷ of organisations, IS Planners have the necessary expertise and credibility within the organisation, respectively, to carry out effective ISP, while in only 35% (39%)⁷ of organisations are the ISP participants skilled/experienced in planning. However, 57% (68%)⁷ and 60% (63%)⁷ of respondents believe that ISP participants are effective at problem solving and making decisions, respectively.

Figure 6.31 summarises the support/control structures used in planning. Approximately two-thirds (67%) of organisation have an IS steering committee, just under two-thirds (63%) have a liaison role, 46% have a task force, 41% have a permanent planning team and 38% have an ISP support team. Half the organisations had either two (23%) or three (27%) of these support/control structures in place while 10% of organisations had none and a further 10% had all five. In terms of other ISP support mechanisms, just over one-third (36%) of organisations regarded the use of automated tools and other computer support as being important to ISP.

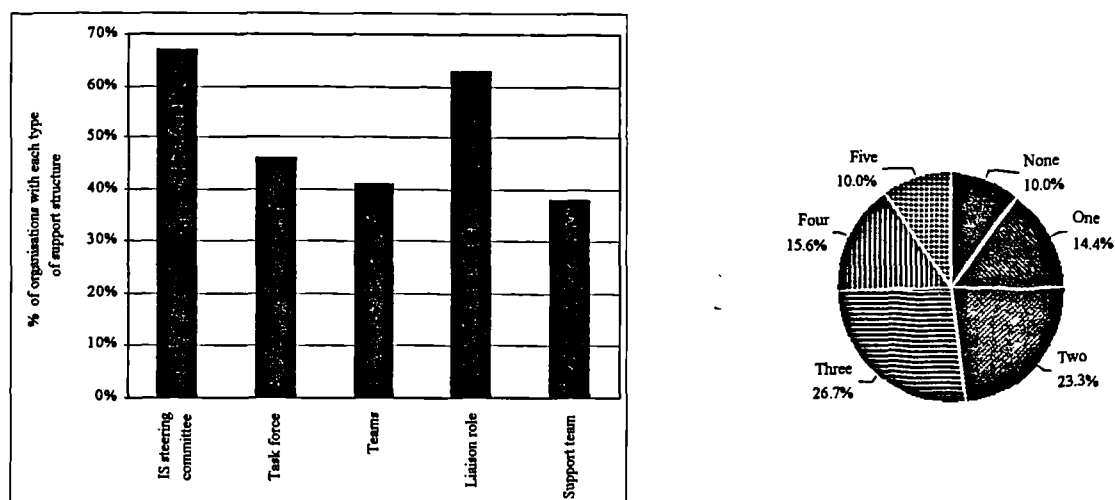


Figure 6.31 - Support/control structures used in ISP

When it comes to implementing the IS plan, just over three-quarters (78%) of organisations have a readily identifiable sponsor for the implementation task and just under three-quarters (73%) of organisations involve major stakeholders. However, in only 54% (55%)⁷ of organisations are these stakeholders committed to the plan's implementation and in only 40% (53%)⁷ do the major stakeholders have a clear understanding of their role and responsibilities in IS plan's implementation. There is evidence^{0.1} that more non-IS respondents than IS Planners believe the major stakeholders have a clear understanding of their role and responsibilities. There is also evidence^{0.001} to suggest the amount of stakeholder commitment to the IS plan's implementation is positively related to their understanding of the role and responsibilities they have with regards to it.

Only 45% of organisations move quickly from their ISP activity to the IS plan's implementation indicating that the majority of organisations may lose some momentum (and possibly commitment¹⁷) between the formulation and implementation activities. In just under half (48%) of organisations are resources committed to the IS plan's implementation. The implementation of the IS plan is regularly reviewed in 57% of organisations.

The IS plan is used as a working document in 61% (47%)⁷ of organisations and is owned by major stakeholders in 51% (45%)⁷. There is evidence^{0.1} that more IS Planners than non-IS respondents believe the plan is used as a working document.

In 70% of organisations the IS plan includes long-range objectives and strategies, in 88% it includes short- to medium-range plans, and in two-thirds it includes the identification of IS that are likely to be early successes. In 72% of organisations the IS plan includes realistic projects in terms of the resources available and in 65% of organisations it contains sufficient information to lend credibility to its promise. However, only 30% of organisations clearly document the IS plan for ease of reference when, for example, changes in the environment occurs, only 28% of plans captures all the information and detailed analysis derived during the planning activity, and only 24% includes alternative solutions to each of the problems identified together with why these were dismissed. The IS plan meets stakeholder expectations in only 44% (45%)⁷ of organisations.

6.3.2 ISP Effectiveness and Feedback

This section describes findings from the survey relating to the main focus of this thesis: ISP effectiveness and feedback. The section is divided into three parts: the extent to which respondents believe their ISP activity to be successful; the extent to which feedback exists within organisations, and the relationship between ISP effectiveness and feedback.

¹⁷ There is evidence to suggest^{0.001} a positive relationship between commitment and moving quickly from formulation to implementation. That is the quicker the organisation moves from formulation to implementation, the more commitment there seems to be present.

6.3.2.1 ISP Effectiveness

A multi-itemed scale was used to measure ISP effectiveness which was subsequently tested for reliability and validity (*c.f.*, §6.2). IS Planners and non-IS respondents of the ISP activity were asked to rate, on a Likert scale¹⁸, the extent to which they (dis)agreed with each of the statements aimed at capturing the underlying concept of ISP. Figure 6.32 shows the average scores of each item for both questionnaires used to measure effectiveness.

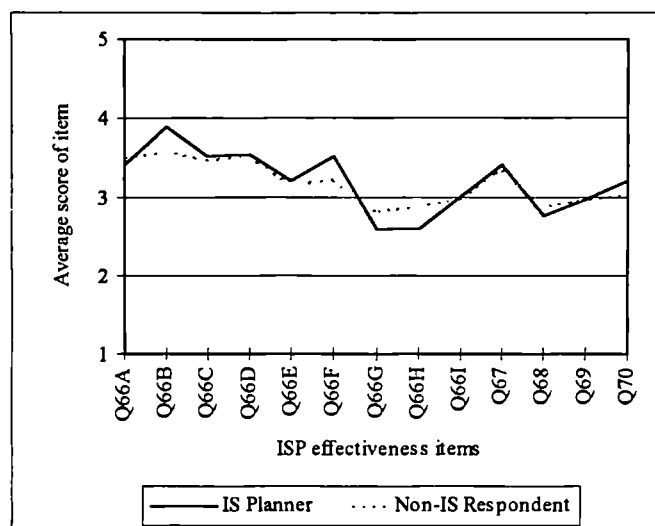
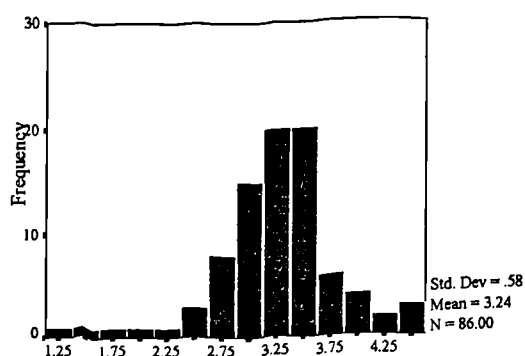


Figure 6.32 - Average score on each ISP effectiveness item

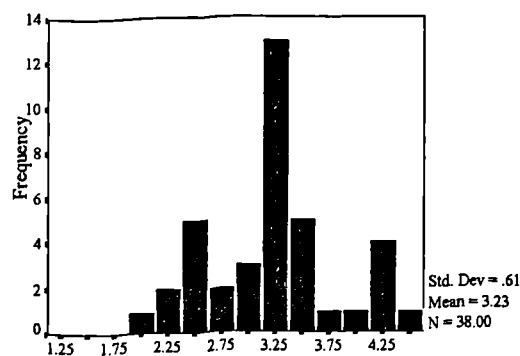
The profile of average scores for both the questionnaires are very similar. There is, however, a discernible⁰⁰⁵ difference between questionnaires for 2 of the 13 items used to measure ISP effectiveness. IS Planners, on average, rate question 66B (that ISP has improved since the last time it was carried out) and question 66F (that ISP has increased the return on investment on IT in the organisation) higher than non-IS respondents.

An overall measure of ISP effectiveness was calculated by taking the average of these 13 items. Figure 6.33a and Figure 6.33b show the distribution of average ISP effectiveness for IS Planners and non-IS respondents of the ISP activity, respectively.

¹⁸ Scale of 1 (strongly disagree) - 5 (strongly agree).



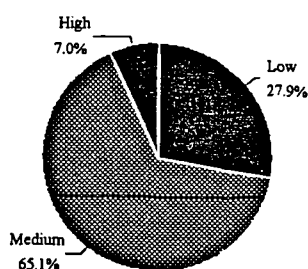
(a) IS Planners



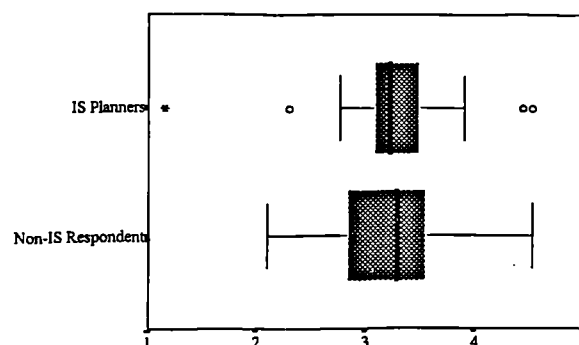
(b) Non-IS respondents

Figure 6.33 - Distributions of average ISP effectiveness

This scale has been divided into three levels of effectiveness: *low* (≤ 3), *medium* (>3 and ≤ 4) and *high* (>4 and ≤ 5). Figure 6.34a summarises the percentage of organisations falling into each of these three categories while Figure 6.34b show the shape of both distributions.



(a) % of organisation in each category



(b) Boxplot of average ISP effectiveness

Figure 6.34 - Average ISP effectiveness

The mean average ISP effectiveness is 3.24 (3.23)⁷ which falls into the *medium* effectiveness category. There is no discernible difference in mean average ISP effectiveness between the two questionnaires. The standard deviation of 0.58 (0.61)⁷ on the surface indicates that both groups of respondents are similar in terms of variation in their responses. However, both the mean and standard deviation of IS Planner responses are affected by outliers/extremes (*c.f.*, Figure 6.34b) and therefore a more appropriate measure of central tendency and spread (dispersion) is the median and the inter-quartile range, respectively. Since IS Planner responses are fairly symmetrically distributed, the mean (≈ 3.24) and median (≈ 3.23) are approximately the same, however the inter-quartile range for IS Planners (≈ 0.54) when compared to those of non-IS responses (≈ 0.76) is lower indicating that IS Planners responses are more tightly clustered around the centre of the distribution than those of non-IS respondents. In other words, IS Planner responses are less variable than those of non-IS respondents.

For the IS Planner questionnaire, the minimum average ISP effectiveness is 1.15, which falls in the *low* category and shows up as an extreme observation on the boxplot, while the maximum is 4.62, which falls in *high* category and shows up as an outlier. The distribution is slightly negatively skewed with three quarters of organisations reporting an average ISP effectiveness of less than 3.54 (*medium* category) and a quarter reporting an average ISP effectiveness of less than 3.00 (*i.e.*, *low* category).

For the non-IS respondents questionnaire, the minimum average ISP effectiveness is 2.10, which falls in the *low* category, and the maximum is 4.54 which falls in the *high* category. The distribution is slightly positively skewed with three quarters of organisations reporting an average ISP effectiveness of less than 3.57 (*medium* category) and a quarter reporting an average ISP effectiveness of less than 2.81 (*i.e.*, *low* category).

In summary, the majority of organisations report *medium* average ISP effectiveness. While IS Planners report a slightly higher mean average ISP effectiveness than non-IS respondents, there is no significant difference between the two. Non-IS responses to average ISP effectiveness are more variable than those of the IS Planners.

6.3.2.2 Feedback

This section provides a descriptive analysis of the presence of ISP system and IS plan feedback. Feedback has been conceptualised as comprising three main components: monitoring, reviewing and updating (*c.f.*, Chapter 4). In addition, each component has been operationalised through the measurement of both an informal and formal element.

6.3.2.2.1 ISP System Feedback

This section discusses the existence of ISP system feedback in terms of the individual components (*i.e.*, monitoring, reviewing and updating), the different elements (*i.e.*, formal vs non-formal), and the total feedback present.

6.3.2.2.1.1 The Individual Components of ISP System Feedback

Figure 6.35 summarises the average (in)formal 'presence' of each feedback component within organisations. Both informal and formal elements of each feedback component are below the neutral point on the Likert scale¹⁸, indicating that, on average, organisations exhibit no formal or informal feedback. The standard deviation for all formal components of feedback is higher than those for the informal components indicating less variation in responses to the latter.

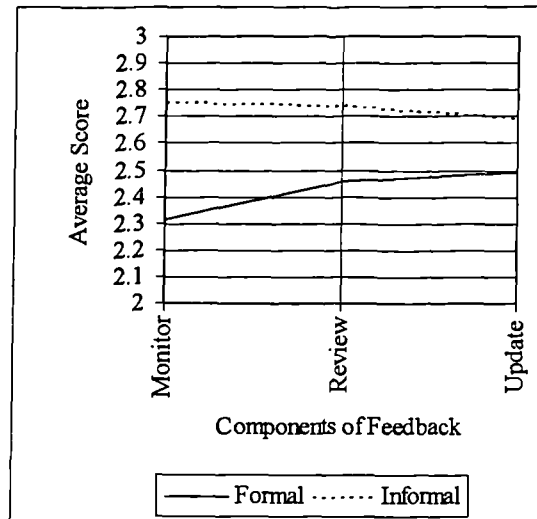


Figure 6.35 - The constituent parts of ISP system feedback

Figure 6.36 summarises the extent to which total (*i.e.*, formal plus informal) monitoring, reviewing and updating occurs within organisations while Figure 6.37 summarises the amount of each component present as a percentage of the total *possible* amount.

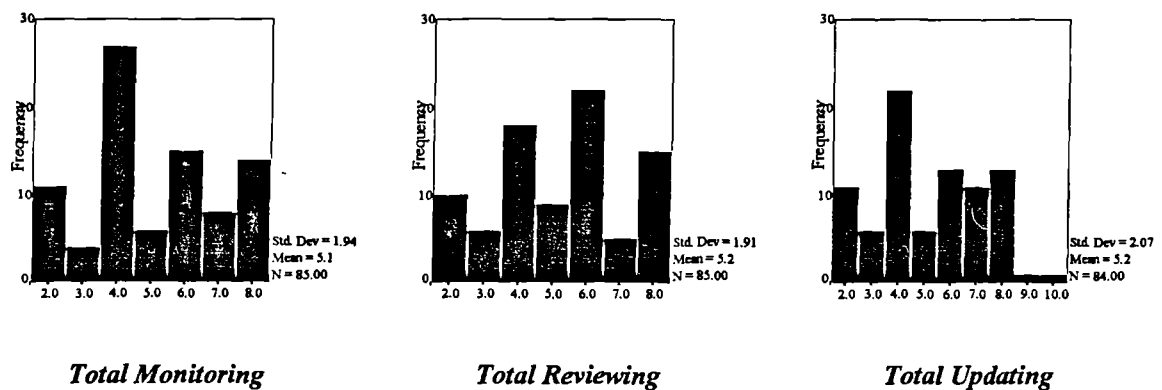


Figure 6.36 - The components of ISP system feedback

Average total monitoring (=5.06) is slightly lower than the averages for total reviewing (=5.20) and updating (=5.19), all three of which are just above the mid-point on the composite (*i.e.*, formal plus informal) scale. The dispersion (standard deviation) is higher for updating (=2.07) than for monitoring (=1.94) and reviewing (=1.91) indicating a larger variation in responses for updating.

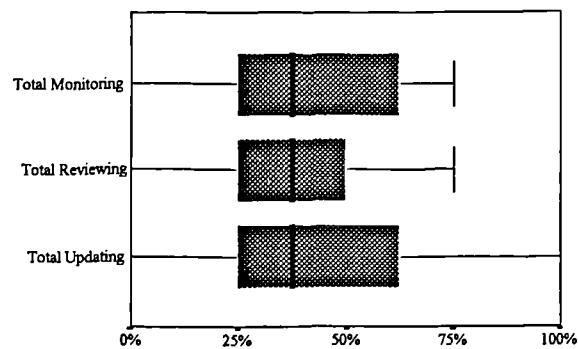


Figure 6.37 - % of total *possible* monitoring, reviewing and updating

On average, organisations exhibit 38%, 40% and 40% of total *possible* monitoring, reviewing and updating, respectively. Three-quarters of organisations exhibit less than 65% of total *possible* monitoring and updating, and less than 50% of total *possible* reviewing, while a quarter of organisations exhibit less than 38% of total *possible* monitoring, reviewing and updating. Monitoring and updating both have positively skewed distribution whereas reviewing has a fairly symmetrical one.

Table 6.4 summarises the total number of organisations who monitor, review and/or update¹⁹. In 48% of organisations no monitoring, reviewing or updating takes place at all while 19% of organisations carry out all three. Of the remaining 33%, 4% of organisations review and update without monitoring while 9% update without monitoring or reviewing leading to the question as to exactly what is being updated. In addition, 5% review without monitoring or updating, 7% monitor but do no reviewing or updating, 4% monitor and review but do no updating and 5% monitor and update but do no review.

<i>Monitor</i>	<i>Review</i>	<i>Update</i>	<i>Number of organisations (n=85)</i>
x	x	x	41 (48%)
✓	✓	✓	16 (19%)
x	x	✓	8 (9%)
✓	x	x	6 (7%)
x	✓	x	4 (5%)
✓	x	✓	4 (5%)
x	✓	✓	3 (4%)
✓	✓	x	3 (4%)

Table 6.4 - The total number of organisations who monitor, review and/or update

Table 6.5 summarises the number of organisations who review and/or update when monitoring is (not) undertaken.

¹⁹ An organisation has been categorised as conducting monitoring/reviewing/updating if the responses given on the Likert scale is ≥ 4 .

Review	No Monitoring			Monitoring		
	No Updating	Updating	TOTAL	No Updating	Updating	TOTAL
No Reviewing	41	8	49	6	4	10
Reviewing	4	3	7	3	16	19
TOTAL	45	11	56	9	20	29

Table 6.5 - Reviewing against updating by (no) monitoring

Of the 34% of organisations that monitor their ISP system, 55% do both reviewing and updating, 21% do not take time to either review or update their ISP and 10% review but do not update. This means that 31% of those that monitor their ISP system seem to do it as an end in itself rather than a means to an end (*i.e.*, to improve the ISP system), which may well be a waste of valuable time and resources. In addition, a further 14% who monitor do not review but nevertheless update their ISP calling into question the quality of the updating taking place.

Of the 66% of organisations that do no monitoring, 73% do no reviewing or updating, 7% review but do not update, 14% do not review but do update, and 5% review and update. In other words, 26% of those organisations that do no monitoring, review and/or update their ISP system. This raises questions as to what exactly is the basis for discussion during the review stage of feedback and/or the appropriateness of recommendations implemented during the update stage.

6.3.2.2.1.2 The Informal/Formal Elements of ISP System Feedback

Figure 6.38 summarises the extent to which informal and formal elements of all three components of feedback (*i.e.*, monitoring plus reviewing plus updating) occur within organisations while Figure 6.39 summarises presence of informal/formal feedback as a percentage of the total *possible* amount.

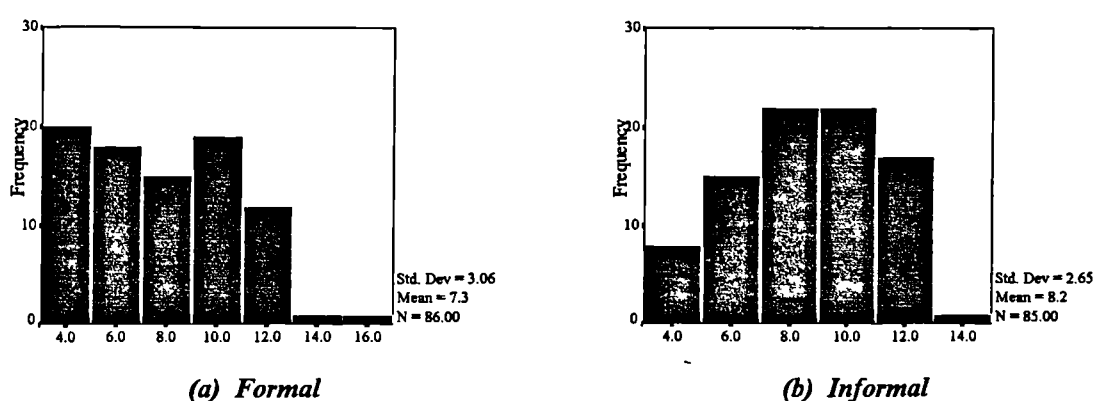


Figure 6.38 - The formal/informal elements of ISP system feedback

Average total informal feedback ($=8.16$) is discernably^{0.05} higher than average total formal feedback ($=7.26$) within organisations. This difference is the result of discernible differences between the informal and formal elements of two of the three feedback components (*i.e.*, monitoring^{0.01} and reviewing^{0.1}), with informal feedback being the more prevalent in each case. The standard deviation for

total informal feedback is lower ($=2.65$) than total formal feedback ($=3.06$). While an outlier in the formal feedback data has distorted this value (*c.f.*, Figure 6.39), the inter-quartile range for total informal feedback ($=4$) is still less than that for total formal feedback ($=4.25$). This indicates that total informal feedback responses were more consistent (less variable) than those of total formal feedback.

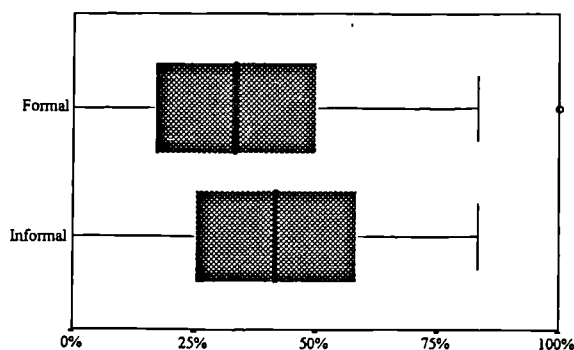


Figure 6.39 - % of total possible formal/informal feedback

On average, organisations exhibit 43% of total possible informal feedback and 36% of total possible formal feedback. Three-quarters of organisations exhibit less than 52% of total possible formal feedback and less than 58% of total possible informal feedback, while a quarter exhibit less than 17% of total possible formal feedback and less than 25% of informal possible feedback.

Table 6.6 summarises the total number of organisations who exhibit formal and informal elements of feedback. As shown in Table 6.4, 48% do not exhibit either informal or formal elements of feedback, 14% exhibit informal feedback only, 9% exhibit formal feedback only and 28% exhibit both elements of feedback.

<i>Informal</i>	<i>Formal</i>	<i>Number of organisations (n=85)</i>
✗	✗	41 (48%)
✓	✓	24 (28%)
✓	✗	12 (14%)
✗	✓	8 (9%)

Table 6.6 - The total number of organisations who exhibit informal/formal elements of feedback

Table 6.7 summarises the (in)formal elements of feedback against each component.

<i>Components of Feedback n (%)</i>	<i>Informal/Formal²⁰ Elements of Feedback</i>			
	No formal No informal	No formal Informal	Formal No informal	Formal Informal
<i>Monitoring</i> (n=85)	56 (66%)	13 (15%)	3 (4%)	13 (15%)
<i>Reviewing</i> (n=85)	59 (69%)	8 (9%)	4 (5%)	14 (16%)
<i>Updating</i> (n=84)	54 (64%)	9 (11%)	7 (8%)	14 (17%)

Table 6.7 - Components vs elements of ISP system feedback

As can be seen, 66% of organisations do no informal/formal monitoring, 19% do either formal (4%) or informal (15%) monitoring, and 15% of organisations do both formal and informal monitoring. Of the 34% of organisations that monitor, 55% do formal monitoring, 90% do informal monitoring and 45% do both.

In terms of reviewing, 69% do no informal/formal reviewing, 14% do either formal (5%) or informal (9%) reviewing, and 16% of organisations do both formal and informal reviewing. Of the 31% of organisations that review, 69% do formal reviewing, 85% do informal reviewing and 54% do both.

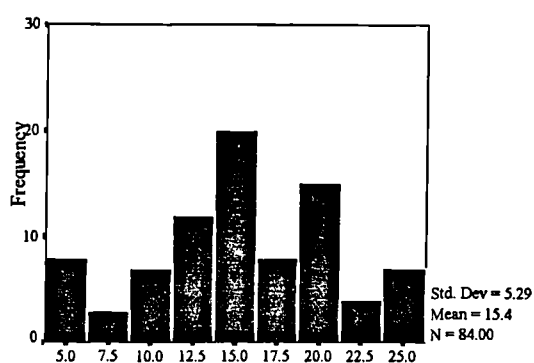
Finally, for updating, 64% do no informal/formal updating, 19% do either formal (8%) or informal (11%) updating, and 17% of organisations do both formal and informal updating. Of the 36% of organisations that update, 70% do formal updating, 77% do informal updating and 47% do both.

The component of feedback carried out by the largest proportion of organisations (30%)²¹ is informal monitoring followed by informal updating (27%), informal reviewing (26%), formal updating (26%), formal reviewing (21%) and finally formal monitoring (20%).

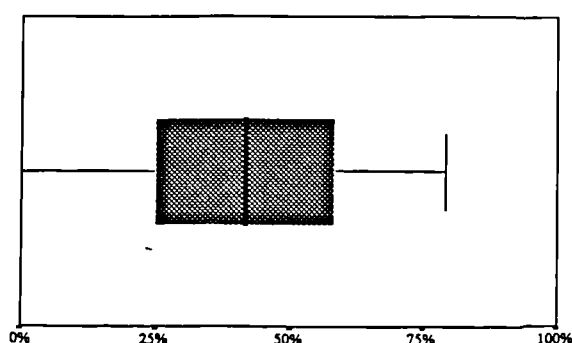
6.3.2.2.1.3 The Total ISP System Feedback

Total ISP system feedback was calculated by summing both elements (*i.e.*, formal and informal) across monitoring, reviewing and updating components. Figure 6.40a shows the distribution of total feedback presence while Figure 6.40b summarises total ISP system feedback presence as a percentage of the total *possible* amount.

On average, organisations exhibit 39% of total *possible* feedback. Three-quarters of organisations exhibit less than 58% of total *possible* feedback while a quarter exhibits less than 25%. The distribution of total feedback is approximately symmetrical and there are no outliers in the data.



(a) Distribution of total feedback



(b) % of total *possible* feedback

Figure 6.40 - Total ISP system feedback presence

²¹

Percentages based on responses of agree (=4) and strongly agree (=5).

Non-IS participants were also asked for their perceptions on the existence of ISP system feedback via a single item on their questionnaire asking whether their organisation's ISP methodology is periodically reviewed and updated to ensure it still suits the needs of the organisation (Q16). Just over two-fifths (42%) of respondents answered positively (agree or strongly disagree) to this statement while a further 24% were undecided.

6.3.2.2.1.4 Summary of ISP System Feedback

In summary, 48% of organisations are missing all three components of ISP system feedback (*i.e.*, they have no feedback whatsoever) while an additional 33% of organisations are missing one (12%) or two (21%) components, implying a potential waste of resources. This means that 81% of organisations are missing one, two or all three components of ISP system feedback, that is only 19% of organisations surveyed claim to have all components of feedback in place. On average, organisations exhibit 39% of total *possible* ISP system feedback.

Of the 52% of organisations exhibiting some or all three components of feedback, 27% only have an informal element, 18% only have a formal element and 55% have both. There is evidence to suggest that informal feedback is more prevalent in organisations than formal feedback.

6.3.2.2.2 IS Plan Feedback

This section follows a similar format to the preceding one by discussing the presence of IS plan feedback in terms of the individual components (*i.e.*, monitoring, reviewing and updating), the different elements (*i.e.*, informal vs formal), and total feedback present.

6.3.2.2.2.1 The Individual Components of IS Plan Feedback

Figure 6.41 summarises the average (in)formal 'presence' of each feedback component within organisations. All informal components of feedback are above the neutral point on the Likert scale¹⁸ while all the formal components are below. This indicates that, on average, organisations exhibit some form of informal feedback but no formal feedback. The standard deviation for all formal components of feedback is higher than those for the informal components indicating less variation in responses regarding the latter.

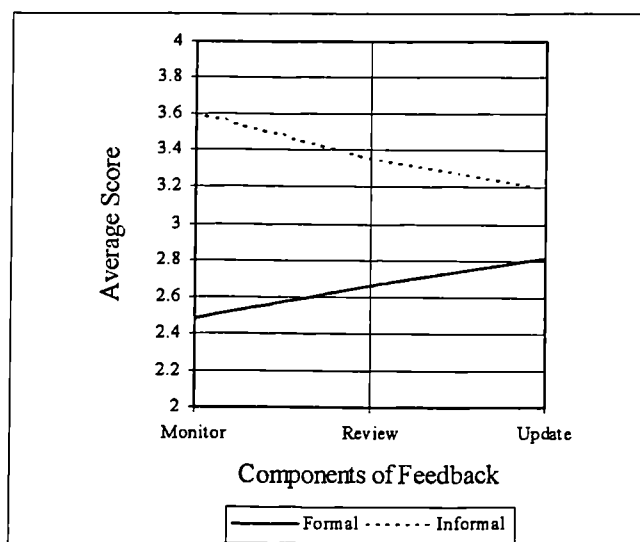


Figure 6.41 - The constituent parts of IS plan feedback

Figure 6.42 summarises the extent to which total (*i.e.*, formal plus informal) monitoring, reviewing and updating occur within organisations while Figure 6.43 summarises the presence of each component as a percentage of the total *possible* amount.

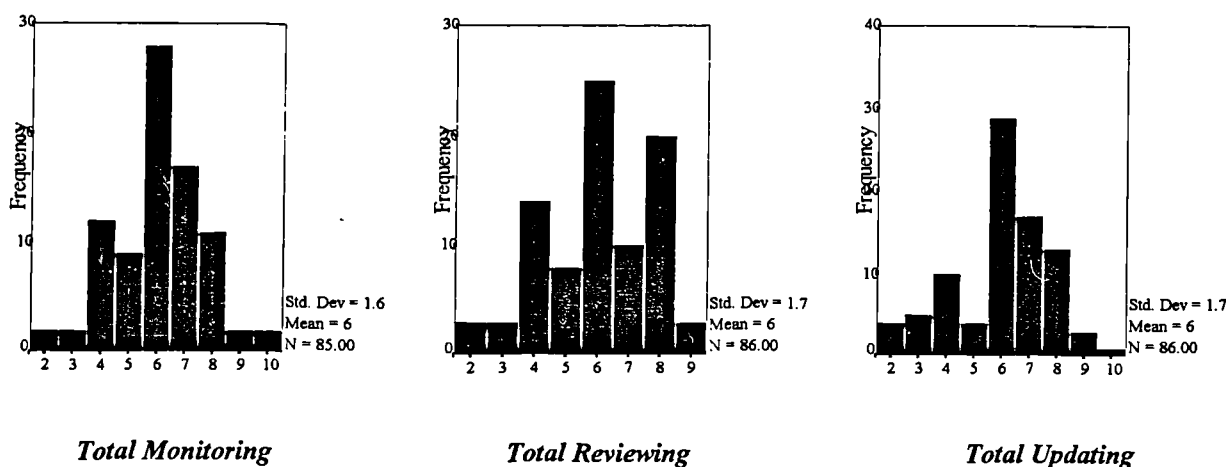


Figure 6.42 - The components of IS plan feedback

Average total monitoring (=6.07) is slightly higher than the averages for total reviewing (=6.02) and updating (=6.01). All three are above the mid-point on the composite (*i.e.*, informal plus formal) scale. The standard deviations of reviewing (=1.74) and updating (=1.77) are higher than for monitoring (=1.61), however, monitoring and updating are affected by outliers in the data (*c.f.*, Figure 6.43). As a consequence, it may be more appropriate to use the median and inter-quartile range as a measure of central tendency and spread. The median for all three components are the same (=6) whereas the interquartile range is higher for reviewing (=3) than for either monitoring (=2) or updating (=2). This indicates that responses to reviewing are more varied than those for monitoring and updating.

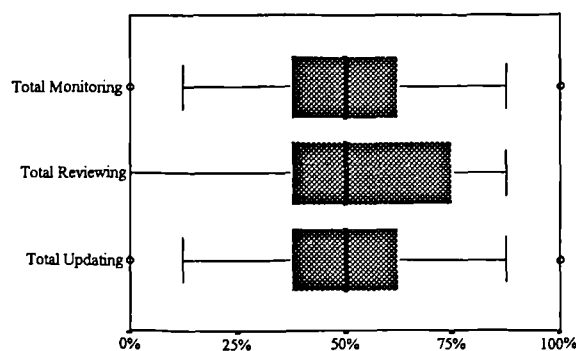


Figure 6.43 - % of total possible total monitoring, reviewing and updating

On average, organisations exhibit 50% the total *possible* monitoring, reviewing and updating. Three-quarters of organisations exhibit less than 63% of total *possible monitoring* and *updating*, and less than 75% of total *possible reviewing* while a quarter exhibit less than 38% of total *possible* monitoring, reviewing and updating. Monitoring and updating have similar symmetrically shaped distributions, whereas reviewing is negatively skewed.

Table 6.8 summarises the total number of organisations who monitor, review and/or update¹⁹. In 39% of organisations all three components of feedback exist while 21% of organisations have no components of feedback at all. Of the remaining 40%, 8% of organisations review and update without monitoring while 1% update without monitoring or reviewing leading to the question as to exactly what is being updated. In addition, 11% of organisations monitor but do not review or update, 11% monitor and review but do not update and 11% monitor and update but do not review.

<i>Monitor</i>	<i>Review</i>	<i>Update</i>	<i>Number of organisations (n=86)</i>
✓	✓	✓	33 (38%)
✗	✗	✗	18 (21%)
✓	✗	✗	9 (11%)
✓	✓	✗	9 (11%)
✓	✗	✓	9 (11%)
✗	✓	✓	7 (8%)
✗	✗	✓	1 (1%)
✗	✓	✗	0 (0%)

Table 6.8 - The total number of organisations who monitor, review and/or update

Table 6.9 summarises the number of organisations who review and/or update when monitoring is (not) undertaken.

	<i>No Monitoring</i>			<i>Monitoring</i>		
<i>Review</i>	<i>No Updating</i>	<i>Updating</i>	<i>TOTAL</i>	<i>No Updating</i>	<i>Updating</i>	<i>TOTAL</i>
<i>No Reviewing</i>	18	1	19	9	9	18
<i>Reviewing</i>	0	7	7	9	33	42
<i>TOTAL</i>	18	8	26	18	42	60

Table 6.9 - Reviewing against updating by (no) monitoring

Of the 70% of organisations that monitor their IS plan, 55% do both reviewing and updating, 15% do not take time to either review or update their ISP, and 15% review but do not update. This means that 30% of organisations that monitor their IS plan seem to do it as an end in itself rather than as a means to an end (*i.e.*, to keep the IS plan current). In addition, a further 15% who monitor do not review but nevertheless update their ISP thus calling into question the quality of the updating taking place.

Of the 30% of organisations that do no monitoring, 69% do no reviewing nor updating, 4% do no reviewing but do updating, 4% do not review but do update and 27% review and update. In other words, 31% of organisations that do no monitoring, review and/or update their ISP system which raises questions as to what exactly is the basis for discussion during the review stage and/or the appropriateness of recommendations implemented during the update stage.

6.3.2.2.2 The Informal/Formal Elements of IS Plan Feedback

Figure 6.44 summarises the extent to which informal and formal feedback (*i.e.*, monitoring plus reviewing plus updating) occurs within organisations while Figure 6.45 summarises the presence of informal/formal feedback as a percentage of the total *possible* amount.

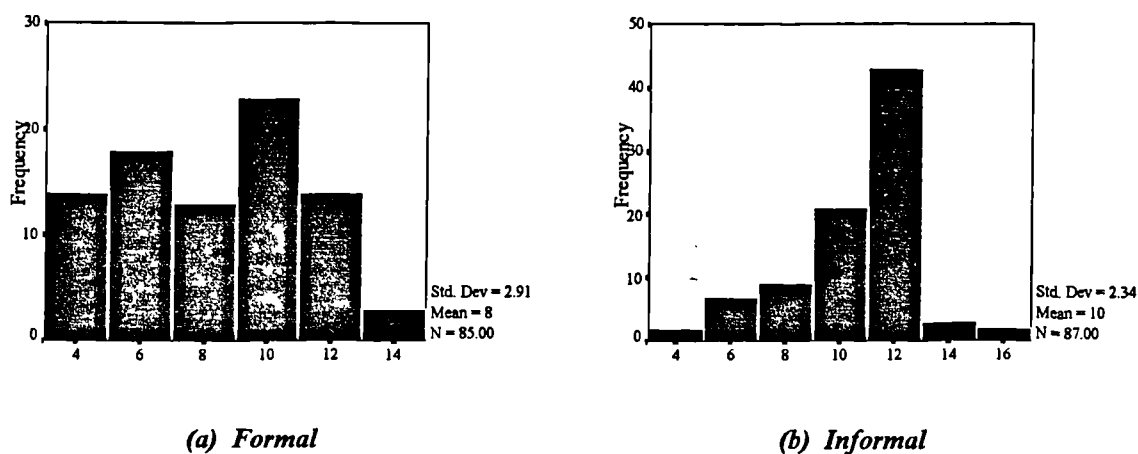


Figure 6.44 - The formal/informal elements of IS plan feedback

Average total informal feedback (=10.15) is significantly^{0.001} higher than average total formal feedback (=7.93) within organisations. This difference is the result of discernible^{0.001} differences between the informal and formal elements of all three feedback components (*i.e.*, monitoring^{0.001}, reviewing^{0.001} and updating^{0.05}), with informal being the more prevalent in each case. The standard deviation for total informal feedback is lower (=2.34) than total formal feedback (=2.91). While an outlier in the informal feedback data has distorted this value (*c.f.*, Figure 6.45), the inter-quartile range for total informal feedback (=3) is still less than that for total formal feedback (=4). This indicates that total informal feedback responses were more consistent (less variable) than those of total formal feedback.

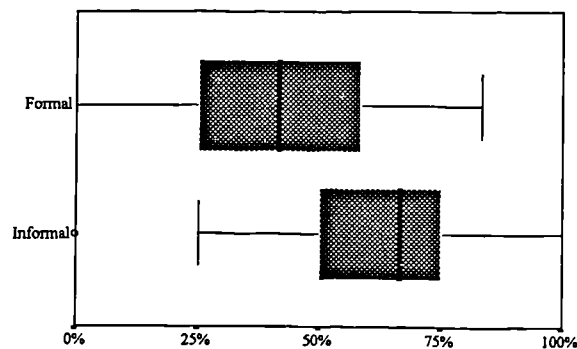


Figure 6.45 - % of total possible formal/informal feedback

On average, organisations exhibit 41% of total possible formal feedback and 60% of total possible informal feedback. Three-quarters of organisations exhibit *less* than 58% of total possible formal feedback while a quarter exhibit *less* than 25%. However, in terms of total possible informal feedback, three-quarters of organisations exhibit *more* than 50% while a quarter exhibits *more* than 75%. The distribution of formal feedback is roughly symmetric whereas the distribution of informal feedback is negatively skewed.

Table 6.10 summarises the total number of organisations who exhibit formal and informal elements of feedback. As shown in Table 6.8, 21% do not exhibit either informal or formal elements of feedback, 35% exhibit informal feedback only, 2% exhibit formal feedback only and 42% exhibit both elements of feedback.

<i>Informal</i>	<i>Formal</i>	<i>Number of organisations (n=86)</i>
✓	✓	36 (42%)
✓	✗	30 (35%)
✗	✗	18 (21%)
✗	✓	2 (2%)

Table 6.10 - The total number of organisations who exhibit informal/formal elements of feedback

Table 6.11 summarises the (in)formal elements of feedback against each component.

<i>Components of Feedback in the IS Plan</i>	<i>n (%)</i>	<i>Informal/Formal Elements of Components</i>			
		<i>No formal No informal</i>	<i>No formal Informal</i>	<i>Formal No informal</i>	<i>Formal Informal</i>
<i>Monitoring</i>	<i>(n=85)</i>	26 (31%)	42 (49%)	3 (4%)	14 (17%)
<i>Reviewing</i>	<i>(n=86)</i>	37 (43%)	26 (30%)	1 (1%)	22 (26%)
<i>Updating</i>	<i>(n=86)</i>	36 (42%)	21 (24%)	13 (15%)	16 (19%)

Table 6.11 - Components vs elements of IS plan feedback

As can be seen, 31% of organisations do no informal/formal monitoring, 49% do either formal (4%) or informal (49%) monitoring, and 17% of organisations do both formal and informal monitoring. Of the 69% of organisations that monitor, 29% do formal monitoring, 95% do informal monitoring and 24% do both.

In terms of reviewing, 43% do no informal/formal reviewing, 31% do either formal (1%) or informal (30%) reviewing, and 26% of organisations do both formal and informal reviewing. Of the 57% of organisations that review, 47% do formal reviewing, 98% do informal reviewing and 45% do both.

Finally, for updating, 42% do no informal/formal updating, 40% do either formal (15%) or informal (24%) updating, and 19% of organisations do both formal and informal updating. Of the 58% of organisations that update, 58% do formal updating, 74% do informal updating and 32% do both.

The part of feedback carried out by the largest proportion of organisations (67%)²¹ is informal monitoring then informal reviewing (55%), informal updating (43%), formal updating (34%), formal reviewing (27%) and finally formal monitoring (20%).

6.3.2.2.2.3 The Total IS Plan Feedback

Total IS Plan feedback was calculated by summing both elements (*i.e.*, formal and informal) across monitoring, reviewing and updating components. Figure 6.46a shows the distribution of total feedback presence while Figure 6.46b summarises total IS plan feedback presence as a percentage of the total *possible* amount.

Organisation, on average, exhibit 50% of the total *possible* IS plan feedback. Three-quarters of organisations exhibit less than 63% of total *possible* feedback while a quarter exhibit less than 42%. The distribution of total IS plan feedback is negatively skewed with one outlier at the lower end of the data.

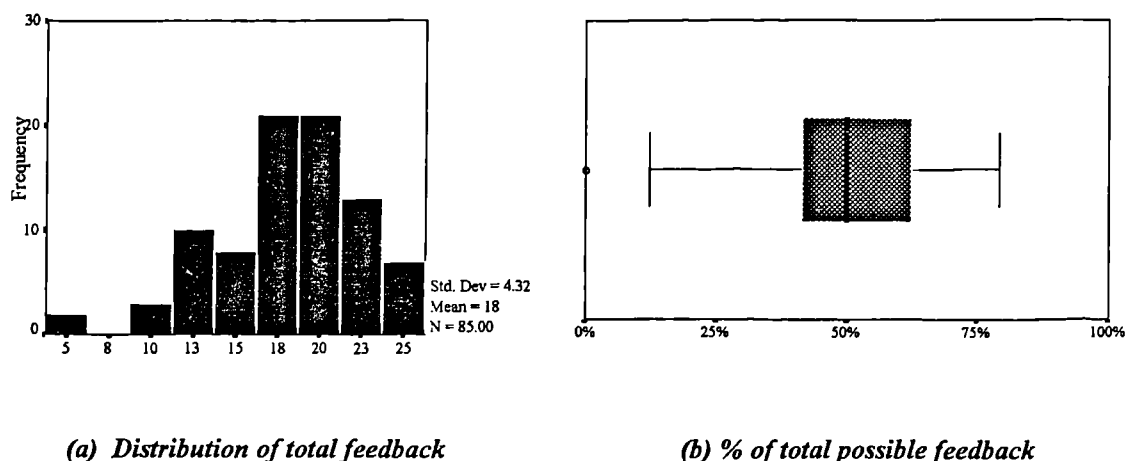


Figure 6.46 - Total presence of IS plan feedback

Non-IS participants were also asked for their perceptions on the existence of IS plan feedback through an item on their questionnaire asking whether their IS plan is continually updated to incorporate changes in the environment as they arise (Q18d). Approximately a third (34%) of respondents answered positively (agree or strongly disagree) to this statement while a further 37% were undecided.

6.3.2.2.4 Summary of IS Plan Feedback

In summary, 21% of organisations are missing all three components of IS plan feedback (*i.e.*, they have no feedback whatsoever) while an additional 41% of organisations are missing one (29%) or two (12%) components, implying a potential waste of resources. This means that 62% of organisations are missing one, two or all three components of ISP system feedback, that is only 38% of organisations surveyed can be said to have all elements of feedback in place. Organisation, on average, exhibit 50% of the total *possible* IS plan feedback.

Of the 79% of organisations exhibiting some or all three components of feedback, 44% only have an informal element, 3% only have a formal element and 53% have both. There is evidence to suggest that informal feedback is more prevalent in organisations than formal feedback.

6.3.2.2.3 Presence of ISP System Feedback vs IS Plan Feedback

Figure 6.47 summarises the total ISP system and IS plan feedback as a percentage of the total *possible* amount. As mentioned above, on average, organisations exhibit 39% of total *possible* ISP system feedback and 50% of total *possible* IS plan feedback. There is a discernible difference^{0.001} between the average total ISP system feedback and average total IS plan feedback, that is there is evidence to suggest that more IS plan feedback is present within organisations than ISP system feedback.

The standard deviation for ISP system feedback (=5.29) is higher than for IS plan feedback (=4.32) which is influenced by an outlier at the lower end of the data. The boxplot clearly shows that the spread of total ISP system feedback responses is higher than that of total IS plan feedback indicating that responses to the former are more variable than those to the latter.

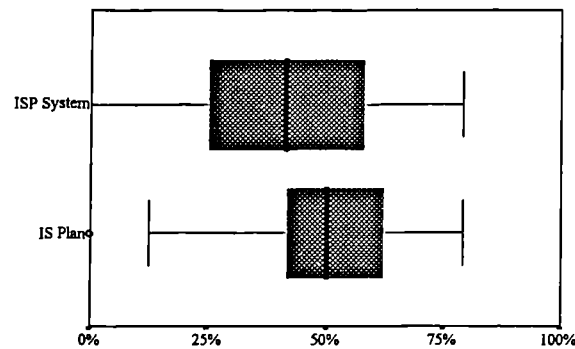


Figure 6.47 - % of total possible feedback

6.3.2.2.4 Feedforward: A Related Concept

Feedforward, as discussed in §4.1.1.3, is related to the concept of feedback. Two questions on the questionnaire were asked of both set of respondents regarding feedforward on the ISP system and IS plan. Feedforward on the ISP system was investigated by asking respondents to comment on the extent to which they agree/disagree that their planning process adapts to the needs of the participants, resources, information available and/or changes in the environment as they arise (Q46d, Q15). Feedforward on the IS plan was measured by asking respondents to comment on the extent to which they agree/disagree that it is easy to incorporate new information at any stage of the planning process as it arises (Q52d, 11d). 28% (34%)⁷ of organisations claim to have feedforward on the IS plan, whereas 69% (53%)⁷ claim to have feedforward on the ISP system. There is evidence^{0.05} that more IS planners than non-IS respondents report the presence of ISP system feedforward.

While only a single indicant was used to measure each feedforward concept, the results point towards the possibility that organisations not carrying out feedback may in fact carry out feedforward. On closer investigation (*c.f.*, Appendix D: §D.6.1.3), it was found that while there was no significant relationship in IS plan feedback between those organisations with feedforward on the IS plan and those without it, there was a significant^{0.05} positive relationship between the presence of ISP system feedback and ISP system feedforward. In other words, there is no evidence that absence of feedback means presence of feedforward, indeed, there is evidence to suggest that if ISP system feedback is present, ISP feedforward is more likely to be present too.

6.3.2.3 Relationships between Feedback and ISP Effectiveness

This section seeks to examine the relationship between feedback and average ISP effectiveness. Details of the full analysis can be found in Appendix D: §D.6.3.

There is evidence^{0.01} to suggest that organisations with above average ISP effectiveness exhibit, on average, more feedback on the IS plan and/or the ISP system than those organisation with below average ISP effectiveness. In addition, when organisations are differentiated by the number of feedback components they exhibit, there is evidence to suggest that organisations having all three components of IS plan^{0.01} /ISP system^{0.05} feedback have higher average ISP effectiveness than in those where two or less exist.

The zero-order correlation coefficients of average ISP effectiveness against total feedback provide an indication of the strength of the linear association between the two (*c.f.*, Table 6.12). This together with an examination of the scatterplots (*c.f.*, Appendix D) provide some evidence to suggest that average ISP effectiveness and both types of feedback, and total ISP system feedback and total IS plan feedback, are linearly related.

	<i>Total IS plan feedback</i>	<i>Total ISP system feedback</i>
<i>Average ISP Effectiveness</i>	.3549 ^{0.01}	.2219 ^{0.05}
<i>Total ISP system feedback</i>	.6118 ^{0.01}	

Table 6.12 - Zero-order correlations of average ISP effectiveness and feedback

Fitting a regression model to the data reveals that 5% of the variation in average ISP effectiveness is explained by total ISP system feedback, while 13% of the variation can be explained by total IS plan feedback. The regression model does not provide a good fit in terms of the total explained variation as feedback is only one factor that has an influence on average ISP effectiveness.

Further investigation of total ISP system feedback in terms of its informal and formal elements reveals that while informal feedback has a linear relationship with average ISP effectiveness, formal feedback does not. That is, formal ISP system feedback is not *linearly* related to average ISP effectiveness. However, the scatterplot does not reveal what non-linear model is more appropriate. Informal ISP system feedback explains 14% of the variation in average ISP effectiveness using the linear model.

Investigation of the total IS plan feedback in terms of its informal and formal elements reveals that a linear model accounts for 15% of variation in average ISP effectiveness. Regressing these elements separately against average ISP effectiveness reveals that the informal element of feedback accounts for the majority of this variation.

Based on the conceptualisation of ISP feedback in Chapter 4: §4.1.2, it has been argued that IS plan feedback is a component of ISP system feedback and as a consequence a regression model with the latter as the dependent and former as the independent variable has been posited. There is a significant^{0.001} positive correlation between the two variables. Fitting a regression model to the data reveals that 37% of the variation in ISP systems feedback can be explained by IS plan feedback.

In summary, there are significant positive relationships between average ISP effectiveness and both types of feedback. That is, as presence of feedback increases so does average ISP effectiveness within organisations. While linear regression does not provide a good model of these relationships, scatter plots of the data do not suggest more appropriate non-linear models. In addition, it has been shown that IS plan feedback accounts for 37% of the variation in ISP system feedback.

6.3.3 Important ISP System Characteristics

This section identifies ISP system characteristics that influence ISP success in order to provide the foundation of a system-oriented evaluation (diagnostic) tool. Appendix D provides details of the analysis carried out in this section, the results of which are shown below. ISP system characteristics related to ISP success have been categorised according to the multi-dimensional systems model identified in Chapter 2: §2.5.10.

The following ISP system characteristics have a statistically discernible relationship with average ISP effectiveness. The relationships exhibited are either positive or negative²² in addition to being either linear or non-linear²³. All relationships are positive unless indicated by '†' and are linear unless indicated by '*'. References to other research findings regarding each of these characteristics can be found in Appendix A.

<i>System Characteristic (Context)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS²⁴ Respondent</i>
1. IS Planner is kept fully informed of changes in the business.	0.01†	
2. Top management provides ISP sponsorship.	0.01†	
3. Environment is highly conducive to ISP.	0.01	0.01
4. IS staff have a lot of credibility within the organisation.	0.01	0.05
5. Managers actively encouraged to do effective long range planning.	<i>not sign.</i>	0.01
6. People actively encouraged to question underlying policy/goals.	<i>not sign.</i>	0.01
7. Non-IS staff readily accept the introduction of IS/IT	<i>not sign.</i>	0.01
8. Top IS Manager has a close working relationship with top management.	0.01	0.05
9. Non-IS staff have an appropriate shared vision of the role of IS/IT within the organisation.	0.01	0.01
10. There is commitment to ISP by the major stakeholders.	0.01	0.01
11. Good quality business plans are produced.	0.01	0.1
12. The IS Planner has the necessary credibility within the organisation to carry out ISP effectively.	0.01	0.01

²² A significant positive relationship indicates that there is evidence to suggest an organisation exhibiting more of a characteristic also exhibits higher average ISP effectiveness whereas a significant negative relationship indicates that an organisation exhibiting more of a characteristic exhibits lower average ISP effectiveness.

²³ Non-linear relationships were identified by Spearman correlation co-efficient.

²⁴ Shaded boxes indicate that the question was not asked on the non-IS respondents' questionnaire.

† No *linear/non-linear* relationship was established since ANOVA was used to analyse this characteristic.

<i>Context (continued)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS²⁵ Respondent</i>
13. An 'anarchic' information political environment exists.	0.05 [†] *	
14. A 'federal' information political environment exists.	0.05	
15. IS Planner participates in business planning.	0.05 [†]	
16. ISP champion is from top management.	0.05 [†]	
17. Organisation supports the learning of lessons from mistakes.	0.05	0.1
18. Organisation actively encourages innovative solutions to problems.	0.05	0.05
19. Amount of annual IT Budget	0.1 [†]	
20. A 'monarch' information political environment exists.	0.1	
21. ISP is linked with business planning.	0.1 [†]	
22. Dynamic business environment	0.1	

<i>System Characteristic (Inputs)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>
23. The ISP objectives/goals are made explicit.	0.01	0.01
24. Realistic ISP objectives/goals are set.	0.01	0.01
25. There are adequate resources available for each stage of ISP.	0.01	
26. The best people are made available during each stage of ISP.	0.01	
27. Participants understand how ISP is to be done.	0.01	0.05
28. Participants clearly know what to expect in terms of ISP deliverables.	0.01	0.1
29. An appropriate number of people take part in the ISP process.	0.01	
30. The ISP participants represent major stakeholder groups within the organisation.	0.01	0.1*
31. The ISP participants are equally involved in the decision making.	0.01	0.01
32. The ISP participants are effective at making decisions.	0.01	0.05*
33. Top management involvement in pre-planning stage.	0.01	
34. Total amount of top management involvement across all stages.	0.01	
35. It is easy to obtain the necessary information needed to plan effectively.	0.01	not sign.
36. The information used to generate the plan is reliable.	0.01	0.01
37. Top management involved in choice stage of ISP.	0.05	
38. Top management involved in implementation stage of ISP.	0.05	
39. Workshops used during the choice stage of ISP.	0.05 [†]	
40. Informal meetings used during choice stage of ISP.	0.05	
41. The IS Planner has the necessary expertise to carry out ISP effectively.	0.05	0.01
42. The ISP participants agree on the objectives/goals of ISP.	0.05	0.05
43. The ISP participants have a clear understanding of the role and responsibilities each of them is expected to have in the planning process.	0.05	0.01
44. The ISP participants are effective at problem solving.	0.05	0.05*
45. There is an IS steering committee.	0.05*	
46. Consultants involved during the intelligence stage of ISP.	0.1*	
47. Middle management involved during the design stage of ISP.	0.1	
48. IS staff involved during the implementation stage of ISP.	0.1	
49. Top management involved during the review stage of ISP.	0.1	
50. Consultants involved during the review stage of ISP.	0.1 [†]	
51. Workshops used during the design stage of ISP.	0.1 [†]	
52. The ISP participants are skilled/experienced in planning.	0.1	0.05

²⁵ Shaded boxes indicate that the question was not asked on the non-IS respondents' questionnaire.

† Negative relationship between this characteristic and average ISP effectiveness, that is more of the characteristic results in lower average ISP effectiveness.

* Non-linear relationship.

<i>System Characteristic (Process)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>
53. The ISP process is good at seeking consensus among participants.	0.01	
54. The ISP process is good at dealing with sources of conflict.	0.01	
55. The ISP process is good at making use of the ISP participants skills/abilities.	0.01	
56. The ISP process is good at meeting individual participants needs.	0.01	

<i>System Characteristic (Methodology)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>
57. Priorities by which competing projects in the final plan may be evaluated are agreed upon.	0.01	
58. The ISP participants are good at analysing the impact on the organisation of internal/external environmental constraints/issues.	0.01	
59. The ISP participants are good at analysing external opportunities/threats of the business with relation to IS/IT.	0.01	
60. The ISP participants are good at identifying appropriate measures of performance for each of the proposed IS.	0.01	
61. The ISP participants are good at evaluating the business risk associated with alternative IS solutions.	0.01	
62. The ISP participants are good at prioritising projects.	0.01	
63. The ISP participants are good at assigning a project manager (champion) to each IS to be developed.	0.01	
64. The ISP participants are good at allocating sufficient resources to develop, implement and maintain each of the proposed IS.	0.01	
65. Automated tools and other computer support are important to ISP.	0.05	
66. A plan of work is developed.	0.05*	
67. Previous approach taken to ISP is reviewed.	0.05	
68. Broad criteria by which alternative solutions may be compared are agreed upon.	0.05	
69. It is easy to translate the business needs into information requirements.	0.05	0.1
70. The ISP participants are good at analysing the business strategy.	0.05	
71. The ISP participants are good at identifying IS to directly support the formulation of the future business strategy (e.g., EIS).	0.05	
72. The ISP participants are good at identifying the necessary management procedures that are needed to ensure the proposed IS are maintained once implemented.	0.05	
73. The ISP participants are good at identifying the necessary management of change issues to support the implementation of each of the proposed IS.	0.05	
74. The ISP participants are good at evaluating quantitatively the business benefits of alternative IS solutions.	0.05	
75. The ISP participants are good at evaluating qualitatively the business benefits of alternative IS solutions.	0.05	
76. The ISP participants are good at developing projects schedule clearly identifying the transition from the present to the desired state.	0.05	
77. The ISP participants are good at developing detailed tactical development plans for each of the proposed IS.	0.05	
78. The ISP methodology is adequately documented to provide an overview of the study and the steps to be taken.	0.1	
79. The ISP participants find the amount of time required to complete ISP acceptable.	0.1*	0.01
80. The ISP participants are good identifying operational and monitoring and control IS.	0.1	

<i>System Characteristic (Output)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>
81. The IS plan includes short- to medium-term plans to achieve the long-term strategy.	0.01	
82. The IS plan includes realistic projects in terms of the resources available.	0.01	
83. The IS plan includes sufficient information to lend credibility to its promise.	0.01	
84. The IS plan is used as a working document.	0.01	0.01
85. The IS plan is clearly documented for ease of reference when, for example, changes in the policy/direction/ circumstances occur.	0.01	
86. The IS plan is communicated to all levels of the organisation.	0.01	
87. The IS plan meets stakeholders expectations.	0.01	0.01
88. The IS plan is continually updated to incorporate changes in the environment as they arise.		0.01
89. The IS plan is owned by major stakeholders.	0.01	0.01
90. The organisation has a formal IS Plan.	0.05 [†]	
91. The IS plan includes long-range objectives and strategies.	0.1	
92. The IS plan captures all the information and detailed analysis that was developed during the planning cycle.	0.1	
93. The IS plan identifies some IS that are likely to be early successes.	0.1	

<i>System Characteristic (Implementation)</i>	<i>Level of Sign.</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>
94. Major stakeholders are involved in the IS plan's implementation.	0.01	
95. Major stakeholders have a clear understanding of the role and responsibilities each of them have in the implementation of the IS plan.	0.01	0.01
96. There is commitment by the major stakeholders to the IS plan's implementation.	0.01	0.01
97. There is commitment of resources for the implementation of the IS plan.	0.01	
98. Move quickly from ISP to the IS plan's implementation.	0.01	
99. The implementation of the IS plan is regularly reviewed.	0.01	
100. There is a readily identifiable sponsor for the implementation task.	0.05	

These characteristics provide a foundation on which organisations can build a tailored system-oriented evaluation (diagnostic) tool. All but four ISP system characteristics are identified as being related to average ISP effectiveness on **both** questionnaires. Items (5) to (7) are significant to non-IS respondents but not to IS Planners, and item (35) is significant to IS Planners but not to non-IS respondents.

The first 22 items in the list are partially controllable (by the ISP activity or ISP participants) or uncontrollable contextual factors. Changing these system characteristics may prove difficult in the short term and as a consequence, it may be more appropriate to channel limited resources into improving those ISP system characteristics that can be more readily changed by the ISP activity and its' participants (*i.e.*, the remaining items on the list).

It should be noted that this list identifies system characteristics that are related to average ISP effectiveness in general and as a consequence some of these characteristics may not be appropriate to all organisation. However, asking the question as to whether each characteristic is appropriate to a given organisational context provides a springboard to discussion about issues that may not of otherwise been explored.

Other ISP system characteristics tested but not found, in general, to be significantly related to (or independent of) average ISP effectiveness are: organisational environment (*i.e.*, heterogeneous or hostile or whether the organisation can find the necessary resources and skills in the IS/IT marketplace); type of organisation (measured along three dimensions: service *vs* non-service; public *vs* private sector, and diversified *vs* specialised); size of organisation; main focus of existing systems; main focus of current IS plan; average importance of IT to the organisation; how information is used within the organisation (*i.e.*, information as a product or information adding value to value chain); structure of IS function (centralised *vs* decentralised); existence of a feudal or technocratic information political environment; whether or not an ISP budget is specifically made available; the role of the ISP champion in ISP; the role of the internal/external consultant in ISP; whether the main decision making stage of ISP takes place during the normal day-to-day running of the organisation or away from it; the time between planning cycle; the length of planning cycle, maturity in planning, and the strategic planning horizon.

Two principal component analyses were carried out, one for IS Planner responses and the other for non-IS respondents responses, in order to determine the underlying dimensions of the ISP system characteristics identified above. Items with loadings, after a varimax rotation, of less than 0.35 on all factors or with loadings greater than 0.35 on two or more factors, were dropped from the analysis and a further factor analysis carried out (Kim & Mueller, 1978; Churchill, 1987). This procedure was continued until a stable solution was reached. For IS Planner responses, a stable solution was reached after four iterations while for non-IS responses it was reached after three. The final factors, items and loading can be found in Appendix D: §D.7 while a summary of factors and their corresponding items are given in Table 6.13 and Table 6.14 for IS Planners and non-IS respondents, respectively.

<i>Factor:</i>	<i>Item No.</i>	<i>Item</i>
Implementation	59a	Readily identifiable sponsor for the implementation task.
	59b	Major stakeholders are involved in the IS plan's implementation.
	59c	Major stakeholders have a clear understanding of the role and responsibilities each of them have in the implementation of the IS plan.
	59d	There is commitment by the major stakeholders to the IS plan's implementation.
Evaluating solutions	55d	Evaluating quantitatively the benefits of alternative IS solutions.
	55e	Evaluating qualitatively the benefits of alternative IS solutions.
	55i	Evaluating the risk associated with alternative IS solutions.
	54i	Identifying the necessary management of change issues to support the implementation of each of the proposed IS.
ISP environment	43a	Environment is highly conducive to ISP.
	43e	Organisation actively encourages innovative solutions to problems.
	43k	Commitment to ISP by the major stakeholders.

Factor:	Item No.	Item
Tactical planning	55g	Developing projects schedule clearly identifying the transition from the present to the desired state.
	55h	Assigning a project manager (champion) to each IS to be developed.
	55i	Allocating sufficient resources to develop, implement and maintain each of the proposed IS.
	55j	Developing detailed tactical development plans for each of the proposed IS.
ISP deliverables	51d	Previous approach taken to ISP is reviewed.
	62b	The IS plan includes short- to medium-term plans to achieve the long-term strategy.
	62d	The IS plan includes sufficient information to lend credibility to its promise.
Quality of information	52a	It is easy to obtain the necessary information needed to plan effectively.
	52b	The information used to generate the plan is reliable.
	47c	The ISP process is good at seeking consensus among participants.
Experience of ISP participants	49h	The ISP participants are effective at problem solving.
	49i	The ISP participants are effective at making decisions.
Management of Expectations	44b	Participants clearly know what to expect in terms of ISP deliverables.
	62j	The IS plan is communicated to all levels of the organisation.
	62k	The IS plan is owned by major stakeholders.
Organisational view of IS/IT	43g	IS staff have a lot of credibility within the organisation.
	43j	Non-IS staff have an appropriate shared vision of the role of IS/IT within the organisation.

Table 6.13 - Underlying dimensions of important ISP system characteristics (IS Planner responses)

Factor:	Item No.	Item
Implementation	7k	Commitment to ISP by the major stakeholders.
	17a	Major stakeholders have a clear understanding of the role and responsibilities each of them have in the implementation of the IS plan.
	17b	There is commitment by the major stakeholders to the IS plan's implementation..
Management of Expectations	8a	Participants understand how ISP is to be done.
	8b	Participants clearly know what to expect in terms of ISP deliverables.
	10c	The ISP participants agree on the objectives/goals of ISP.
Experience of ISP participants	10f	The ISP participants are skilled/experienced in planning.
	10i	The ISP participants are effective at making decisions
Quality of IS plan	11c	It is easy to translate the business needs into information requirements.
	18d	The IS plan is continually updated to incorporate changes in the environment as they arise.

Table 6.14 - Underlying dimensions of important ISP system characteristics (non-IS responses)

The nine underlying dimensions, based on IS Planner responses, account for 71% of the total variation in the IS Planners data whereas the four underlying dimensions, based on the non-IS responses, account for 78% of total variation in the non-IS respondents data. The underlying dimensions identified from the non-IS responses are a sub-set of those identified from the IS Planners data. As a consequence, it may be wise for ISP practitioners with limited resources to focus their attention on these common dimensions. In particular, the implementation dimension seems to of particular importance since it has also been identified by Lederer & Sethi (1991) as an underlying dimension influencing ISP success. Indeed, they found (*ibid*: p114) that implementation was the best predictor of overall ISP satisfaction.

6.3.4 Contextual Factors of Feedback

This section investigates possible contextual factors related to ISP system feedback together with some possible justification as to why these relationships exist. In particular, it investigates the relationship between feedback and a learning environment as argued in Chapter 4: §4.1.2.2.2.

6.3.4.1 Feedback and the Learning Environment

The learning environment was measured using primarily two items on the questionnaire: whether people are actively encouraged to question underlying organisational policy/goals (*c.f.*, the concept of double loop learning²⁶ (Q43c)), and whether the organisation provide support for learning lessons from mistakes (*c.f.*, the concept of single loop learning²⁶ (Q43d)). Two additional questions were also included in the questionnaire as a way of testing the construct validity of these two learning measures. These were whether the organisation actively encourages innovative solutions (Q43e) and whether an individual's intuition is accepted as a valid tool in decision making (Q43f), both of which are more likely to exist within a learning environment. The double loop and single loop learning items correlated highly with these two characteristics providing some evidence of construct validity.

50% (75%)⁷ of organisations *actively* encourage innovative solutions to problems while in 40% (50%)⁷ an individual's intuition is accepted as a valid decision making tool. However, only 38% (58%)⁷ of organisations support the learning of lessons from wrong decisions reflecting (according to IS Planners) a lack of single-loop learning (individual learning) which has the effect of minimising risks rather than encouraging more innovative solutions. In addition, only 21% (45%)⁷ of respondents believe that their organisation encourages people *actively* to question underlying organisational policy/goals, reflecting a lack of 'double-loop' learning within the majority of organisations. There are significant differences in the proportion of IS Planner and non-IS respondent who believe their organisation actively encourages innovate solutions^{0.01}, supports learning lessons from wrong decisions^{0.05} and/or encourages people to question underlying organisation policy/goals^{0.01}. In other words, more non-IS respondents than IS Planners believe their particular organisation supports one or more of these activities.

In total, 56% (37%)⁷ of organisations do not exhibit either single or double loop learning, 14% (39%)⁷ exhibit both, 23% (18%)⁷ exhibit single loop learning but not double loop, and a further 7% (5%)⁷ exhibit double loop but not single loop learning. There is evidence to suggest that more IS Planners than non-IS respondent report that neither single nor double loop learning exists within their organisation^{0.05} whereas more non-IS respondents than IS Planners report that both types of learning exists^{0.01}. There is a significant^{0.001} positive relationship between single loop learning and double loop learning,

²⁶

As defined by Argyris (1991).

Based on the responses received from IS Planners, there is no evidence to suggest that either types of feedback are related to the presence of double loop learning within the organisation. In addition, there is no discernible relationship between ISP system feedback and single loop learning although there is a significant positive relationship^{0.001} between IS plan feedback and single loop learning (SLL).

The data was divided into four categories (based on the two dimensions of low vs high single loop learning, and low vs high presence of ISP system feedback) in order to establish whether a difference existed in mean average ISP effectiveness for different levels of single loop learning and ISP system feedback. Figure 6.48 summarises the percentage of organisations falling into each category and the mean average ISP effectiveness of each group on a scale of 1 to 5, as before.

Presence of Single Loop Learning	H	18% (3.28)	20% (3.50)
	L	30% (2.89)	32% (3.35)
		Presence of ISP System Feedback	
		L	H

Figure 6.48 - Single loop learning vs ISP system feedback

Those organisations with both high SLL and ISP system feedback have the highest mean average ISP effectiveness while organisations who had both low SLL and ISP system feedback have the lowest mean average ISP effectiveness. There is a discernible^{0.001} difference in mean average ISP effectiveness between organisations falling in the bottom right and left quadrants, and those falling in the top right and bottom left quadrant.

While this provides some evidence to suggest that organisations exhibiting more SLL and ISP system feedback have higher mean average ISP effectiveness, the results are far from conclusive. Better conceptualisation and operationalisation of the learning environment construct will help to provide more rigorous results; this is a topic for further research.

6.3.4.2 Other Contextual Factors

Factor analysis was used to identify other contextual factors related to ISP system feedback through the same procedure as identified above in §6.3.3. The stable five factor solution was reached after five iterations (*c.f.*, Appendix D: §D.8.2) and is summarised in Table 6.15. The five factors account for 63% of the total variation in IS Planner responses (56% if the final factor is excluded).

<i>Factor:</i>	<i>Item No.</i>	<i>Item</i>
Stakeholder involvement & commitment in implementation	49a	The ISP participants represent the major stakeholders in the organisation.
	59b	Major stakeholders are involved during the IS plan's implementation.
	59d	Major stakeholders are committed to the IS plan's implementation.
	62l	The IS plan is owned by major stakeholders.
Understanding the ISP activity	44a	ISP participants understand how planning is to be done.
	47e	The ISP process is good at making use of the participants skills/abilities.
	49g	ISP participants clearly understand what their role and responsibilities are.
	62g	The IS plan captures all the information and detailed analysis of ISP.
View of IS/IT	43g	The IS staff have a lot of credibility with the rest of the organisation.
	43j	Non-IS staff have an appropriate shared vision of the role of IT/IS.
ISP support structures	50b	A task forced is used during planning.
	50d	Liaison roles are used during planning.
?	51c	How other organisations do their ISP is investigated.
	54b	IS to directly support the formulation of the future business strategy are identified.
	55b	Participants are good at comparing the required IS/IT with the existing IS/IT.

Table 6.15 - Underlying dimensions of contextual factors related to feedback.

For all but the final factor, a sensible common theme could be identified for each group of items. Each of these factors (dimensions) could logically be associated with the presence of ISP system feedback. Possible explanations are provided below.

The first factor relates to stakeholder involvement and commitment during the implementation stage. It would seem sensible to suggest that if there is no commitment or involvement in the implementation then the ISP activity is unlikely to be very highly regarded. If this is the case, then there will probably also be less commitment to improving ISP and as a consequence less feedback will be present.

The second factor relates to the ISP participants understanding of the ISP activity itself. It would seem sensible to suggest that if they have little understanding of what is going on, they are unlikely to be able to provide informal let alone formal feedback.

The third factor relates to how IS/IT and the IS staff are perceived by the rest of the organisation. It would seem sensible to suggest that if perceptions are not high then people are less likely to want to 'waste their time' or get involved in activities associated with its identification (*i.e.*, ISP), and as a consequence ISP improvement through feedback.

The final explainable factor relates to the existence of ISP support structures. It would seem sensible to suggest, that feedback, particularly formal feedback, is more likely to present if such structures exists than if they do not.

It should be noted that the explanations given here as to why each of the factor may be associated with feedback are purely speculative. Further research should seek to identify whether or not these contextual factors are indeed associated with the presence of ISP system feedback and if they are, what type of relationships exists.

6.3.5 Summary of Results

This chapter has attempted to provide answers to the four main research questions identified at the end of Chapter 2 which were:

1. To what extent does feedback exist within organisations?
2. Is feedback related to ISP success?
3. What ISP system characteristics are related to ISP success?
4. What contextual factors are related to feedback?

Data were collected from multiple stakeholder via two questionnaires (*i.e.*, IS Planner and non-IS respondent). The differences in the proportions of positive responses received to each question appearing on both questionnaires, were identified and reported on above. A summary of significant differences are provides in Table 6.16.

<i>Item</i>	<i>(% of yes')</i>		<i>Significance Level</i>		
	<i>IS Planner</i>	<i>Non-IS</i>	<i>1%</i>	<i>5%</i>	<i>10%</i>
1. The environment is highly conducive to ISP.	19	32			✓
2. There is commitment to ISP by the major stakeholders.	48	61			✓
3. Managers are actively encouraged to do effective strategic (long range) ISP planning.	16	29		✓	
4. People are actively encouraged to question underlying organisational policy/goals.	21	45	✓		
5. Positive support is given in learning lessons from mistakes.	38	58		✓	
6. Innovative solutions to problems are actively encouraged.	50	74	✓		
7. Good quality business plans are produced.	37	53		✓	
8. Major stakeholders have clear understanding of their role and responsibilities in the IS plan's implementation.	40	53			✓
9. Effectiveness of pre-planning stage.	41	63		✓	
10. Effectiveness of intelligence stage.	62	39		✓	
11. Effectiveness of choice stage.	72	58			✓
12. Effectiveness of review stage.	37	21		✓	
13. Appropriate amount of time spent doing ISP	21	11			✓
14. Effective methods available for the implementation stage.	58	39		✓	
15. Presence of ISP system feedforward.	69	53		✓	
16. The ISP participants represent the major stakeholder groups in the organisation.	71	53		✓	
17. The IS plan is used as a working document.	61	47			✓

Table 6.16 - Difference in the proportion of responses between IS Planners and non-IS respondents

Of the 50 questions asked on both questionnaires, 17 produced significantly different responses. The shaded boxes in the table indicate answers were more IS Planners than non-IS respondents answered yes to a question. As can be seen, in the cases where this happened the questions are predominately associated with the ISP activity itself whereas in the cases where this did not happen (*i.e.*, unshaded boxes) questions are predominately related (except for item 9) to the general environment or

the boundary between the organisation and the ISP activity (*i.e.*, item 8). This seems to suggest that more IS Planners than non-IS respondents regard the general environment to be a cause for concern whereas more non-IS respondents than IS Planners regard the ISP activity to be a cause for concern.

These differences are of particular importance when they relate to items which have been identified as important system characteristics (*c.f.*, §6.3.3). Some agreement in stakeholders' perceptions on the current state of each characteristic is necessary before feedback can take place.

Two types of feedback were investigated in this research: ISP system feedback and IS plan feedback. In terms of ISP system feedback presence, it was found that just under half (48%) of organisations are missing all three components of feedback while a further 33% are missing one (12%) or two (21%) components, implying a potential waste of resources. In other words, only 19% of organisations have all components of feedback in place. Of the 52% of organisations exhibiting some or all three components of feedback, 27% only have an informal element, 18% only have a formal element and 55% have both. There is evidence to suggest that informal feedback is more prevalent in organisations than formal feedback. On average, organisations exhibit 39% of total *possible* ISP system feedback. Three-quarters of organisations exhibit less than 58% of total *possible* ISP system feedback and a quarter exhibit less than 25%.

In terms of IS plan feedback, it was found that approximately a fifth (21%) of organisations are missing all three components of IS plan feedback while a further two-fifths (41%) are missing one (29%) or two (12%) components, once again implying a potential waste of resources. This means that 62% of organisations are missing one, two or all three components of ISP system feedback; that is only 38% of organisations surveyed can be said to have all elements of feedback in place. Of the 79% of organisations exhibiting some or all three components of feedback, 44% only have an informal element, 3% only have a formal element and 53% have both. There is evidence to suggest that informal feedback is more prevalent in organisations than formal feedback. On average, organisations exhibit 50% of the total *possible* IS plan feedback. Three-quarters of organisations exhibit less than 63% of total *possible* IS plan feedback and a quarter exhibit less than 42%.

In terms of the average ISP effectiveness within organisations (which was used as a surrogate for ISP success), approximately two-thirds (65%) of organisations report *medium* average ISP effectiveness. While IS Planners report a slightly higher mean average ISP effectiveness than non-IS respondents there is no significant difference between the two. There are significant positive relationships between average ISP effectiveness and both types of feedback. In addition, IS plan feedback was shown to account for 37% of the variation of ISP system feedback.

In summary, the results clearly indicate that organisations, in general, do not exhibit much of either type of feedback although there is evidence to suggest that more IS plan than ISP system feedback exists. The results also show that average ISP effectiveness is positively related to both types of feedback. In other words, there is evidence to suggest that those organisations with higher levels of feedback also have higher levels of average ISP effectiveness.

Feedback is a pre-requisite of controlled improvement. If organisations wish to actively improve their ISP activities, making them more successful, then feedback should be present. Given the general lack of ISP system feedback within organisations it is perhaps not surprising that ISP problems identified nearly a decade ago are still being identified by IS Managers today. Without feedback, these problems are unlikely to be actively addressed by an organisation.

In addition to exploring the existence of feedback and its' relationship with average ISP effectiveness, important ISP system characteristics were identified (from both questionnaires) in order to provide the foundation of a system-oriented evaluation (diagnostic) tool. The underlying dimensions of these characteristics were explored revealing nine different dimensions based on IS Planner responses, and four based on non-IS responses which turned out to be a sub-set of the IS Planner dimensions. These nine underlying dimensions are: implementation; quality of information/plan; experience of ISP participants; management of expectations; evaluation of solutions; ISP environment; tactical planning; ISP deliverables, and organisational view of IS/IT. The first four of these dimension are common to both IS Planners and non-IS respondents.

Finally, an investigation into possible contextual factors influencing ISP system feedback was conducted. A factor analysis revealed four underlying 'explainable' dimensions which were: stakeholder involvement & commitment during the IS plan's implementation; ISP participants understanding of the ISP activity; the view of IS/IT and IS staff within the organisation, and the ISP support structures present. The absence/presence of these contextual factors within an organisation may help other researchers, wishing to research feedback in more depth, to identify potential organisations to study. In addition, exploration of the relationships between feedback and each of these contextual dimensions provide avenues of further research.

7. Conclusion

This concluding chapter is divided into four sections: summary of research objectives and results; contribution to knowledge; implications for researchers including the limitations of this thesis and avenues of future research, and finally the implications of the research findings to practitioners.

7.1 Summary of Research Objectives and Results

It is argued in this thesis that the lack of feedback could be impeding ISP improvement and its subsequent success. The research has therefore sought to establish whether feedback exists within organisations and to investigate whether this existence is related to ISP success¹. Two types of feedback have been investigated, feedback on the ISP system and feedback on the IS plan. While the former is concerned with the activity of producing plans, the latter is concerned with keeping the contents of the plan up to date between planning cycles. ISP success has been operationalised using thirteen items which have subsequently been reduced to one measure of average ISP effectiveness and correlated against total feedback in order to establish whether a relationship exists.

The results indicate that while both ISP system and IS plan feedback do exist within organisations, they are by no means prevalent. Organisations exhibit more IS plan feedback, on average, than ISP system feedback and in both cases there is evidence to suggest more informal feedback is present than formal.

In terms of ISP system feedback, 48% of organisations do not exhibit any feedback whatsoever (*i.e.*, there are no components of feedback in place) while an additional 33% are missing one (12%) or two (21%) components of feedback (*i.e.*, monitoring, reviewing and/or updating) implying a potential waste of resources. This means that 81% of the organisations surveyed are missing one, two or all three components of ISP system feedback. In other words only 19% of the sample have all components of ISP system feedback in place.

For IS plan feedback, 21% of organisations are missing all three components of feedback (*i.e.*, they have no feedback whatsoever) while an additional 41% of organisations are missing one (29%) or two (12%) components, which again implies a potential waste of resources. This means that 62% of the organisations surveyed are missing one, two or all three components of ISP system feedback, that is, only 38% of the sample can be said to have all components of IS plan feedback in place.

The majority of organisations report *medium*² average ISP effectiveness (*i.e.*, ISP success). While IS Planners report a slightly higher mean average ISP effectiveness than non-IS respondents, there is no significant difference between the two groups.

¹ Measured using the surrogate of average ISP effectiveness.

² Between 3 and 4 on a 5-point Likert scale.

There is evidence of a significant relationship between the presence of both types of feedback within organisations and ISP success. That is, the more feedback present within an organisation the higher the level of ISP success.

One of the thirteen ISP effectiveness items on the IS Planner questionnaire (*i.e.*, whether ISP had improved since the last time it was carried out) is not as significantly related to the overall measure of ISP success as are the other twelve items. This relationship only becomes significant when IS Planner responses are combined with those of non-IS respondents who do regard ISP improvement as a facet of ISP success. The insignificance of IS Planner responses may be the reason why feedback is not prevalent in organisations since it is the IS Planner who is the most likely person to initiate feedback.

Having established that feedback is related to ISP success, a secondary objective of this research was to provide, through the identification of ISP system characteristics related to ISP success, the foundation of an system-oriented (diagnostic) evaluation tool which could be used by organisations as the first stage in the ISP system feedback activity (*i.e.*, monitoring/evaluation).

Finally, contextual factors related to feedback were identified. These factors can not only be used to help researchers choose organisations most likely to exhibit feedback but also open up avenues of future research (see below).

7.2 Contribution to Knowledge

This research contributes to knowledge in two major ways: contribution of the results and contribution to method.

7.2.1 Contributions of the Results

The main research results not only provide evidence that ISP feedback is by no means prevalent in organisations, but also that those organisations exhibiting ISP feedback have greater ISP success than those who do not (*c.f.*, §6.3.2). These results provide a possible reason as to why ISP is still proving to be a major concern for IS Managers despite the wealth of research conducted in this area over the last decade. If feedback does not exist, how can an organisation's experience be incorporated into its ISP activity so improvement can occur!

In addition to these main results, the research has also made several contributions to knowledge during the research process. In particular, it has:

- provided an updated summary of ISP research undertaken to date building on previous research summaries (*c.f.*, Table 2.1);
- adapted existing models in both business planning and ISP in order to clarify the boundaries of the current research (*c.f.*, §2.4.1);

- conceptualised ISP in a multi-dimensional way (*i.e.*, systems view) as suggested by a number of researchers (*c.f.*, §2.5.10; Figure 2.5);
- taken into account both rational and irrational aspects of ISP (*c.f.*, 4.1.2.2.1.2);
- applied private sector research (*i.e.*, problems/issues research and ISP models) to a public sector setting providing some evidence that public sector ISP practices are similar to those of the private sector (*c.f.*, Chapter 5);
- proposed an evaluation framework (*c.f.*, §4.2.4);
- identified the different issues needed to be addressed when evaluating (*c.f.*, §4.2.5);
- summarised the planning evaluation literature (*c.f.*, §4.2.6.2) and identified deficiencies with it (*c.f.*, §4.2.6.3);
- developed a goal-oriented ISP evaluation model and operationalised it using a comprehensive set of questions giving a balanced view of ISP success (*c.f.*, §4.2.6.5);
- conceptualised a new model of ISP feedback based on general systems theory (*c.f.*, §4.1.2), and a model of ISP feedback existence (*c.f.*, §4.1.2.1) adapted from the existing feedback literature;
- operationalised the model of feedback existence (*c.f.*, §4.1.2.1) in order to determine the relationship between the presence of feedback and ISP success;
- provided a summary of current ISP practices through a detailed description of how organisations carry out their ISP, independent of whether a bespoke or a proprietary approach to ISP is used (*c.f.*, §6.3.1);
- identified ISP system characteristics related to ISP success providing the foundation of a system-oriented (diagnostic) evaluation (*c.f.*, §6.3.3);
- identified contextual factors related to feedback providing a foundation for future research (*c.f.*, §6.3.4).

7.2.2 Contributions to Method

In addition to the contributions identified above, the research has also contributed to method. In particular, it has:

- synthesised existing literature on research methods (*c.f.*, §3.2.3) to provide an integrated framework (*c.f.*, Table 3.2) aimed at highlighting the types of methods available at each stage of the research;
- tested the reliability and validity of the goal-oriented ISP evaluation model as suggested by a number of evaluation researchers (*c.f.*, §6.2);
- tested the reliability and validity of the existence of feedback model, using multiple stakeholder viewpoints (*c.f.*, §6.2).

7.3 Implications to Researchers

There are several limitations of the research described in this thesis which could provide a springboard for further research. The limitations come in two forms: firstly, those associated with the concepts and their operationalisation, and secondly, those associated with the research methodology.

7.3.1 Conceptual Limitations and Further Research

The conceptual model of feedback presence used in this research comprises three main components: monitoring, reviewing and updating. Even though each has been operationalised through the measurement of both formal and informal elements of each component, each question represents a single indicant measuring a slightly different facet of feedback. In other words, the measurement scale could have achieved greater validity had multiple indicants been used to measure each component. However, given the absence of empirical data regarding feedback and therefore no knowledge as to whether it exists or not in practice, a more detailed measurement scale at this stage was deemed to be too complex.

Many factors are involved in ISP success. While this research provides evidence to suggest that directional feedback is one of them, it has been assumed that motivational feedback³ is already present within those organisations exhibiting directional feedback. Directional feedback is a necessary but not sufficient condition for change to occur - as with any activity recommending alterations to the status quo within the organisation, there must also be motivation to change. Further research should investigate the presence of motivational as well as directional feedback within organisations and a study made of the relationship between the two and how they influence ISP success.

While motivational feedback deals with those contextual factors which help to initiate and support change within the organisation, there may be other contextual factors which influence either the feedback methodology or content, thus providing a contingency perspective to feedback. While this research identifies some contextual factors that seem to be related to ISP system feedback in particular, further research should seek to validate these and investigate in more depth the nature of these relationships. In particular, the relationship between the presence of feedback and a learning environment could be explored more thoroughly than it has been here by using a multi-dimensional construct to measure the concept of a learning environment (*e.g.*, Pedler *et al.*, 1991; Jones & Hendry, 1992). Feedforward, a related concept to feedback, could also be investigated further than has been possible in this research.

Another limitation of this research is that it does not adequately address the notion of tacit knowledge/experience of IS Planners and planning participants which, while not captured by any formal processes, are nevertheless fed back into the planning activity in order to improve it. While this research

³ Directional feedback identifies what needs to be changed whereas motivational feedback provides the will to change.

measures informal aspects of the feedback activity, which hopefully captures some of this knowledge/experience, a better measure of the tacit feedback needs to be conceptualised and operationalised to ensure that all aspects of feedback are measured.

Finally, a further area of research, which is not associated with a limitation but more with the boundaries drawn around the current investigation, is the application of the feedback model within the wider organisational context. Applying the feedback model to other activities within the organisation, such as business planning, will help to establish whether there is a lack of feedback in general or just with regards to ISP.

7.3.2 Methodological Limitations and Further Research

One of the major limitations concerns the sampling frame chosen. The frame used in this research comprised personal, institutional and external mailing list contacts, chosen primarily because of the availability of named individuals to whom the questionnaire could be sent. The use of a such a sampling frame implies that the research results should be applied with caution to the population from which the sample was drawn. However, given no empirical ISP feedback research exists to date, the results of this research provide some tentative conclusions as to what could be happening in the population as a whole.

It should be noted, however, that while a random sample is needed to make the results generalisable, in practice, samples can rarely be said to retain their random properties even if a random sample has initially been drawn from the population. Bias can be introduced at each stage of the research process (*e.g.*, non-respondent bias, interpretation and presentation of results). However, if the researcher is aware of each type of bias then they can proactively seek to minimise it or at least take it into account during data analysis and interpretation.

In order to provide additional external validity (and therefore generalisability) to these results, longitudinal research should be carried out within organisations in order to study the phenomenon of feedback in more detail. This type of research design will not only provide a better understanding of the activities of feedback in place but will also allow the researcher to study in more detail the content components of feedback (*i.e.*, context, input and output) which have only been touched on in this research.

Another methodological limitation concerns the profile of the respondents. Different stakeholder viewpoints were sought from each organisation in an attempt to reduce bias and therefore provide a more balanced view of 'reality'. However, it should be noted that while the different respondents were not all IS personnel, they were all participants in the ISP activity, and this could have introduced some bias. To gain a broader picture of current practice, organisational members not participating in the ISP activity could have been polled to measure their perceptions of ISP success.

Finally, given the current research was only conducted within UK organisations, other researchers could implement the same research instrument in different countries in order to provide an international dimension with relation to the existence of feedback.

7.3.3 Further Analyses

Further analyses not central to the current research question but nevertheless interesting avenues of future study, include:

- identification of ISP success factors specific to different organisational types (*e.g.*, public vs private, service vs non-service); this will help to produce a better tailored system-oriented evaluation tool for particular types of organisations;
- exploration of how each item constituting the construct of ISP success relates specifically to feedback thus providing avenues of future research as to why particular relationships exist;
- identification of appropriate weights for each item constituting the construct of ISP success in order to establish a better (more realistic) overall measure. Different weights could be identified for different types of organisation since some items may be more important in some than others;
- identification of the underlying dimensions of the ISP effectiveness construct in order to provide a better understanding of ISP success;
- identification of factors that discriminate between organisations with high and low feedback, the results of which could be used by researchers to determine which organisations are more likely to exhibit feedback;
- validation of the multi-dimensional systems model used to categories ISP factors;
- validation of the system-oriented evaluation tool identified in this research. Further research could usefully seek to validate these items as a measure of ISP success in a similar way to which the goal-oriented evaluation tool was validated in this research.

7.4 Implications to Practitioners

The results of this research suggest that practitioners should actively seek to establish procedures, whether they be formal or informal, to monitor, review and update their ISP system. Figure 7.1 provides a flow diagram of how ISP system feedback may work in practice.

The ISP cycle should start with some agreement as to what constitutes ISP success, the level of success which is 'acceptable'⁴ and how it should be measured which may require mechanisms to be built into the planning activity. A key lesson to be drawn from the work of Galliers (1987b), among others, is the need for both IS professional, senior management and other stakeholders not only to agree on this measure but also to act as the final evaluators. Recommendations made at the end of the last planning

⁴ It is unrealistic to expect ISP within any organisation to be 100% successful and trying to achieve this could be a waste of time and resources due to the law of diminishing returns. As a consequence, an 'acceptable' level of success should be agreed upon by different stakeholders in order to measure the ISP activity against.

cycle regarding updates to the ISP system, should also be reviewed to ensure they are still appropriate given the change in the environment between cycles. Based on these activities, the ISP system should then be updated.

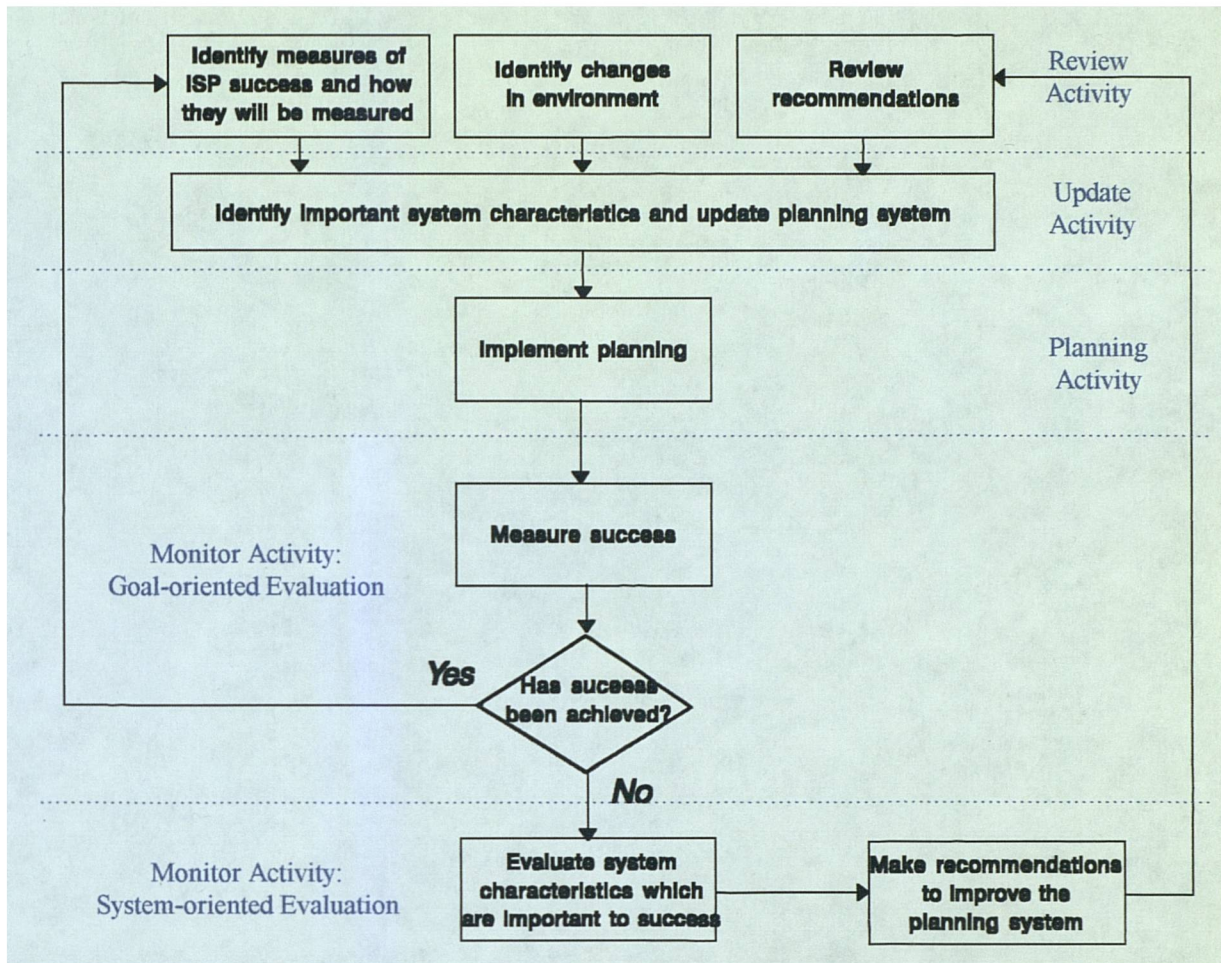


Figure 0.1 - A flow diagram of ISP system feedback in practice

After the planning activity has been completed, ISP success, as perceived from different stakeholder viewpoints, should be assessed. Using a goal-oriented focus to evaluation at this stage allows the organisation to assess whether or not the level of acceptable success set at the start has been achieved. If it has not, then a system-oriented focus to evaluation should be undertaken in order to determine how the ISP system can be improved (*i.e.*, monitor and review stage). Recommendations are then implemented during the next planning cycle (*i.e.*, update stage).

The system-oriented focus to evaluation involves the assessment of ISP system characteristics that are known to be related to ISP success. Organisations can use those ISP system characteristics identified by this research as a foundation on which to build their own tailored-made system-oriented evaluation tool. Additional characteristics can be identified by organisations using the multi-dimensional ISP model (*i.e.*, systems view of ISP) as a framework for further discussion (*c.f.*, Figure 2.5). This will help to ensure all dimensions of ISP are taken into consideration during evaluation (*i.e.*, monitoring).

Epilogue

This research has shown that a significant positive relationship exists between ISP success and ISP systems feedback yet only a minority of organisations exhibit the three main components of monitoring, reviewing and updating. While there is some awareness of the need to monitor, review and update the IS plan, organisations seem to be less aware of the need to monitor, review and update the ISP activity itself. The lack of ISP system feedback within organisations may provide the key to why problems identified by ISP researchers nearly a decade ago are still being identified as problems today.

Appendix A

References (alphabetically)

- [63] Anderssen & MacDonald-Taylor, 1983
 [74] Armstrong, 1982
 [55] Atkinson, 1992
 [83] Ball, 1982
 [59] Barwise *et al.*, 1986
 [115] Blair, 1987
 [6] Bowman *et al.*, 1983
 [45] Boynton & Zmud, 1987
 [12] Brancheau & Wetherbe, 1987
 [43] Camillus, 1975
 [20] Cash *et al.*, 1983
 [78] Davenport *et al.*, 1992
 [67] Davis & Olson, 1985
 [98] DiGuilio & Zinn, 1987
 [80] Doll & Ahmed, 1983
 [3] Dyson & Foster, 1983a
 [29] Dyson, 1990
 [31] Earl *et al.*, 1988
 [88] Earl, 1983
 [22] Earl, 1989
 [93] Earl, 1990a
 [41] Earl, 1993
 [27] Edwards, 1989
 [53] Ein-dor & Segev, 1978a
 [75] Ein-Dor & Segev, 1978b
 [107] Emberton, 1987
 [112] Foster & Foster, 1982
 [69] Fredrickson & Iaquinto, 1989
 [92] Galbraith, 1973
 [65] Galliers *et al.*, 1994b
 [90] Galliers, 1986a
 [42] Galliers, 1987c
 [91] Galliers, 1990a
 [89] Grindley, 1985
 [84] Grindley, 1991
 [56] Gupta, 1989
 [35] Hall, 1977
 [76] Handy, 1985
 [52] Harris, 1989
 [8] Hartog & Herbert, 1986
 [109] Henderson, 1990
 [57] Hoffer *et al.*, 1989
 [1] Holloway & King, 1979
 [106] Jessup & Kukalis, 1990
 [79] Johnson, 1984
 [61] Karimi, 1988
 [21] Kay *et al.*, 1980
 [39] Kemerer & Sosa, 1988
 [48] King & Cleland, 1977
 [15] King & Cleland, 1978
 [54] King & Sabherwal, 1992
 [16] King, 1980
 [13] King, 1983
 [18] King, 1988
 [68] Kling, 1980
 [33] Kukalis, 1991
 [85] Lederer & Mendelow, 1988b
 [58] Lederer & Mendelow, 1986a
 [72] Lederer & Mendelow, 1993
 [40] Lederer & Sethi 1988a
 [102] Lederer & Sethi, 1991
 [101] Lederer & Sethi, 1992b
 [95] Lee, 1993
 [70] Lichfield *et al.*, 1975
 [60] Lin, 1991
 [82] Locke *et al.*, 1981
 [38] Lorange, 1982
 [81] Lyles & Lenz, 1982
 [87] McLean & Soden, 1977
 [77] Martino, 1983
 [100] McFarlan *et al.*, 1983b
 [103] McFarlan, 1971
 [114] McFarlan, 1984
 [104] Minzberg, 1994
 [111] Mumford & Pettigrew, 1975
 [66] Nadler, 1977
 [110] Nath, 1989
 [28] O'Connor, 1993
 [108] Pellegrinelli & Bownan, 1994
 [19] Premkumar & King, 1991
 [25] Premkumar & King, 1992
 [9] Pyburn, 1983
 [36] Quinn, 1981
 [23] Raghunathan & Raghunathan, 1988
 [10] Raghunathan & Raghunathan, 1990
 [30] Raghunathan & Rahunathan, 1994
 [97] Raghunathan, 1985
 [46] Raimond & Eden, 1990
 [14] Ramanujam & Venkatraman, 1987a
 [44] Ramanujam, *et al.*, 1986
 [105] Reck & Reck, 1989
 [71] Reid, 1989
 [96] Reponen, 1990
 [32] Saaksjarvi, 1988
 [49] Sambamurthy *et al.*, 1993
 [37] Schaffir, 1976
 [62] Scott-Morton, 1991
 [26] Sinclair, 1986
 [4] Singleton *et al.*, 1988
 [34] Sinha, 1990
 [73] Steiner, 1979
 [24] Sullivan, 1985
 [2] Taylor, 1979
 [11] Ugboro, 1991
 [7] Venkatraman & Ramanujam, 1987
 [64] Venkatraman, 1989
 [113] Waibel, 1987
 [5] Ward *et al.*, 1990
 [50] Wightman, 1987
 [86] Wilson, 1989
 [51] Young, 1987
 [99] Zachman, 1982
 [17] Zani, 1970
 [94] Zuthsi, 1981
 [47] Zviran, 1990

References (numerically)

N.b. For authors appearing more than once in the list, repeated factors are recorded under the most recent reference only

- | | | |
|---------------------------------------|---|--------------------------------------|
| [1] Holloway & King, 1979 | [59] Barwise <i>et al.</i> , 1986 | [88] Earl, 1983 |
| [2] Taylor, 1979 | [60] Lin, 1991 | [89] Grindley, 1985 |
| [3] Dyson & Foster, 1983a | [61] Karimi, 1988 | [90] Galliers, 1986a |
| [4] Singleton <i>et al.</i> , 1988 | [62] Scott-Morton, 1991 | [91] Galliers, 1990a |
| [5] Ward <i>et al.</i> , 1990 | [63] Anderssen & MacDonald-Taylor, 1983 | [92] Galbraith, 1973 |
| [6] Bowman <i>et al.</i> , 1983 | [64] Venkatraman, 1989 | [93] Earl, 1990a |
| [7] Venkatraman & Ramanujam, 1987 | [65] Galliers <i>et al.</i> , 1994b | [94] Zuthsi, 1981 |
| [8] Hartog & Herbert, 1986 | [66] Nadler, 1977 | [95] Lee, 1993 |
| [9] Pyburn, 1983 | [67] Davis & Olson, 1985 | [96] Reponen, 1990 |
| [10] Raghunathan & Raghunathan, 1990 | [68] Kling, 1980 | [97] Raghunathan, 1985 |
| [11] Ugboro, 1991 | [69] Fredrickson & Jaquinto, 1989 | [98] DiGiulio & Zinn, 1987 |
| [12] Brancheau & Wetherbe, 1987 | [70] Lichfield <i>et al.</i> , 1975 | [99] Zachman, 1982 |
| [13] King, 1983 | [71] Reid, 1989 | [100] McFarlan <i>et al.</i> , 1983b |
| [14] Ramanujam & Venkatraman, 1987a | [72] Lederer & Mendelow, 1993 | [101] Lederer & Sethi, 1992b |
| [15] King & Cleland, 1978 | [73] Steiner, 1979 | [102] Lederer & Sethi, 1991 |
| [16] King, 1980 | [74] Armstrong, 1982 | [103] McFarlan, 1971 |
| [17] Zani, 1970 | [75] Ein-Dor & Segev, 1978b | [104] Minzberg, 1994 |
| [18] King, 1988 | [76] Handy, 1985 | [105] Reck & Reck, 1989 |
| [19] Premkumar & King, 1991 | [77] Martino, 1983 | [106] Jessup & Kukalis, 1990 |
| [20] Cash <i>et al.</i> , 1983 | [78] Davenport <i>et al.</i> , 1992 | [107] Emberton, 1987 |
| [21] Kay <i>et al.</i> , 1980 | [79] Johnson, 1984 | [108] Pellegriinelli & Bownan, 1994 |
| [22] Earl, 1989 | [80] Doll & Ahmed, 1983 | [109] Henderson, 1990 |
| [23] Raghunathan & Raghunathan, 1988 | [81] Lyles & Lenz, 1982 | [110] Nath, 1989 |
| [24] Sullivan, 1985 | [82] Locke <i>et al.</i> , 1981 | [111] Mumford & Pettigrew, 1975 |
| [25] Premkumar & King, 1992 | [83] Ball, 1982 | [112] Foster & Foster, 1982 |
| [26] Sinclair, 1986 | [84] Grindley, 1991 | [113] Waibel, 1987 |
| [27] Edwards, 1989 | [85] Lederer & Mendelow, 1988b | [114] McFarlan, 1984 |
| [28] O'Connor, 1993 | [86] Wilson, 1989 | [115] Blair, 1987 |
| [29] Dyson, 1990 | [87] McLean & Soden, 1977 | |
| [30] Raghunathan & Raghunathan, 1994 | | |
| [31] Earl <i>et al.</i> , 1988 | | |
| [32] Saaksjarvi, 1988 | | |
| [33] Kukalis, 1991 | | |
| [34] Sinha, 1990 | | |
| [35] Hall, 1977 | | |
| [36] Quinn, 1981 | | |
| [37] Schaffir, 1976 | | |
| [38] Lorange, 1982 | | |
| [39] Kemmer & Sosa, 1988 | | |
| [40] Lederer & Sethi 1988a | | |
| [41] Earl, 1993 | | |
| [42] Galliers, 1987c | | |
| [43] Camillus, 1975 | | |
| [44] Ramanujam, <i>et al.</i> , 1986 | | |
| [45] Boynton & Zmud, 1987 | | |
| [46] Raimond & Eden, 1990 | | |
| [47] Zviran, 1990 | | |
| [48] King & Cleland, 1977 | | |
| [49] Sambamurthy <i>et al.</i> , 1993 | | |
| [50] Wightman, 1987 | | |
| [51] Young, 1987 | | |
| [52] Harris, 1989 | | |
| [53] Ein-dor & Segev, 1978a | | |
| [54] King & Sabherwal, 1992 | | |
| [55] Atkinson, 1992 | | |
| [56] Gupta, 1989 | | |
| [57] Hoffer <i>et al.</i> , 1989 | | |
| [58] Lederer & Mendelow, 1986a | | |

Measurement Scale:

<i>Nominal</i>	N
<i>Ordinal (using Likert scale)</i>	O
<i>Ratio</i>	R

Dimension:

<i>Context (U)</i>	Uncontrollable contextual factor
<i>Context (P)</i>	Partially controllable contextual factor

All controllable contextual factors have been shown as either inputs and/or outputs

Scale
N
N
N
N
N

A.1 PART I - General Information

SECTION 1: Personal Details
1. Level of management
2. Number of reporting level between participant and CEO
3. Level of participant in organisations
4. Level at which participants is involved in IS planning
5. Major role of participant in ISP

SECTION 2: Organisational Details	References	Dimension	Scale
6. Industry sector?	[19]; [60]; [77]; [79];	Context (U)	N
7. Primary activity of organisation in this sector?	[60]; [77];	Context (U)	N
8. Type of organisations?	[40]; [53]; [60]; [77]; [79];	Context (U)	N
9. Which factor most influences the structure of the organisation?	[77];	Context (U)	N
10. Total number of employees? (<i>Surrogate for size of organisation</i>)	[38]; [52]; [53]; [60]; [77]; [79]; [80]; [100];	Context (U)	R
11. Annual turnover/budget? (<i>Surrogate for size of organisation</i>)	[38]; [52]; [53]; [60]; [77]; [79]; [80]; [100];	Context (U)	R

SECTION 3: The IS/IT Environment	References	Dimension	Scale
12. Annual IT budget (including h/w, s/w and staff) (<i>used to find % IT Spend</i>)	[10]; [20]; [25]; [26]; [28]; [39]; [45]; [52]; [60]; [114]; [42]; [49]; [9]; [52]; [73]; [77]; [77]; [9]; [38]; [40]; [42]; [52]; [53]; [60]; [61]; [73]; [94]; [103]; [2]; [4]; [45]; [46]; [48]; [56]; [78];	Context (P)	R
13. Role of IS (<i>using McFarlans strategic grid</i>)		Context (P)	N
14. Disruption caused if all IT systems were to shutdown		Context (P)	N
15. Structure of IS organisation		Context (P)	N
16. Which factor most influences the structure of IS organisation		Context (P)	N
17. Type of IS organisation: profit vs cost centre?		Context (P)	N
18. Reporting levels between top IS manager and CEO		Context (P)	N
19. Information political environment		Context (P)	O

SECTION 4: The General Planning Environment	References	Dimension	Scale
<p>20. Does organisation have an IS plan?</p> <p>21. How often does IS planning take place?</p> <p>22. How long has organisation been doing ISP? (<i>Maturity in ISP</i>)</p> <p>23. Strategic planning horizons of IS plans?</p> <p>24. How long does ISP take (<i>i.e.</i>, the length of the planning cycle)?</p> <p>25. Is there a budget for ISP?</p> <p>26. Major objective/focus of planning?</p> <p>27. Relationship between ISP and business planning?</p> <p>28. Does IS planner participate in business planning?</p> <p>29. Is IS planner kept fully informed of changes in the business?</p> <p>30. Management level of ISP sponsor?</p> <p>31. Management level of ISP champion?</p> <p>32. Major role of Champion and internal/external consultant?</p> <p>33. General approach taken to ISP (<i>using Earls 5 Approaches</i>)?</p> <p>34. Amount of participation by stakeholders in each stage of planning?</p> <p>35. Extent to which different information gathering/reporting mechanisms were used in each stage of planning?</p> <p>36. Where the main decision making stage of ISP takes place?</p> <p>37. Main focus of IS identified by the current IS plan?</p>	<p>[58]; [75]; [97]; [97];</p> <p>[38]; [42]; [44]; [52]; [53]; [54]; [60]; [1]; [24]; [25]; [32]; [40]; [45]; [52]; [53]; [56]; [57]; [58]; [60]; [61];</p> <p>[32]; [40]; [41]; [60]; [61]; [97];</p> <p>[4]; [5]; [11]; [14]; [18]; [20]; [25]; [28]; [29]; [30]; [32]; [33]; [34]; [37]; [38]; [41]; [42]; [43]; [46]; [47]; [52];</p> <p>[4]; [17]; [20]; [25]; [28]; [32]; [38]; [41]; [42]; [47]; [52]; [57]; [60]; [61]; [84]; [85]; [87]; [97]; [109]; [110];</p> <p>[19]; [40]; [51]; [57];</p> <p>[10]; [11]; [27]; [38]; [40]; [41]; [42]; [57]; [73]; [104];</p> <p>[27]; [38]; [57]; [76]; [97];</p> <p>[1]; [2]; [22]; [27]; [32]; [38]; [40]; [46]; [57]; [65]; [70]; [111];</p> <p>[41]; [57];</p> <p>[5]; [11]; [14]; [17]; [23]; [25]; [28]; [38]; [41]; [51]; [57]; [59]; [61]; [63]; [77]; [83]; [86]; [87]; [89]; [91]; [94]; [95]; [96]; [102]; [96];</p> <p>[5]; [46]; [52]; [57]; [52]; [57];</p>	<p>Output</p> <p>Input</p> <p>Context (U)</p> <p>Output</p> <p>Input</p> <p>Input</p> <p>Input/Output</p> <p>Context (P)</p> <p>Context (P)</p> <p>Context (P)</p> <p>Context (P)</p> <p>Context (P)</p> <p>Input</p> <p>Methodology</p> <p>Input/Process</p> <p>Methodology</p> <p>Process</p> <p>Output</p>	<p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>O</p> <p>O</p> <p>N</p> <p>N</p>

Section 5: The External Organisational/IT Environment		References	Dimension	Scale
38.	Heterogeneity, dynamism and hostility of external environment?	[8]; [9]; [12]; [35]; [37]; [44]; [49]; [52]; [54]; [57]; [60]; [61]; [77]; [85]; [86]; [87]; [88]; [89]; [90]; [94];	Context (U)	O
39.	Organisation's industry use of information	[52]; [60];	Context (U)	O
40.	Availability of necessary resources and skills in market place	[39]; [53];	Context (U)	O
41.	Organisation's industry sector's use of IT	[52]; [60];	Context (U)	N
Section 6: The Internal Organisational Environment		References	Dimension	Scale
42.	Organisational Culture	[5]; [9]; [15]; [20]; [25]; [28]; [35]; [38]; [42]; [44]; [45]; [52]; [54]; [57]; [60]; [61]; [73]; [76]; [94]; [95]; [100];	Context (U)	N
Section 7: The Internal Organisational Environment		References	Dimension	Scale
43.	Within the organisation:	[10]; [11]; [13]; [14]; [15]; [20]; [25]; [35]; [38]; [39]; [41]; [52]; [57]; [60]; [61]; [70]; [81]; [87]; [94]; [104]; [106];	Context (P)	O
a)	the environment is highly conducive to IS planning;	[11]; [13]; [34]; [35]; [38]; [41]; [42]; [57]; [70]; [97]; [111];	Context (U)	O
b)	managers are <u>actively</u> encouraged (through, for example, the organisation's reward system) to do effective <u>strategic (long range)</u> IS planning;	[43]; [48];	Context (P)	O
c)	people are <u>actively</u> encouraged to question underlying organisational policy/goals;	[2]; [38];	Context (P)	O
d)	if something goes wrong you can expect support in learning lessons from it;	[1]; [14]; [38]; [43]; [52]; [57]; [60]; [70]; [73]; [111];	Context (P)	O
e)	innovative solutions to problems are <u>actively</u> encouraged;	[38]; [60];	Context (P)	O
f)	an individual's intuition is accepted as a valid tool in decision making;	[6]; [9]; [21]; [38]; [39]; [41]; [76]; [77]; [80]; [84]; [85]; [87]; [89];	Context (P)	O
g)	the IS staff have credibility with the rest of the organisation;	[9]; [38]; [39]; [49]; [61]; [63]; [73]; [87]; [100]; [42]; [53]; [62];	Context (P)	O
h)	the top IS manager has a close working relationship with top management;	[4]; [6]; [9]; [11]; [25]; [26]; [28]; [38]; [39]; [41]; [42]; [44]; [45]; [52]; [60]; [62]; [63]; [85]; [86];	Context (P)	O
i)	non-IS staff readily accept the introduction of IS/IT;		Context (P)	O
j)	non-IS staff have an appropriate shared vision of the role of IT/IS within the organisation;		Context (P)	O

k) there is commitment to IS <u>planning</u> by the major stakeholders;	[3]; [5]; [14]; [28]; [38]; [40]; [45]; [61]; [73]; [74]; [77]; [83]; [86]; [87]; [89]; [91]; [93]; [94]; [95]; [98];	Context (P)	O
l) the IS planning objectives are made <u>explicit</u> ;	[2]; [3]; [13]; [15]; [52]; [57]; [66]; [82];	Input	O
m) <u>realistic</u> IS planning objectives/goals are set;	[5]; [13]; [28]; [42]; [62]; [111]; [112];	Input	O
n) <u>good quality</u> business plans are produced.	[10]; [18]; [19]; [41]; [77]; [83]; [85]; [87]; [89]; [90];	Context (U)	O

A.2 PART II - THE INFORMATION SYSTEMS PLANNING ACTIVITY

44. Participants clearly know what to expect from the:	References	Dimension	Scale
a) IS planning process itself (<i>i.e.</i> , understanding how the planning is to be done);	[10]; [25]; [35]; [38]; [41]; [61]; [65]; [70]; [73]; [94]; [95]; [98];	Input	O
b) contents of the plan (<i>i.e.</i> , the deliverables from the planning process).	[3]; [5]; [41]; [42]; [57]; [61]; [73]; [95]; [98]; [102];	Input	O

45. Within the organisation:	References	Dimension	Scale
a) automated tools and other computer support are important to IS planning;	[1]; [5]; [13]; [22]; [28]; [55]; [57]; [64]; [101]; [106];	Method	O
b) there are adequate resources available for <u>each stage</u> of IS planning;	[3]; [5]; [10]; [13]; [14]; [25]; [38]; [41]; [52]; [53]; [57]; [61]; [83]; [94]; [111];	Input	O
c) the <u>best people</u> are made available during <u>each stage</u> of IS planning;	[5]; [28]; [38]; [101];	Input	O
d) an appropriate <u>number</u> of people take part in the IS planning process.	[14]; [40]; [76];	Input	O

46. The IS planning methodology used:	References	Dimension	Scale
a) is too complicated;	[38]; [41]; [42]; [57];	Methodology	O
b) is too bureaucratic;	[38]; [40]; [41]; [73];	Methodology	O
c) is adequately documented to provide an overview of the study and the steps to be taken;	[5]; [101];	Methodology	O
d) is flexible, adapting to the needs of the participants, resources, information available and/or changes in the planning environment as they arise.	[14]; [18]; [38]; [40]; [42]; [52]; [57]; [58]; [60]; [61]; [73]; [111];	Methodology	O

47. The IS planning process is <u>good</u> at:	References	Dimension	Scale
a) <i>anticipating</i> potential problems before they arise;	[7]; [38]; [42]; [66]; [73]; [76]; [111]; [4]; [42]; [49]; [66]; [76]; [111]; [35]; [49]; [66]; [76]; [111]; [66]; [76]; [111]; [2]; [66]; [105]; [111];	Process	O
b) <i>encouraging</i> debate among participants;		Process	O
c) <i>seeking</i> a consensus among participants;		Process	O
d) <i>dealing</i> with sources of conflict;		Process	O
e) <i>making</i> use of the IS planning participants skills/abilities;		Process	O
f) <i>meeting</i> individual participants needs (e.g. personal development).		Process	O
48. The IS planner has the necessary:	References	Dimension	Scale
a) expertise to carry out IS planning effectively;	[2]; [3]; [28]; [35]; [39]; [42]; [56]; [57]; [63]; [66]; [94]; [95]; [99]; [101]; [38]; [41]; [42]; [57]; [76]; [94]; [100];	Input	O
b) credibility within the organisation to carry out IS planning effectively.		Input	O
49. The IS planning participants:	References	Dimension	Scale
a) represent the major stakeholder groups in the organisation;	[2]; [3]; [5]; [6]; [35]; [41]; [45]; [46]; [48]; [55]; [56]; [57]; [59]; [83]; [85]; [102]; [106]; [111]; [114]; [28]; [38]; [40]; [41]; [6]; [13]; [66]; [71]; [105]; [66]; [66]; [2]; [28]; [38]; [42]; [49]; [57]; [66]; [73]; [76]; [99]; [101]; [106]; [111]; [5]; [38]; [66]; [76]; [111]; [40]; [66]; [76]; [95]; [35]; [40]; [66]; [76]; [95];	Input	O
b) find the amount of time required to complete the ISP acceptable;		Input	O
c) <u>agree</u> on the objectives/goals of the IS planning;		Input	O
d) are <u>equally</u> involved in the decision making;		Process	O
e) openly express their feelings/fears;		Process	O
f) are skilled/experienced in planning;		Input	O
g) have a clear understanding of the role & responsibilities each of them is expected to have in the <u>planning process</u> ;		Input	O
h) are effective at problem solving;		Input	O
i) are effective at making decisions.		Input	O
50. Support/control structures are <u>important</u> to ISP	[2]; [5]; [22]; [25]; [32]; [45]; [51]; [52]; [53]; [61]; [63]; [72]; [73]; [76]; [92]; [97]; [101]; [105]; [113]; [115];	Input	O

51. As part of ISP:	<i>References</i>	<i>Dimension</i>	<i>Scale</i>
a) time is put aside for deciding <u>how IS planning should be done</u> (<i>i.e.</i> , planning to plan);	[5]; [38]; [65];	Methodology	O
b) a plan of work (identifying stages, time scales and checkpoints) is developed;	[4]; [5]; [38]; [63]; [70];	Methodology	O
c) <u>how</u> other organisations do their <u>IS planning</u> is investigated (benchmarking);	[1]; [5]; [28]; [26]; [40]; [63];	Methodology	O
d) the previous approach taken to IS planning is reviewed to ensure it is still appropriate to the needs of the organisation;	[3]; [64]; [69]; [111];	Methodology	O
e) broad criteria by which <u>alternative solutions</u> to a problem may be compared are agreed upon;	[5]; [40]; [41]; [42]; [58]; [62];	Methodology	O
f) priorities by which <u>competing projects</u> in the final plan may be evaluated are agreed upon;	[6]; [42];	Methodology	O
g) an assessment is done as to whether or not the organisation has the necessary resources (including internal expertise) to do IS planning.			
52. During ISP:	<i>References</i>	<i>Dimension</i>	<i>Scale</i>
a) it is <u>easy</u> to obtain the necessary information needed to plan effectively;	[3]; [18]; [56]; [57];	input/method	O
b) the information used to generate the plan is <u>reliable</u> ;	[3]; [11]; [38]; [40]; [57]; [67];	input	O
c) it is <u>easy</u> to translate the business needs into information requirements;	[57];	method	O
d) it is <u>easy</u> to incorporate <u>new</u> information at <u>any</u> stage of the planning process as they arise	[3];	Methodology	O
53. During ISP, participants are <u>good</u> at <u>analysing</u> the:	<i>References</i>	<i>Dimension</i>	<i>Scale</i>
a) impact on the organisation of internal/external environmental constraints/issues;	[2]; [3]; [4]; [5]; [11]; [12]; [37]; [38]; [40]; [41]; [42]; [45]; [48]; [58]; [64];	Methodology	O
b) business strategy;	[4]; [5]; [6]; [10]; [18]; [25]; [28]; [32]; [41]; [42]; [45]; [47]; [58]; [102]; [103]; [105]; [107];	Methodology	O
c) external IT environment (<i>e.g.</i> , trends);	[5]; [6]; [14]; [19]; [20]; [40]; [41]; [45]; [48]; [85]; [86]; [97]; [103]; [107];	Methodology	O
d) internal expertise/skills base in order to assess capability of the organisation in delivering the IS proposed by the plan;	[5]; [6]; [28]; [38]; [42]; [97];	Methodology	O

e) impact of different political viewpoints on the decisions taken;	[2]; [4]; [28]; [45]; [46]; [48]; [56]; [86]; [95]; [111];	Methodology	○
f) other organisations <u>use</u> of IS/IT (benchmarking);	[45]; [48];	Methodology	○
g) current usage of IS/IT in the organisation (<i>i.e.</i> , hardware, software & information audit);	[5]; [6]; [42]; [45]; [86]; [102]; [103]; [107];	Methodology	○
h) internal strengths/weaknesses of the business with relation to IS/IT;	[1]; [4]; [5]; [6]; [11]; [25]; [38]; [42]; [45]; [48]; [64]; [68];	Methodology	○
i) external opportunities/threats of the business with relation to IS/IT.	[5]; [6]; [11]; [25]; [38]; [40]; [41]; [42]; [45]; [48]; [64]; [68]; [69]; [95];	Methodology	○

54. During ISP the participants are <u>good</u> at <u>identifying</u> :	References	Dimension	Scale
a) <u>solutions</u> with no reference to where the organisation is <u>today</u> in terms of its IS (<i>i.e.</i> , 'out-of-the-box' thinking);	[42];	Methodology	○
b) IS to directly <u>support</u> the <u>formulation</u> of the future business strategy (<i>e.g.</i> , Executive IS);	[5];	Methodology	○
c) IS to <u>deliver</u> and/or <u>drive</u> the business strategy (<i>e.g.</i> , new IS products and/or services);	[5]; [6]; [7]; [39]; [45]; [97];	Methodology	○
d) IS to <u>support</u> the (indirect) achievement of the business strategy/operations (<i>e.g.</i> operational and monitoring & control systems);	[5]; [42]; [97];	Methodology	○
e) <u>existing</u> IS that need to be changed (<i>i.e.</i> , modified, enhanced, divested and/or integrated);	[5]; [97];	Methodology	○
f) the appropriate <u>technology</u> needed to support the proposed IS;	[3]; [5]; [17]; [41]; [42]; [97]; [101];	Methodology	○
g) the necessary <u>management procedures</u> that are needed to ensure the proposed IS are maintained once implemented;	[5]; [19]; [101];	Methodology	○
h) the necessary <u>human resource issues</u> (<i>e.g.</i> , training and education) that need to be addressed for each of the proposed IS;	[3]; [5]; [10]; [28]; [42]; [45]; [85]; [86]; [101]; [107]; [111];	Methodology	○
i) the necessary <u>management of change issues</u> (<i>i.e.</i> , the change in the organisation's structure and culture required) to support the implementation of each of the proposed IS;	[2]; [3]; [5]; [10]; [38]; [42]; [57]; [101]; [111];	Methodology	○
j) appropriate <u>measures of performance</u> for each of the proposed IS.	[42]; [56]; [97];	Methodology	○

55. During ISP the planning participants are <u>good</u> at:	<i>References</i>	<i>Dimension</i>	<i>Scale</i>
a) <i>challenging</i> the established business/technology assumptions & policies; b) <i>comparing</i> the required IS/IT with the existing IS/IT (<i>i.e.</i> , gap analysis); c) <i>evaluating quantitatively</i> the business <u>benefits</u> of alternative IS solutions; d) <i>evaluating qualitatively</i> the business <u>benefits</u> of alternative IS solutions; e) <i>evaluating</i> the business <u>risk</u> associated with alternative IS solutions; f) <i>prioritising</i> projects; g) <i>developing</i> projects schedule clearly identifying the transition from the present to the desired state; h) <i>assigning</i> a project manager (champion) to each IS to be developed; i) <i>allocating</i> sufficient resources to develop, implement and maintain each of the proposed IS; j) <i>developing</i> detailed <u>tactical development plans</u> for each of the proposed IS.	[2]; [48]; [59]; [5]; [3]; [5]; [28]; [42]; [57]; [69]; [74]; [85]; [86]; [97]; [3]; [5]; [28]; [42]; [57]; [69]; [74]; [85]; [86]; [97]; [45]; [60]; [5]; [11]; [28]; [37]; [38]; [41]; [42]; [45]; [72]; [101]; [41]; [43]; [97]; [27]; [31]; [57]; [58]; [108]; [2]; [11]; [16]; [37]; [38]; [42]; [58]; [61]; [70]; [97]; [101]; [5]; [6]; [9]; [15]; [18]; [40]; [41]; [42]; [57]; [97]; [107];	Methodology Methodology Methodology Methodology Methodology Methodology Methodology Methodology Methodology Implementation	O O O O O O O O O O
56. Overall, each of the 6 stages of planning are carried out <u>effectively</u> . 57. An appropriate amount of time is spent in each of the 6 stages. 58. <u>Effective methods</u> are available for each of planning stages.	[11]; [28]; [38]; [41]; [73]; [84]; [85]; [101]; [1]; [2]; [6]; [14]; [24]; [32]; [38]; [53]; [57]; [94];	Methodology Methodology Method	O O O
59. During the IS plans implementation: a) there is a readily identifiable <u>sponsor</u> (<i>person who secures funding</i>) for the <u>implementation</u> task; b) major stakeholders are involved; c) major stakeholders have a clear understanding of the role & responsibilities each of them have in the <u>implementation</u> of the IS plan; d) there is commitment by the major stakeholders to the IS plans <u>implementation</u> ; e) there is commitment of <u>resources</u> for the implementation of the IS plan.	[2]; [5]; [38]; [42]; [56]; [70]; [108]; [46]; [5]; [63]; [111]; [5]; [23]; [28]; [37]; [42]; [46]; [56]; [57]; [62]; [101]; [3]; [6]; [11]; [16]; [25]; [37]; [39]; [40]; [42]; [56]; [58]; [61]; [63]; [97];	Implementation Implementation Implementation Implementation Implementation	O O O O O

60. We move <u>quickly</u> from IS planning into the IS plans implementation.	[57];	Implementation	0
61. The <u>implementation</u> of the IS plan is <u>regularly</u> reviewed.	[51; [46]; [57]; [97];	Implementation	0
	<i>References</i>	<i>Dimension</i>	<i>Scale</i>
62. The IS plan itself:			
a) includes long-range objectives & strategies;	[11]; [33]; [38]; [43]; [45]; [57];	Output	0
b) includes short- to medium- range plans to achieve the long-term strategy;	[43]; [45];	Output	0
c) includes <u>realistic</u> projects in terms of the resources available;	[41];	Output	0
d) contains sufficient information to lend credibility to its promise;	[37]; [42]; [57];	Output	0
e) is <u>used</u> as a working document;	[3]; [18]; [37]; [74]; [87]; [102];	Implementation	0
f) is clearly documented for ease of reference when, for example, changes of policy/direction/circumstances occur;	[42];	Output	0
g) captures all the information and detailed analysis that was developed during the planning cycle;	[5]; [40];	Output	0
h) identifies some IS that are likely to be <u>early</u> successes;	[22]; [38]; [58]; [70];	Output	0
i) includes the alternative solutions to each of the problems identified together with why these were dismissed;	[15]; [18];	Output	0
j) is communicated to all levels of the organisation;	[3]; [7]; [35]; [39]; [57]; [62]; [72]; [74]; [76];	Implementation	0
k) meets stakeholders expectations;	[97]; [106]; [111];		
l) is owned by the major stakeholders.	[41]; [57];	Output	0
	[4]; [45];	Output	0

Appendix B

INFORMATION SYSTEMS RESEARCH UNIT

November, 1994

Dear

Re: Information Systems Planning Survey

Thank you for agreeing to participate in this national survey among IS and general managers into the effectiveness of information systems planning. The purpose of this research is to understand better the opinion of yourself and other experienced practitioners concerning the critical factors that influence the effectiveness of the information systems planning activity. Your answers will enable us to provide you with a general diagnostic planning tool.

The questionnaire has been divided into three parts. Part I collects general background information on yourself and your organisation while Part II collects information specifically relating to the information system planning activity within your organisation. Finally, Part III seeks to gain some assessment of how successful you regard your planning activity to be. Please read the '*Instruction to Respondents*' on the inside cover of the questionnaire before completing it. This questionnaire should take approximately 45 minutes to complete.

In order to gain a range of perspectives with regards to planning effectiveness, we would like to obtain the viewpoints of one or two non-IS participants of your information systems planning activity. If this is possible, please ask each of them to complete one copy of the questionnaire with the blue cover. This questionnaire should take approximately 10 minutes to complete. ***PLEASE ENSURE THAT THE NON-IS RESPONDENTS ANSWERS THE QUESTIONNAIRE WITH RESPECT TO THE SAME LEVEL OF INFORMATION SYSTEMS PLANNING AS YOURSELF.***

Please return the completed questionnaire by **23rd DECEMBER 1994**. All responses will be treated entirely confidentially, no individual or organisation will be named in the results. All respondents will receive a complimentary copy of the report once the research is complete.

If you are now unable to participate in this research, **please will you let us know by return** so we know not to contact you further.

Thank you, in advance, for your time and consideration. We look forward to hearing from you.

Yours sincerely

Bernadette S H Baker
ISRU Manager/Research Fellow

INFORMATION SYSTEMS RESEARCH UNIT

Warwick Business School

University of Warwick

Coventry

CV4 7AL



Researcher: Ms Bernadette Baker
Research Fellow

Information Systems Planning Survey:

(To be completed by the IS Manager/Planner.)

Please return by: 10th March 1995

The results will be treated entirely confidentially. Individual respondents and organisations will not be named in the report. Participants will receive a complimentary copy of the final report.

Instructions to Respondent

Information systems planning (ISP) refers to the process that sets the goals, objectives, strategies and long-term plans for the Information Systems activity.

Stakeholders refer to those people in the organisation who have the power to influence the success/failure of any decisions relating to the introduction of information systems/technology.

IMPORTANT: Please answer all questions with respect to your most recent planning experience in the organisational unit with which you are most familiar (e.g., if you answer the first section with respect to the corporate level of the organisation, please continue to answer all questions at that level).

Many of the questions require you to circle a five point scale (see below). Please indicate the degree to which you agree/disagree that the issue is currently being addressed within your organisation.

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Undecided</i>	<i>Agree</i>	<i>Strongly agree</i>
1	2	3	4	5

Please rate your immediate reaction to each of the statements, do not spend more than a few seconds on each.

Example:	Current situation
The information systems (IS) planning objectives are made explicit.	1 ② 3 4 5

The response to this question indicates that within the organisation the IS planning objectives are currently not made that explicitly (② → disagree). If you **do not** currently address the issue then please circle number 1 (① → strongly disagree).

Stages of Planning

In the questionnaire we have used six stages to represent the process of planning. These are given below with a brief explanation of the contents of each stage.

1) Pre-planning:	Activities that need to be carried out before planning begins.
2) Intelligence:	Searching the environment for conditions calling for decisions. Assessing current strengths, weaknesses, opportunities and threats both internally and externally.
3) Design:	Inventing, developing and analysing possible courses of action. This involves processes to understand the problem, generate solutions, and test solutions feasibility.
4) Choice:	Selecting a course of action from alternatives available and prioritising projects.
5) Implementation:	Implementing the IS plan.
6) Review:	Reviewing the implementation of the IS plan.

PART I - GENERAL INFORMATION

SECTION 1: Personal Details

1. Which level of management are you?

(Please tick one only).

Top management	<input type="checkbox"/>	Lower management	<input type="checkbox"/>
Middle management	<input type="checkbox"/>	Other (please specify):	

2. How many reporting levels between you and the Chief Executive? (Please tick one only).

Direct link	<input type="checkbox"/>	One level	<input type="checkbox"/>	Two levels	<input type="checkbox"/>	Three or more levels	<input type="checkbox"/>
-------------	--------------------------	-----------	--------------------------	------------	--------------------------	----------------------	--------------------------

3. Which of the following best describes your level within the organisation? (Please tick one only).

Corporate	<input type="checkbox"/>	Division	<input type="checkbox"/>	Function	<input type="checkbox"/>	Process	<input type="checkbox"/>	Product	<input type="checkbox"/>	Other (please specify):
-----------	--------------------------	----------	--------------------------	----------	--------------------------	---------	--------------------------	---------	--------------------------	-------------------------

4. What is the main organisational level at which you are involved in IS planning? (Please tick one only).

Corporate	<input type="checkbox"/>	Division	<input type="checkbox"/>	Function	<input type="checkbox"/>	Process	<input type="checkbox"/>	Product	<input type="checkbox"/>	Other (please specify):
-----------	--------------------------	----------	--------------------------	----------	--------------------------	---------	--------------------------	---------	--------------------------	-------------------------

***PLEASE ANSWER THE REMAINDER OF THE QUESTIONNAIRE WITH
RESPECT TO THIS LEVEL OF INFORMATION SYSTEMS PLANNING.***

5. What is your major role in Information Systems Planning? (Please tick one only).

IS Planner/Champion.	<input type="checkbox"/>	Planning participant.	<input type="checkbox"/>	Internal/External Consultant.	<input type="checkbox"/>
Member of <u>support</u> team (providing support for the main planning activity).	<input type="checkbox"/>	Sponsor (person who secures funding for IS planning).	<input type="checkbox"/>	Other (please specify):	

SECTION 2: Organisational Details

6. Which best describes the **industry sector** your organisation is in? (Please tick one only).

Agriculture; Forestry, Fisheries.	<input type="checkbox"/>	Community Services (e.g., Governmental services).	<input type="checkbox"/>	Hotels; Leisure; Catering; Travel; Repairs.	<input type="checkbox"/>
Banking; Finance; Insurance; Business Services; Leasing.	<input type="checkbox"/>	Energy; Water Supply.	<input type="checkbox"/>	Metal Goods; Engineering; Vehicle Industry.	<input type="checkbox"/>
Conglomerates.	<input type="checkbox"/>	Extraction of minerals and ores other than fuels; manufacture of metals, mineral products and chemicals.	<input type="checkbox"/>	Transport; Storage; Communications.	<input type="checkbox"/>
Construction.	<input type="checkbox"/>	Health.	<input type="checkbox"/>	Other (please specify):	

7. What is your organisations **primary activity** in this sector? (Please tick one only).

Manufacturing	<input type="checkbox"/>	Distribution	<input type="checkbox"/>	Retail	<input type="checkbox"/>	Service	<input type="checkbox"/>	Other (please specify):
---------------	--------------------------	--------------	--------------------------	--------	--------------------------	---------	--------------------------	-------------------------

8. Is your organisation: (please tick one of each pair)

Public sector (e.g., Governmental sector?)	<input type="checkbox"/>
Private sector? (e.g., PLC, Ltd)	<input type="checkbox"/>

Diversified?	<input type="checkbox"/>
Specialised?	<input type="checkbox"/>

Centralised?	<input type="checkbox"/>
Decentralised?	<input type="checkbox"/>

9. Which of the following factors **most** influences the structure of your organisation? (Please tick one only).

Product	<input type="checkbox"/>	Market	<input type="checkbox"/>	Function	<input type="checkbox"/>	Don't know	<input type="checkbox"/>
Geography	<input type="checkbox"/>	Process	<input type="checkbox"/>	History	<input type="checkbox"/>	Other (please specify):	

10. Approximately, what is the **total** number of employees in your organisation?

11. Approximately, what was your organisation's **annual turnover/total budget** (if public sector organisation) during the last financial year? (i.e., 1993/94)

£

SECTION 3: The Information Systems/Technology Environment

12. Approximately what was your organisation's **annual IT budget** (including hardware/software & staff) during the last financial year? (i.e., 1993/94)

£

13. Which **best** describes the **main focus** of your: (1) existing; and (2) planned systems (including those currently under development):
(Please tick one in each column only).

	Existing Systems	Planned systems including those currently under development
Critical to achieving the business strategy <u>now</u> .	<input type="checkbox"/>	<input type="checkbox"/>
Critical to achieving the business strategy <u>in the future</u> .	<input type="checkbox"/>	<input type="checkbox"/>
Critical to the business operations.	<input type="checkbox"/>	<input type="checkbox"/>
Valuable but not critical.	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>
Don't know.	<input type="checkbox"/>	<input type="checkbox"/>

14. What disruption would be caused if **all** the IT systems in your organisation were to shutdown for **each** of the following periods of time? (Please tick one in each row).

	No disruption	Little/some disruption	Moderate disruption	Major disruption	Organisations Closure
a) 1 hour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) 1 day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 1 week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) indefinitely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Which of the following **best** describes the structure of the **IS organisation**? (Please tick one only).

Centralised: controlled fully by HQ.	<input type="checkbox"/>
Centralised federal: organised from centre, some input from units.	<input type="checkbox"/>
Decentralised federal: guidelines from centre, primary input from units.	<input type="checkbox"/>
Decentralised: controlled fully by units.	<input type="checkbox"/>
Other (please specify):	

16. Which of the following factors **most** influences the structure of the **IS organisation**? (Please tick one only).

Product	<input type="checkbox"/>	Market	<input type="checkbox"/>	Function	<input type="checkbox"/>	Don't know	<input type="checkbox"/>
Geography	<input type="checkbox"/>	Process	<input type="checkbox"/>	History	<input type="checkbox"/>	Other (please specify):	

17. Is the **IS organisation** a:

profit centre?	<input type="checkbox"/>	cost centre?	<input type="checkbox"/>	Other (please specify):
----------------	--------------------------	--------------	--------------------------	-------------------------

18. How many reporting levels are there between the **top** IS manager and the Chief Executive Officer? (Please tick one only).

Direct link	<input type="checkbox"/>	One level	<input type="checkbox"/>	Two levels	<input type="checkbox"/>	Three or more levels	<input type="checkbox"/>
-------------	--------------------------	-----------	--------------------------	------------	--------------------------	----------------------	--------------------------

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

19. Within your organisation: (please circle a number in each row)

	Current Situation
a) IS/IT professionals see themselves as custodians/owners of the organisation's information. The focus is on categorisation and modelling of the organisation's information assets;	1 2 3 4 5
b) individuals obtain and manage their own information. There is no overall information management policy;	1 2 3 4 5
c) information is managed by individual business units or functions which define their own information needs and report limited information to the overall corporation;	1 2 3 4 5
d) information categories and reporting structures are defined by the organisation's leaders;	1 2 3 4 5
e) consensus is reached by negotiation, about the organisation's key information elements and reporting structures.	1 2 3 4 5

SECTION 4: The General IS Planning Environment20. Does your organisation have an IS plan? (Please tick one only).

A formal plan exists	A plan exists but has not been finalised/formalised	No plan exists ¹	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comment:21. How often does IS planning take place? (Please tick one only).

Every year	1-2 years	3-4 years	5+ years	Continuously	Infrequently	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. For how long has your organisation been doing IS planning? (Please tick one only).

< 1 year	1-2 years	3-4 years	5-9 years	10+ years	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. What is the **strategic** planning horizon for IS plans? (Please tick one only).

< 1 year	1-2 years	3-5 years	6-10 years	10+ years	Don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. How long does IS planning take? (Please tick one only).

< 2 weeks	2 - 4 weeks	1-3 months	3-6 months	6 + months	Continuous	Don't Know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. Is a budget specifically put aside for the IS planning activity?
(Please tick one only).

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Don't Know	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	------------	--------------------------

¹ If no plan exists, substitute IS plan with ISP output for the rest of the questionnaire.

26. Which of the following best describes what is (i.e., current situation)/should be the major objective/focus of your IS planning? (Please tick <u>one</u> in <u>each</u> column)	Current situation	Should be
Strategic/competitive: providing useful long-range objectives for IS; to align IS with business strategy; enhance/identify IT/IS based products/services.	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency/Resource: increasing organisational efficiency/cost reduction; improve the control over IS; improve resource allocation.	<input type="checkbox"/>	<input type="checkbox"/>
Effectiveness: improve co-ordination, communication and/or system integration; improve short- and/or long-term IS performance; improve decision making and management of operations.	<input type="checkbox"/>	<input type="checkbox"/>
Technical/Output: agreed prioritised applications portfolio, IT architecture and/or acquisition; technological leadership; to provide a foundation for subsequent service level agreements and commitment planning programmes.	<input type="checkbox"/>	<input type="checkbox"/>
Intangible: for example, learning, management development, raising awareness of IS potential throughout the organisation and to improve management/IS relations.	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify):

27. Which of the following **best** describes the relationship between IS planning & business planning? (Please tick one only).

Totally independent activities.	<input type="checkbox"/>
IS planning is undertaken separately but inputs into business planning.	<input type="checkbox"/>
Business planning is undertaken separately but inputs into IS planning.	<input type="checkbox"/>
IS planning and business planning are intertwined.	<input type="checkbox"/>
Other (please specify):	

28. Does the IS planner participate in **business planning**?
(Please tick one only).

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Don't Know	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	------------	--------------------------

29. Is the IS planner kept **fully** informed of changes in the business?
(Please tick one only).

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Don't Know	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	------------	--------------------------

30. Who provides the **highest level** of support for the IS planning activity (i.e., the **sponsor**)? (Please tick one only)

Top Management	Middle Management	Lower Management	IS Manager/Executive	Consultants	IS staff/users
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. Who drives the planning activity, taking **responsibility** for its success (i.e., the **champion**)? (Please tick one only)

Top Management	Middle Management	Lower Management	IS Manager/Executive	Consultants	IS staff/users
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. What is the **major** role of the champion and internal/external consultant (if applicable) in IS planning? (Please tick one in each column only):

	Champion	Internal/External Consultant
A process role (i.e., facilitator (manager) of the planning process).	<input type="checkbox"/>	<input type="checkbox"/>
An expert role (i.e., recommender of strategy).	<input type="checkbox"/>	<input type="checkbox"/>
A support role (i.e., member of the support team).	<input type="checkbox"/>	<input type="checkbox"/>
A planning participant only.	<input type="checkbox"/>	<input type="checkbox"/>
Not applicable.	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>

33. In your organisation, which of the following best describes the approach taken to Information System planning?
(Please tick one only).

Develop key themes for IS/IT investments derived from a consensus view of priorities established by a group of senior executives (<i>organisational led, thematic</i>).	<input type="checkbox"/>
Use techniques (e.g., a consultant's methodology) to identify IS needs by analysing business processes and objectives (<i>method driven</i>).	<input type="checkbox"/>
Develop IT architecture as a foundation for expected application needs (<i>technology driven</i>).	<input type="checkbox"/>
Establish IT capital and expense budgets to satisfy approved projects which is essentially wish list based (<i>administrative, resource driven</i>).	<input type="checkbox"/>
Business plans are analysed to identify where IS/IT is most critical to meeting those plans (<i>business led</i>).	<input type="checkbox"/>

34. Please indicate which of the following stakeholders participate in each stage² of the planning. (Please circle the extent of participation). (1 = minimal; 2 = moderate; 3 = a lot; **no circle** = no participation).

	<i>Pre-planning stage</i>	<i>Intelligence stage</i>	<i>Design stage</i>	<i>Choice stage</i>	<i>Implementation stage</i>	<i>Review stage</i>
a) Top Management	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
b) Middle Management	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
c) Lower Management	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
d) IS manager/executive	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
e) IS staff	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
f) Users	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
g) Consultants	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
h) Customers	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
i) Suppliers	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
Others: (please specify)	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

35. Please indicate which of the following information gathering/reporting mechanism are used in each stage of planning. (Please circle the extent of usage). (1 = minimal; 2 = moderate; 3 = a lot; **no circle** = not used).

	<i>Pre-planning stage</i>	<i>Intelligence stage</i>	<i>Design stage</i>	<i>Choice stage</i>	<i>Implementation stage</i>	<i>Review stage</i>
a) Workshop;	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
b) Interviews;	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
c) Open-ended questionnaires;	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
d) Closed-ended questionnaires;	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
e) Formal meetings (formal agenda);	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
f) Informal meetings (e.g., networking)	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
g) Reports.	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
Others (please specify):	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

36. Which of the following **best** describes where the **main** decision making stage of IS planning takes place? (Please tick one only).

During the normal day-to-day running of the organisation.	<input type="checkbox"/>
On-site, but well away from the day-to-day running of the organisation.	<input type="checkbox"/>
Off-site, well away from the day-to-day running of the organisation.	<input type="checkbox"/>
Other (please specify):	

37. What is the **main focus** of the IS identified by the **current** IS plan? (Please tick one only).

Modifications (reworks) to existing systems.	<input type="checkbox"/>
Enhancements to existing systems.	<input type="checkbox"/>
Replacing existing systems.	<input type="checkbox"/>
New developments.	<input type="checkbox"/>
Sustaining current systems.	<input type="checkbox"/>
Other (please specify):	

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

SECTION 5: The External Organisational/IT Environment

38. Your organisation operates in: (please circle a number in each row)

	Current situation
a) a variety of markets requiring a high degree of diversity in marketing and/or production orientations;	1 2 3 4 5
b) an environment in which customer tastes and competitors' actions are highly unpredictable;	1 2 3 4 5
c) a hostile environment (i.e., intense competition).	1 2 3 4 5

39. Within your organisation's industry sector: (please circle a number in each row)

	Current Situation
a) information itself is sold as a product/service;	1 2 3 4 5
b) information is used to add value to the principal services/products being supplied.	1 2 3 4 5

40. In the external IS/IT marketplace it is difficult to find the necessary resources and skills (e.g., human and/or hardware/software) to do what we want to with IT/IS.	1 2 3 4 5
---	-----------

41. Which of the following **best** describes your organisation's industry sector's **use** of IT? (Please tick one only).

IT is the means of delivering goods and services in the sector.	<input type="checkbox"/>
Business strategies increasingly depend on IT for their implementation.	<input type="checkbox"/>
IT potentially provides new strategic opportunities.	<input type="checkbox"/>
IT has no strategic impact in the sector.	<input type="checkbox"/>

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

SECTION 6: The Internal Organisational/IT Environment

42. Which of the following **best** describes your organisation's style of management? (Please tick **one** only).

Autocratic style of management where leadership is controlled by a key figure at centre; Few rules or procedures (little bureaucracy); Individuals not committees make decisions. (<i>Metaphor: Watching the boss</i>).	<input type="checkbox"/>
Organisational strength lies in the functions or specialities co-ordinated at the top by a narrow band of senior mgmt; Formal procedures for organisational roles and communications. (<i>Metaphor: Doing things by the book</i>).	<input type="checkbox"/>
Job or project oriented; Influence is based on expertise rather than position; Top management allocate resources to different projects as appropriate. (<i>Metaphor: Everyone pitches in</i>).	<input type="checkbox"/>
The organisation is subordinate to the individual; Individuals are regarded as central to the organisation; Influence and roles are shared according to expertise; Control mechanisms and management hierarchies are impossible without mutual consent. (<i>Metaphor: The individual is in control</i>).	<input type="checkbox"/>

43. Within your organisation: (please circle a number in each row)	Current situation
a) the environment is highly conducive to IS planning;	1 2 3 4 5
b) managers are actively encouraged (through, for example, the organisation's reward system) to do effective strategic (long range) IS planning;	1 2 3 4 5
c) people are actively encouraged to question underlying organisational policy/goals;	1 2 3 4 5
d) if something goes wrong you can expect support in learning lessons from it;	1 2 3 4 5
e) innovative solutions to problems are actively encouraged;	1 2 3 4 5
f) an individual's intuition is accepted as a valid tool in decision making;	1 2 3 4 5
g) the IS staff have a lot of credibility with the rest of the organisation;	1 2 3 4 5
h) the top IS manager has a close working relationship with top management;	1 2 3 4 5
i) non-IS staff readily accept the introduction of IS/IT;	1 2 3 4 5
j) non-IS staff have an appropriate shared vision of the role of IT/IS within the organisation;	1 2 3 4 5
k) there is commitment to IS planning by the major stakeholders;	1 2 3 4 5
l) the IS planning objectives are made explicit ;	1 2 3 4 5
m) realistic IS planning objectives/goals are set;	1 2 3 4 5
n) good quality business plans are produced.	1 2 3 4 5

PART II - THE INFORMATION SYSTEMS PLANNING PROCESS

44. Participants clearly know what to expect from the:	Current situation
a) IS planning process itself (<i>i.e.</i> , understanding how the planning is to be done);	1 2 3 4 5
b) contents of the plan (<i>i.e.</i> , the deliverables from the planning process).	1 2 3 4 5

45. Within your organisation:	Current situation
a) automated tools and other computer support are important to IS planning;	1 2 3 4 5
b) there are adequate resources available for each stage of IS planning;	1 2 3 4 5
c) the best people are made available during each stage of IS planning;	1 2 3 4 5
d) an appropriate number of people take part in the IS planning process.	1 2 3 4 5

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

46. The IS planning methodology used:	Current situation
a) is too complicated;	1 2 3 4 5
b) is too bureaucratic;	1 2 3 4 5
c) is adequately documented to provide an overview of the study and the steps to be taken;	1 2 3 4 5
d) is flexible, adapting to the needs of the participants, resources, information available and/or changes in the planning environment as they arise.	1 2 3 4 5

47. The IS planning process is <u>good</u> at:	Current situation
a) <i>anticipating</i> potential problems before they arise;	1 2 3 4 5
b) <i>encouraging</i> debate among participants;	1 2 3 4 5
c) <i>seeking</i> a consensus among participants;	1 2 3 4 5
d) <i>dealing</i> with sources of conflict;	1 2 3 4 5
e) <i>making</i> use of the IS planning participants skills/abilities;	1 2 3 4 5
f) <i>meeting</i> individual participants needs (e.g., personal development).	1 2 3 4 5

48. The IS planner has the necessary:	Current situation
a) expertise to carry out IS planning effectively;	1 2 3 4 5
b) credibility within the organisation to carry out IS planning effectively.	1 2 3 4 5

49. The IS planning participants:	Current situation
a) represent the major stakeholder groups in the organisation;	1 2 3 4 5
b) find the amount of time required to complete ISP acceptable;	1 2 3 4 5
c) <u>agree</u> the objectives/goals of the IS planning;	1 2 3 4 5
d) are <u>equally</u> involved in the decision making;	1 2 3 4 5
e) openly express their feelings/fears;	1 2 3 4 5
f) are skilled/experienced in planning;	1 2 3 4 5
g) have a clear understanding of the role & responsibilities each of them is expected to have in the <u>planning process</u> ;	1 2 3 4 5
h) are effective at problem solving;	1 2 3 4 5
i) are effective at making decisions.	1 2 3 4 5

50. Within your organisation, the following support/control structures are <u>important</u> to IS planning:	Current situation
a) information systems steering committee;	1 2 3 4 5
b) task force (temporary group set up for IS planning);	1 2 3 4 5
c) teams (permanent group set up for IS planning);	1 2 3 4 5
d) liaison role (representative from user group liaise with IS/IT staff) ;	1 2 3 4 5
e) an IS planning <u>support</u> team which collects, synthesises and analyses data for input into the planning process.	1 2 3 4 5
Other (please specify):	1 2 3 4 5

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

51. As part of the IS planning process:	Current situation
a) time is put aside for deciding <u>how IS planning should be done</u> (i.e., planning to plan);	1 2 3 4 5
b) a plan of work (identifying stages, time scales and checkpoints) is developed;	1 2 3 4 5
c) <u>how</u> other organisations do their <u>IS planning</u> is investigated (benchmarking);	1 2 3 4 5
d) the previous approach taken to IS planning is reviewed to ensure it is still appropriate to the needs of the organisation;	1 2 3 4 5
e) broad criteria by which <u>alternative solutions</u> to a problem may be compared are agreed upon;	1 2 3 4 5
f) priorities by which <u>competing projects</u> in the final plan may be evaluated are agreed upon;	1 2 3 4 5
g) an assessment is done as to whether or not the organisation has the necessary resources (including internal expertise) to do IS planning.	1 2 3 4 5

52. During IS planning:	Current situation
a) it is <u>easy</u> to obtain the necessary information needed to plan effectively;	1 2 3 4 5
b) the information used to generate the plan is <u>reliable</u> ;	1 2 3 4 5
c) it is <u>easy</u> to translate the business needs into information requirements;	1 2 3 4 5
d) it is <u>easy</u> to incorporate <u>new</u> information at <u>any</u> stage of the planning process as it arises.	1 2 3 4 5

53. During the IS planning process the participants are <u>good</u> at <u>analysing</u> the:	Current situation
a) impact on the organisation of internal/external environmental constraints/issues;	1 2 3 4 5
b) business strategy;	1 2 3 4 5
c) external IT environment (e.g., trends);	1 2 3 4 5
d) internal expertise/skills base in order to assess capability of the organisation in delivering the IS proposed by the plan;	1 2 3 4 5
e) impact of different political viewpoints on the decisions taken;	1 2 3 4 5
f) other organisations <u>use</u> of IS/IT (benchmarking);	1 2 3 4 5
g) current usage of IS/IT in the organisation (i.e., hardware, software & information audit);	1 2 3 4 5
h) internal strengths/weaknesses of the business with relation to IS/IT;	1 2 3 4 5
i) external opportunities/threats of the business with relation to IS/IT.	1 2 3 4 5

54. During the IS planning process the participants are <u>good</u> at <u>identifying</u> :	Current situation
a) <u>solutions</u> with no reference to where the organisation is <u>today</u> in terms of its IS (i.e., 'out-of-the-box' thinking);	1 2 3 4 5
b) IS to directly <u>support the formulation</u> of the future business strategy (e.g., Executive IS);	1 2 3 4 5
c) IS to <u>deliver and/or drive</u> the business strategy (e.g., new IS products and/or services);	1 2 3 4 5
d) IS to <u>support</u> the (indirect) achievement of the business strategy/operations (e.g. operational and monitoring & control systems);	1 2 3 4 5
e) <u>existing</u> IS that need to be changed (i.e., modified, enhanced, divested and/or integrated);	1 2 3 4 5
f) the appropriate <u>technology</u> needed to support the proposed IS;	1 2 3 4 5
g) the necessary <u>management procedures</u> that are needed to ensure the proposed IS are maintained once implemented;	1 2 3 4 5
h) the necessary <u>human resource issues</u> (e.g., training and education) that need to be addressed for each of the proposed IS;	1 2 3 4 5
i) the necessary <u>management of change issues</u> (i.e., the change in the organisation's structure and culture required) to support the implementation of each of the proposed IS;	1 2 3 4 5
j) appropriate <u>measures of performance</u> for each of the proposed IS.	1 2 3 4 5

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

55. During the IS planning process the planning participants are <u>good</u> at:	Current situation
a) <u>challenging</u> the established business/technology assumptions & policies;	1 2 3 4 5
b) <u>comparing</u> the required IS/IT with the existing IS/IT (<i>i.e.</i> , gap analysis);	1 2 3 4 5
c) <u>evaluating quantitatively</u> the business <u>benefits</u> of alternative IS solutions;	1 2 3 4 5
d) <u>evaluating qualitatively</u> the business <u>benefits</u> of alternative IS solutions;	1 2 3 4 5
e) <u>evaluating</u> the business <u>risk</u> associated with alternative IS solutions;	1 2 3 4 5
f) <u>prioritising</u> projects;	1 2 3 4 5
g) <u>developing</u> projects schedule clearly identifying the transition from the present to the desired state;	1 2 3 4 5
h) <u>assigning</u> a project manager (champion) to each IS to be developed;	1 2 3 4 5
i) <u>allocating</u> sufficient resources to develop, implement and maintain each of the proposed IS;	1 2 3 4 5
j) <u>developing</u> detailed <u>tactical development plans</u> for each of the proposed IS.	1 2 3 4 5

56. Overall, the following 6 stages of planning are carried out <u>effectively</u> :	Current situation
a) <u>pre-planning stage</u> : preparing for planning;	1 2 3 4 5
b) <u>intelligence stage</u> : scanning environment for conditions calling for decisions with respect to IS/IT;	1 2 3 4 5
c) <u>design stage</u> : inventing, developing and analysing possible courses of action with respect to IS/IT;	1 2 3 4 5
d) <u>choice stage</u> : selecting a course of action from the alternatives available and prioritising projects;	1 2 3 4 5
e) <u>implementation stage</u> : implementing the contents of the IS plan;	1 2 3 4 5
f) <u>review stage</u> : reviewing the implementation of the IS plan.	1 2 3 4 5

57. An appropriate amount of time is spent in each of the 6 stages of planning identified above.	1 2 3 4 5
--	-----------

58. We have <u>effective methods</u> (<i>e.g.</i> , SWOT analysis) for each of the following stages of the planning process:	Current situation
a) <u>pre-planning stage</u> : preparing for planning;	1 2 3 4 5
b) <u>intelligence stage</u> : scanning environment for conditions calling for decisions with respect to IS/IT;	1 2 3 4 5
c) <u>design stage</u> : inventing, developing and analysing possible courses of action with respect to IS/IT;	1 2 3 4 5
d) <u>choice stage</u> : selecting a course of action from the alternatives available and prioritising projects;	1 2 3 4 5
e) <u>implementation stage</u> : implementing the contents of the IS plan;	1 2 3 4 5
f) <u>review stage</u> : reviewing the implementation of the IS plan.	1 2 3 4 5

59. During the IS plans implementation:	Current situation
a) there is a readily identifiable <u>sponsor</u> (<i>person who secures funding</i>) for the <u>implementation</u> task;	1 2 3 4 5
b) major stakeholders are involved;	1 2 3 4 5
c) major stakeholders have a clear understanding of the role & responsibilities each of them have in the <u>implementation</u> of the IS plan;	1 2 3 4 5
d) there is commitment by the major stakeholders to the IS plans <u>implementation</u> ;	1 2 3 4 5
e) there is commitment of <u>resources</u> for the implementation of the IS plan.	1 2 3 4 5

60. We move <u>quickly</u> from IS planning into the IS plans implementation.	1 2 3 4 5
61. The <u>implementation</u> of the IS plan is <u>regularly</u> reviewed.	1 2 3 4 5

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

62. The IS plan itself:	Current situation
a) includes long-range objectives & strategies;	1 2 3 4 5
b) includes short- to medium- range plans to achieve the long-term strategy;	1 2 3 4 5
c) includes realistic projects in terms of the resources available;	1 2 3 4 5
d) contains sufficient information to lend credibility to its promise;	1 2 3 4 5
e) is used as a working document;	1 2 3 4 5
f) is clearly documented for ease of reference when, for example, changes of policy/direction/circumstances occur;	1 2 3 4 5
g) captures all the information and detailed analysis that was developed during the planning cycle;	1 2 3 4 5
h) identifies some IS that are likely to be early successes;	1 2 3 4 5
i) includes the alternative solutions to each of the problems identified together with why these were dismissed;	1 2 3 4 5
j) is communicated to all levels of the organisation;	1 2 3 4 5
k) meets stakeholders expectations;	1 2 3 4 5
l) is owned by the major stakeholders.	1 2 3 4 5

Monitor, review and control can be done on both the IS plan (*i.e.*, the plans **content**) and the IS planning activity itself (*i.e.*, the **process** of formulation). **Question 63** relates to the monitoring, reviewing and controlling of the IS **plan** while **question 64** relates to the monitoring, reviewing and controlling of the IS **planning process**. (Please circle a number for both formal and informal).

63. With respect to the IS plan there are (in)formal ³ processes in place which:		Current situation
a) monitor changes in the internal/external environment that may affect the IS planned or under development. (<i>i.e.</i> , <i>Monitoring the contents of the IS plan</i>);	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5
b) allow time to discuss & make recommendations about the opportunities/threats arising from these environmental changes which affect the IS planned or under development. (<i>i.e.</i> , <i>Reviewing the contents of the IS plan</i>);	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5
c) ensure that the plan and development schedule are updated in response to these changes in the environment. (<i>i.e.</i> , <i>Controlling (updating) the contents of the IS plan</i>).	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5

64. With respect to the IS planning process there are (in)formal processes in place which:		Current situation
a) monitor the strengths and weaknesses of the planning process itself. (<i>i.e.</i> , <i>Monitoring the IS planning process</i>);	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5
b) allow time to discuss & make recommendations about the weaknesses of the planning process. (<i>i.e.</i> , <i>Reviewing the IS planning process</i>);	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5
c) ensure that the planning process itself is updated . (<i>i.e.</i> , <i>Controlling (updating) the IS planning process</i>) in line with these recommendations.	<u>Formal</u>	1 2 3 4 5
	<u>Informal</u>	1 2 3 4 5

3

Formal processes refer to **explicit** procedures put in place by the organisation to carry out a particular activity. Informal processes include all other processes which have not been formalised.

Reminder:

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Undecided</i>	<i>Agree</i>	<i>Strongly agree</i>
1	2	3	4	5

65. Please identify below any other factors you believe to be **critical to the success of planning**.

a)	d)
b)	e)
c)	f)

PART III - OVERALL EFFECTIVENESS EVALUATION

66. Based on your own perceptions, Information Systems Planning has:	Current situation	N/A
a) helped you to be more effective than similar organisations at identifying IS opportunities;	1 2 3 4 5	
b) improved since the last time it was carried out;	1 2 3 4 5	
c) improved the efficiency of your organisation as a whole;	1 2 3 4 5	
d) improved the effectiveness of your organisation as a whole;	1 2 3 4 5	
e) increased customer satisfaction with your organisation;	1 2 3 4 5	
f) increased the return on investment on IT in your organisation;	1 2 3 4 5	
g) increased annual sales volume of your organisation;	1 2 3 4 5	<input type="checkbox"/>
h) increased market share of products and/or services of your organisation;	1 2 3 4 5	<input type="checkbox"/>
i) increased the profit of your organisation.	1 2 3 4 5	<input type="checkbox"/>

67. Overall, the objectives of planning have been achieved.	1 2 3 4 5
68. Only those information systems identified in the IS plan are implemented.	1 2 3 4 5
69. Overall, IS planning is very efficient . It makes good use of the resources available.	1 2 3 4 5
70. Overall, IS planning has been successful.	1 2 3 4 5

∞ **END OF QUESTIONNAIRE** ∞

Thank you

Ref: 0116

Please return to:

Ms B Baker
Information Systems Research Unit
Warwick Business School
University of Warwick
COVENTRY
CV4 7AL

INFORMATION SYSTEMS RESEARCH UNIT
Warwick Business School
University of Warwick
Coventry
CV4 7AL



Researcher: Ms Bernadette Baker
Research Fellow

Information Systems Planning Survey:

(To be completed by non-IS participants of IS planning.)

Please return by: 10th March 1995

The results will be treated entirely confidentially. Individual respondents and organisations will not be named in the report. Participants will receive a complimentary copy of the final report.

Instructions to Respondent

Information systems planning (ISP) refers to the process that sets the goals, objectives, strategies and long-term plans for the Information Systems activity.

Stakeholders refer to those people in the organisation who have the power to influence the success/failure of any decisions relating to the introduction of information systems/technology.

IMPORTANT: Please answer all questions with respect to your most recent planning experience in the organisational unit with which you are most familiar (e.g., if you answer the first section with respect to the corporate level of the organisation, please continue to answer all questions at that level).

Many of the questions require you to circle a five point scale (see below). Please indicate the degree to which you agree/disagree that the issue is currently being addressed within your organisation.

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Undecided</i>	<i>Agree</i>	<i>Strongly agree</i>
1	2	3	4	5

Please rate your immediate reaction to each of the statements, do not spend more than a few seconds on each.

Example:	Current situation
The information systems (IS) planning objectives are made explicit.	1 ② 3 4 5

The response to this question indicates that within the organisation the IS planning objectives are currently not made that explicitly (② → disagree. If you **do not** currently address the issue then please circle number 1 (① → strongly disagree).

PART I - GENERAL INFORMATION

SECTION 1: Personal Details

1. Which level of management are you?

(Please tick one only).

Top management	<input type="checkbox"/>	Lower management	<input type="checkbox"/>
Middle management	<input type="checkbox"/>	Other (please specify):	

2. How many reporting levels between you and the Chief Executive? (Please tick one only).

Direct link	<input type="checkbox"/>	One level	<input type="checkbox"/>	Two levels	<input type="checkbox"/>	Three or more levels	<input type="checkbox"/>
-------------	--------------------------	-----------	--------------------------	------------	--------------------------	----------------------	--------------------------

3. Which of the following best describes your level within the organisation? (Please tick one only).

Corporate	<input type="checkbox"/>	Division	<input type="checkbox"/>	Function	<input type="checkbox"/>	Process	<input type="checkbox"/>	Product	<input type="checkbox"/>	Other (please specify):
-----------	--------------------------	----------	--------------------------	----------	--------------------------	---------	--------------------------	---------	--------------------------	-------------------------

4. What is the main organisational level at which you are involved in the formulation of IS plan(s)? (Please tick one only).

Corporate	<input type="checkbox"/>	Division	<input type="checkbox"/>	Function	<input type="checkbox"/>	Process	<input type="checkbox"/>	Product	<input type="checkbox"/>	Other (please specify):
-----------	--------------------------	----------	--------------------------	----------	--------------------------	---------	--------------------------	---------	--------------------------	-------------------------

***PLEASE ANSWER THE REMAINDER OF THE QUESTIONNAIRE WITH
RESPECT TO THIS LEVEL OF INFORMATION SYSTEMS PLANNING.***

5. What is your major role in Information Systems Planning? (Please tick one only).

IS Planner/Champion.	<input type="checkbox"/>	Planning participant.	<input type="checkbox"/>	Internal/External Consultant.	<input type="checkbox"/>
Member of <u>support</u> team (providing support for the main planning activity).	<input type="checkbox"/>	Sponsor (person who secures funding for IS planning).	<input type="checkbox"/>	Other (please specify):	

6. Which of the following best describes what is (i.e., current situation)/should be the major objective/focus of your IS planning? (Please tick one in each column)

	Current situation	Should be
<u>Strategic/competitive</u> : providing useful long-range objectives for IS; to align IS with business strategy; enhance/identify IT/IS based products/services.	<input type="checkbox"/>	<input type="checkbox"/>
<u>Efficiency/Resource</u> : increasing organisational efficiency/cost reduction; improve the control over IS; improve resource allocation.	<input type="checkbox"/>	<input type="checkbox"/>
<u>Effectiveness</u> : improve co-ordination, communication and/or system integration; improve short- and/or long-term IS performance; improve decision making and management of operations.	<input type="checkbox"/>	<input type="checkbox"/>
<u>Technical/Output</u> : agreed prioritised applications portfolio, IT architecture and/or acquisition; technological leadership; to provide a foundation for subsequent service level agreements and commitment planning programmes.	<input type="checkbox"/>	<input type="checkbox"/>
<u>Intangible</u> : for example, management development, raising awareness of IS potential throughout the organisation and to improve management/IS relations.	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify):

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

SECTION 2: The Internal Organisational/IT Environment

7. Within your organisation: (please circle a number in each row)	Current situation
a) the environment is highly conducive to IS planning;	1 2 3 4 5
b) managers are actively encouraged (through, for example, the organisation's reward system) to do effective strategic (long range) IS planning;	1 2 3 4 5
c) people are actively encouraged to question underlying organisational policy/goals;	1 2 3 4 5
d) if something goes wrong you can expect support in learning lessons from it;	1 2 3 4 5
e) innovative solutions to problems are actively encouraged;	1 2 3 4 5
f) an individual's intuition is accepted as a valid tool in decision making;	1 2 3 4 5
g) the IS staff have credibility with the rest of the organisation;	1 2 3 4 5
h) the top IS manager has a close working relationship with top management;	1 2 3 4 5
i) non-IS staff readily accept the introduction of IS/IT;	1 2 3 4 5
j) non-IS staff have an appropriate shared vision of the role of IT/IS within the organisation;	1 2 3 4 5
k) there is commitment to IS planning by the major stakeholders;	1 2 3 4 5
l) the IS planning objectives are made explicit ;	1 2 3 4 5
m) realistic IS planning objectives/goals are set;	1 2 3 4 5
n) good quality business plans are produced.	1 2 3 4 5

PART II - THE INFORMATION SYSTEMS PLANNING PROCESS

8. IS planning participants clearly know what to expect from the:	Current situation
a) IS planning process itself (<i>i.e.</i> , understanding how the planning is to be done);	1 2 3 4 5
b) contents of the plan (<i>i.e.</i> , the deliverables from the planning process).	1 2 3 4 5

9. The IS planner has the necessary:	Current situation
a) expertise to carry out IS planning effectively;	1 2 3 4 5
b) credibility within the organisation to carry out IS planning effectively.	1 2 3 4 5

10. The IS planning participants:	Current situation
a) represent the major stakeholder groups in the organisation;	1 2 3 4 5
b) find the amount of time required to complete the ISP acceptable;	1 2 3 4 5
c) agree on the objectives/goals of the ISP;	1 2 3 4 5
d) are equally involved in the decision making;	1 2 3 4 5
e) openly express their feelings/fears;	1 2 3 4 5
f) are skilled/experienced in planning;	1 2 3 4 5
g) have a clear understanding of the role & responsibilities each of them is expected to have in the planning process ;	1 2 3 4 5
h) are effective at problem solving;	1 2 3 4 5
i) are effective at making decisions.	1 2 3 4 5

Reminder:

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

11. During IS planning:	Current situation
a) it is <u>easy</u> to obtain the necessary information needed to plan effectively;	1 2 3 4 5
b) the information used to generate the plan is <u>reliable</u> ;	1 2 3 4 5
c) it is <u>easy</u> to translate the business needs into information requirements;	1 2 3 4 5
d) it is <u>easy</u> to incorporate <u>new</u> information at <u>any</u> stage of the planning process as it arises.	1 2 3 4 5

12. Overall, the following 6 stages of planning are carried out <u>effectively</u> :	Current situation
a) <u>pre-planning stage</u> : preparing for planning;	1 2 3 4 5
b) <u>intelligence stage</u> : scanning environment for conditions calling for decisions with respect to IS/IT;	1 2 3 4 5
c) <u>design stage</u> : inventing, developing and analysing possible courses of action with respect to IS/IT;	1 2 3 4 5
d) <u>choice stage</u> : selecting a course of action from the alternatives available and prioritising projects;	1 2 3 4 5
e) <u>implementation stage</u> : implementing the contents of the IS plan;	1 2 3 4 5
f) <u>review stage</u> : review the implementation of the IS plan.	1 2 3 4 5

13. An appropriate amount of time is spent in each of the 6 stages of planning identified above.	1 2 3 4 5
--	-----------

14. We have <u>effective methods</u> (e.g., SWOT analysis) for each of the following stages of the planning process:	Current situation
a) <u>pre-planning stage</u> : preparing for planning;	1 2 3 4 5
b) <u>intelligence stage</u> : scanning environment for conditions calling for decisions with respect to IS/IT;	1 2 3 4 5
c) <u>design stage</u> : inventing, developing and analysing possible courses of action with respect to IS/IT;	1 2 3 4 5
d) <u>choice stage</u> : selecting a course of action from the alternatives available and prioritising projects;	1 2 3 4 5
e) <u>implementation stage</u> : implementing the contents of the IS plan;	1 2 3 4 5
f) <u>review stage</u> : review the implementation of the IS plan.	1 2 3 4 5

15. The planning process is flexible, adapting to the needs of the participants, resources, information available and/or changes in the environment.	1 2 3 4 5
--	-----------

16. The IS planning methodology is periodically reviewed & updated to ensure it still suits the needs of the organisation.	1 2 3 4 5
--	-----------

17. During the IS plans implementation:	Current situation
a) major stakeholders have a clear understanding of the role & responsibilities each of them have in the <u>implementation</u> of the IS plan;	1 2 3 4 5
b) there is commitment by the major stakeholders to the IS plans <u>implementation</u> .	1 2 3 4 5

18. The IS plan:	Current situation
a) <u>contents</u> meet stakeholders' expectations;	1 2 3 4 5
b) is <u>used</u> as a working document;	1 2 3 4 5
c) is owned by the major stakeholders;	1 2 3 4 5
d) is continually updated to incorporate changes in the environment as they arise.	1 2 3 4 5

PART III - OVERALL EFFECTIVENESS EVALUATION

19. Based on your own perceptions, Information Systems Planning has:	Current situation	N/A
a) helped you to be more effective than similar organisations at identifying IS opportunities;	1 2 3 4 5	
b) improved since the last time it was carried out;	1 2 3 4 5	
c) improved the efficiency of your organisation as a whole;	1 2 3 4 5	
d) improved the effectiveness of your organisation as a whole;	1 2 3 4 5	
e) increased customer satisfaction with your organisation;	1 2 3 4 5	
f) increased the return on investment on IT in your organisation;	1 2 3 4 5	
g) increased annual sales volume of your organisation;	1 2 3 4 5	<input type="checkbox"/>
h) increased market share of products and/or services of your organisation;	1 2 3 4 5	<input type="checkbox"/>
i) increased the profit of your organisation.	1 2 3 4 5	<input type="checkbox"/>

20. Overall, the objectives of planning have been achieved.	1 2 3 4 5
21. Only those information systems identified in the IS plan are implemented.	1 2 3 4 5
22. Overall, IS planning is very efficient . It makes good use of the resources available.	1 2 3 4 5
23. Overall, IS planning has been successful.	1 2 3 4 5

∞ END OF QUESTIONNAIRE ∞

Thank you

Ref: 0116

Please return to:

Ms B Baker
Information Systems Research Unit
Warwick Business School
University of Warwick
COVENTRY
CV4 7AL

Appendix C

Planning Evaluation Research

This appendix summarises the research carried out in the area of planning effectiveness. Table C.1 shows how the research described below has been categorised according to focus and approach described in Chapter 4 (§4.2.6.2).

<i>Researcher(s)</i>	<i>Focus</i>		<i>Approach</i>		
	<i>Outcome-oriented</i>	<i>System-oriented</i>	<i>Normative</i>	<i>Comparative</i>	<i>Improvement</i>
Camillus (1975)	1-7;		2-6;		1; 7;
Steiner (1979)	1-4; 15-20;	5-14; 21-40;	2-3; 5-15; 19-40;	17;	1; 4; 16; 18;
Dyson & Foster (1980, 1982, 1983a, 1983b)		1-13;	1-13;		
Pyburn (1981, 1983)	1-3;		1-3;		
Zutshi (1981)	4a-f;	1-3;	1-3; 4a;		4b-4f;
Foster & Foster (1982)	14;	1-13; 15-16;	1-16;		
King (1983, 1988)	1; 3-5; 11;	2; 6-10;	1-9; 11;	10;	
Ramanujam <i>et al.</i> (1986)	1-3;		1 b,e,f; 3;	2;	1 a,c,d;
Ramanujam & Venkatraman (1987a)	1; 2;	4-15;	1 b,e,f; 4-15;	2;	1 a,c,d;
Ramanujam & Venkatraman (1987b)	2;			2;	
Venkatraman & Ramanujam (1987)	1;	4-15;	1 b,e,f; 4-15;		1 a,c,d;
Waibel (1987)		2-12;	2-12;		
Galliers (1987a)	1;		1;		
Lederer & Sethi (1988a)	1;	2;	1; 2;		
Lederer & Sethi (1991, 1992)	1;		1;		
Saaksjarvi (1988)	6-11;	1-5;	6-11;		1-5;
Harris (1989)	1; 16-18;	4-15;	1 b,e,f; 4-15;		1 a,c,d; 16-18;
Premkumar (1989); Premkumar & King (1991, 1992)	1-7;				1-7;
Premkumar & King (1994a)	1-7;	8-25;	8-25;		1-7;
Sinha (1990)	1; 2;		1; 2;		
Lin (1991)	1; 2c-e;	2a-b;	1; 2;		
Ugboro (1991)		5-15;	5-15		
Earl (1993)	1;3;	2;	1-3		
Raghunathan & Raghunathan (1994)	1;	4-8; 11; 14-18;	1 b,f; 4-8; 11; 14;15;		1 a,c,d,g,j; 16-18;

Table C.1 - Categorisation of Previous Research

It should be noted that an item identified as a goal by one researcher (*i.e.*, outcome-oriented) may be identified by another as a system characteristics (*i.e.*, system-oriented). For example, organisational learning can be regarded as either a planning objective or a desirable system characteristic. Categorisation, therefore, has been carried out on the basis of how the researcher's themselves have conceptualised their evaluation tool (*i.e.*, system and/or outcome oriented focused).

In addition, it could be argued that all evaluation items (*i.e.* system characteristics and/or outcomes) identified by the researchers below are normative in nature. The nature of academic research is such that researchers seek to identify items that are normative. In other words, the items they identify are arguably their conceptualisations of items 'belonging' to an 'ideal' system. However, where models of planning effectiveness have identified evaluation items specifically evaluated with respect to a *previous* or *similar* system (maybe from another organisation), these items have been categorised under improvement and comparative categories, respectively.

Summary of the Planning Effectiveness Research

Camillus (1975), based on previous research, identifies 7 *purposes* of planning which provide a checklist to help system designers develop '*more effective formal planning systems*'. These are:

1. *Mind-stretching*, helping to develop new ideas and opportunities with respect to events external to the organisation in order to increase its ability to anticipate and adjust to changes (*i.e.*, objective is organisational flexibility);
2. *Development of broad strategies and long-term policies* in order to determine what business the organisation should compete in 'within a given environment for the reasonably foreseeable future' (*i.e.*, objective is to facilitate adaptation to future conditions);
3. *Development of action plans and operating projects* in order to allocate sufficient resources for the strategies identified. The focus is internal, emphasising projects budgets rather than functional ones (*i.e.*, objective is resource allocation);
4. *Development of a frame of reference for the annual operating budget* which is about determining various profit goals, capital expenses, and budget, again this is internally focused (*i.e.*, objective is control);
5. *Development of a framework in the minds of senior management* in order to facilitate consistency and speed when making operating decision (*i.e.*, objective is to educate);
6. *Management development* where junior and middle managers benefit from exposure to a broader view of the organisation's policies and operations (*i.e.*, objective is management development);
7. *Promoting internal communication and achieving greater co-ordination.* (*i.e.*, objective is integration);

Camillus argues that as the objective of planning moves from the purpose of 'mind stretching' to that of 'promoting internal communication and achieving greater co-ordination' that a more formal planning system will be needed.

Steiner (1979: pp 301-303) develops a planning system effectiveness tool for those organisations with a comprehensive formal strategic planning system (FSPS). The tool comprises five dimensions and was operationalised using 43 items although it was neither tested by Steiner for reliability nor validity. The dimensions and corresponding items are:

- (1) Overall managerial perceived value:
 1. The chief executive officer believes the system helps him/her to discharge better his/her responsibility.
 2. Other major line managers think the system is useful to them.
 3. Overall, the benefits or strategic planning are perceived to be greater than the costs by most managers.
 4. Major changes are needed in our strategic planning system.
- (2) Does our SPS produce (*i.e.*, output) the 'right' substantive answers and results?:
 5. Developing basic company mission and lines of business.
 6. Foreseeing future major opportunities.
 7. Foreseeing future major threats.
 8. Properly appraising company strengths.
 9. Properly appraising company weaknesses.
 10. Developing realistic current information about competitors.

11. Clarifying priorities.
12. Developing useful long-range objectives.
13. Developing useful long range programme strategies.
14. Developing creditable medium- and short-range plans to implement strategies so as to achieve goals.
15. Preventing unpleasant surprises.
16. Our company performance has been better than others in our industry not doing comprehensive managerial planning.
17. Our major financial indicators have been better after introducing planning than before.: sales; profit; ROI; EPS.
- (3) Does our SPS yield valuable ancillary benefits:
 21. The system has improved the quality of management.
 22. The system is a unifying, co-ordinating force in company operations.
 23. The system facilitates communications and collaboration throughout the company.
- (4) The design of the planning system:
 24. Top management has accepted the idea that strategic planning is its major responsibility.
 25. Our system fits the management style of the company.
 26. The system fits the reality of our strategic decision making processes.
 27. The corporate planner is situated close to the top management of the company.
 28. The corporate planner works well with the top management.
 29. The corporate planner works well with other line managers and staff.
 30. The planning committee structure is just right for us.
- (5) Is the planning process effective?
 31. Top management spends an appropriate amount of time on strategic planning.
 32. There is too much foot-dragging about planning. It is given lip service but too many line managers really do not accept it.
 33. Line managers generally spend an appropriate amount of time with other line managers and/or staff in developing strategic plans.
 34. The system proceeds on the basis of an acceptable set of procedures.
 35. The planning procedures are well understood in the company.
 36. The work requirement to complete the plans is acceptable to our managers and staff.
 37. The process is effective in inducing in-depth thinking.
 38. Too much attention is paid to putting numbers in boxes. The process is too proceduralised, too routine, too inflexible.
 39. New ideas are generally welcomed.
 40. Managers really do face up to company weaknesses in devising plans.
 41. Divisions do not get sufficient guidance from head quarters for effective planning.
 42. Divisions are encouraged and helped from head quarters for effective planning.
 43. The ability of managers to do effective strategic planning is taken into consideration in a proper manner when they are measured for overall performance.

Ugboro (1991) uses eleven items of Steiner's evaluation tool (items 5-15) to differentiate between effective from non-effective strategic planning systems (SPS) although there is no evidence to suggest the effectiveness construct was validated. Based on this distinction, the difference in the degree of top management involvement is investigated.

Questionnaires were received from the CEO or other officers responsible for strategic planning in 63 US electronic computer equipment manufacturers. The results indicate that different roles and degree of involvement of top management have a significant positive impact on the planning effectiveness. Seven types of involvement are identified as being important to the SPS: acceptance of strategic planning as management's major responsibility; assignment of appropriate amount of time to strategic planning; development of a climate which supports strategic planning; development of a formal corporate mission statement; commitment of resources to the implementation of plans; evaluation of managerial performance with the results of the SPS, and full participation of line executives in the strategic planning process.

Dyson & Fosters' (1980, 1982, 1983a, 1983b) seeks to answer two questions: (1) what constitutes effective planning; and (2) what is the impact of participation on that effectiveness? They

distinguish between the system-oriented and the outcome-oriented view of evaluation (*i.e.*, what they term process-oriented and goal-oriented, respectively), one of the earliest studies to do so.

They identify characteristics of an effective planning system that must be addressed in order for the planning system to be regarded as effective. The multi-dimensional model developed was based on some earlier work of Dyson (1977) in which seven attributes of effectiveness were proposed as necessary (although not necessarily sufficient) conditions. In addition, two attributes identified by Houlden's (1978) work were included and a further three from discussions between the researchers and planners. Another attribute was added to these twelve after the initial fieldwork was conducted.

The final model comprised thirteen measures of effectiveness. They suggest that organisations operationalise the model by rating themselves against each attribute on a scale of one to seven in order to create an effectiveness 'profile'. They argue that this 13 item profile cannot be reduced to a single measure because of the likelihood that different criteria will have different weights in different organisations. The thirteen items (attributes) in the profile are:

1. ***Clear statement of objectives for planning process*** which are agreed to by participants and are kept insight throughout the planning;
2. ***Integration of the planning function*** into the organisation as a whole so that planning is not a solitary activity carried out by the planning function but has commitment and involvement of the other functional heads;
3. ***Catalytic action of planning function*** which stimulates participants to think strategically;
4. ***Richness of formulation*** which takes into consideration several potential futures and enables the organisation to construct contingency plans. Galliers (1991a) has discussed this in relation to ISP specifically suggesting an approach to do this;
5. ***Depth of evaluation*** is required in the assessment of the options identified in the plan should comprise multiple criteria which should include several non-financial as well as financial measures. King (1980) discusses a 'strategic program evaluation' which allows strategic choices to be made based on non-financial criteria which by their very nature tend to be more subjective than financial ones;
6. ***Treatment of uncertainty*** should be taken into account by assessing the uncertainty in the estimates of externally influenced factors such as demand forecasts and competitors activity;
7. ***Resources planned*** include not only the necessary finance required to implement the plan but also detailed identification of the human resources, raw materials and equipment needed;
8. ***Data used*** for planning purposes is adequate, relevant, concise, timely and accurate;
9. ***Iteration in the planning process*** allows information that comes to light during the planning process to be used to update previous decisions if need be;
10. ***Assumptions*** should be explicitly identified so to avoid unrealistic and/or inconsistent ones;
11. ***Quantification of goals*** aids the monitoring and control of the operating objectives;
12. ***Control measures (responsiveness to uncertainty)*** ensure the appropriate feedback mechanisms are in place so that any changes in the environment can lead to the appropriate modification of the plan;
13. ***Feasibility of Implementation*** should be investigated to ensure that potential barriers are identified and avoided.

The model was not rigorously tested for validity. However, Dyson & Foster did apply the model in ten UK organisations by assessing each organisation against all thirteen attributes. While they found each planning effectiveness attribute relevant to each organisation, the reliability of the instrument is called into question due to the single-item nature of each attribute.

Dyson & Foster (1982) seeks to establish whether a relationship exists between participation and strategic planning effectiveness. Using data collected from the ten UK organisations they found for some aspects of effectiveness (*i.e.*, the thirteen attributes identified above), participation and effectiveness are directly or inversely related.

Waibel (1987) uses twelve of the thirteen measures of planning effectiveness identified by Dyson & Foster (1980, 1982, 1983a, 1983b) excluding the 'clear statement of objectives for planning process' item, to investigate the relationship between planning effectiveness and the different attributes of steering committees. Data was collected from multiple stakeholders in 34 US army medical treatment

facilities via a self-administered mail questionnaire which was used to validate the evaluation model. The results indicate a positive relationship between the presence of an IS steering committee, the length and frequency of steering committee meetings and effective planning. In addition, he found that an individual's role/participation in the organisation has a bearing on how that individual perceives planning effectiveness, similar to other research findings which indicate the perceptions of ISP success differ from one management level to the other (e.g., Galliers, 1987a).

While Dyson & Foster argue against the goal/achievement (*i.e.*, outcome-oriented) view of measuring effectiveness, a later paper by Foster & Foster (1982), argue that both goal/achievement and process-oriented (*i.e.*, systems-oriented) views of planning effectiveness are complementary as long as the goal/achievement view is sensitive to changes in the environment (*i.e.*, it is adaptive). This adaptive idea of planning is also supported by other authors such as Ackoff (1970) and Mintzberg (1988).

Foster & Foster (1982) suggest that this goal-oriented view of effectiveness, which they term 'the adaptive goals/achievement' view, should address four items:

1. *Achievement of goals*: has the planned goals have been achieved?
2. *Realistic goals*: was performance as good as it could have been given the state of knowledge at the time the goals were set? This provides a check on the setting of over-modest goals.
3. *Responsiveness of planning system*: how responsive is the system to changes in the environment in terms of adapting to new goals?
4. *Planning and success are strongly related*: has success been a direct result of planning rather than other factors?

They argue that the planning system should firstly be assessed using some multi-criteria measurement similar to Foster & Dysons' (1980, 1983a) evaluation tool. For those seemingly effective systems the 4 items identified above should then be used to test the operational effectiveness of the planning system.

Foster & Foster (*ibid*) provide no indication as to how any of the 4 additional items are operationalised. In addition, the last item is an implicit assumption made by all planning evaluation studies and difficult to prove in practice as discussed previously (*c.f.*, §4.2.2).

Realistic goals and responsiveness of the planning system address the problems identified by Dyson & Foster (1982) of measuring the achievement of goals. That is, they help to ensure that easily attainable goals are not set so the activity is always viewed to be highly effective and that goals attainable at the beginning of the activity are still attainable or even desirable at the end. This implies that instead of providing a measure of planning effectiveness they provide a measure of validity for the achievement of goals. The setting of realistic goals and responsiveness of the planning system are items that should be addressed by the planning system and therefore both represent system characteristics..

Further research conducted by Foster & Lock (1990) sought to identify whether, within the 13 original attributes, there were some common underlying elements.

Factor analysis¹ was carried out using the data collected from the original ten organisations studied and tentative findings were discussed. Three major factors were identified and tentative descriptors given to them: technical expertise; resource consideration, and iteration/integration of the process. There was also evidence to suggest a difference between the type of organisation (based on organisational style) and its' view of what constitutes effectiveness (*i.e.*, different types of organisation view different factors to be the most important in the measurement of effectiveness), providing some evidence for a contingency approach to measuring planning effectiveness.

Zutshi (1981) develops a strategic planning system evaluation methodology based on the system dimensions of input, process and output and the *relationships* between them. This methodology was applied in 8 large US corporations but was not tested for validity. The strategic planning system characteristics studied were:

1 Factor analysis seeks to describe the covariance relationships among many variables in terms of a few underlying factors (Johnson & Wichern, 1982).

1. the complexity of the organisational system measured by:
 - behavioural:
 - the personality characteristics of the decision makers;
 - the leadership qualities;
 - the configuration of power.
 - structural complexity;
 - external factors:
 - complexity of the organisations environment;
 - variability of the organisations environment.
2. the resources committed to the strategic planning system. These were:
 - human;
 - financial;
 - organisational commitment is measured by:
 - the amount of top management commitment;
 - the amount of top management involvement;
 - co-ordination and communication among organisational groupings;
 - the role of the CEO;
 - and the level of the planner in the organisation.
3. the effectiveness of the resource utilisation, measure by:
 - the degree to which different activities are performed;
 - structural dissonance;
 - the qualitative dimension of the resources committed;
 - linkage between planning and implementation;
4. the outcome of the strategic planning system in terms of its effects on the behaviour and the output of the organisation. This was measured by:
 - a) identification of business opportunities;
 - b) improvement in management anticipation;
 - c) more reliable forecasting;
 - d) increased procedural efficiency;
 - e) reduction of duplication and conflict;
 - f) prevention of costly mistakes;

Pyburn (1981, 1983) investigated the effect of five different organisational factors on ISP performance interviewing the IS managers in 8 organisation. The organisational factors under investigation were: volatility of the business environment; communication style of top management; complexity of the IS environment; status of the IS executive, and physical proximity of IS executive to top management. ISP performance was measured using three criteria, all of which can be regarded as planning goals - outcomes of the system - what the system should achieve. These were the degree to which:

1. IS addressed the critical needs of the business;
2. the IS function was well managed;
3. ISP made clear the role and direction of IS within the organisation and the resources needed.

While the study lacks both internal and external validity and the sample size was small and therefore not generalisable, the results indicate that all five organisational factors had an effect on ISP performance. Pyburn goes on to identify three broad approaches to planning (*i.e.*, *personal-informal*, *personal-formal* and *written-formal*) which are dependent on the relationships of IS and senior managers and extent to which planning mechanism were structured and formalised. While he found that none of these approaches were universally successful, formal approaches were more successful in 3 contexts: in complex information system environments, when the top management style is more formal and when the data processing department is located further away from top management. More informal approaches were found to be more effective in rapidly changing business environments.

King (1983, 1984) proposes a 'direct' methodological framework for evaluating strategic planning systems and compares it to the 'indirect' methodologies in previous use. The direct methodology is aimed primarily at providing '*the basis for the achievement of planning accountability and for the improved management of planning*' although '*it has also proved to be a valuable tool for diagnosis of problems in the organization*' (1983: p 263).

King (1983) develops a evaluation framework based around a simple schematic ISP model comprising 6 dimensions. These are:

- **resource inputs** refer to non-informational sources 'driving' the planning activity (*e.g.*, human resource, finance, computer time);
- **planning goals** which refer to the specific purposes as to why planning is undertaken (*e.g.*, rational scheme for prioritising projects);
- **strategic planning system** represents all of the processes, procedures and analyses that takes place (*e.g.*, planning schedule, role of participants);
- **planning outputs** refers not only to the document produced (*i.e.*, the strategic plan) but to its contents (*i.e.*, the roles and strategies which have been chosen);
- **business performance** is measured through such indices as profit, ROI, ROA, market share;
- **external standards** refers to the 'body of standards' the process elements may be compared against.

He goes onto identify ten evaluation points based on this model which he believes constitutes a comprehensive assessment of strategic planning. While the complete framework was not applied in any one organisation, each of the parts were individually tested. These evaluation points (each of which are in need of operationalising) are:

1. **Effectiveness of strategic planning** which assesses how well the organisation's planning system has met its goals.
2. **Relative worth of the strategic planning system** is judged against external 'good planning' standards (system characteristics);
3. **Role and impact of the strategic planning system** which assesses firstly whether the plan is implemented and then whether or not the plan is used to guide the strategic direction of the organisation.
4. **Performance of strategic plans** are assessed by analysing the impact of each recommendation in turn on the organisation in relation to business performance and the achievement of specific business goals.
5. **Relative worth of strategy** is judged against external standards that apply to the strategy itself rather than the planning system as in (2).
6. **Adaptive value of the strategic planning system** focuses on the ability of the planning system to change by means of 'self-correcting' characteristics.
7. **Relative efficiency of the strategic planning system** in the consumption of resources.
8. **Adequacy of resources** with respect to the objectives of planning.
9. **Allocation of planning resources** refers to the actual allocation of the resources to the various functions and activities of planning.
10. **Appropriateness of strategic planning goals** to the issues/problems that need to be addressed. This could be compared to other comparable organisations or accepted external standards.

King (1983), like Dyson & Foster (1980, 1983a), does not propose an overall measure of utility as '*significant conceptual and practical problems in trying to reduce the multiple assessments to a single overall utility*' (King 1988: p 275). Therefore no attempt is made to synthesise the various measures into a single overall utility. Instead, the overall evaluation is made in terms of a profile of evaluation dimensions as identified above. King, however, does suggests that an overall assessment of planning can be made by synthesising the different evaluation points in purely a judgmental way.

King (1988) applies his strategic planning evaluation framework (King 1983) to ISP. He adds an additional dimension to the simple schematic model of planning giving a total of 7 dimensions:

- **informational inputs** which specifically relate to the inputs into information systems planning from the business plan (*e.g.*, CSF, strength, weakness, opportunities and threats assessments).

In addition, one evaluation point is removed (*i.e.*, **allocation of the planning resources**) and another is added:

11. *strategic congruence* which addresses the degree of fit between IS strategy and business strategy.

The evaluation profiles of both Dyson & Fosters (1980) and King (1983; 1988) may be used as a diagnostic tool. Although both were used in a small number of organisations, neither were tested for validity.

Premkumar (1989), adapts King's model (King, 1988) to include 2 additional dimensions: outcome (*i.e.*, the organisational impact of planning) and organisational environment. He also provides a measure of the interrelationships between the different dimensions.

This adapted conceptual model of planning comprised goals, resources, planning process, output plans, outcome in the organisation, and organisational environment. Based on previous research, three environmental factors were taken into consideration: the role of IS in the organisation, the planning structure, and the quality of the strategic planning system.

Three interrelationships, based on previous research, were also investigated. These were:

- Integration of the goals with the planning process. The quality of various integration mechanisms used to facilitate the transfer of information inputs to ISP were investigated;
- Efficiency of utilisation of the resources used during the planning process;
- Implementation of the output to produce the desired outcomes. The quality of the implementation mechanisms were investigated.

The conceptual models various components together with their interrelationships were evaluated. The dimension 'outcome' was measured at three levels of the organisation: ISP, IS function and organisation.

At the ISP level, *fulfilment of objectives of IS planning* was used to *measure planning effectiveness*. Seven objectives were identified and the extent to which they had been satisfied measured. These objectives were:

1. better assessment of technology trends and better system investment decisions;
2. improved communication with top management;
3. improved communication with users for better appreciation of the role of IS in the business and in their operations;
4. better integration of business objectives and strategies with IS objectives and plans;
5. greater exploitation of IS opportunities for gaining competitive advantage;
6. increase user satisfaction with IS services;
7. better planning and control of human, software and hardware resources;

At the level of the IS function, improvement in performance of the IS function was used to assess functional impact.

At the organisational level, IS executives *perception* of improvement in performance of the organisation due to IS was used to measure the organisational impact (*i.e.*, IS effectiveness not ISP effectiveness). Five measures were used to assess performance, these were:

1. improvement in ROI for the firm;
2. increase in market share for the firm's products/services;
3. improvement in internal efficiency of the firm's operations;
4. increase in annual sales revenue for the firm;
5. increase in customer satisfaction;

In this study, while outcome was measured at three levels, the ISP level was the only level used to measure the construct of planning effectiveness. The construct of planning effectiveness used in this study was outcome-oriented and used the improvement approach to assess each of the items. This effectiveness model was tested for both reliability and validity using data collected through a large scale field survey sent to IS managers/executives.

In a later paper (Premkumar & King, 1991) sought to answer five questions: what the major inputs to the ISP system were; how firms evaluate the impact of planning; whether or not there were differences in planning characteristics among firms in different industries; what effect does the role of

IS have on the planning practices, and how does strategic business planning impact on ISP. The results indicated that information input from the business plans and the planning resources significantly influenced the quality of the planning process which in turn significantly influences the contribution of IS to an organisation's performance. Of the three contextual variables investigated (*i.e.*, industry, role of IS in the organisation and quality of the strategic planning system), the role of IS was the only one *significantly* influencing the quality of the planning process and hence performance.

In another paper (Premkumar & King, 1992), the role of IS is investigated further. Differences in planning, organisational support and the performance of ISP among organisations are explored for the four different IS roles of the strategic grid (McFarlan, 1984a). In addition, the relationship of performance (measured along the dimensions of outcome of ISP, the IS function and organisational impact) to the fit between the "role of IS" and the quality of the planning process, is also discussed. The results of the research indicated that those organisations positioned in the strategic/turnaround quadrant were shown to be more effective at IS planning and their IS contributed more to the organisation's performance than those in the factory/support quadrant. There was a significant relationship between 'fit' and fulfilment of objectives, some relationship between 'fit' and IS contribution to organisational performance but no significant relationship between 'fit' and the performance of the IS function.

Premkumar & King (1994a) go onto look at additional organisational characteristics that may affect ISP. These characteristics were: organisational size; industry; planning time horizon; role of IS in the organisation; adequacy of resources; quality of strategic business planning; quality of implementation mechanisms and quality of facilitation mechanisms.

ISP success is measured against two dimensions: the achievement of the 7 common planning objectives (*i.e.*, outcome oriented) identified above and the quality of the planning process (*i.e.*, system-oriented) operationalised using 18 items (*ibid*: pp 102-103):

8. Analysis of technology trends and its effect on the firm;
9. Exploring opportunities for using IS to gain competitive advantage;
10. Analysis of internal strengths and weaknesses that are critical to IS;
11. Analysis of role of IT in the firm;
12. Analysis of business opportunities and threats in the environment that are related to IS;
13. Strategic telecommunications planning;
14. Analysis of environmental issues that affect IS function;
15. Analysis of role of end-user computing;
16. Analysis of business process and development of company-wide information architecture;
17. Review of business strategies and linking IS plans with business plans;
18. Analysis of hardware and software requirements;
19. Analysis of human resource requirements for the IS function;
20. Exploring opportunities for using IS for cost reduction, product differentiation, etc.;
21. Assessment of hardware and software market and formulating system acquisition plans;
22. Analysis of internal consistency between different levels of plans;
23. Evaluation of alternate strategies;
24. Analysis of resource constraints and contingency plans;
25. Review, feedback and refinement of plans.

Canonical correlation analysis was used to investigate the relationship between the predictor set (*i.e.*, the eight organisational characteristics) and the criterion set (*i.e.*, the two dimensions of the ISP success). The analysis indicated that five of the eight organisational variables were significantly related to the two success dimensions which were: the role of IS in the organisation; the quality of the strategic business planning system; the adequacy of the resources; the quality of the implementation mechanisms, and the quality of the facilitation mechanisms.

Ramanujam *et al.* (1986) use a multi-dimensional measurement of planning systems effectiveness to establish how seven factors dimensions of planning are associated with this effectiveness. Underlying these seven dimensions are two aspects of planning, namely the design elements (*i.e.*, system capabilities, user of techniques, attention to internal facets, attention to external facets and functional coverage) and the context of planning (*i.e.*, resources provided for planning and resistance to planning).

Three measures of effectiveness were used to provide a multi-dimensional view of planning system effectiveness. These were:

1. *The extent to which key planning objectives were fulfilled.* Six commonly quoted objectives were used to measure fulfilment against:
 - (a) *enhancing* management development;
 - (b) predicting future trends;
 - (c) *improving* short-term performance;
 - (d) *improving* long-term performance;
 - (e) evaluating alternatives based on more relevant information;
 - (f) avoiding problem areas.
2. *The organisation's economic performance.* Four financial measures were used to measure the organisation's performance *relative to its competitors*. These were:
 - (a) growth in sales;
 - (b) growth in earnings;
 - (c) changes in market share;
 - (d) return on investment.
3. *Overall measure of satisfaction* with the planning system was deemed to be of particular importance when using a mandatory (which the planning system is likely to be) rather than a voluntary system. This measure can also be used to internally validate the fulfilment of objectives (Ramanujam *et al.*, 1986: p 353)

Completed questionnaires were received from 207 organisations. The findings of the study suggested the determinants of effectiveness are dependent on the criterion of effectiveness used. The implication for this is that planning systems should be tailored to particular purposes of planning as systems designed to meet several purposes are unlikely to be productive. King (1983) supports this by saying that trade-offs are inevitable if multiple aims are sought from the planning system.

Further research (Venkatraman & Ramanujam, 1987) combined the systems capability dimension (which was originally included in the design element dimension) and the extent of fulfilment of the key planning objectives to provide both a system-oriented and outcome-oriented focus to planning effectiveness.

Twelve variables were used to conceptualise the *systems capability* dimension based on a survey of the previous normative and descriptive literature. These were:

4. ability to anticipate surprises and crises;
5. flexibility to adapt to unanticipated changes;
6. ability to identify new business opportunities;
7. ability to identify key problem areas;
8. ability to foster managerial motivation;
9. ability to enhance the generation of new ideas;
10. ability to communicate top management's expectation down the line;
11. ability to foster management control;
12. ability to foster organisational learning;
13. ability to communicate line managers' concerns to top management;
14. ability to integrate diverse functions and operations;
15. ability to enhance innovation.

The key planning objectives were conceptualised using the six items identified from the original research (Ramanujam *et al.*, 1986: see above). The two dimensional effectiveness model was tested for validity. The results indicated the model exhibited validity and the *capabilities dimension* was a strong predictor of the *objectives dimension*, confirming the interrelated nature of the two dimensions.

In a later study, Ramanujam & Venkatraman (1987a) explored the multivariate relationship between six of the original dimensions (*i.e.*, use of techniques, attention to internal facets, attention to external facets and functional coverage, resources provided for planning and resistance to planning) and the two of the three original measures of effectiveness (excluding overall satisfaction). In addition to the two original measures of effectiveness they added a third which had originally appeared as one of the six design dimensions (*c.f.*, Ramanujam *et al.*, 1986: see above), that of system capability arguing that '*the development of these capabilities themselves can be viewed as an index of the system's*

effectiveness...Examining the extent of improvement over time in the creativity and control aspects of the system becomes a promising approach to evaluate the system's potential for effectiveness gains'. This gave both a system-oriented and outcome-oriented focus to the evaluation.

The results indicated the two contextual dimensions of resistance and resources, had the strongest impact on effectiveness and suggest, therefore, that *'attempts to enhance planning effectiveness should begin with a focus on the organizational context within which planning takes place'* (p 463). Two of the design dimensions also had a significant impact on planning effectiveness (*i.e.*, the use of techniques and external orientation) while the other two (*i.e.*, internal orientation and functional coverage) weakly influenced effectiveness. They go on to suggest possible weights for the three dimensions of planning effectiveness.

In a further study, Ramanujam & Venkatraman (1987b) classified questionnaire responses into high and low performers in order to study the difference in factors between these two groups. Responses were classified high-low by taking the median of the composite of a four-item assessment of each organisation's performance (*i.e.*, sales growth, net income growth, return on investment and change in market share) *relative to their competitors*. The factors studied were fulfilment of planning objectives; general trends in the use and perceived usefulness of planning (a combination of the contextual dimensions of resource commitment and resistance previously used); key planning issues receiving emphasis and the degree of emphasis placed on different functions in planning (an amalgamation of external and internal facets, and functional coverage); use of planning techniques, and roles of the planning system (systems capability).

Six factors of good planning were identified: adequate resource commitment; line-staff co-operation; retrospectively; built on functional integration; extends beyond techniques, and no trade-off between creativity and control.

Saaksjarvi (1988) surveyed IS managers in 71 large Finnish organisations to find out how successful their ISP was, which factors explain the success/failure, and which practical planning arrangements were used in the cases of success/failure. Five planning process factors were used to differentiate planning practices: planning method; length of planning cycle; degree of integration between ISP and business planning; existence of IS steering committees, and responsibility for ISP.

ISP success was measured using a three-dimensional evaluation tool adapted from Ramanujam *et al.* (1986) and Venkatraman & Ramanujam (1987) research. The three dimensions were achievement of planning objectives, improvement in IS capabilities and an overall satisfaction with the planning process.

Based on Venkatraman & Ramanujam (1987) evaluation tool, Saaksjarvi identified 5 IS capabilities indicators based on the original twelve general system capabilities and 5 objectives of ISP. The 5 IS capabilities were improvement in:

1. co-operation of the top executives and the IS management;
2. match of the IS and business plans;
3. coverage of applications;
4. IS co-ordination;
5. flexibility of IS services.

and the 5 objectives of ISP were:

6. developing IS as a competitive weapon;
7. defining the problems and requirements of the business functions;
8. supporting the corporate management by IS;
9. developing the IS architecture;
10. facilitating the IS management.

To these 10 items of ISP effectiveness, Saaksjarvi retained the item of overall measure of satisfaction with planning identified by Ramanujam *et al.* (1986):

11. overall satisfaction with the planning process

The paper provides no indication as to how the additional items are identified. The adapted measurement tool was only tested for content validity.

The results of the survey indicated that ISP was '*quite successful*'. Improvement in the co-operation skills of the IS and the corporate management, match of the IS and business plans and the coverage of the applications, were shown to all have an influence on ISP success.

Lin (1991) in an attempt to help organisations achieve effective ISP, identifies nine major ISP *process* factors and then investigates their relationship with ISP effectiveness measured using two dimensions. The nine process factors are:

1. *consistency* of the ISP process in ensuring the compatibility of IS within the organisation;
2. *integration* of the ISP process into the other planning processes of the organisation;
3. *efficiency* of the ISP process in utilising the available personnel, financial, technical and managerial resources;
4. *comprehensiveness* of the ISP process in terms of assessing organisational strengths and weaknesses and environmental opportunities and threats;
5. *innovation* of the ISP process (*i.e.*, does the process identify competitive advantage applications?);
6. *flexibility* of the ISP process in responding to the needs of management and users;
7. *aggressiveness* of the ISP process in proactively searching for opportunities;
8. *portfolio balancing* which refers to the extent to which assessments of riskiness associated with various resource allocation decision are made;
9. *implementation* refers to the extent to which the ISP process addresses potential issues related to the implementation of the plan.

These nine system-oriented process factors were subsequently tested (using a sample of IS executive from 545 organisations) against two measures of ISP effectiveness in order to establish whether they influenced ISP effectiveness. The two measures of ISP effectiveness used were:

1. the extent of fulfilment of key ISP objectives;
2. and IS executives' satisfaction with ISP measured in terms of:
 - a) the ISP resources provided;
 - b) the ISP process;
 - c) the outcomes resulting from the ISP exercise;
 - d) overall satisfaction with the ISP system;
 - e) top management satisfaction with the organisations ISP in general.

All nine process factors were shown not only to be valid and reliable but also to influence ISP success. Lin (1991) suggests that these factors could be used in conjunction with 'extent to fulfilment of key ISP objectives' to provide both a process-oriented (*i.e.*, system-oriented) and goal-oriented (*i.e.*, outcome-oriented) measuring of ISP success. Additional results indicated that there were significant differences in ISP success among organisations in different industry, and firm size (measured by business sales volume).

Raghunathan & Raghunathan (1994) apply Venkatraman & Ramanujam (1987) conceptual model of planning effectiveness to ISP. While keeping the same dimensions of 'improvement in systems capabilities' and 'planning objectives' they operationalise these dimensions in a slightly different way based on results obtained from their own research.

In operationalising the ISP objectives dimension they remove the item 'evaluating alternatives based on more relevant information' (see above Ramanujam *et al.*, 1986: item 1(e)) and include:

- (g) *improving* decision making;
- (h) *increasing* user satisfaction;
- (i) *improving* systems integration;
- (j) *improving* resource allocation.

In operationalising the system capabilities dimension they remove the ability to enhance the generation of new ideas (see above Venkatraman & Ramanujam, 1987: item 9), ability to communicate top management's expectation down the line (item 10), ability to foster organisational learning (item 12), and the ability to communicate line managers' concerns to top management (item 13) and include:

16. a tool to improve cross-functional systems integration;
17. a tool to improve co-ordination of decision making;
18. a tool to improve integration of IS into the organisation.

Data was gathered via a mail survey from 192 IS executives and the measurement instrument of ISP effectiveness was tested for both reliability and validity.

Harris (1989) seeks primarily to address two questions in his research (1) what organisational contextual variables affect the planning process?, and (2) what organisational context variables affect the IS plan?. In addition he seeks answers to two subsidiary research questions: what areas of the IS function are planned?, and what are the major inhibitors/constraints to successful ISP?

From a review of the literature 16 different contextual variables are identified which he classifies into four categories: environmental/corporate influence; corporate planning influences; IS corporate interface influences, and IS function influence.

Harris adapts Venkatraman & Ramanujam (1987) model of business planning effectiveness to ISP, adding 3 more objectives to the 'objective fulfilment' dimension:

16. improve IS/DP communications with upper management;
17. improve IS/DP communications with users;
18. increase visibility of IS/DP in overall organisation.

Data was collected via a mail survey from top IS executives in 92 organisations. The results indicated that four of the contextual factors (*i.e.*, competitive nature of the industry, management style of the top IS official, propensity to pioneer with hardware and formalisation of purpose) correlated very highly with ISP success and that these factors are mostly under the control of the top IS official. The final evaluation tool was never tested for reliability or validity.

Galliers (1987a) using a single-item measure of ISP success, asked organisations to rank (on a scale of 1 to 4) how successful their ISP had been. He then went onto identify why ISP been successful/unsuccessful in the organisation and how these organisations themselves measured the ISP success. While only a single measure of success was taken, this was evaluated from three different stakeholder viewpoints (*i.e.*, senior, middle and user management), providing the measurement with some reliability.

Given a list of ten critical success factors of ISP (identified from previous research) and asked to rank these from most important to least important, senior management ranked the CSF differently to middle/user management providing evidence that different levels of management have different views on what constitutes ISP success.

Lederer & Sethi (1988a) surveyed IS managers in 80 organisations in order to identify factors critical to successful (S)ISP with the aim of enhancing managers' understanding of how to carry out a more effective planning process. The survey instrument was based on previous ISP problem research from which a '*comprehensive list of the problems*' was identified (49 items in all); these were divided into three categories: resource, process and output related problems.

Four questions were used to assess effectiveness of (S)ISP:

1. overall satisfaction with the (S)ISP methodology;
2. satisfaction with the resources required for:
 - planning;
 - process;
 - output.

The results indicated that securing top management commitment for plan implementation and the need to carry out further analysis in order implement the plan were the two major problems experienced by IS managers.

In a later paper, Lederer & Sethi (1991) (using the same data) identified underlying dimensions of the problems identified by the survey. Using exploratory factor analysis they identified five underlying dimensions: the organisation; implementation; database; hardware, and cost. They argue

that these five factors could be used by organisation to evaluate different ISP methodologies in terms of their attention to each dimension. Indeed, these five factors could provide a basis for a system-oriented focus to evaluation.

They also use multiple discriminant analysis to investigate the ability of each dimension to predict overall satisfaction with the (S)ISP methodology. The results indicated that implementation was the best predictor of overall satisfaction.

In a further investigation (Lederer & Sethi, 1992) of the relationship among the five dimensions identified above, a causal model was posited describing (1) the influence of organisation problems on hardware, cost and database problems, and (2) the influence of organisation, hardware, cost and database problems on implementation problems. It was discovered that problems of cost had the biggest effect on problems of implementation.

Sinha (1990) views planning effectiveness in terms of the degree of usage of the formal strategic planning system (FSPS) by the decision makers. It is argued that if the FSPS is effective then it will be used '*more intensively*'; that is the more effective it is the more decisions (particularly major decisions) will be made through it. This measure is akin to the system usage measurement in the IS evaluation literature (*c.f.*, Ein-Dor & Segev, 1978a). Planning system effectiveness is measured by system usage which is operationalised as:

1. contribution of planning system to formulating the decision;
2. contribution of planning system to implementing the decision.

The research was conducted in three phases. Phase one involved interviews with planning executives from twelve companies about ten specific decisions made by their particular companies during the previous five years and how the FSPS had contributed to those decisions. In phase two, these interviews were used as a the foundation for a questionnaire sent to corporate-level planning executives, of which 117 replied. The third and final stage involved the collection of data via telephone of questionnaire respondents in order to cross-check the accuracy of the data. Content validity was addressed during stage one of the study. Construct validity was assessed through the correlation of responses from multiple informants in eight of the organisation initially interviewed (the planning executive and one other executive) on 80 decisions made, during phase two of the research.

The results indicated that FSPS contributed highly to decisions considered to be important and risky and to those that were global or divestment in nature.

Earl (1990; 1993) conducted interviews with three levels of management in 27 organisations to investigate their experiences with (S)ISP. Data were collected on several aspects of (S)ISP: stimuli, aims, benefits, successful and unsuccessful factors, problems, procedures and methods employed. From the research 65 different concerns were identified; these Earl classified under three different categories: method, process and implementation. Based on these three dimensions, Earl suggested five distinct approaches to (S)ISP, these were: business-led, method-driven, administrative, technological and organisational.

Earl asked each of the three stakeholder groups participating in the research to compare the effectiveness of their approach to (S)ISP against three criteria, viz.:

1. the ability of the approach to identify competitive advantage applications;
2. the number of unsuccessful features of their approach; -
3. the mean success scores of the approach;

The first and third criteria focus on the outcomes of ISP (*i.e.*, ISP is expected to be generally successful and to produce competitive advantage applications) while the second criteria of effectiveness focuses more on the approach itself. It is therefore arguable that the first and third criteria represent an outcome-oriented focus of effectiveness whereas the second criteria represents a system-oriented focus. The results of the evaluation indicated the organisational approach to ISP was the best overall.

Appendix D

D. DATA ANALYSES	D-1
D.1 DATA COLLECTION/PREPARATION	D-1
<i>D.1.1 Testing for Bias in non-response items (i.e., missing values).....</i>	<i>D-1</i>
D.2 RELIABILITY OF THE RESEARCH INSTRUMENT	D-1
<i>D.2.1 ISP Success Scale (using Cronbach's Alpha)</i>	<i>D-1</i>
<i>D.2.2 IS Plan Feedback Scale</i>	<i>D-2</i>
<i>D.2.3 ISP System Feedback Scale</i>	<i>D-2</i>
D.3 VALIDITY OF THE RESEARCH INSTRUMENT	D-2
<i>D.3.1 Convergent Validity.....</i>	<i>D-2</i>
D.3.1.1 ISP Success Scale	D-2
D.3.1.2 Composite Measurement Scales.....	D-3
D.3.1.3 Unidimensionality	D-3
<i>D.3.2 Discriminant Validity</i>	<i>D-4</i>
D.3.2.1 ISP Success and IS Plan Feedback	D-4
D.3.2.2 ISP Success and ISP System Feedback	D-5
D.3.2.3 IS Plan Feedback and ISP System Feedback.....	D-5
<i>D.3.3 Concurrent Validity.....</i>	<i>D-5</i>
D.4 GENERAL BACKGROUND INFORMATION	D-6
<i>D.4.1 Profile of Respondents.....</i>	<i>D-6</i>
<i>D.4.2 Profile of Organisations</i>	<i>D-7</i>
<i>D.4.3 The External Organisational/IT Environment.....</i>	<i>D-8</i>
<i>D.4.4 The Information Systems/Technology Environment.....</i>	<i>D-9</i>
<i>D.4.5 General ISP Environment.....</i>	<i>D-12</i>
D.5 ISP EFFECTIVENESS ANALYSIS	D-18
D.6 FEEDBACK ANALYSIS	D-19
<i>D.6.1 ISP system feedback</i>	<i>D-19</i>
<i>D.6.2 IS plan feedback.....</i>	<i>D-23</i>
<i>D.6.3 Feedforward: A Related Concept.....</i>	<i>D-27</i>
<i>D.6.4 Relationships between Feedback and Average ISP Effectiveness</i>	<i>D-28</i>
<i>D.6.5 Total ISP System Feedback and Total IS Plan Feedback</i>	<i>D-38</i>
D.7 ISP SYSTEM CHARACTERISTICS	D-41
D.8 CONTEXTUAL FACTORS FOR ISP SYSTEM FEEDBACK	D-47
<i>D.8.1 Learning Environment.....</i>	<i>D-47</i>
<i>D.8.2 Other Contextual Factors.....</i>	<i>D-48</i>

D. Data Analyses

D.1 Data Collection/Preparation

D.1.1 Testing for Bias in non-response items (i.e., missing values)

Questions 8b, 8c, 32a-b, 36, 56a-f, 58a-f and 62l were tested for non-response item bias in the IS Planner questionnaire whereas questions 19g-i were tested in the non-IS respondent questionnaire. Differences in average ISP effectiveness, ISP system feedback and IS plan feedback were tested. The only difference found was for missing vs non-missing categories of Q8c.

t-tests of difference in average ISP effectiveness for of Missing vs non-Missing values of Q8c

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Missing	9	3.6633	.541	.180
Non-Missing	77	3.1921	.570	.065
Mean Difference		.4713		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	2.36	84	.021	.200	(.074, .869)

∴ reject H_0 at the 5% significance level → evidence to suggest means are not equal.

D.2 Reliability of the Research Instrument

D.2.1 ISP Success Scale (using Cronbach's Alpha)

Item-TOTAL Statistics:	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-TOTAL Correlation	Alpha if Item Deleted
Q66A	38.2317	59.4148	.6231	.8995
Q66B	37.9878	61.8887	.4183	.9072
Q66C	38.1707	57.6001	.7201	.8954
Q66D	38.1585	56.5301	.8237	.8912
Q66E	38.4634	60.8690	.4496	.9065
Q66F	38.3415	57.1412	.7025	.8958
Q66G	39.0488	57.8741	.6609	.8977
Q66H	39.0122	58.0616	.5824	.9013
Q66I	38.7317	56.5444	.5949	.9016
Q67	38.2805	57.1920	.7419	.8943
Q68	38.8415	60.1104	.4332	.9083
Q69	38.6829	58.3674	.6486	.8983
Q70	38.5366	57.0912	.7398	.8944

Reliability Coefficients

N of Cases = 82.0

N of Items = 13

Alpha = .9065

D.2.2 IS Plan Feedback Scale

<i>Item-TOTAL Statistics:</i>	<i>Scale mean if Item Deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-TOTAL correlation</i>	<i>Alpha if item deleted</i>
<i>Q63AI</i>	15.5765	13.5566	.4949	.7648
<i>Q63AII</i>	14.4706	14.8950	.4484	.7738
<i>Q63BI</i>	15.4118	12.4832	.6358	.7281
<i>Q63BII</i>	14.7059	13.8768	.5782	.7462
<i>Q63CI</i>	15.2588	12.1941	.6260	.7306
<i>Q63CII</i>	14.8706	14.2331	.4467	.7751

Reliability Coefficients

N of Cases = 85.0

N of Items = 6

Alpha = .7865

D.2.3 ISP System Feedback Scale

<i>Item-TOTAL Statistics:</i>	<i>Scale mean if Item Deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-TOTAL correlation</i>	<i>Alpha if item deleted</i>
<i>Q64AI</i>	13.1071	19.6872	.7384	.8866
<i>Q64AII</i>	12.6310	20.4766	.6768	.8955
<i>Q64BI</i>	12.9524	19.1302	.7976	.8774
<i>Q64BII</i>	12.6429	20.6902	.7234	.8893
<i>Q64CI</i>	12.8929	18.7715	.7711	.8819
<i>Q64CII</i>	12.6786	20.2448	.7165	.8898

Reliability Coefficients

N of Cases = 84.0

N of Items = 6

Alpha = .9039

D.3 Validity of the Research Instrument**D.3.1 Convergent Validity****D.3.1.1 ISP Success Scale*****Non-IS Respondents***

	<i>Q19A</i>	<i>Q19B</i>	<i>Q19C</i>	<i>Q19D</i>	<i>Q19E</i>	<i>Q19F</i>
<i>Q23</i>	.6870	.4803	.7879	.7213	.6212	.5089
<i>n</i>	(37)	(37)	(37)	(37)	(37)	(36)
<i>prob</i>	P= .000	P= .003	P= .000	P= .000	P= .000	P= .002
	<i>Q19G</i>	<i>Q19H</i>	<i>Q19I</i>	<i>Q20</i>	<i>Q21</i>	<i>Q22</i>
<i>Q23</i>	.3784	.3953	.3038	.7376	.4034	.6930
<i>n</i>	(22)	(22)	(22)	(36)	(37)	(37)
<i>prob</i>	P= .082	P= .069	P= .169	P= .000	P= .013	P= .000

IS Planners

	<i>Q66A</i>	<i>Q66B</i>	<i>Q66C</i>	<i>Q66D</i>	<i>Q66E</i>	<i>Q66F</i>
<i>Q70</i>	.5512	.2032	.4599	.6321	.3388	.4521
<i>n</i>	(84)	(83)	(84)	(84)	(84)	(83)
<i>prob</i>	P= .000	P= .065	P= .000	P= .000	P= .002	P= .000
	<i>Q66G</i>	<i>Q66H</i>	<i>Q66I</i>	<i>Q67</i>	<i>Q68</i>	<i>Q69</i>
<i>Q70</i>	.4030	.3906	.4848	.7217	.3979	.7474
<i>n</i>	(51)	(53)	(49)	(84)	(84)	(84)
<i>prob</i>	P= .003	P= .004	P= .000	P= .000	P= .000	P= .000

<i>IS Planners and Non-IS Respondents</i>						
	<i>Q66,19A</i>	<i>Q66,19B</i>	<i>Q66,19C</i>	<i>Q66,19D</i>	<i>Q66,19E</i>	<i>Q66,19F</i>
<i>Q70, 23</i>	.5821	.2935	.5574	.6375	.3950	.4496
<i>n</i>	(138)	(137)	(138)	(138)	(138)	(136)
<i>prob=</i>	.000	.001	.000	.000	.000	.000
	<i>Q66,19G</i>	<i>Q66,19H</i>	<i>Q66,19I</i>	<i>Q67,20</i>	<i>Q68,21</i>	<i>Q69,22</i>
<i>Q70, 23</i>	.4102	.3356	.3816	.7071	.3738	.7262
<i>n</i>	(86)	(88)	(84)	(137)	(138)	(138)
<i>prob=</i>	.000	.001	.000	.000	.000	.000

D.3.1.2 Composite Measurement Scales

	<i>TOTAL ISP system feedback</i>		<i>TOTAL IS plan feedback</i>		<i>Average ISP effectiveness (excluding Q70)</i>
<i>Q51D</i>	.2480 (84) P= .023	<i>Q56F</i>	.2658 (77) P= .019	<i>Q70</i>	.7375 (138) P= .000

D.3.1.3 Unidimensionality

Unidimensionality requires that the items which measure a construct load on to the same factor with relatively high loadings. Factor analysis (FA) was used to verify unidimensionality. If the set of items does measure a single theoretical concept then for the unrotated matrix (Green, 1978):

- the first extracted component should explain a large proportion of the variance in the items (say, > 40%);
- subsequent components should explain fairly equal proportions of the remaining variance except for a gradual decrease;
- all or most of the items should have substantial loadings on the 1st component (say > 0.3); and
- all or most of the items should have higher loadings on the first component than on subsequent components.

As can be seen from the following FA, each of the dimensions satisfy these conditions providing evidence of their unidimensionality.

D.3.1.3.1 ISP Success Scale

Factor Matrix:

	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>
<i>Q66A</i>	.70289	-.28681	-.16522
<i>Q66B</i>	.49264	-.33380	.45867
<i>Q66C</i>	.78224	-.10948	.29178
<i>Q66D</i>	.86941	-.05319	.10853
<i>Q66E</i>	.51892	-.11095	.42000
<i>Q66F</i>	.77359	-.11995	.19804
<i>Q66G</i>	.70422	.60307	-.06784
<i>Q66H</i>	.63635	.70330	-.01903
<i>Q66I</i>	.65134	.56000	.07449
<i>Q67</i>	.80648	-.21834	-.13943
<i>Q68</i>	.50346	-.14218	-.52771
<i>Q69</i>	.71898	-.20978	-.34683
<i>Q70</i>	.80671	-.23577	-.20419

D.3.1.3.2 IS Plan Feedback Scale**Factor Matrix:**

	Factor 1	Factor 2
Q63AI	.64929	-.48322
Q63AII	.61001	.51600
Q63BI	.77643	-.44129
Q63BII	.73800	.44506
Q63CI	.76649	-.45502
Q63CII	.62752	.57676

D.3.1.3.3 ISP System Feedback Scale**Factor Matrix:**

	Factor 1
Q64AI	.82246
Q64AII	.77674
Q64BI	.86826
Q64BII	.81284
Q64CI	.84867
Q64CII	.80442

D.3.2 Discriminant Validity

Responses to Q66B were removed from the discriminant validity because the correlation on Q70 based on responses to IS Planner questionnaire alone resulted in a significance value of 0.065. It was only when responses from the non-IS respondent questionnaire were combined with those from the IS Planner questionnaire that Question 66B was found to exhibit convergent validity. Since the constructs of feedback are only detailed on the IS Planner questionnaire, only responses from this questionnaire is used to test discriminant validity and therefore Q66B was omitted from this analysis.

D.3.2.1 ISP Success and IS Plan Feedback**Rotated Factor Matrix: (Varimax rotation)**

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q66A	.60609	-.03694	.54223	.08823	.22030
Q66C	.21381	.33189	.73921	.11176	.05499
Q66D	.46135	.36852	.68937	-.00568	.06426
Q66E	.09952	.05675	.76477	-.03135	-.07255
Q66F	.50076	.26376	.54182	.13834	.23409
Q66G	.21679	.85456	.25136	.05890	.19804
Q66H	.15245	.90817	.17898	-.02509	.13996
Q66I	.30707	.82858	.12599	.02209	.01299
Q67	.73094	.27535	.40051	.04588	.03288
Q68	.63603	.18168	.13854	-.19710	.03362
Q69	.77926	.23896	.16154	.08725	.16925
Q70	.75206	.24703	.41777	-.08682	-.01504
Q63AI	.33816	-.11067	-.08387	.82833	-.11160
Q63AII	.52533	.12492	-.19565	.12955	.56960
Q63BI	-.18541	-.01452	.06982	.89526	.13785
Q63BII	-.04736	.02221	.13225	.18706	.88513
Q63CI	-.09021	.15467	.09664	.82367	.14382
Q63CII	.30393	.27068	-.00767	-.06708	.71857

D.3.2.2 ISP Success and ISP System Feedback

Rotated Factor Matrix: Varimax rotation

	Factor 1	Factor 2	Factor 3	Factor 4
Q66A	.84514	.03581	-.06362	.15149
Q66C	.57889	.13877	.32712	.35226
Q66D	.72615	-.05025	.39245	.35809
Q66E	.32092	.05087	.09612	.81469
Q66F	.74014	.10680	.27177	.15834
Q66G	.36553	.11917	.85095	.02440
Q66H	.24497	-.01368	.92758	.03585
Q66I	.29716	.06748	.81016	.12071
Q67	.85032	-.09286	.26196	-.01647
Q68	.54778	-.07867	.18866	.12176
Q69	.78553	.13749	.22364	-.14402
Q70	.85153	-.12598	.21930	.08547
Q64AI	-.20083	.81498	.09109	.05167
Q64AII	.08825	.69292	.10383	.47329
Q64BI	-.09725	.86440	-.03990	.13137
Q64BII	-.00785	.59202	.01900	.57792
Q64CI	.06575	.89882	.03986	-.12176
Q64CII	.15340	.74916	.01955	.02086

D.3.2.3 IS Plan Feedback and ISP System Feedback

Rotated Factor Matrix: Varimax Rotation

	Factor 1	Factor 2	Factor 3
Q64AI	.68796	.50331	-.06532
Q64AII	.80407	.08955	.24504
Q64BI	.66060	.63712	-.00559
Q64BII	.82255	.12643	.24126
Q64CI	.65589	.56110	.07222
Q64CII	.77310	.15491	.28849
Q63AI	.25815	.71392	.11653
Q63AII	.07840	.08660	.79853
Q63BI	.12512	.88193	.18475
Q63BII	.18359	.24091	.79799
Q63CI	.11704	.83833	.23467
Q63CII	.23610	.09597	.80481

D.3.3 Concurrent Validity

ANOVA was used to test the null hypotheses that the mean average ISP effectiveness is the same for top management vs non-top management ISP support (Q30) and link with business planning vs no link with business planning (Q27).

t-tests of difference in average ISP effectiveness between different levels of ISP support

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \mu_1 - \mu_2 \neq 0$ (two-tailed test)

Variable	Number of Cases	Mean	SD	SE of Mean
Other	19	2.9058	.652	.150
Top Management	67	3.3366	.528	.064
Mean Difference		-.4308		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-2.98	84	.004	.145	(-.719, -.143)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests for difference in average ISP effectiveness between organisations where ISP is linked with business planning and those where it is not

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
No link with business planning	10	2.7590	.928	.294
Link with business planning	73	3.3242	.496	.058
Mean Difference		-.5652		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	-1.89	9.72	.089	.299	(-1.232, .102)

\therefore reject H_0 at the 10% significance level \Rightarrow evidence to suggest means are not equal.

Since the number of cases in the group of 'no link with business planning' is so low a non-parametric test was also carried out.

Mann-Whitney U - Wilcoxon Rank Sum W Test

Variable Average ISP Effectiveness

By Variable Relationship between ISP and Business Planning (Q27)

Mean	Rank	Cases
28.10	10	no link
43.90	73	link
	83	TOTAL

Corrected for ties			
U	W	Z	2-tailed P
226	281	-1.9457	.0517

\therefore reject H_0 at the 10% significance level \Rightarrow evidence to suggest means are not equal.

D.4 General Background Information

D.4.1 Profile of Respondents

Management Level of respondent: (Q1)

	IS Planner	Non-IS Respondent
Top	38 (43%)	24 (44%)
Middle	43 (49%)	25 (45%)
Lower	6 (7%)	4 (7%)
Other	1 (1%)	2 (4%)
TOTAL	88	55

Number of reporting levels between Participant and CEO: (Q2)

	IS Planner	Non-IS Respondent
Direct Link	22 (24 %)	15 (27%)
1 Level	47 (52%)	26 (47%)
2 Levels	11 (12%)	6 (11%)
3 or more	10 (11%)	8 15%)
TOTAL	90	55

Level of respondent in organisation: (Q3)

	IS Planner	Non-IS Respondent
<i>Corporate</i>	53 (60%)	19 (35%)
<i>Division</i>	18 (20%)	21 (38%)
<i>Function</i>	16 (18%)	13 (24%)
<i>Process</i>	2 (2%)	0 (0%)
<i>Product</i>	0 (0%)	2 (3%)
<i>Other</i>	0 (0%)	0 (0%)
TOTAL	89	55

Level at which respondent is involved in ISP: (Q4)

	IS Planner	Non-IS Respondent
<i>Corporate</i>	61 (69%)	18 (33%)
<i>Division</i>	20 (22%)	20 (37%)
<i>Function</i>	3 (3%)	12 (22%)
<i>Process</i>	3 (3%)	1 (2%)
<i>Product</i>	0 (0%)	1 (2%)
<i>Other¹</i>	2 (2%)	2 (4%)
TOTAL	89	54

Respondents role in ISP: (Q5)

	IS Planner	Non-IS Respondent
<i>IS Planner/Champion</i>	67 (75%)	16 (29%)
<i>Member of Support team</i>	2 (2%)	4 (7%)
<i>Planning Participant</i>	10 (11%)	22 (40%)
<i>ISP Sponsor</i>	1 (1%)	6 (11%)
<i>Internal/External Consultant</i>	8 (9%)	0 (0%)
<i>Other¹</i>	1 (1%)	7 (13%)
TOTAL	89	55

D.4.2 Profile of Organisations**Primary Activity in Industry Sector: (Q7)**

	TOTAL
<i>Manufacturing</i>	18 (20%)
<i>Distribution</i>	6 (7%)
<i>Retail</i>	10 (11%)
<i>Service</i>	55 (62%)
TOTAL	89

	TOTAL
<i>Service</i>	55 (62%)
<i>Non-Service</i>	34 (38%)
TOTAL	89

The type of organisation is: (Q8)

<i>Public sector</i>	49 (54%)
<i>Private sector</i>	41 (46%)
TOTAL	90

<i>Diversified</i>	44 (55%)
<i>Specialised</i>	36 (45%)
TOTAL²	80

<i>Centralised</i>	34 (42%)
<i>Decentralised</i>	47 (58%)
TOTAL²	81

Size of the organisation:**TOTAL number of employees: (Q10)**

< 1000	24 (28%)
1000 < 10000	39 (45%)
10000+	23 (27%)
TOTAL	86

Annual Turnover/budget: (Q11)

< £10m	6 (8%)
£10m < £100m	22 (29%)
£100m < £500m	25 (33%)
£500m < £1000m	8 (11%)
£1000m+	14 (19%)
TOTAL	75

Question	n	Mean	TrMean	Std. Dev	Min	Max	LQ	Median	UQ
Q10	86	15826	8466	38794	13	250000	687	4000	10250
Q11	75	8.57E+8	4.16E+8	2.56E+9	1.8E+6	2.00E+10	4.00E+7	2.00E+8	6.00+8

¹ Including multiple responses.² Response rate low due to problems of questionnaire layout.

Organisational Culture: (Q42)

	TOTAL
Autocratic (the <i>Power</i> culture)	8 (9%)
Bureaucratic (the <i>Role</i> culture)	47 (53%)
Job or project (the <i>Task</i> culture)	25 (28%)
<i>People</i> culture	9 (10%)
TOTAL	89

D.4.3 The External Organisational/IT Environment

The organisation operates in: (n.b., not mutually exclusive categories)

	TOTAL³
Heterogeneous environment	41 (48%)
Dynamic environment	25 (29%)
Hostile environment	35 (41%)
Difficult to find skills	28 (32%)

Within the organisation's industry sector: (Q38)

	IS Planner³
a) information itself is sold as a product/service.	17 (20%)
b) information is used to add value to the principle services/products being supplied.	57 (65%)

Industry sector's use of IT:

	IS Planner
<i>Delivery</i>	29 (33%)
<i>Dependent</i>	50 (56%)
<i>Drive</i>	6 (7%)
<i>Delayed</i>	4 (4%)
TOTAL	89

H₀: Information used to add value is independent of the organisation's industry sector's use of IT

Variable Information used to add value (Q38b)

By Variable Organisation's industry sector's use of IT (Q41)

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob
<i>Between Groups</i>	3	15.2383	5.0794	4.4519	.0059
<i>Within Groups</i>	84	95.8413	1.1410		
TOTAL	87	111.0795			

Reject H₀ @ 1% level

Levene Test for Homogeneity of Variances:

Statistic	df1	df2	2-tail Sig.
1.2344	3	84	.302

Multiple Range Tests: Tukey-HSD test with significance level .050

(*) Indicates significant differences which are shown in the lower triangle

Mean	Industry Sector's use of IT	a	b	c	d
1.7500	a) Delayed				
3.3333	b) Drive				
3.6897	c) Delivery	*			
3.7347	d) Dependent	*			

³ Proportion of yes' (Likert scale response ≥ 4).

D.4.4 The Information Systems/Technology Environment

TOTAL IT budget: (Q12)

< £1m	20 (25%)
£1m < £5m	23 (29%)
£5m < £10m	12 (15%)
£10m +	25 (31%)
TOTAL	80

IT Spend as a % of TOTAL turnover/budget: (Q12/Q11)

0 < 0.02	38 (53%)
0.02 < 0.04	21 (30%)
0.04+	12 (17%)
TOTAL	71

Question	n	Mean	TrMean	Std. Dev	Min	Max	LQ	Median	UQ
Q12	80	3E+07	1.15E+07	1E+08	15000	7E+08	962500	3E+06	1.5E+07
ITSPEND	71	0.029	0.02	0.04	0.001	.25	0.01	.017	.031

Structure of IS organisation: (Q15)

	TOTAL
Centralised	23 (26%)
Centralised federal	29 (32%)
Decentralised federal	33 (37%)
Decentralised	4 (4%)
Other	1 (1%)
TOTAL	90

Structure of IS organisation vs Structure of the organisation: (Q15 vs Q8C)

Structure of IS Organisation	Structure of Organisation		
	Centralised	Decentralised	TOTAL
Centralised	15 (19%)	5 (6%)	20 (25%)
Centralised federal	13 (16%)	13 (16%)	26 (32%)
Decentralised federal	6 (7%)	24 (30%)	30 (37%)
Decentralised		4 (5%)	4 (5%)
Other		1 (1%)	1 (1%)
TOTAL	34 (42%)	47 (58%)	81

IS organisation is a: (Q17)

	TOTAL
Profit centre	14 (16%)
Cost centre	76 (84%)
TOTAL	90

Number of reporting levels between the top IS Manager and CEO: (Q18)

	TOTAL
Direct link	36 (40%)
1 level	43 (48%)
2 levels	10 (11%)
3 or more levels	1 (1%)
TOTAL	90

Within the organisation: Q43/7

	IS Planner³	Non-IS³
g) the IS staff have a lot of credibility with the rest of the organisation.	29 (32%)	13 (34%)
h) the <u>top</u> IS manager has a close working relationship with top management.	62 (75%)	31 (82%)
i) non-IS staff readily accept the introduction of IS/IT.	43 (48%)	20 (53%)
j) non-IS staff have an appropriate shared vision of the role of IT/IS.	18 (20%)	7 (18%)
62 j) The IS plan is communicated to all levels of the organisation;	29 (33%)	

N.B: - where more than one non-IS response were received from an organisation, the average response was taken in order to provide, in effect, one response from both IS Planner and non-IS respondent per organisation.

	Q43J
Q62J	.2137 (88)
	P= .046

Main Focus of existing and planned systems: (Q13)

	Existing	Planned
Strategic	17 (19%)	17 (19%)
Turnaround	2 (2%)	56 (64%)
Factory	61 (69%)	12 (14%)
Support	8 (9%)	2 (2%)
Other	2 (2%)	1 (1%)
TOTAL	90	88

Main Focus of: (Q13)

Existing Systems	Planned Systems					TOTAL
	Strategic	Turnaround	Factory	Support	Other	
Strategic	5 (6%)	12 (14%)				17 (19%)
Turnaround		1 (1%)	1 (1%)			2 (2%)
Factory	11 (12%)	41 (47%)	8 (9%)	1 (1%)		61 (69%)
Support	1 (1%)	2 (2%)	3 (3%)	1 (1%)		7 (8%)
Other					1 (1%)	1 (1%)
TOTAL	17 (19%)	56 (64%)	12 (14%)	2 (1%)	1 (1%)	88

Main focus of current IS plan: (Q37a,b)

	TOTAL
Modifications (reworks) to existing systems	2 (2%)
Enhancements to existing systems	21 (25%)
Replacing existing systems	31 (36%)
New developments	23 (27%)
Sustaining current systems	6 (7%)
Other	2 (2%)
TOTAL	85

Main focus of current IS plan (Q37)	Main Focus of Planned Systems (Q13b)					TOTAL
	Strategic	Turnaround	Factory	Support	Other	
Modifications		2				2
Enhancements	2	15	2			19
Replacements	9	17	5			31
New developments	5	13	5			23
Sustaining systems	1	4		1		6
Other		4			1	5
TOTAL	17	55	12	1	1	86

Disruption caused if all the IT-based systems in the organisation were to shutdown: (Q14)

Amt of disruption	1 Hour	1 Day	1 Week	Indefinitely
None	9 (10%)			
Little/some	47 (53%)	8 (9%)		
Moderate	27 (30%)	48 (53%)	9 (10%)	
Major	6 (7%)	33 (37%)	72 (81%)	50 (56%)
Organisations Closure		1 (1%)	8 (9%)	40 (44%)
TOTAL	89	90	89	90

	TOTAL
Fairly important (2<=3)	13 (14%)
Important (3<=4)	70 (78%)
Very Important (4<=5)	7 (8%)
TOTAL	90

Information Politics: Q19 (categorise not mutually exclusive)

	TOTAL
Technocratic Utopianism	30 (33%)
Anarchy	25 (28%)
Feudalism	58 (64%)
Monarchy	43 (48%)
Federalism	46 (51%)

Number of environments exhibited in organisations:

	TOTAL
None	2 (2%)
One	18 (20%)
Two	33 (37%)
Three	30 (33%)
Four	7 (8%)
TOTAL	90

	Power	Role	Task	People	TOTAL
Technocratic Utopianism	1 (1%)	14 (16%)	11 (12%)	4 (5%)	30 (34%)
Anarchy	2 (2%)	14 (16%)	4 (5%)	4 (5%)	24 (27%)
Feudalism	7 (8%)	30 (34%)	14 (16%)	6 (7%)	57 (64%)
Monarchy	5 (6%)	19 (21%)	15 (17%)	4 (5%)	43 (48%)
Federalism	2 (2%)	22 (25%)	19 (21%)	3 (3%)	46 (52%)

Feudalism

	No	Yes
Diversified	8	36
Specialised	17	19

H_0 : Columns and rows are independent

$$\chi^2(1) = 6.479^* \quad \text{Prob.} = .011$$

\therefore reject H_0 @ 5% level of significance

Feudalism

	No	Yes
Centralised	20	14
Decentralised	6	41

H_0 : Columns and rows are independent

$$\chi^2(1) = 17.15^* \quad \text{Prob.} = .00003$$

\therefore reject H_0 @ 1% level of significance

H_0 : No difference in Anarchy across different organisational cultures

Variable Anarchy (Q19B)
By Variable Organisational Culture (Q42)

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	13.3241	4.4414	3.2888	.0245
Within Groups	85	114.7883	1.3505		
TOTAL	88	128.1124			\therefore Reject H_0 @ 5% level

Levene Test for Homogeneity of Variances:

Statistic	df1	df2	2-tail Sig.
1.1727	3	85	.325

Multiple Range Tests: Tukey-HSD test with significance level .050

(*) Indicates significant differences which are shown in the lower triangle

		Culture			
		a	b	c	d
Mean	Culture				
2.0800	a) Task				
2.3750	b) Power				
2.6383	c) Role				
3.4444	d) People	*			

D.4.5 General ISP Environment*Within the organisation: (Q43/7)*

	IS Planner ³	Non-IS ³
a) the environment is highly conducive to IS planning.	17 (19%)	12 (32%)
k) there is commitment to IS planning by the major stakeholders.	43 (48%)	23 (61%)

Existence of IS plan: (Q20)

Formal IS plan exist	53 (60%)
IS plan exists but are not formalised	28 (31%)
No IS plan exists	8 (9%)
TOTAL	89

<i>Importance of IS/IT (Q14)</i>	<i>Existence of Plan (Q20)</i>			
	<i>Formal</i>	<i>Informal</i>	<i>No plan</i>	<i>TOTAL</i>
Fairly important (2<=3)	5 (6%)	5 (6%)	3 (3%)	13 (15%)
Important (3<=4)	43 (48%)	21 (24%)	5 (6%)	69 (78%)
Very Important (4<=5)	5 (6%)	2 (2%)		7 (8%)
TOTAL	53 (60%)	28 (31%)	8 (9%)	89

<i>Time Between Cycles (Q21)</i>		<i>Experience of ISP (Q22)</i>		<i>Planning Cycle(Q24)</i>	
Every year	38 (43%)	< 1 year	3 (3%)	< 2 weeks	1 (1%)
1-2 years	16 (18%)	1-2 years	16 (18%)	2-4 weeks	3 (4%)
3-4 years	10 (11%)	3-4 years	28 (31%)	1-3 months	25 (30%)
5+ years	0 (0%)	5-9 years	15 (17%)	3-6 months	16 (19%)
Continuously	21 (24%)	10+ years	20 (22%)	6+ months	15 (18%)
Infrequently	3 (3%)	Dont Know	7 (8%)	Continuous	23 (28%)
TOTAL	88	TOTAL	89	TOTAL	83

<i>Experience of ISP (Q22)</i>	<i>Existence of IS Plan (Q20)</i>			
	<i>Formal</i>	<i>Informal</i>	<i>No Plan</i>	<i>TOTAL</i>
< 5 years	27 (33%)	17 (21%)	3 (4%)	47 (57%)
5-9 years	13 (16%)	2 (2%)		15 (18%)
10+ years	12 (15%)	6 (7%)	2 (2%)	20 (24%)
TOTAL	52 (63%)	25 (31%)	5 (6%)	82

<i>Length of Planning Cycle (Q24)</i>	<i>Time between cycles (Q21)</i>					<i>TOTAL</i>
	<i>Every year</i>	<i>1-2 years</i>	<i>3-4 years</i>	<i>Continuously</i>	<i>Infrequently</i>	
< 2 weeks			1 (1%)			1 (1%)
2-4 weeks	2 (2%)	1 (1%)				3 (4%)
1-3 months	17 (20%)	2 (2%)	3 (4%)	3 (4%)		25 (30%)
3-6 months	7 (8%)	5 (6%)	3 (4%)			15 (18%)
6+ months	5 (6%)	3 (4%)	2 (2%)	4 (5%)	1 (1%)	15 (18%)
Continuously	4 (5%)	5 (6%)	1 (1%)	13 (15%)		23 (27%)
Don't know	2 (2%)					2 (2%)
TOTAL	37 (44%)	16 (19%)	10 (12%)	20 (24%)	1 (1%)	84

Strategic planning horizon for IS plans (Q23)

< 1 year	1 (1%)
1-2 years	18 (20%)
3-5 years	65 (73%)
6-10 years	3 (3%)
Don't know	2 (2%)
TOTAL	89

Within the organisation: Q43/7

	IS Planner ³	Non-IS ³
(b) managers are actively encouraged (through, for example, the organisation's reward system) to do effective strategic (long range) IS planning.	14 (16%)	11 (29%)

*Major objective/focus of ISP currently and what it should be (Q26, Q6)**

	<i>Currently</i>		<i>Should be</i>	
	<i>IS Planner</i>	<i>Non-IS Respondent</i>	<i>IS Planner</i>	<i>Non-IS Respondent</i>
Strategic/competitive	18 (28%)	5 (17%)	48 (73%)	12 (38%)
Efficiency/resource	25 (39%)	10 (35%)	5 (8%)	8 (25%)
Effectiveness	11 (17%)	9 (31%)	9 (14%)	8 (25%)
Technical/output	7 (11%)	3 (10%)	0 (0%)	0 (0%)
Intangible	3 (5%)	2 (7%)	4 (6%)	4 (12%)
TOTAL	64	29	64	32

*IS Planner**Should be (Q26b)*

<i>Current objective/ focus of ISP (Q26a)</i>	Strategic/ competitive	Efficiency/ resource	Effectiveness	Technical/ output	Intangible	TOTAL
Strategic/competitive	14 (22%)	2 (3%)	1 (2%)	1 (2%)		18 (28%)
Efficiency/resource	18 (28%)	2 (3%)	4 (6%)		1 (2%)	25 (39%)
Effectiveness	8 (13%)	1 (2%)	2 (3%)			11 (17%)
Technical/output	5 (8%)		1 (2%)		1 (2%)	7 (11%)
Intangible	2 (3%)		1 (2%)			3 (5%)
TOTAL	47 (73%)	5 (8%)	9 (14%)	1 (2%)	2 (3%)	64

*Non-IS Respondent**Should be (Q6b)*

<i>Current objective/ focus of ISP (Q6a)</i>	Strategic/ competitive	Efficiency/ resource	Effectiveness	Technical/ output	Intangible	TOTAL
Strategic/competitive	3 (11%)		1 (4%)			4 (14%)
Efficiency/resource	6 (21%)	1 (4%)	3 (11%)			10 (36%)
Effectiveness	2 (7%)	4 (14%)	3 (11%)			9 (32%)
Technical/output		2 (7%)	1 (4%)			3 (11%)
Intangible	1 (4%)	1 (4%)				2 (7%)
TOTAL	12 (43%)	8 (29%)	8 (29%)			28

Within the organisation: (Q43/7)

	<i>IS Planner³</i>	<i>Non-IS³</i>
(l) the IS planning objectives are made explicit .	39 (43%)	17 (45%)
(m) realistic IS planning objectives/goals are set.	57 (63%)	23 (61%)
(n) good quality business plans are produced.	33 (37%)	20 (53%)
49 (c) ISP participants agree the ISP objectives/goals. (Q10c)	54 (61%)	24 (63%)

Planning objectives made explicit Q43l (Q7l)

	<i>Planning objectives made explicit Q43l (Q7l)</i>		Total
	<i>No</i>	<i>Yes⁴</i>	
<i>ISP participants agree the ISP objectives/goals Q49c (Q10c)</i>	23 (11)	12 (3)	35 (14)
	28 (10)	26 (14)	54 (24)
Total	51 (38)	38 (17)	89 (38)

Relationship between ISP and business planning: (Q27)

Totally independent activities	10 (12%)
ISP is undertaken separately but inputs into business planning	17 (20%)
Business planning is undertaken separately but inputs into ISP	36 (42%)
ISP and business planning are intertwined	23 (27%)
TOTAL	86

⁴ Response rate low for this question due to problems with the wording.

		<i>Good quality business plans are produced</i>		
		<i>No</i>	<i>Yes</i>	<i>TOTAL</i>
Q27	Totally independent activities	7 (2)	3 (2)	10 (4)
	Bottom-up	9 (2)	8 (5)	17 (7)
	Top-down	26 (11)	10 (9)	36 (20)
	ISP and business planning are intertwined	12 (3)	11 (4)	33 (7)
	<i>TOTAL</i>	54 (18)	32 (20)	86 (38)

IS Planner participates in business planning (Q28)

	<i>TOTAL</i>
Yes ³	45 (52%)
No	42 (48%)
<i>TOTAL</i>	87

IS planner is kept fully informed of changes in the business (Q29)

	<i>TOTAL</i>
Yes ³	42 (51%)
No	40 (49%)
<i>TOTAL</i>	82

<i>Does the IS planner participate in business planning (Q28)?</i>	<i>Is IS planner kept fully informed of changes in the business (Q29)?</i>	<i>Frequency</i>
*	*	25 (31%)
*	✓	13 (16%)
✓	*	14 (17%)
✓	✓	29 (36%)
<i>TOTAL</i>		81

<i>Highest level of support of:</i>	<i>ISP sponsor (Q30)</i>	<i>ISP champion (Q31)</i>
Top Management	69 (78%)	40 (45%)
Middle Management	6 (7%)	18 (20%)
Lower Management	1 (1%)	1 (1%)
IS Manager/executive	11 (12%)	28 (32%)
Consultants	1 (1%)	2 (2%)
IS staff/users	1 (1%)	0 (0%)
<i>TOTAL</i>	89	89

<i>Major role of the:</i>	<i>Champion (Q32a)</i>	<i>Consultant (Q32b)</i>
Process role	34 (52%)	11 (14%)
Expert role	28 (43%)	19 (24%)
Support role	1 (2%)	3 (4%)
Planning participant only	2 (3%)	2 (3%)
N/A		44 (56%)
<i>TOTAL</i>	65	79

ISP approach according to Earl (1990) classification (Q33)

Organisational led	28 (33%)
Method driven	5 (6%)
Technology driven	12 (14%)
Administrative	9 (11%)
Business led	31 (36%)
<i>TOTAL</i>	85

Good quality business plan? (Q43n; 7n)

	<i>IS Planner³</i>	<i>Non-IS³</i>
Organisational led	15 (54%)	6 (55%)
Method driven	1 (20%)	1 (50%)
Technology driven	2 (17%)	3 (60%)
Administrative	2 (22%)	3 (75%)
Business led	10 (32%)	6 (40%)

The ISP methodology used: (Q46)

	<i>IS Planner³</i>
(a) is too complicated.	8 (9%)
(b) is too bureaucratic.	8 (9%)
(c) is adequacy documented to provide an overview of the study and the steps to be taken.	34 (39%)

The ISP process is good at: (Q47)

	IS Planner ³
a) <i>anticipating</i> potential problems before they arise;	35 (39%)
b) <i>encouraging</i> debate among participants;	60 (67%)
c) <i>seeking</i> a consensus among participants;	52 (63%)
d) <i>dealing</i> with sources of conflict;	31 (34%)
e) <i>making</i> use of the IS planning participants skills/abilities;	50 (56%)
f) <i>meeting</i> individual participants needs (e.g., personal development).	27 (30%)

The ISP participants: (Q49/10)

	IS Planner ³	Non-IS ^d
d) are <u>equally</u> involved in the decision making;	38 (43%)	13 (34%)
e) openly express their feelings/fears;	57 (63%)	24 (63%)

Main decision making stage of ISP takes place: (Q36)

During the normal day-to-day running of the organisation	34 (43%)
On-site, but well away from the day-to-day running of the organisation	40 (51%)
Off-site, well away from the day-to-day running of the organisation	5 (6%)
TOTAL	79

Stakeholders participate in each stage of planning (0=no participation; 1=minimal; 2=moderate; 3= a lot): Q34

	Pre-planning stage	Intelligence stage	Design stage	Choice stage	Implementation stage	Review stage	Ave
Top Management	1.29	1.3	0.78	2.05	0.88	1.63	7.92 (10.7%)
Middle Management	1.72	1.87	1.64	1.75	1.95	1.83	10.76 (14.6%)
Lower Management	0.84	1.33	1.26	1.05	1.84	1.31	7.61 (10.3%)
IS manager/executive	2.38	2.43	2.27	2.47	2.24	2.32	14.10 (19.1%)
IS staff	1.44	1.92	2.28	1.49	2.47	1.68	11.29 (15.3%)
Users	1.06	1.56	1.47	1.43	2.08	1.69	9.30 (12.6%)
Consultants	0.85	1.06	1.01	0.81	0.73	0.61	5.07 (6.9%)
Customers	0.55	0.8	0.44	0.47	0.6	0.66	3.52 (4.8%)
Suppliers	0.45	0.88	0.69	0.49	1.08	0.58	4.18 (5.7%)
Total Average	10.57 (14.3%)	13.16 (17.8%)	11.82 (16.0%)	12.01 (16.3%)	13.87 (18.8%)	12.31 (16.7%)	73.7

Information gathering/reporting mechanism usage in each stage of planning (0=not used; 1=minimal; 2=moderate; 3= a lot): (Q35)

	Pre-planning stage	Intelligence stage	Design stage	Choice stage	Implementation stage	Review stage	Ave
Workshop;	1.06	1.21	1.35	1.13	0.96	0.98	6.69 (13.3%)
Interviews;	1.32	2.00	1.24	0.81	0.67	1.36	7.39 (14.7%)
Open-ended questionnaires;	0.51	0.72	0.34	0.30	0.31	0.63	2.80 (5.6%)
Closed-ended questionnaires;	0.44	0.56	0.35	0.36	0.3	0.62	2.63 (5.2%)
Formal meetings	1.55	1.67	1.80	2.31	1.68	1.85	10.86 (21.6%)
Informal meetings	2.04	2.13	1.87	1.40	1.68	1.42	10.56 (21.0%)
Reports.	1.31	1.55	1.51	1.02	1.32	1.75	9.46 (18.8%)
Total Average	8.21 (16.3%)	9.87 (19.6%)	8.46 (16.8%)	8.33 (16.5%)	6.92 (13.7%)	8.60 (17.1%)	50.4

During ISP: (Q52, 11)

	IS Planner ³	Non-IS ³
a) it is <u>easy</u> to obtain the necessary information needed to plan effectively;	19 (21%)	7 (18%)
b) the information used to generate the plan is <u>reliable</u> ;	15 (17%)	7 (18%)
c) it is <u>easy</u> to translate the business needs into information requirements;	19 (23%)	9 (24%)

Overall the following 6 stages of ISP are carried out effectively (Q56, 12):

Stages of ISP	IS Planner ³	Non-IS ³
Pre-planning	34 (42%)	24 (63%)
Intelligence	51 (62%)	15 (39%)
Design	57 (70%)	22 (58%)
Choice	58 (72%)	22 (58%)
Implementation	54 (67%)	22 (58%)
Review	30 (37%)	8 (21%)

Effective methods are available for the following 6 stages of ISP (Q58, 14):

Stages of ISP	IS Planner ³	Non-IS ³
Pre-planning	27 (34%)	17 (45%)
Intelligence	37 (47%)	14 (37%)
Design	41 (52%)	22 (58%)
Choice	45 (58%)	20 (53%)
Implementation	45 (58%)	15 (39%)
Review	26 (33%)	9 (24%)

	Q14A	Q14B	Q14C	Q14D	Q14E	Q14F
Q12	.4516 (38)	.7064 (38)	.5738 (38)	.6109 (38)	.6236 (38)	.8168 (38)
	P= .004	P= .000	P= .000	P= .000	P= .000	P= .000
	Q58A	Q58B	Q58C	Q58D	Q58E	Q58F
Q56	.6042 (79)	.6218 (79)	.6128 (79)	.6647 (78)	.5704 (78)	.6884 (78)
	P= .000	P= .000	P= .000	P= .000	P= .000	P= .000

An appropriate amount of time is spent in each of the 6 stages of planning: (Q57)³

IS Planner	19 (21%)
Non-IS participant	4 (11%)

	Q44A
Q57	.3718 (89)
	P= .000

Question Number	Item	IS Planner ³
25	Budget specifically put aside for ISP	36 (41%)
45b	Adequate resources are available for each stage of ISP	17 (19%)
45c	Best people are made available during each stage of ISP	30 (33%)
45d	An appropriate number of people take part in the ISP	32 (36%)

ISP participants clearly know what to expect from the: (Q44, 8)

	IS Planner ³	Non-IS ³
a) IS planning process (<i>i.e.</i> , understanding how the planning is to be done);	39 (43%)	19 (50%)
b) contents of the plan (<i>i.e.</i> , the deliverables from the planning process).	45 (51%)	24 (63%)

a) the IS Planner has the expertise to carry out ISP effectively. (Q48, 9)	60 (72%)	30 (79%)
b) the IS Planner has the credibility within the organisation. (Q48, 9)	58 (70%)	24 (63%)

The ISP participants: (Q49, 10)

a) represent the major stakeholder groups in the organisation;	63 (71%)	20 (53%)
b) find the amount of time required to complete the IS plans acceptable;	22 (25%)	12 (32%)
f) are skilled in planning;	31 (35%)	15 (39%)
g) have a clear understanding of the role & responsibilities each of them is expected to have in the planning process;	38 (43%)	15 (39%)
h) are effective at problem solving;	51 (57%)	26 (68%)
i) are effective at making decisions.	53 (60%)	24 (63%)

ISP methodology is adequately documented (Q46c)

Participants clearly know what to expect from the ISP process (Q44a)

	No	Yes ³	Total
No	36	12	48
Yes ³	17	22	39
Total	53	34	87

ISP participants have a clear understanding of their role and responsibilities in ISP (Q49g /10g)

Participants clearly know what to expect from the ISP process (Q44a/8a)

	No	Yes ³	Total
No	37 (16)	13 (3)	50 (19)
Yes ³	14 (7)	25 (12)	39 (19)
Total	51 (23)	38 (15)	89 (38)

	Q62K
Q44B	.4075 (86) P= .000

The following support/control structures are important to ISP: (Q50)

	IS Planner ³
a) information systems steering committee;	60 (67%)
b) task force (temporary group set up for IS planning);	41 (46%)
c) teams (permanent group set up for IS planning);	37 (41%)
d) liaison role (representative from user group liaise with IS/IT staff) ;	56 (63%)
e) an IS planning support team which collects, synthesises and analyses data for input into the planning process.	34 (38%)

45 a) automated tools and other computer support are important to ISP.	32 (36%)
59 a) there is a readily identifiable sponsor (person who secures funding) for the implementation task;	70 (78%)
59 b) major stakeholders are involved;	66 (73%)
59 e) there is commitment of resources to the implementation of the IS plan.	43 (48%)

	IS Planner ³	Non-IS ³
59 c) major stakeholders have a clear understanding of the role & responsibilities each of them have in the implementation of the IS plan. (Q17a)	36 (40%)	20 (53%)
59 d) there is commitment by the major stakeholders to the IS plans implementation . (Q17b)	48 (54%)	21 (55%)

	Q59C		Q17A
Q59D	.7306 (89) P= .000	Q17B	.6815 (38) P= .000

	IS Planner ³
60) We move quickly from IS planning into the IS plans implementation.	40 (45%)
61) The implementation of the IS plan is regularly reviewed.	51 (57%)

	Q60
Q59D	.4843 (88) P= .000

The IS plan: (Q62)

a) includes long-range objectives & strategies;	62 (70%)
b) includes short- to medium- range plans to achieve the long-term strategy;	78 (88%)
c) includes realistic projects in terms of the resources available;	63 (72%)
d) contains sufficient information to lend credibility to its promise;	57 (65%)
e) is clearly documented for ease of reference when, for example, changes of policy/direction/circumstances occur;	26 (30%)
f) captures all the information and detailed analysis that was developed during the planning cycle;	25 (28%)
g) identifies some IS that are likely to be early successes;	58 (66%)
h) includes the alternative solutions to each of the problems identified together with why these were dismissed;	21 (24%)

<i>The IS Plan: (Q62k,e,l; 18a,b,c)</i>	<i>IS Planner³</i>	<i>Non-IS³</i>
meets stakeholders expectations;	39 (44%)	17 (45%)
is <u>used</u> as a working document;	54 (61%)	18 (47%)
is owned by the major stakeholders.	41 (51%)	17 (45%)

	Q8B		Q44B
Q18A	.4919 (37)	Q62K	.4075 (86)
	P= .002		P= .000

D.5 ISP Effectiveness Analysis

IS Planners:

	<i>n</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>	<i>LQ</i>	<i>Median</i>	<i>UQ</i>
Q66A	86	3.4186	.7741	1	5	3	3	4
Q66B	84	3.8929	.7447	2	5	4	4	4
Q66C	86	3.5233	.8363	1	5	3	4	4
Q66D	86	3.5349	.8636	1	5	3	4	4
Q66E	86	3.2093	.8277	1	5	3	3	4
Q66F	85	3.5176	.8812	1	5	3	4	4
Q66G	52	2.5769	.9771	1	5	2	3	3
Q66H	54	2.5926	1.0003	1	5	2	3	3
Q66I	50	3.0200	1.1516	1	5	2	3	4
Q67	85	3.4118	.8903	1	5	3	4	4
Q68	84	2.7619	1.1260	1	5	2	2	4
Q69	84	2.9762	.9439	1	5	2	3	3.75
Q70	84	3.1905	.9629	1	5	3	3	4

Non-IS Participants of the ISP activity:

	<i>n</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>	<i>LQ</i>	<i>Median</i>	<i>UQ</i>
Q19A	55	3.49	0.92	1	5	3	4	4
Q19B	55	3.58	0.76	2	5	3	4	4
Q19C	55	3.47	0.90	2	5	3	3	4
Q19D	55	3.51	0.86	2	5	3	4	4
Q19E	55	3.16	0.83	1	5	3	3	4
Q19F	54	3.22	0.66	2	5	3	3	4
Q19G	36	2.81	0.86	1	5	2	3	3
Q19H	36	2.89	0.98	1	5	2	3	3
Q19I	36	2.97	1.08	1	5	2	3	3.75
Q20	54	3.35	0.80	2	5	3	3	4
Q21	55	2.89	1.07	1	5	2	3	4
Q22	55	2.96	0.90	1	4	2	3	4
Q23	54	3.04	0.87	2	4	2	3	4

<i>Variable</i>	<i>n</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>	<i>LQ</i>	<i>Median</i>	<i>UQ</i>
AVGEFF A	86	3.24	.58	1.15	4.62	3.00	3.23	3.54
AVGEFF B	55	3.23	.61	2.10	4.54	2.81	3.30	3.57

t-tests of difference in Q66B/19B between the two questionnaires

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
IS Planner	85	3.8824	.747	.081
Non-IS respondent	54	3.5926	.765	.104
Mean Difference		.2898		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95%CI for Diff
Equal	2.21	137	.029	.131	(.030, .549)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in Q66F/19F between the two questionnaires

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
IS Planner	86	3.5116	.878	.095
Non-IS respondent	53	3.2264	.669	.092
Mean Difference		.2852		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95%CI for Diff
Unequal	2.16	132.98	.032	.132	(.024, .546)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in average ISP effectiveness between questionnaires

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
IS Planner	86	3.2573	.595	.064
Non-IS respondent	55	3.2013	.600	.081
Mean Difference		.0560		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95%CI for Diff
Equal	.54	139	.588	.103	(-.148, .260)

\therefore cannot reject $H_0 \Rightarrow$ no evidence to suggest means are different.

D.6 Feedback Analysis

D.6.1 ISP system feedback

	n	Mean	Std Dev	Min	Max	LQ	Median	UQ
Q64AI	86	2.3140	1.1089	1	5	1	2	3
Q64AII	86	2.7558	1.0509	1	5	2	3	4
Q64BI	86	2.4535	1.1025	1	5	1.75	2	3
Q64BII	86	2.7442	.9724	1	4	2	3	4
Q64CI	86	2.4884	1.1856	1	5	1.75	2	4
Q64CII	85	2.6941	1.0354	1	5	2	3	4

Total Monitoring of ISP System (MONTOTPR)

<i>Value</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
2.00	11	12.9	12.9
3.00	4	4.7	17.6
4.00	27	31.8	49.4
5.00	6	7.1	56.5
6.00	15	17.6	74.1
7.00	8	9.4	83.5
8.00	14	16.5	100.0
TOTAL	85	100.0	

Total Review on ISP System (REVTOTPR)

<i>Value</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
2.00	10	11.8	11.8
3.00	6	7.1	18.8
4.00	18	21.2	40.0
5.00	9	10.6	50.6
6.00	22	25.9	76.5
7.00	5	5.9	82.4
8.00	15	17.6	100.0
TOTAL	85	100.0	

Total Update of ISP System (UPTOTPR)

<i>Value</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
2.00	11	13.1	13.1
3.00	6	7.1	20.2
4.00	22	26.2	46.4
5.00	6	7.1	53.6
6.00	13	15.5	69.0
7.00	11	13.1	82.1
8.00	13	15.5	97.6
9.00	1	1.2	98.8
10.00	1	1.2	100.0
TOTAL	84	100.0	

<i>Variable</i>	<i>n</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>	<i>LQ</i>	<i>Median</i>	<i>UQ</i>
MONTOTPR	85	5.06	1.94	2.00	8.00	4.00	5.00	7.00
REVTOTPR	85	5.20	1.91	2.00	8.00	4.00	5.00	6.00
UPTOTPR	84	5.19	2.07	2.00	10.00	4.00	5.00	7.00

<i>Question Number</i>	<i>Concept</i>	<i>Frequency of Yes' (%)</i>
64ai	Formal Monitoring	17 (20%)
64aii	Informal Monitoring	26 (30%)
64bi	Formal Reviewing	18 (21%)
64bii	Informal Reviewing	22 (26%)
64ci	Formal Updating	22 (26%)
64cii	Informal Updating	23 (27%)

<i>ISP system feedback</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
No Monitor, Review, Update	3	4.0	4.0
No Monitor, No Review, Update	8	10.7	14.7
No Monitor, Review, No Update	4	5.3	20.0
No Monitor, No Review, No Update	41	48.2	65.9
Monitor, No Review, No Update	6	7.1	72.9
Monitor, Review, No Update	3	3.5	76.5
Monitor, No Review, Update	4	4.7	81.2
Monitor, Review, Update	16	18.8	100.0
<i>TOTAL</i>	85	100.0	

Total formal ISP system feedback (FPROCFO)

<i>TOTAL Feedback Formal (min=3; max=15)</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
3.00	18	20.9	20.9
4.00	2	2.3	23.3
5.00	4	4.7	27.9
6.00	14	16.3	44.2
7.00	6	7.0	51.2
8.00	9	10.5	61.6
9.00	12	14.0	75.6
10.00	7	8.1	83.7
11.00	6	7.0	90.7
12.00	6	7.0	97.7
13.00	1	1.2	98.8
15.00	1	1.2	100.0
<i>TOTAL</i>	86	100.0	

Total informal ISP system feedback (FPROCIN)

<i>TOTAL Informal Feedback (min=3; max=15)</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
3.00	8	9.4	9.4
5.00	4	4.7	14.1
6.00	11	12.9	27.1
7.00	10	11.8	38.8
8.00	12	14.1	52.9
9.00	13	15.3	68.2
10.00	9	10.6	78.8
11.00	6	7.1	85.9
12.00	11	12.9	98.8
13.00	1	1.2	100.0
<i>TOTAL</i>	85	100.0	

t-tests of differences in total formal vs informal ISP system feedback

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

<i>Variable</i>	<i>Number of Cases</i>	<i>Mean</i>	<i>SD</i>	<i>SE of Mean</i>
Total Informal Feedback	85	8.1647	2.654	.288
Total Formal Feedback	86	7.2558	3.061	.330
Mean Difference		.9089		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	2.08	166.19	.040	.438	(.044, 1.774)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of differences in formal vs informal ISP system monitoring

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	86	2.3140	1.109	.120
Informal	86	2.7558	1.051	.113
Mean Difference		-.4419		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-2.68	170	.008	.165	(-.767, -.117)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of differences in formal vs informal ISP system reviewing

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	86	2.4535	1.102	.119
Informal	86	2.7442	.972	.105
Mean Difference		-.2907		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	-1.83	167.39	.068	.159	(-.604, .022)

\therefore CANNOT reject H_0 at the 10% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of differences in formal vs informal ISP system updating

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	86	2.4884	1.186	.128
Informal	85	2.6941	1.035	.112
Mean Difference		-.2057		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-1.21	169	.229	.170	(-.542, .131)

\therefore CANNOT reject H_0 at the 5% significance level \Rightarrow no evidence to suggest means are different.

Variable	n	Mean	Std. Dev	Min	Max	LQ	Median	UQ
FPROCFO	86	7.26	3.06	3.00	15.00	5	7	9.25
FPROCIN	85	8.16	2.65	3.00	13.00	6	8	10

FPROCTOT Total Feedback on Planning Process

TOTAL Feedback (min=6; max=30)	Frequency	Valid Percent	Cum Percent
6.00	8	9.5	9.5
8.00	3	3.6	13.1
9.00	2	2.4	15.5
10.00	2	2.4	17.9
11.00	3	3.6	21.4
12.00	10	11.9	33.3
13.00	2	2.4	35.7
14.00	8	9.5	45.2
15.00	2	2.4	47.6
16.00	10	11.9	59.5
17.00	3	3.6	63.1
18.00	5	6.0	69.0
19.00	3	3.6	72.6
20.00	7	8.3	81.0
21.00	5	6.0	86.9
22.00	3	3.6	90.5
23.00	1	1.2	91.7
24.00	6	7.1	98.8
25.00	1	1.2	100.0
TOTAL	84	100.0	

Variable	n	Mean	Std. Dev	Min	Max	LQ	Median	UQ
FPROCTOT	84	15.38	5.29	6.00	25.00	12.00	16.00	20.00

Non-IS Respondents:

ISP system feedback (Q16) => The ISP methodology is periodically reviewed and updated to ensure it still suits the needs of the organisation.

Non-IS respondent	16 (42%)
--------------------------	----------

D.6.2 IS plan feedback

	n	Mean	Std Dev	Min	Max	LQ	Median	UQ
Q63AI	85	2.4824	1.0868	1	5	2	2	3
Q63AII	87	3.5977	.8688	1	5	3	4	4
Q63BI	86	2.6628	1.1126	1	5	2	3	4
Q63BII	87	3.3563	.9147	1	5	3	4	4
Q63CI	86	2.8140	1.1733	1	5	2	3	4
Q63CII	87	3.1954	1.0097	1	5	3	3	4

Total Monitoring of IS Plan (MONTOTPL)

TOTAL Monitoring (min=2; max=10)	Frequency	Valid Percent	Cum Percent
2.00	2	2.4	2.4
3.00	2	2.4	4.7
4.00	12	14.1	18.8
5.00	9	10.6	29.4
6.00	28	32.9	62.4
7.00	17	20.0	82.4
8.00	11	12.9	95.3
9.00	2	2.4	97.6
10.00	2	2.4	100.0
TOTAL	85	100.0	

Total Reviewing of IS Plan (REVTOTPL)

TOTAL Reviewing (min=2; max=10)	Frequency	Valid Percent	Cum Percent
2.00	3	3.5	3.5
3.00	3	3.5	7.0
4.00	14	16.3	23.3
5.00	8	9.3	32.6
6.00	25	29.1	61.6
7.00	10	11.6	73.3
8.00	20	23.3	96.5
9.00	3	3.5	100.0
TOTAL	86	100.0	

Total Update on IS Plan (UPTOTPL)

TOTAL Updating (min=2; max=10)	Frequency	Valid Percent	Cum Percent
2.00	4	4.7	4.7
3.00	5	5.8	10.5
4.00	10	11.6	22.1
5.00	4	4.7	26.7
6.00	29	33.7	60.5
7.00	17	19.8	80.2
8.00	13	15.1	95.3
9.00	3	3.5	98.8
10.00	1	1.2	100.0
TOTAL	86	100.0	

Variable	n	Mean	Std. Dev	Min	Max	LQ	Median	UQ
MONTOTPL	85	6.07	1.61	2.00	10.00	5.000	6.000	7.000
REVTOTPL	86	6.02	1.74	2.00	9.00	5.000	6.000	8.000
UPTOTPL	86	6.01	1.77	2.00	10.00	5.000	6.000	7.000

Question Number	Concept	Frequency of Yes' (%)
63ai	Formal Monitoring	17 (20%)
63aii	Informal Monitoring	58 (67%)
63bi	Formal Reviewing	23 (27%)
63bii	Informal Reviewing	48 (55%)
63ci	Formal Updating	29 (34%)
63cii	Informal Updating	37 (43%)

Type of IS plan feedback	Frequency	Valid Percent	Cum Percent
No Monitor, Review, Update	7	8.3	8.3
No Monitor, No Review, Update	1	1.2	9.5
No Monitor, No Review, No Update	18	20.9	30.2
Monitor, No Review, No Update	9	10.5	40.7
Monitor, Review, No Update	9	10.5	51.2
Monitor, No Review, Update	9	10.5	61.6
Monitor, Review, Update	33	38.4	100.0
TOTAL		100.0	

Formal IS plan feedback (FPLANFO)

<i>TOTAL Formal Feedback (min=3; max=15)</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
3	10	11.8	11.8
4	4	4.7	16.5
5	1	1.2	17.6
6	17	20.0	37.6
7	3	3.5	41.2
8	10	11.8	52.9
9	12	14.1	67.1
10	11	12.9	80.0
11	5	5.9	85.9
12	9	10.6	96.5
13	3	3.5	100.0
TOTAL	85	100.0	

Informal IS plan feedback (FPLANIN)

<i>TOTAL Informal Feedback (min=3; max=15)</i>	<i>Frequency</i>	<i>Valid Percent</i>	<i>Cum Percent</i>
3.00	2	2.3	2.3
6.00	7	8.0	10.3
7.00	3	3.4	13.8
8.00	6	6.9	20.7
9.00	11	12.6	33.3
10.00	10	11.5	44.8
11.00	19	21.8	66.7
12.00	24	27.6	94.3
13.00	2	2.3	96.6
14.00	1	1.1	97.7
15.00	2	2.3	100.0
TOTAL	87	100.0	

<i>Variable</i>	<i>n</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>	<i>LQ</i>	<i>Median</i>	<i>UQ</i>
FPLANFO	85	7.93	2.91	3.00	13.00	6.000	8.000	10.000
FPLANIN	87	10.15	2.34	3.00	15.00	9.000	11.000	12.000

t-tests of difference in formal vs informal IS plan feedback

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

<i>Variable</i>	<i>Number of Cases</i>	<i>Mean</i>	<i>SD</i>	<i>SE of Mean</i>
Total Informal Feedback	87	10.1494	2.335	.250
Total Formal Feedback	85	7.9294	2.915	.316
Mean Difference		2.2200		

t-test for Equality of Means

<i>Variances</i>	<i>t-value</i>	<i>df</i>	<i>2-Tail Sig</i>	<i>SE of Diff</i>	<i>95% CI for Diff</i>
Unequal	5.50	160.68	.000	.403	(1.423, 3.017)

\therefore reject H_0 at the 0.1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in formal vs informal IS plan monitoring

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	85	2.4824	1.087	.118
Informal	87	3.5977	.869	.093
Mean Difference		-1.1153		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	-7.42	160.52	.000	.150	(-1.412, -.819)

\therefore reject H_0 at the 0.1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in formal vs informal IS plan reviewing

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	86	2.6628	1.113	.120
Informal	87	3.3563	.915	.098
Mean Difference		-.6935		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	-4.48	164.12	.000	.155	(-1.000, -.387)

\therefore reject H_0 at the 0.1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in formal vs informal IS plan updating

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal	86	2.8140	1.173	.127
Informal	87	3.1954	1.010	.108
Mean Difference		-.3814		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	-2.29	166.70	.023	.167	(-.710, -.053)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

Total IS plan feedback (FPLANTOT)

TOTAL Feedback (min=6; max=30)	Frequency	Valid Percent	Cum Percent
6.00	2	2.4	2.4
9.00	2	2.4	4.7
11.00	1	1.2	5.9
12.00	10	11.8	17.6
14.00	4	4.7	22.4
16.00	4	4.7	27.1
17.00	6	7.1	34.1

18.00	15	17.6	51.8
19.00	5	5.9	57.6
20.00	9	10.6	68.2
21.00	7	8.2	76.5
22.00	9	10.6	87.1
23.00	4	4.7	91.8
24.00	5	5.9	97.6
25.00	2	2.4	100.0
TOTAL		85	100.0

Variable	n	Mean	Std. Dev	Min	Max	LQ	Median	UQ
FPLANTOT	85	18.06	4.32	6.00	25.00	16.00	18.00	21.00

Non-IS Respondents

IS plan feedback (Q18D) => the IS plan is continually updated to incorporate changes in the environment.

Non-IS respondent	13 (34%)
--------------------------	----------

t-tests of total feedback between IS plan vs ISP system

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
IS plan feedback	85	18.0588	4.324	.469
ISP system feedback	84	15.3810	5.294	.578
Mean Difference		2.6779		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Unequal	3.60	159.87	.000	.744	(1.208, 4.148)

∴ reject H_0 at the 0.1% significance level => evidence to suggest means are not equal.

D.6.3 Feedforward: A Related Concept

Feedforward on IS plan (Q52D/11D) => it is easy to incorporate new information at any stage of the planning process as it arises.

IS Planner (Q52D)	25 (28%)
Non-IS respondent (Q11D)	13 (34%)

	FPLANTOT	AVGEFF A
Q54D	.1057 (84)	.1380 (85)
	P= .339	P= .208

Feedforward on ISP system (Q46D/Q15) => the planning process is flexible, adapting to the needs of the participants, resources, information available and/or changes in the environment as they arise.

IS Planner (Q46D)	62 (69%)
Non-IS respondent (Q15)	20 (53%)

	FPROCTOT	AVGEFF A
Q46D	.2238 (84)	.0691 (86)
	P= .041	P= .527

D.6.4 Relationships between Feedback and Average ISP Effectiveness

t-tests of difference in ISP systems feedback for organisations with above and below mean average ISP effectiveness

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Below	36	13.6667	5.105	.851
Above	46	16.8478	4.962	.732
Mean Difference		-3.1812		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-2.85	80	.006	1.118	(-5.407, -.955)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in IS plan feedback for organisations with above and below mean average ISP effectiveness

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Below	36	16.7222	4.026	.671
Above	47	19.2766	3.944	.575
Mean Difference		-2.5544		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-2.90	81	.005	.881	(-4.308, -.800)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

Mann-Whitney U - Wilcoxon Rank Sum W Test

Variable Average ISP Effectiveness
By Variable Number of ISP system feedback components present

Mean	Rank	Cases
53.06	16	All three
39.36	67	Two or less
	83	TOTAL

Corrected for ties			
U	W	Z	2-tailed P
359	849	-2.0445	.0409

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of difference in average ISP effectiveness for organisations with all three components of IS plan feedback vs those with two or less

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
All three	32	3.5056	.443	.078
Two or less	52	3.0958	.610	.085
Mean Difference		.4099		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	3.30	82	.001	.124	(.163, .657)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

Regression

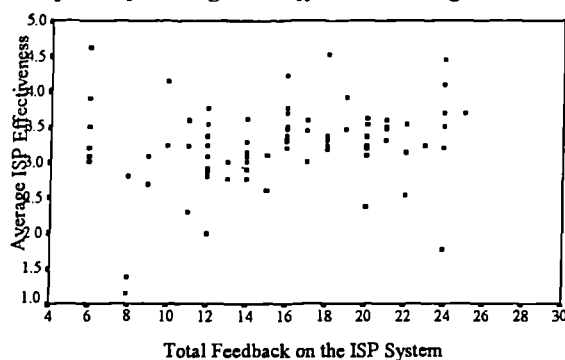
Assumptions associated with linear regression are that of:

- Normality, that is for any fixed value of the independent variable X, the distribution of the dependent variable Y is normal.
- Homogenous variance, that is the variation in difference between actual and predicted values must be the same for all fitted values of Y (i.e., residuals remain constant for all Y').
- Linearity, that is there is a linear or straight line relationship between dependent and independent variables.

Investigating the scatter plots of the residual ($Y' - Y$) can determine whether these assumptions are violated.

Average ISP Effectiveness and Total ISP System Feedback

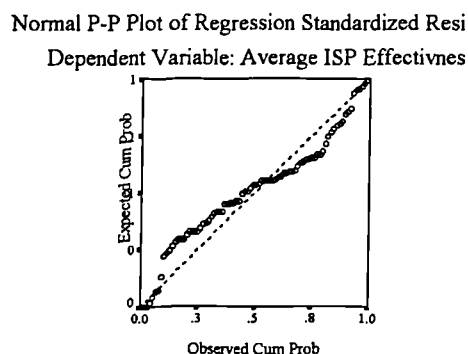
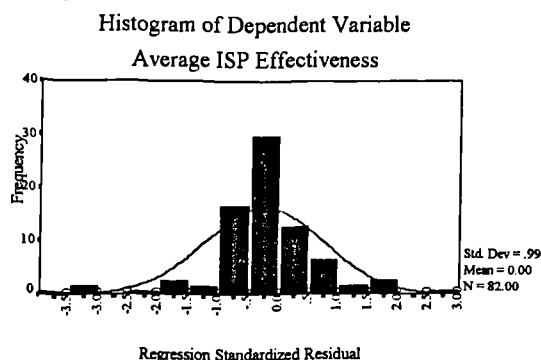
	FPROCTOT	
	Pearson	Spearman
AVGEFF_A	.2219 (82)	.3010 N(82)
	P= .045	Sig .006

Scatter plots of average ISP effectiveness against total ISP System feedback

The correlation co-efficient and scatter plots suggest a positive relationship between average ISP effectiveness and total ISP system feedback.

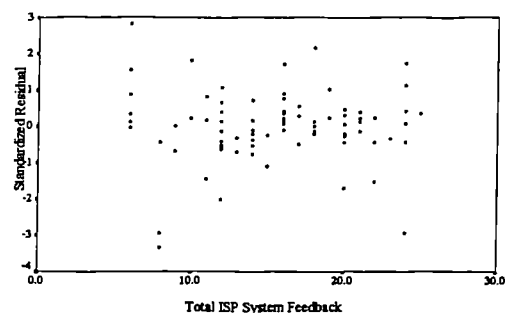
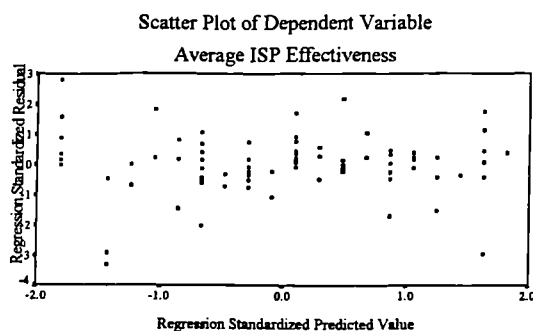
Assumptions

Normality



The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity



There seems to be no relationship between predicted and residual values indicating that the linearity assumption is not violated. The variance is approximately constant for all predicted values of Y indicating that the homoscedasticity assumption has not been violated

In general, standardised residual values greater than an absolute value of 3 are considered outliers. The casewise plot of standardized residual option in SPSS provides information about specific outliers and is shown below. There are no standardised residual values of more than 3 which means there are no outliers in the data indicating that the model fits all data values equally well.

The data was investigated (using Cooks Distances which considers changes in all residuals when a case is omitted) for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is 0.234 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.22192
R Square	.04925
Adjusted R Square	.03736
Standard Error	.57129

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	1	1.35247	1.35247	4.14391	.0451
Residual	80	26.10994	.32637		

Variables in the Equation

<i>Variable</i>	<i>B</i>	<i>SE B</i>	<i>Beta</i>	<i>T</i>	<i>SigT</i>
FPROCTOT	.024658	.012113	.221919	2.036	.0451
(Constant)	2.854728	.197511		14.453	.0000

r^2 is low indicating that a linear model is not a good fit. In other words only 5% of the total variation in average ISP effectiveness is accounted for by total ISP system feedback.

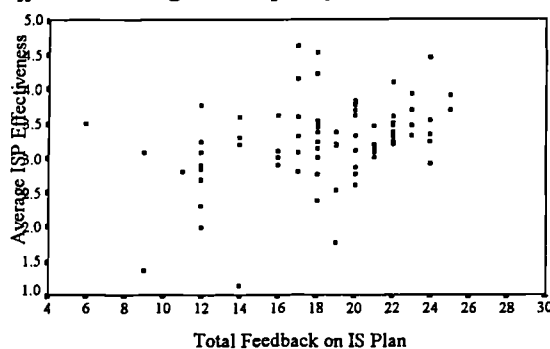
The regression equation is

$$\text{Average ISP effectiveness} = 0.045 \text{ Total ISP system feedback} + 2.85$$

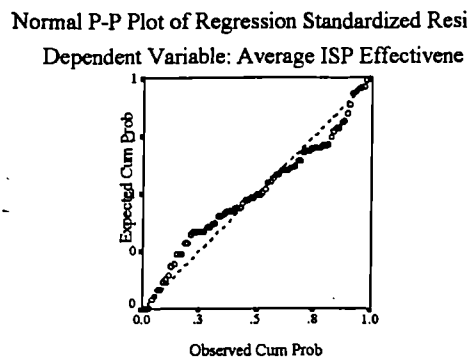
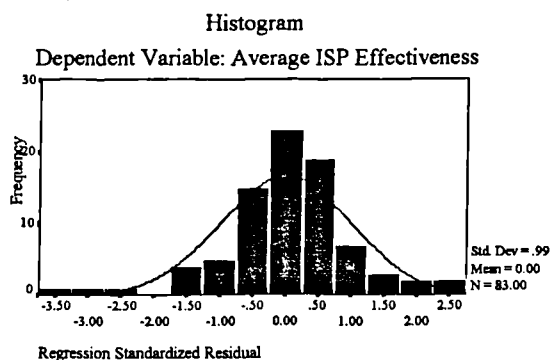
There is evidence to suggest that this regression equation fits better than a straight horizontal line passing through 2.85.

Average ISP Effectiveness and Total IS Plan Feedback

	FPLANTOT
AVGEFF_A	.3549
	(83)
	P= .001

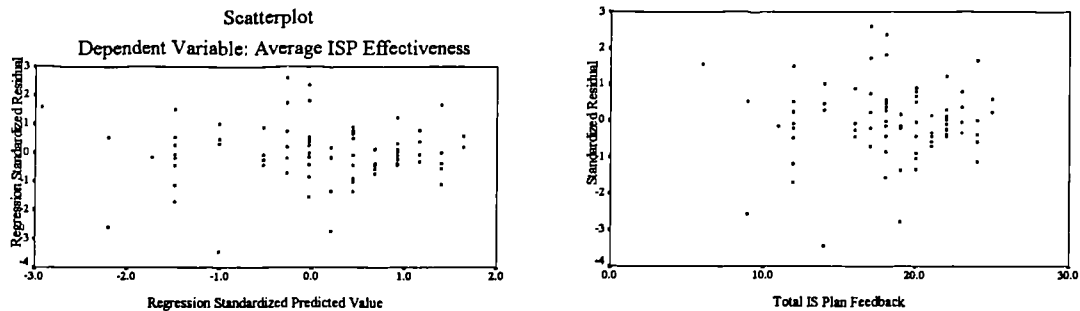
Scatter plots of average ISP effectiveness against IS plan feedback

The correlation co-efficient and scatter plots suggest a positive relationship between average ISP effectiveness and total ISP system feedback.

Assumptions***Normality***

The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity



There seems to be no relationship between predicted and residual values indicating that the linearity assumption has not been violated. The variance is approximately constant for all predicted values of Y indicating that the homoscedasticity has not been violated.

The casewise plot of standardized residual identifies one case to be an outlier (case 51). This suggests that the model may not fit well the lower data values.

	-6.	-3.	3.	6.			
Case #	0:.....:	.....:	.....:	0	AVGEFF_A	*PRED	*RESID
51	.	*	..	.	1.15	3.0355	-1.8855

Using Cooks Distances, the data was investigated for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is 0.273 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.35490
R Square	.12595
Adjusted R Square	.11516
Standard Error	.54782

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	1	3.50295	3.50295	11.67248	.0010
Residual	81	24.30836	.30010		

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
FPLANTOT	.049744	.014560	.354900	3.417	.0010
(Constant)	2.339109	.271283		8.622	.0000

r^2 is low indicating that a linear model is not a good fit. In other words only 13% of the total variation in average ISP effectiveness is accounted for by total IS plan feedback.

The regression equation is

$$\text{Average ISP effectiveness} = 0.05 \text{ Total IS plan feedback} + 2.34$$

There is evidence to suggest, however, that this regression equation fits better than a straight horizontal line passing through 2.34.

Average ISP Effectiveness and Total Informal/Formal ISP System Feedback

Zero-order	Pearsons		Spearman's	
	FPROCFO	FPROCIN	FPROCFO	FPROCIN
AVGEFF_A	.1829 (84) P= .096	.2640 (83) P= .016	.2786 N(84) Sig .010	.3472 N(83) Sig .001
FPROCFO		.7170 (84) P= .000		.7303 N(84) Sig .000

First order correlation co-efficient

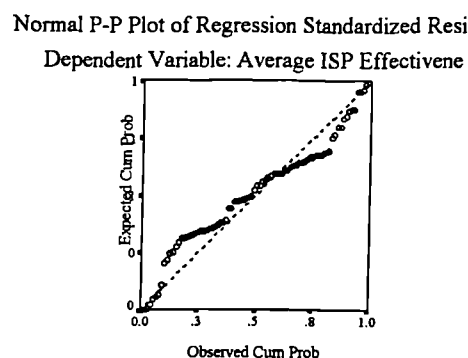
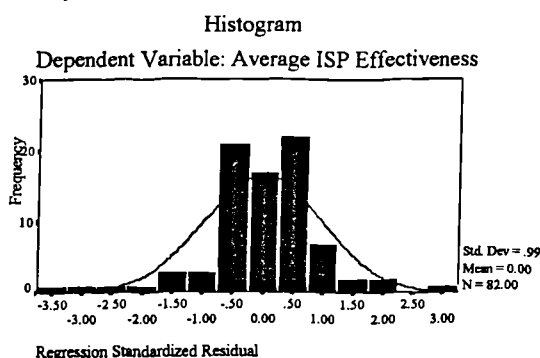
Controlling for..

	<i>FPROCIN</i>	<i>FPROCFO</i>
	FPROCFO	FPROCIN
AVGEFF_A	-.0321 (79) P= .776	.2057 (79) P= .065

The zero order correlation co-efficient suggest a positive relationship between average ISP effectiveness and total formal/informal ISP system feedback. However, the difference in significance between Pearsons (which measures linear relationships) and Spearman's (which measure linear and non-linear relationships) indicates the relationship between average ISP effectiveness and total formal ISP feedback is not non-linear. The first order correlation co-efficient indicates that when *formal* ISP system feedback is kept constant that *informal* ISP system feedback and average ISP effectiveness no longer have a significant linear relationship at the 5% level.

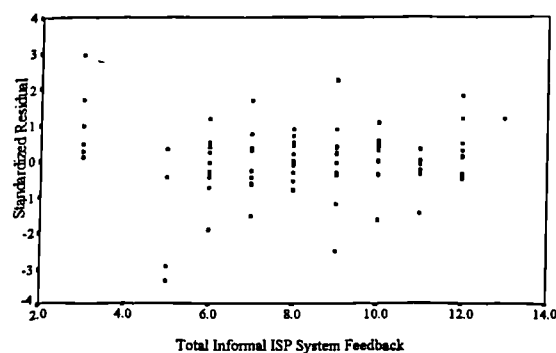
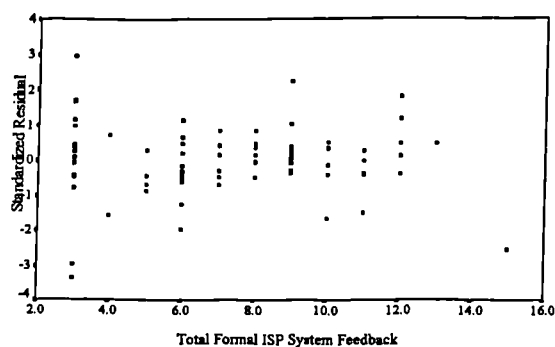
Assumptions

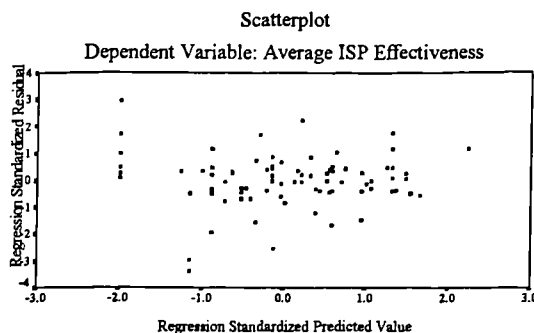
Normality



The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity





There seems to be no relationship between predicted and residual values indicating that the linearity assumption has not been violated. The variance is approximately constant for all predicted values of Y indicating that the homoscedasticity assumption has not been violated.

The casewise plot of standardized residual identifies one case to be an outlier (case 51). This suggest that the model may not fit well the lower data values.

	-6.	-3.	3.	6.		
Case #	0:.....:	:.....:	0	AVGEFF_A	*PRED	*RESID
51	.	*	..	.	1.15	3.0640 -1.9140

Using Cooks Distances, the data was investigated for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is 0.455 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.25886
R Square	.06701
Adjusted R Square	.04339
Standard Error	.56950

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	2	1.84023	.92012	2.83696	.0646
Residual	79	25.62217	.32433		

Variables in the Equation

Variable	B	SE B	Beta	T	SigT
FPROCFO	-.008444	.029571	-.044053	-.286	.7760
FPROCIN	.063886	.034191	.288262	1.869	.0654
(Constant)	2.769922	.208683		13.273	.0000

r^2 is low indicating that a linear model is not a good fit. In other words only 7% of the total variation in average ISP effectiveness is accounted for by total informal/formal ISP system feedback. However, the is evidence at the 5% level to suggest that the relationship between the independents and dependent variable is not linear.

The regression equation is

$$\text{Average ISP effectiveness} = 0.064 \text{ Total informal ISP system feedback} - 0.0084 \text{ Total formal ISP system feedback} + 2.77$$

Regressing each independent variable separately against average ISP effectiveness reveals that informal ISP system feedback on its own does have a linear relationship with average ISP effectiveness at the 5% level accounting for 7% of variation of average ISP effectiveness. However, formal ISP system feedback does not have a significant linear relationship with average ISP effectiveness.

Regression of informal ISP system feedback on average ISP effectiveness

Multiple R	.26404
R Square	.06972
Adjusted R Square	.05823
Standard Error	.56450

Analysis of Variance

	<i>DF</i>	<i>Sum of Squares</i>	<i>Mean Square</i>	<i>F</i>	<i>Signif F</i>
Regression	1	1.93439	1.93439	6.07035	.0159
Residual	81	25.81157	.31866		

Variables in the Equation

<i>Variable</i>	<i>B</i>	<i>SE B</i>	<i>Beta</i>	<i>T</i>	<i>Sig T</i>
FPROCIN	.058559	.023768	.264041	2.464	.0159
(Constant)	2.748104	.204890		13.413	.0000

Regression of formal ISP system feedback on average ISP effectiveness

Multiple R	.18288
R Square	.03345
Adjusted R Square	.02166
Standard Error	.57836

Analysis of Variance

	<i>DF</i>	<i>Sum of Squares</i>	<i>Mean Square</i>	<i>F</i>	<i>Signif F</i>
Regression	1	.94913	.94913	2.83750	.0959
Residual	82	27.42857	.33449		

Variables in the Equation

<i>Variable</i>	<i>B</i>	<i>SE B</i>	<i>Beta</i>	<i>T</i>	<i>Sig T</i>
FPROCFO	.035093	.020833	.182883	1.684	.0959
(Constant)	2.996646	.164149		18.256	.0000

Average ISP Effectiveness and Total Informal/Formal IS Plan Feedback

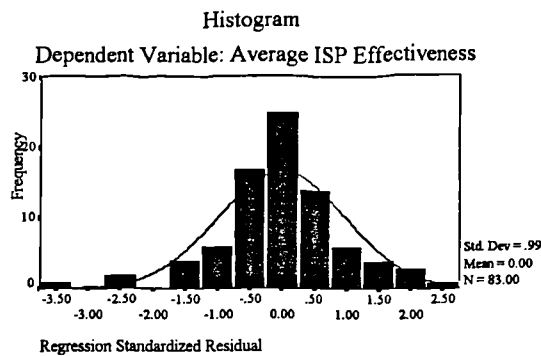
	FPLANFO	FPLANIN
AVGEFF_A	.2282 (83)	.3724 (85)
	P= .038	P= .000
FPLANFO		.3397 (85)
		P= .001

<i>Controlling for..</i>	<i>FPLANIN</i>	<i>FPLANFO</i>
	FPLANFO	FPLANIN
AVGEFF_A	.1284 (80)	.3185 (80)
	P= .250	P= .004

The correlation co-efficient suggest a positive relationship between average ISP effectiveness and total formal/informal ISP system feedback. However, the 1st order partial correlation co-efficient shows that when total *informal* IS plan feedback is kept constant that there is no longer a significant linear relationship between average ISP effectiveness and total

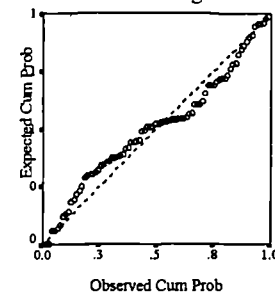
Assumptions

Normality



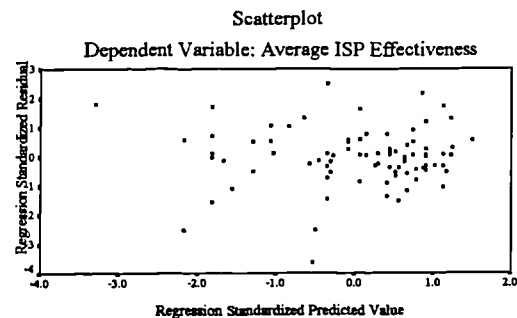
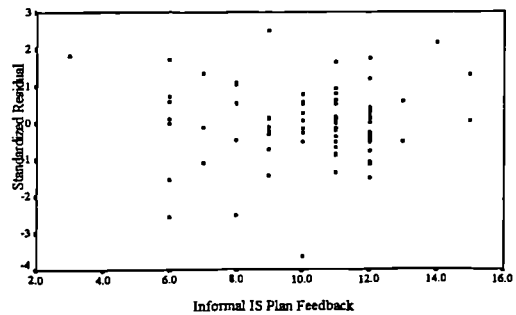
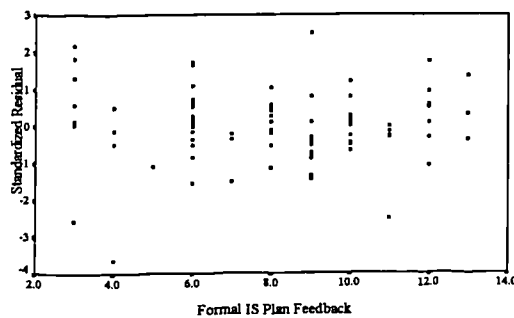
Normal P-P Plot of Regression Standardized Residuals

Dependent Variable: Average ISP Effectiveness



The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity



There seems to be no relationship between predicted and residual values indicating that the linearity assumption of the model has not been violated. The variance is approximately constant for all predicted values of Y indicating the homoscedasticity assumption has not been violated.

The casewise plot of standardized residual identifies one case to be an outlier (case 51). This suggests that the model may not fit well the lower data values.

Case #	-6.	-3.	3.	6.	AVGEFF_A	*PRED	*RESID
51	*	.	.	.	1.15	3.1227	-1.9727

Using Cooks Distances, the data was investigated for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is 0.232 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.38499
R Square	.14822
Adjusted R Square	.12692
Standard Error	.54416

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	2	4.12209	2.06105	6.96029	.0016
Residual	80	23.68921	.29612		

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
FPLANFO	.025592	.022094	.125866	1.158	.2502
FPLANIN	.084766	.028210	.326513	3.005	.0035
(Constant)	2.172634	.293037		7.414	.0000

r^2 is low indicating that a linear model is not a good fit. In other words only 15% of the total variation in average ISP effectiveness is accounted for by total informal IS plan feedback.

The regression equation is

$$\text{Average ISP effectiveness} = 0.085 \text{ Total informal IS plan feedback} + 0.026 \text{ Total formal IS plan feedback} + 2.17$$

There is evidence to suggest that this regression equation fits better than a straight horizontal line passing through 2.17.

Removing total formal IS plan feedback from the regression and running the model again reveals that explained variation drops to 14% with the new regression equation being:

$$\text{Average ISP effectiveness} = 0.098 \text{ Total informal IS plan feedback} + 2.24$$

Regressing total formal IS plan feedback against average ISP effectiveness reveals that explained the model is now significant but only explains 5% of variation in average ISP effectiveness with the new regression equation being:

$$\text{Average ISP effectiveness} = 0.038 \text{ Total formal IS plan feedback} + 2.87$$

Regression of informal IS plan feedback on average ISP effectiveness

Multiple R	.37240
R Square	.13868
Adjusted R Square	.12830
Standard Error	.54554

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	1	3.97717	3.97717	13.36373	.0004
Residual	83	24.70154	83.29761		

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
FPLANIN	.097800	.026753	.372398	3.656	.0004
(Constant)	2.243250	.280454		7.999	.0000

1 Outliers found

	-6.	-3.	3.	6.			
Case #	0:.....:	.....:	.....:	0	AVGEFF A	*PRED	*RESID
51	.	*	..	.	1.15	3.2212	-2.0712

Regression of formal IS Plan feedback on average ISP effectiveness

Multiple R	.22821
R Square	.05206
Adjusted R Square	.04038
Standard Error	.57050

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	1	1.44841	1.44841	4.45023	.0380
Residual	81	26.36290	.32547		

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
FPLANFO	.046402	.021996	.228210	2.110	.0380
(Constant)	2.874472		.185530	15.493	.0000

Outliers = 3.

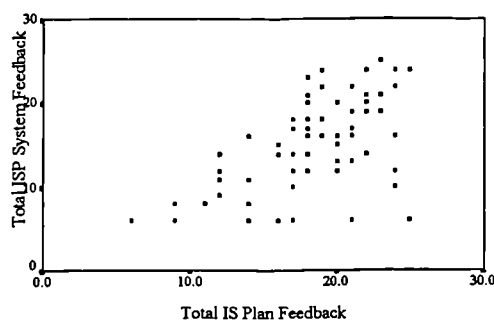
```

-6.      -3.      3.      6.
Case #   O:.....: :.....:O   AVGEFF_A   *PRED   *RESID
      51   .      * ..      .      1.15      3.0601      -1.9101

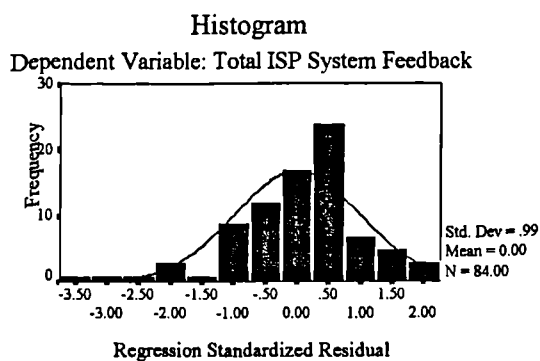
```

D.6.5 Total ISP System Feedback and Total IS Plan Feedback

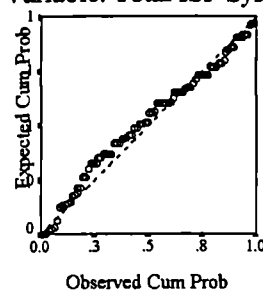
	FPLANTOT
FPROCTOT	.6118 (84) P= .000



The correlation co-efficient suggest a positive relationship between average ISP effectiveness and total formal/informal ISP system feedback.

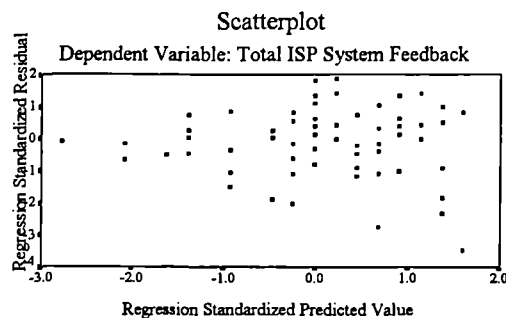
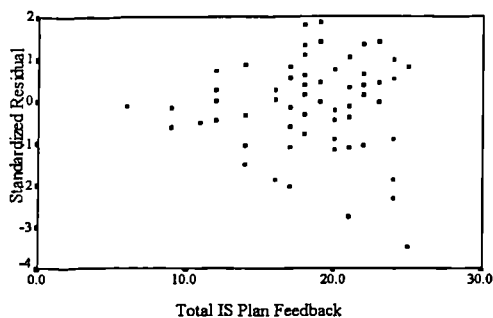
AssumptionsNormality

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Total ISP System Feedback



The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity



There seems to be no relationship between predicted and residual values indicating that the linearity assumption has not been violated. The variance is approximately constant for all predicted values of Y indicating homoscedasticity.

The casewise plot of standardized residual identifies one case to be an outlier (case 31). This suggest that the model may not fit well the lower data values.

		-6.	-3.	3.	6.			
Case #	0	:	:	:	:	O	FPROCTOT	*PRED
31	.	*	.	.	.	.	6.00	20.5717
								*RESID
								-14.5717

Using Cooks Distances, the data was investigated for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is 0.280 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.61176
R Square	.37425
Adjusted R Square	.36662
Standard Error	4.21288

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	1	870.44261	870.44261	49.04350	.0000
Residual	82	1455.36692	17.74838		

Variables in the Equation

Variable	B	SE B	Beta	T	SigT
FPLANTOT	.745333	.106429	.611763	7.003	.0000
(Constant)	1.938337	1.973792		.982	.3290

r^2 is low indicating that a linear model is not a good fit. In other words only 37% of the total variation in total ISP system feedback is accounted for by total IS plan feedback.

The regression equation is

$$\text{Total ISP system feedback} = 0.085 \text{ Total IS plan feedback} + 1.94$$

There is evidence to suggest that this regression equation fits better than a straight horizontal line and that the line may pass through the origin.

D.6.5.1 Total ISP System Feedback and Total Informal/formal IS Plan Feedback

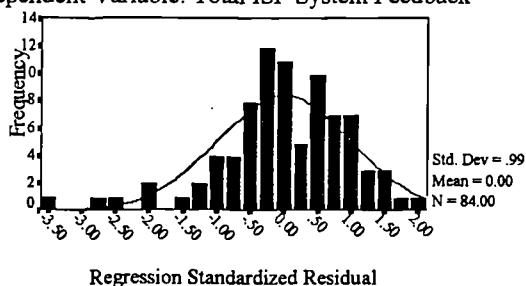
	FPLANFO	FPLANIN
FPROCTOT	.5980 (84) P= .000	.3999 (84) P= .000
FPLANFO		.3397 (85) P= .001

The correlation co-efficient suggest a positive relationship between average ISP effectiveness and total formal/informal ISP system feedback.

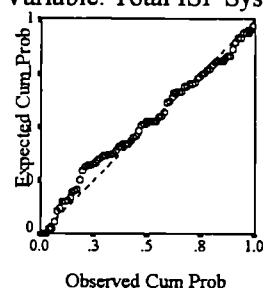
Assumptions

Normality

Histogram
Dependent Variable: Total ISP System Feedback

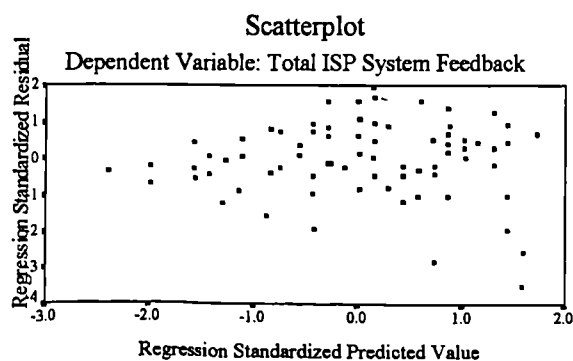
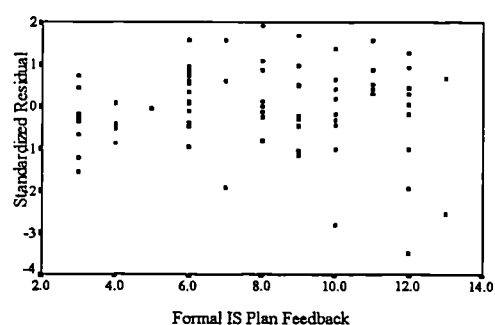
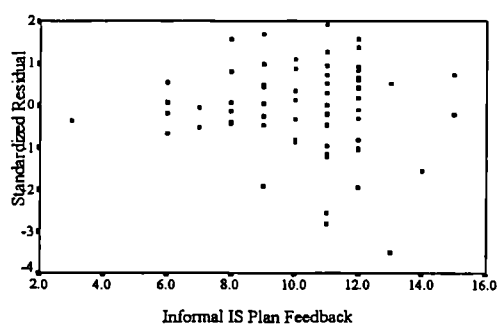


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Total ISP System Feedback



The distribution of residuals of the dependent variable is approximately normally distributed.

Linearity & Homoscedasticity



There seems to be no relationship between predicted and residual values indicating that a linear model may be an appropriate fit between dependent and independent variables. The variance is approximately constant for all predicted values of Y indicating homoscedasticity.

The casewise plot of standardized residual identifies one case to be an outlier (case 31). This suggest that the model may not fit well the lower data values.

	-6.	-3.	3.	6.			
Case #	0:.....:	:.....:	0	FPROCTOT	*PRED	*RESID	
31	.	*	..	.	6.00	20.6385	-14.6385

Using Cooks Distances, the data was investigated for observations having a large influence on the estimates of the parameters in the regression equation. The maximum change in residual value is .192 indicating that there are no cases that have a large influence on the data.

Regression

Multiple R	.62670
R Square	.39275
Adjusted R Square	.37775
Standard Error	4.17570

Analysis of Variance

	DF	Sum of Squares	Mean Square	F	Signif F
Regression	2	913.45848	456.72924	26.19396	.0000
Residual	81	1412.35105	17.43643		

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
FPLANFO	.958802	.172045	.521311	5.573	.0000
FPLANIN	.457704	.211336	.202591	2.166	.0333
(Constant)	3.182770	2.110713		1.508	.1355

r^2 is low indicating that a linear model is not a good fit. In other words only 39% of the total variation in total ISP system feedback is accounted for by total formal/informal IS plan feedback.

The regression equation is

$$\text{Total ISP system feedback} = 0.96 \text{ Total formal IS plan feedback} + 0.46 \text{ Total informal IS plan feedback} + 3.18$$

There is evidence to suggest that this regression equation fits better than a straight horizontal line and that the line may pass through the origin.

D.7 ISP System Characteristics

ISP system characteristics which could be used as a foundation to an evaluation tool on which organisations may build were identified through a combination of t-tests, anova and correlation analysis depending on the measurement scale used, using average ISP effectiveness as the dependent variable.

Correlations against average ISP effectiveness:

Q12	Q19B	Q19D	Q19E
-.2033 (77)	-.2193 N(86)	.2125 (86)	.2730 (86)
P= .076	Sig .042	P= .050	P= .011

⁵ Non-linear relationships identified via Spearmans correlation co-efficient (indicated by Sig.). Linear identified via Peasons correlation co-efficient (indicated by P=).

t-tests of average ISP effectiveness between organisations where a formal plan exists and those where one does not

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Formal plan exists	52	3.3679	.454	.063
No formal plan exists	27	3.1059	.612	.118
Mean Difference		.2620		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	2.15	77	.034	.122	(.020, .504)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of average ISP effectiveness between organisations where the IS Planner does participate in business planning and those where they do not.

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Yes	44	3.3707	.553	.083
No	41	3.1085	.595	.093
Mean Difference		.2621		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	2.11	83	.038	.124	(.015, .510)

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

t-tests of average ISP effectiveness between organisations where the IS Planner is kept informed of changes in the business and where they are not

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_1: \mu_1 - \mu_2 \neq 0 \quad (\text{two-tailed test})$$

Variable	Number of Cases	Mean	SD	SE of Mean
Yes	41	3.4661	.501	.078
No	39	3.0095	.618	.099
Mean Difference		.4566		

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	3.64	78	.000	.125	(.207, .706)

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal.

For tests of mean difference in average ISP effectiveness between highest level of ISP support (Q30) and link with business planning (Q27) see §E3

H_0 : Average ISP effectiveness is independent of the level of ISP champion

Variable ISP Effectiveness
By Variable Level of ISP Champion (Q31)

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob
Between Groups	2	2.1319	1.0660	3.3768	.0391
Within Groups	80	25.2534	.3157		
TOTAL	82	27.3854			

Levene Test for Homogeneity of Variances:

Statistic	df1	df2	2-tail Sig.
.2135	2	80	.808

Multiple Range Tests: Tukey-HSD test with significance level .050

(*) Indicates significant differences which are shown in the lower triangle

Mean	ISP Champion	a	b	c
3.0369	a) IS Manager/Executive			
3.2711	b) Middle Management			
3.4064	c) Top Management	*		

\therefore reject H_0 at the 5% significance level \Rightarrow evidence to suggest means are not equal.

Correlations against average ISP effectiveness: IS Planner Questionnaire

Q34AA	Q34BG	Q34CB	Q34DA	Q34EA	Q34EE	Q34FA
.2821 (85)	-.1879 N(84)	.2075 (83)	.2373 (84)	.2178 (83)	-.1853 (83)	.2132 (84)
P= .009	Sig. .087	P= .060	P= .030	P= .048	P= .094	P= .052
Q34FG	Q34TOP	Q35CA	Q35DA	Q35DF	Q38B	Q43A
-.1911 N(83)	.2890 (86)	-.1907 (83)	-.2307 N(82)	.2482 (82)	.1992 (81)	.4886 (86)
Sig. .083	P= .007	P= .084	Sig. .037	P= .025	P= .075	P= .000
Q43D	Q43E	Q43G	Q43H	Q43J	Q43K	Q43L
.2294 (86)	.2771 (86)	.4638 (86)	.4634 (79)	.3676 (86)	.5082 (86)	.3287 (86)
P= .034	P= .010	P= .000	P= .000	P= .000	P= .000	P= .002
Q43M	Q43N	Q44A	Q44B	Q45A	Q45B	Q45C
.4895 (86)	.3709 (86)	.4200 (86)	.3706 (84)	.2305 (86)	.2975 (86)	.4767 (86)
P= .000	P= .000	P= .000	P= .001	P= .033	P= .005	P= .000
Q45D	Q46C	Q47C	Q47D	Q47E	Q47F	Q48A
.3109 (86)	.1861 (83)	.4017 (79)	.4044 (86)	.4370 (86)	.3172 (86)	.2235 (79)
P= .004	P= .092	P= .000	P= .000	P= .000	P= .003	P= .048
Q48B	Q49A	Q49B	Q49C	Q49D	Q49F	Q49G
.3443 (79)	.3324 (85)	.1975 N(85)	.2656 (85)	.3588 (85)	.1821 (85)	.2622 (85)
P= .002	P= .002	Sig. .070	P= .014	P= .001	P= .095	P= .015
Q49H	Q49I	Q50A	Q51B	Q51D	Q51E	Q51F
.2776 (85)	.3136 (85)	.2143 N(86)	.2410 N(86)	.2240 (86)	.2571 (86)	.4833 (86)
P= .010	P= .003	Sig. .048	Sig. .025	P= .038	P= .017	P= .000
Q52A	Q52B	Q52C	Q53A	Q53B	Q53I	Q54B
.3299 (86)	.3680 (86)	.2662 (79)	.3036 (86)	.2550 (86)	.3006 (86)	.2225 (85)
P= .002	P= .000	P= .018	P= .004	P= .018	P= .005	P= .041

Q54D	Q54G	Q54I	Q54J	Q55C	Q55D	Q55E
.2046 (85)	.2150 (85)	.2657 (85)	.3098 (85)	.2707 (85)	.2131 (86)	.3512 (86)
P= .060	P= .048	P= .014	P= .004	P= .012	P= .049	P= .001
Q55F	Q55G	Q55H	Q55I	Q55J	Q56A	Q56B
.4165 (79)	.2451 (86)	.3111 (86)	.3391 (86)	.2368 (86)	.3106 (79)	.4237 (79)
P= .000	P= .023	P= .004	P= .001	P= .028	P= .005	P= .000
Q56C	Q56D	Q56E	Q56F	Q57	Q58B	Q58C
.3449 (79)	.4655 (78)	.3087 (78)	.3934 (78)	.4336 (85)	.2521 (77)	.2065 (77)
P= .002	P= .000	P= .006	P= .000	P= .000	P= .027	P= .072
Q58D	Q58E	Q58F	Q59A	Q59B	Q59C	Q59D
.4638 (76)	.4413 (76)	.3565 (76)	.2687 (86)	.3520 (86)	.4359 (86)	.4847 (85)
P= .000	P= .000	P= .002	P= .012	P= .001	P= .000	P= .000
Q59E	Q60	Q61	Q62A	Q62B	Q62C	Q62D
.2799 (85)	.4259 (86)	.5513 (86)	.1833 (85)	.2905 (86)	.4086 (86)	.4366 (86)
P= .009	P= .000	P= .000	P= .093	P= .007	P= .000	P= .000
Q62E	Q62F	Q62G	Q62H	Q62J	Q62K	Q62L
.4848 (86)	.4484 (86)	.2019 (86)	.2049 (86)	.3040 (85)	.4387 (85)	.4304 (78)
P= .000	P= .000	P= .062	P= .058	P= .005	P= .000	P= .000

Correlations against average ISP effectiveness: Non-IS Respondent Questionnaire

Q7A	Q7B	Q7C	Q7D	Q7E	Q7G
.5524 (38)	.6236 (38)	.4590 (38)	.2904 (38)	.3495 (38)	.3630 (37)
P= .000	P= .000	P= .004	P= .077	P= .031	P= .027
Q7H	Q7I	Q7J	Q7K	Q7L	Q7M
.3609 (38)	.4814 (38)	.4244 (38)	.7028 (38)	.4905 (38)	.6016 (38)
P= .026	P= .002	P= .008	P= .000	P= .002	P= .000
Q7N	Q8A	Q8B	Q9A	Q9B	Q10A
.3030 (38)	.4009 (38)	.3194 (37)	.4116 (38)	.5918 (38)	.2726 N(38)
P= .064	P= .013	P= .054	P= .010	P= .000	Sig .098
Q10B	Q10C	Q10D	Q10F	Q10G	Q10H
.5421 (38)	.3959 (38)	.5524 (38)	.3322 (38)	.4364 (38)	.3255 N(38)
P= .000	P= .014	P= .000	P= .042	P= .006	Sig .046
Q10I	Q11B	Q11C	Q15	Q16	Q17A
.3927 N(38)	.4117 (38)	.3023 (38)	.6053 (38)	.4702 (38)	.6579 (38)
Sig .015	P= .010	P= .065	P= .000	P= .003	P= .000
Q17B	Q18A	Q18B	Q18C	Q18D	
.6489 (38)	.4373 (38)	.6149 (38)	.5917 (38)	.5252 (38)	
P= .000	P= .006	P= .000	P= .000	P= .001	

Factor analysis

Note: only those items having a significant relationship with average ISP effectiveness were included in the factor analysis.

Final Statistics: IS Planner Responses

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Q43A	.73957	1	7.63186	27.3	27.3
Q43E	.65857	2	2.19698	7.8	35.1
Q43G	.82585	3	1.96423	7.0	42.1
Q43J	.78530	4	1.67620	6.0	48.1
Q43K	.81011	5	1.45932	5.2	53.3
Q44B	.50040	6	1.37608	4.9	58.2
Q47C	.49602	7	1.30912	4.7	62.9
Q49H	.91004	8	1.17723	4.2	67.1
Q49I	.84478	9	1.08896	3.9	71.0
Q51D	.73807				
Q52A	.79320				
Q52B	.77394				
Q54I	.50242				
Q55C	.76564				
Q55D	.72851				
Q55E	.66243				
Q55G	.76023				
Q55H	.74661				
Q55I	.53503				
Q55J	.59593				
Q59A	.69860				
Q59B	.80152				
Q59C	.82121				
Q59D	.76120				
Q62B	.64137				
Q62D	.64751				
Q62J	.66868				
Q62K	.66724				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.
VARIMAX converged in 7 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q43A	.13943	-.00509	.76132	.20633	.14854
Q43E	.18827	.13631	.74679	.02628	.15571
Q43G	-.00018	.13406	.26860	-.12333	.00860
Q43J	.12351	-.01631	-.18221	.27713	.10581
Q43K	.07650	.06369	.77910	.08850	.22280
Q44B	.17275	.24543	.04827	-.03857	.24204
Q47C	.23886	.06098	.03819	-.21984	.29338
Q49H	.09119	.04011	.21375	.02687	.06670
Q49I	.19623	.12599	.10644	.16617	.20878
Q51D	.18073	-.01714	.24531	.04320	.79246
Q52A	.18315	.17548	.15389	.21759	.00928
Q52B	.18236	.28672	.11641	.10095	.08462
Q54I	.10284	.57727	.06867	.24277	.22172
Q55C	.03690	.79423	.22871	.18367	.09284
Q55D	.07844	.77360	-.00241	.16292	.14639
Q55E	.26298	.73271	-.02793	.05522	-.11376

Q55G	-.06018	.19759	.06062	.78554	.24993
Q55H	.22211	.11138	.16403	.79339	.01505
Q55I	.19835	.20451	.26088	.50069	-.22994
Q55J	.07961	.26510	-.03069	.59933	.33232
Q59A	.68588	.15109	.26322	.10883	.04150
Q59B	.79524	.04721	.21887	.06998	.18588
Q59C	.82786	.15484	-.00401	.12970	.09919
Q59D	.78113	.16601	.08383	.06334	.10621
Q62B	.06848	.13997	.25631	.07923	.66816
Q62D	.09369	.15359	.05594	.22541	.72354
Q62J	.03293	-.06743	.10440	.05605	-.07286
Q62K	.20375	.29046	.00619	.05767	.24750

	Factor 6	Factor 7	Factor 8	Factor 9
Q43A	.20586	.05765	.08013	.15404
Q43E	.06034	.09498	-.09584	-.00813
Q43G	.13360	-.05944	.02592	.83570
Q43J	-.11938	.22439	.19089	.73996
Q43K	.04324	.23777	.27807	-.00254
Q44B	.15037	.25101	.51206	.00973
Q47C	.45226	.24209	.15409	.11180
Q49H	-.03643	.92059	.02096	-.00239
Q49I	.21178	.77710	.19622	.14360
Q51D	-.06445	.01383	.06623	.07966
Q52A	.80627	.01666	.06715	-.05376
Q52B	.78636	.03943	.06360	.06009
Q54I	.14144	-.03567	.13765	.07461
Q55C	.02778	.09766	-.04890	.16159
Q55D	.25554	.08019	.05375	-.03605
Q55E	.11050	.04994	.15387	-.03547
Q55G	-.03103	.17315	.01897	.05514
Q55H	.12391	.00362	-.09546	-.06170
Q55I	.09060	.06930	.25342	.07081
Q55J	.14864	-.04146	.12829	.09201
Q59A	-.09173	-.14678	.27916	-.12084
Q59B	.25304	.11708	.02645	-.03298
Q59C	.15669	.14869	.01228	.19594
Q59D	.20995	.19248	.12641	.06357
Q62B	.14339	.27347	.00134	-.05780
Q62D	.13126	.06505	.11386	.05723
Q62J	.19719	.04680	.77298	.07154
Q62K	-.17846	.00955	.65481	.12663

Final Statistics: Non-IS respondent

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Q7K	.81016	1	3.83268	38.3	38.3
Q8A	.81044	2	1.79332	17.9	56.3
Q8B	.83101	3	1.14909	11.5	67.8
Q10C	.63656	4	1.00892	10.1	77.8
Q10F	.80434				
Q10I	.82349				
Q11C	.74761				
Q17A	.79211				
Q17B	.86462				
Q18D	.66367				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.
VARIMAX converged in 6 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4
Q7K	.84378	.23707	.10478	.17608
Q8A	.31042	.84239	.05527	.03749
Q8B	.11875	.89443	-.00160	.13003
Q10C	.04555	.78823	.11402	-.01351
Q10F	.15164	.16071	.86552	.07994
Q10I	.17729	-.00585	.87560	.15925
Q11C	.05355	.00950	.20141	.83910
Q17A	.82778	.29757	.06520	.11869
Q17B	.85812	-.03832	.32522	.14495
Q18D	.27295	.10491	.02820	.75985

D.8 Contextual Factors for ISP System Feedback

D.8.1 Learning Environment

	Q43D	Q43E	Q43F	AVGEFF	FPLANTOT	FPROCTOT
Q43C	.5014 (90)	.3999 (90)	.3681 (90)	.1627 (86)	.2064 (85)	.1255 (84)
	P= .000	P= .000	P= .000	P= .135	P= .058	P= .255
Q43D		.3814 (90)	.3576 (90)	.2294 (86)	.2821 (85)	.1087 (84)
		P= .000	P= .001	P= .034	P= .009	P= .325

Within the organisation: (Q43/7)

	IS Planner	Non-IS
(c) people are actively encouraged to question underlying organisational policy/goals.	19 (21%)	17 (45%)
(d) if something goes wrong you can expect support in learning lessons from it.	34 (38%)	15 (58%)
(e) innovative solutions to problems are actively encouraged.	45 (50%)	28 (74%)
(f) an individual's intuition is accepted as a valid tool in decision making.	36 (40%)	18 (50%)

IS Planner

$n = 90$

SLL

DLL	No	Yes
No	50 (56%)	21 (23%)
Yes	6 (7%)	13 (14%)

H_0 : Columns and rows are independent

$$\chi^2(1) = 19.67$$

Prob. = 0.00058

\therefore reject H_0 @ 0.1% significance level

Non-IS Respondents

$n = 38$

SLL

DLL	No	Yes
No	14 (37%)	7 (18%)
Yes	2 (5%)	15 (39%)

H_0 : Columns and rows are independent

$$\chi^2(1) = 9.47$$

Prob. = 0.00208

\therefore reject H_0 @ 1% significance level

H_0 : Average ISP effectiveness is independent of SLL and ISP system feedback

Variable Average ISP effectiveness
By Variable High/low SLL and high/low ISP system feedback

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob
Between Groups	3	4.4427	1.4809	5.0179	.0031
Within Groups	78	23.0197	.2951		
TOTAL	81	27.4624			

Levene Test for Homogeneity of Variances:

Statistic	df1	df2	2-tail Sig.
1.1995	3	78	.316

Multiple Range Tests: Tukey-HSD test with significance level .050

(*) Indicates significant differences which are shown in the lower triangle

Mean		SLL	Feedback	a	b	c	d
2.8913	a)	Low	Low				
3.2800	b)	High	Low				
3.3546	c)	Low	High	*			
3.5012	d)	High	High	*			

\therefore reject H_0 at the 1% significance level \Rightarrow evidence to suggest means are not equal

D.8.2 Other Contextual Factors

Note: only those items having a significant relationship with total ISP system feedback were included in the factor analysis.

Final Statistics: Based on IS Planner responses

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
Q43G	.70556	1	4.11972	27.5	27.5
Q43J	.62120	2	1.53775	10.3	37.7
Q44A	.63470	3	1.39766	9.3	47.0
Q47E	.51242	4	1.32582	8.8	55.9
Q49A	.71139	5	1.09784	7.3	63.2
Q49G	.59145				
Q50B	.65060				
Q50D	.80826				
Q51C	.51020				
Q54B	.46740				
Q55B	.67015				
Q59B	.79700				
Q59D	.64686				
Q62G	.50365				
Q62L	.64795				

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.
 VARIMAX converged in 7 iterations.

Rotated Factor Matrix:

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q43G	.10092	-.02243	.79572	-.09792	.22830
Q43J	.05602	.19143	.76035	.02375	-.05209
Q44A	.24411	.73666	.08785	-.07593	-.13768
Q47E	.30860	.49685	.31572	.25361	-.07956
Q49A	.82792	.05493	.10340	.08604	.06951
Q49G	.08935	.68211	.14441	.11796	.28883
Q50B	.18151	.19832	-.21628	.71724	.13081
Q50D	.14062	.03796	.10935	.87899	.04968
Q51C	.08543	.26133	-.30882	-.13978	.56542
Q54B	.26644	-.06814	.15926	.28809	.53236
Q55B	-.00657	.05985	.17890	.10461	.78967
Q59B	.87744	.10675	.03615	.10481	.05844
Q59D	.74829	.22251	.14513	.06327	.11108
Q62G	.09196	.67784	-.07856	.11514	.12768
Q62L	.73943	.24077	-.07902	.18666	.04623

References

- ACC, 1990, The Strength of the Counties, *ACC Briefing Paper*, December
- Ackoff, R L, 1970, A Concept of Corporate Planning, Wiley, New York
- Ackoff, R L, 1981, Creating the Corporate Future, Wiley, New York
- Adriaans, W & Hoogakker, J T, 1989, Planning an IS at Netherland Gas, *Long Range Planning*, **22** (3), pp 64-74
- Agarwal, R, Roberge, L & Tanniru, M R, 1994, MIS Planning: A Methodology for System Prioritization, *Information & Management*, **27** (5), pp 261-274
- Albrecht, L, K, 1973, Organization and Management of Information and Management of Information Processing Systems, Macmillan, NY
- Anderssen, A S & MacDonald-Taylor, W K R, 1983, Successful Computer Systems Strategic Planning, *Computer Sciences* (Australia)
- Ang, S, Cummings, L L, Straub, D W & Earley, P C, 1993, The Effects of Information Technology and the Perceived Mood of the Feedback Giver on Feedback Seeking, *Information Systems Research*, **4** (3), pp 240 -261
- Angell, I O & Smithson, S, 1991, Information Systems Management: Opportunities & Risks, Macmillan, Hampshire, pp 189-212
- Annett, J, 1969, Feedback and Human Behaviour, Penguin Books
- Ansoff, H I, 1970, Does Planning Pay? The Effect of Planning on Success of Acquisitions in American Firms, *Long Range Planning*, **3** (2), pp 2-8
- Ansoff, H I, 1987, Corporate Strategy, Penguin Business
- Argyris, C, 1991, Teaching Smart People How to Learn, *Harvard Business Review*, May-June, pp 99-109
- Armstrong, J S, 1982, The Value of Formal Planning for Strategic Decisions: Review of Empirical Research, *Strategic Management Journal*, **3**, pp 197-211
- Atkinson, R A, 1990, The Motivations for Strategic Planning, *Journal of Information Systems Management*, Fall, pp 53-56
- Atkinson, R A, 1992, Keeping IS Strategic Plans off the Shelf, *Information Systems Management*, Winter, pp 68-71
- Audit Commission, 1992, Citizen's Charter Performance Indicators, London
- Audit Commission, 1994, High Risk/High Potential: An Executive Report on the Management of Information Technology in Local Government, May, London
- Austin, S, Reardon, B & Story, P, 1988, A Blueprint for Information Systems Planning, *Computing Canada*, **14** (11), May 26, pp 34-35
- Bakopoulos, Y J A, 1985, Towards a more Precise Concept of Information Technology, *Centre for IS Research, Sloan School of Management*, June
- Ball, L, 1982, MIS Strategic Planning: You can be the Captain of the Ship, *Infosystems*, May, pp 33-34,36,38
- Barlow, J F, 1990, Putting ISP Methodologies into Perspective, *Journal of Systems Management*, **41** (7), July, pp 6-9, 15

- Banville, C & Landry, M, 1989, Can the Field of MIS be Disciplined?, *Communications of the ACM*, **32** (1), January
- Bartunek, J M & Murnighan, J K, 1984, The Nominal Group Technique: Expanding the Basic Procedure and Underlying Assumptions, *Group & Organization Studies*, **9** (3), September, pp 417-432
- Barwise, P, Thomas, K, Marsh, P & Wesley, R, 1986, Research on Strategic Investment Decisions, in *Strategic Management Research: A European Perspective* by J McGee & H Thomas (Eds.), pp 23-52
- BDO Consulting, 1992, *A Study of Strategic Practice*, October
- Beer, S, 1959, *Cybernetics and Management*, English University Press, London
- Beer, S, 1981, *The Brain of the Firm: The Managerial Cybernetics of Organisations*, 2nd Edition, John Wiley & Sons
- Bellamy, C & Taylor, J A, 1994, Reinventing Government in the Information Age, *Public Money & Management*, July-September, pp 59-62
- Benbasat, I, Goldstein, D K & Mead, M, 1987, The Case Research Strategy in Studies of Information Systems, *MIS Quarterly*, September, pp 369-386
- Benington, J & Stoker, G, 1989, Local Government in the Firing Line, in *Glasnost in Britain?: Against Censorship and in Defence of the Word* by N Buchan & T Sumner (Eds.), Macmillan, Hampshire.
- Blair, J, 1987, Not Again! The Messy Business of Planning, *Computerworld*, **21** (48), pp 69-76
- Boal, K B & Bryson, J M, 1987, Representation, Testing and Policy Implications of Planning Process, *Strategic Management Journal*, **8**, pp 211-231
- Bowman, G, Davis, G & Wetherbe, J, 1983, Three Stage Model of MIS Planning, *Information & Management*, **6** (1), pp 11-25
- Boynton, A C & Zmud, R W, 1987, Information Technology Planning in the 1990's: Directions for Practice and Research, *MIS Quarterly*, **11** (1), March, pp 59-71
- Brancheau, J & Wetherbe, J C, 1987, Key Issues in Information Systems, *MIS Quarterly*, **11** (1), pp 23-46
- Bryman, A & Cramer, D, 1990, *Quantitative Data Analysis for Social Scientists*, Routledge, London
- Bullen, C V & Rockart, J F, 1981, A Primer on Critical Success Factors, Working Paper # 69, *Sloan School of Management, Massachusetts Institute of Technology*, Cambridge, Massachusetts, June
- Burrell, G & Morgan, G, 1979, *Sociological Paradigms and Organization Analysis*, Heinemann Books, London
- Butler, D, 1985, *Information Technology and Realpolitik*, Butler Cox Foundation
- Cameron, K S & Whetten, D A (Eds.), 1983, *Organizational Effectiveness: A Comparison of Multiple Methods*, Academic Press, New York, pp 261-277
- Camillus, J C, 1972, Formal Planning Systems: The Control Considerations in Design, unpublished PhD dissertation, *Graduate School of Business Administration, Harvard University*
- Camillus, J C, 1975, Evaluating the Benefits of Formal Planning, *Long Range Planning*, **8** (3), June, pp 33-40
- Campbell, J P, 1977, On the Nature of Organizational Effectiveness, in *New Perspectives on Organisational Effectiveness* by P S Goodman & J M Pennings (Eds.), Jossey-Bass, San Francisco

- Cash, J I, 1985, Interorganizational Systems: An Information Society Opportunity or Threat?, *The Information Society*, **3** (3)
- Cash, J I & Konsynski, B R, 1985, IS Redraws Competitive Boundaries, *Harvard Business Review*, **63** (2), March, pp 134-142
- Cash J I, McFarlan, F W & McKenney, J L, 1983, Corporate Information Systems Management: Text and Cases, Irwin, Illinois
- Checkland, P, 1981, Systems Thinking, Systems Practice, Wiley, Chichester
- Churchill, G A, 1979, A Paradigm for Developing Better Measures of Marketing Constructs, *Journal of Marketing Research*, **16**, pp 64-73
- Churchill, G A, 1987, Marketing Research Methodological Foundations, Dryden Press
- Ciborra, C U, 1994, The Grassroots of IT and Strategy, in Strategic Information Systems: A European Perspective by C Ciborra & T Jelassi (Eds.), Wiley
- Clark, T D, 1992, Corporate Systems Management: An Overview and Research Perspective, *Communications of the ACM*, **35** (2), February, pp 61-75
- Classe, A, 1994, The Essex Fire Service, *Computer Weekly*, October 6th, p 50
- Clemons, E & McFarlan, F W, 1986, Telecom: Hook-up or Lose Out, *Harvard Business Review*, July-August, pp 91-97
- Cohen, J K & Cyert, R M, 1973, Strategy Formulation, Implementation and Monitoring, *Journal of Business*, July, pp 349-367
- Collins, 1990, Collins Cobuild English Language Dictionary, Birmingham University
- Conlin, J, 1989, Brainstorming - It's not as easy as you think!, *Successful Meetings*, September
- Converse, J M & McDonnell, J, 1986, Survey Questions: Handcrafting the Standardized Questionnaire, Sage, London
- Conway, F, 1967, Sampling: An Introduction for Social Scientists, George Allen & Unwin Ltd, London
- Cook, T D & Reichardt, C S (Eds.), 1979, Qualitative and Quantitative Methods in Evaluation Research, Sage Publications
- Cronbach, L J, 1946, Response sets and test validating, *Educational and Psychological Measurement*, **6**, pp 475-495
- Cronbach, L J, 1971, Coefficient Alpha and the Internal Consistency of Tests, *Psychometrika*, **16**, September, pp 297-334
- Daft, R L & Wiginton, J C, 1979, Language and Organisation, *Academy Management Review*, **4**
- Davenport, T H, Eccles, R G & Prusak, L, 1992, Information Politics, *Sloan Management Review*, **34** (1), Fall, pp 53-65
- Davenport, T H & Short, J E, 1990, The New Industrial Engineering: Information Technology and Business Process Redesign, *Sloan Management Review*, Summer, pp 11-27
- Davis, G B & Olson, M H, 1985, Management Information Systems: Conceptual Foundations, Structure and Development, McGraw-Hill, NY
- De Geus, A P, 1988, Planning as Learning, *Harvard Business Review*, March-April, pp 70-74

- DeLone, W H & McLean, E R, 1992, Information Systems Success: The Quest for the Dependent Variable, *Information Systems Research*, 3 (1), pp 60-95
- Department of Environment, 1991, Local Government Review: The Structure of Local Government in England, *Consultation Paper*, April
- Dickson, G W, Leitheiser, R L, Nechis, M & Wetherbe, J C, 1984, Key Information System Issues for the 1980's, *MIS Quarterly*, 8 (3), September
- DiGuiulio, L W & Zinn, T K, 1987, Criteria for System Success - Part IV, *Computers in Healthcare*, 8 (8), July, pp 66-67
- Driscoll, W J, 1988, Strategic Information Systems: Planning in the Retail Environment, *Retail Control*, 56 (7), September, pp 13-18
- Doll, W J & Ahmed, M U, 1983, Diagnosing and Treating the Credibility Syndrome, *MIS Quarterly*, September, pp 21-32
- Dyson, R G, 1977, A Research Programme for Strategic Planning under Uncertainty, Multiple Objectives and Multiple Interest Groups, *Technische Hogeschool Twente, Enschede*
- Dyson, R G, 1990, Strategic Planning: Models and Analytical Techniques, Wiley
- Dyson, R G & Foster, M J, 1980, Effectiveness in Strategic Planning, *European Journal of Operational Research*, 5, pp 163-170
- Dyson, R G & Foster, M J, 1982, The Relationship of Participation and Effectiveness in Strategic Planning, *Strategic Management Journal*, 3, pp 77-88
- Dyson, R G & Foster, M J, 1983a, Effectiveness in Strategic Planning Revisited, *European Journal of Operational Research*, 12, pp 146-158
- Dyson, R G & Foster, M J, 1983b, Making Planning More Effective, *Long Range Planning*, 16 (6), pp 68-73
- Earl, M J, 1983, Emerging Trends in Managing New Information Technologies, Working Paper # 83/4, *Oxford Institute of Information Management, Oxford University*
- Earl, M J, 1989, Management Strategies for Information Technology, Business Information Technology Series, Prentice-Hall
- Earl, M J, 1990a, Strategic Information Systems Planning in UK Companies: Results of a Field Study, Working Paper # RDP 90/1, *Oxford Institute of Information Management, Oxford University*
- Earl, M J, 1990b, Approaches to Strategic Information Systems Planning Experience in twenty-one United Kingdom Companies. *Paper presented at the 11th International Conference of Information Systems Conference Proceedings*, Copenhagen
- Earl, M J, 1993, Experiences in Strategic Information Systems Planning, *MIS Quarterly*, March, pp 1-24
- Earl, M J, Feeny, D, Lockett, M & Runge, D, 1988, Competitive Advantage through Information Technology: Eight Maxims for Senior Managers, *Journal of Multinational Business*, Summer
- Easterby-Smith, M, Thorpe, R & Lowe, A, 1991, Management Research: An Introduction, Sage Publications, London
- Edwards, B, 1989, Project Sponsors: Their Contribution to Effective IT Implementation, *Oxford/PA Conference Proceedings*, 25-27 September

- Ein-Dor, P & Segev, E, 1978a, Organizational Context and the Success of Management Information Systems, *Management Science*, 24 (10), June, pp 1064-1077
- Ein-Dor, P & Segev, E, 1978b, Strategic Planning for Management Information Systems, *Management Science*, 25 (15), pp 1631-1641
- Emberton, J, 1987, Effective ISP and Implementation, *Information Age (UK)*, 9 (3), July, pp 159-162
- Erdos, P L & Morgan, A J, 1970, Professional Mail Surveys, McGraw-Hill, London
- Fahey, L & Christensen, H K, 1986, Evaluating the Research of Strategy Content, *Journal of Management*, 12, pp 167-183
- Fay, B, 1987, An Alternative View: Interpretive Social Science, in Interpreting Politics, by M T Gibbons (Ed.), New York University Press
- Ferber, R, 1948-49, The Problem of Bias in Mail Returns: A Solution, *Public Opinion Quarterly*, Winter, pp 669-676
- Ferlie, E, 1992, The Creation and Evolution of Quasi-Markets in the Public Sector: A Problem for Strategic Management, *Strategic Management Journal*, 13, pp 79-97
- Fieldler, K D, Gover, V & Teng, S C, 1995, An Empirical Study of IT Enabled Business Process Redesign and Corporate Competitive Strategy, *European Journal of Information Systems*, 4, pp 17-30
- Fiol, C M & Lyles M A, 1985, Organizational Learning, *Academy of Management Review*, 10 (4), pp 803-813
- Fitzgerald, E P, 1993, Success Measures for Information Systems Strategic Planning, *Journal of Strategic Information Systems*, 2 (2), December
- Flood, R L & Carson, E R, 1988, Dealing with Complexity: An Introduction to the Theory and Application of Systems Science, Plenum Press, New York & London
- Flynn, D J & Hepburn, P A, 1994, Strategic Planning for Information Systems - A Case Study of a UK Metropolitan Council, *European Journal of Information Systems*, 3 (3), pp 207-217
- Forrester, J W, 1961, Industrial Dynamics, MIT Press, Wiley, London
- Foster, M J & Foster, D N, 1982, Assessing the Effectiveness of Strategic Planning, *Omega*, 10 (1), pp 19-23
- Foster, M J & Lock, A R, 1990, Factoring Effectiveness Factors, *Journal of the Operational Research Society*, 41 (2), pp 111-117
- Fredrickson, J W & Iaquinto, A L, 1989, Inertia and Creeping Rationality in Strategic Decision Processes, *Academy of Management Journal*, 32 (3), pp 516-542
- Gable, G G, 1994, Integrating Case Study and Survey Research Methods: An Example in Information Systems, *European Journal of Information Systems*, 3 (2), pp 112-126
- Galbraith, J, 1973, Designing Complex Organisations, Reading, MA, Addison-Wesley
- Galliers, R D, 1985, In Search of a Paradigm for Information Systems Research, *IFIP WG 8.2 Colloquium Proceedings*, Manchester Business School, UK, 1-3 September
- Galliers, R D, 1986a, Applied Research in Information Systems Planning, *Database 1987 Conference*, Edinburgh, 15-16th April
- Galliers, R D, 1986b, A Failure of Direction, *Business Computing & Communications*, July/August

- Galliers, R D, 1987a, Information Systems Planning in Britain & Australia in the Mid-1980's: Key Success Factors, unpublished PhD dissertation, *University of London*, UK
- Galliers, R D, 1987b, Discord at the Top, *Business Computing & Communications*, February
- Galliers, R D, 1987c, Information Systems Planning in the UK and Australia - A Comparison of Current Practice, *Oxford Surveys in Information Technology*, 4, pp 223-255
- Galliers, R D, 1990a, Strategic Information Systems Planning: Myths, Reality and Guidelines for Successful Implementation, *paper presented at the 32nd Annual Conference of the Operational Research Society*, Bangor, 11th-14th September
- Galliers, R D, 1990b, Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy, in The Information Systems Research Arena of the 90s by H-E Nissen, R A Hirschheim & H K Klein (Eds.), Amsterdam, North-Holland, pp 327-345
- Galliers, R D, 1991a, A Scenario Based Approach to Strategic Information Systems Planning, in System Thinking in Europe, M C Jackson *et al.*, New York, Plenum Press, March, pp 73-87
- Galliers, R D, 1991b, Integrative Information Systems Research, *The International Journal of Information Management*, November
- Galliers, R D, 1991c, Strategic Information Systems Planning: Myths, Reality and Guidelines for Successful Implementation, *European Journal of Information Systems*, 1 (1), pp 55-64
- Galliers, R D, 1992, Information Technology - Management's boon or bane?, *Journal of Strategic Information Systems*, 1 (2), pp 50-56.
- Galliers, R D & Baker, B S H, 1994, Strategic Information Management: Challenges and Strategies in Managing Information Systems, Management Reader Series, Butterworth Heinemann
- Galliers, R D & Land, F F, 1987, Choosing Appropriate Information Systems Research Methodologies, *Communications of the ACM*, 30 (11), November
- Galliers, R D, Merali, Y & Spearing, L, 1994a, Coping with Information Technology? Key Information Systems Management Issues in the 1990's: Viewpoints of British Managers, *Journal of Information Technology*, 9, March, pp 223-238
- Galliers, R D, Pattison, E M & Reponen, T, 1994b, Strategic Information Systems Planning Workshops: Lessons from three cases, *International Journal of Information Management*, 14, pp 51-66
- Galliers, R D & Sutherland, A R, 1991, Information System Management and Strategy Formulation: The Stages of Growth Model revisited, *Journal of Information Systems*, 1 (1), March, pp 89-114
- Gallo, T E, 1988, Strategic Information Management Planning, Prentice-Hall
- Garrett, B, 1987, The Learning Organization, Gower
- Garvin, D A, 1993, Building a Learning Organization, *Harvard Business Review*, July-August, pp 78-91
- Gerrity, J P & Rockart, J F, 1986, EUC: Are you a leader or a laggard, *Sloan Management Review*, Summer, pp 25-34
- Goodhue, D L, Quillard, J A & Rockart, J F, 1988, Managing the Data Resource: a Contingency Perspective, *MIS Quarterly*, 12 (3), September, pp 373-392
- Goyder, J, 1988, The Silent Minority: Non-Respondents on Social Surveys, Oxford, Polity Press
- Graham, W K, 1977, Acceptance of Ideas Generated through Individual and Group Brainstorming, *Journal of Social Psychology*, 101, pp 231-234

- Green, P E, 1978, Analyzing Multivariate Data, The Dryden Press, Illinois
- Green, G I & Keim, R T, 1983, After Implementation What's Next - Evaluation, *Journal of Systems Management*, **34** (9), pp 10-15
- Greenley, G E, 1983, Effectiveness in Marketing Planning, *Strategic Management Journal*, **4**, pp 1-10
- Grindley, C B, 1985, Information Technology Strategy Studies, *Price Waterhouse*, London
- Grindley, K, 1991, Price Waterhouse Information Technology Review 1991/92, *Price Waterhouse*, London
- Grindley, K, 1992, Price Waterhouse Information Technology Review 1992/93, *Price Waterhouse*, London
- Grindley, K, 1993, Price Waterhouse Information Technology Review 1993/94, *Price Waterhouse*, London
- Grinyer, P & Norburn, D, 1974, Strategic Planning in 21 UK Companies, *Long Range Planning*, **7** (4), pp 80-88
- Grinyer, P & Norburn, D, 1975, An Empirical Investigation of some Aspects of Strategic Planning, *Journal of Royal Statistical Society, Series A*, **138**, pp 70-97
- Gupta, Y P, 1989, Management Information Systems Planning Analysis and Techniques, *Technovation*, **9** (1), May, pp 63-81
- Gupta, Y P & Guimaraes, T, 1993, Issues in Management Systems Planning, *Technovation*, **13** (18), December, pp 533-544
- Hall, W K, 1977, The Impact of Managerial Behavior on Planning Effectiveness, *Managerial Planning*, September/October, pp 19-24
- Hammer, M, 1990, Re-engineering Work: Don't Automate, Obliterate, *Harvard Business Review*, July-August, pp 104-112
- Handy, C B, 1985, Understanding Organisations, Penguin Business Books
- Hardaker, M & Ward, B K, 1987, Getting Things Done: How to make a team work, *Harvard Business Review*, November-December, **65** (6), pp 112-120
- Harris, A L, 1989, An Investigation of the Impact of Organizational Context Variables on Information Systems Planning, unpublished PhD dissertation, *Georgia State University*
- Hartog, L & Herbert, M, 1986, 1985 Opinion Survey of MIS Managers: Key Issues, *MIS Quarterly*, **10** (4), pp 351-362
- Hax, A C & Majluf, N S, 1984, Strategic Management: An Integrative Approach, Prentice Hall, Englewood Cliffs
- Hax, A C & Majluf, N S, 1988, The Concept of Strategy and the Strategy Formation Process, *Interfaces*, **18** (3), May-June, pp 99-109
- Hayward, R G, 1987, Developing an Information Systems Strategy, *Long Range Planning*, **20** (2), pp 100-113
- Henderson, J C, 1990, Plugging into strategic partnerships: the critical IS connection, *Sloan Management Review*, Spring, pp 7-18

- Henderson, J C & Sifonis, J G, 1988, The Value of Strategic Planning: Understanding Consistency, Validity, and IS Markets, *MIS Quarterly*, 12 (2), June, pp 187-199
- Henderson, J C & Treacy, M E, 1986, Managing End-user Computing for Competitive Advantage, *Sloan Management Review*, Winter, pp 3-14
- Henry, H W, 1979, Strategic Management: A New View of Business Policy and Planning, Schendel & Hofer (Eds.), Boston, Mass., Little & Brown Company, pp 245-248
- Hirschheim, R & Smithson, S, 1988, A Critical Analysis of Information Systems Evaluation, in Information Systems Assessment: Issues and Challenges by N Bjorn-Andersen & G B Davis (Eds.), pp 17-37
- Hodgkinson, S L, 1991, The Role of the Corporate IT Function in the Large Multi-Business Company, unpublished PhD dissertation, *University of Oxford*
- Hofer, C W & Schendel, D, 1978, Strategy Formulation: Analytical Concepts, West Publishing Company, New York
- Hoffer, J A, Michael S J & Carroll, J J, 1989, The Pitfalls of Strategic Data & Systems Planning: A Research Agenda, *Proceedings of the 22nd Annual Hawaii International Conference of System Sciences*, Los Alamito, CA:IEEE Computer Society Press, IV, pp 348-356
- Holloway, C & King, W R, 1979, Evaluating Alternative Approaches to Strategic Planning, *Long Range Planning*, 12, August, pp 74-78
- Hood, C, 1991, A Public Management for all Seasons, *Public Administration*, 69 (1)
- Hopper, M, 1990, Ratting SABRE - New Ways to Compete on Information, *Harvard Business Review*, 68, pp 118-125
- Houlden, B T, 1978, Effective Corporate Planning, Teaching Material, *University of Warwick*
- Hrenbiniak, L G & Joyce, W F 1984, Implementing Strategy, Macmillan Publishing Company, NY
- Huff, A S & Reger, R K, 1987, A Review of Strategic Process Research, *Journal of Management*, 13 (2), pp 211-236
- Huff, S L & Beattie, E S, 1985, Strategic versus Competitive Information Systems, *Business Quarterly*, 50 (4), Winter, pp 97-102
- Huysman, M H, Fischer, S J & Heng, M S H, 1994, An Organizational Learning Perspective on Information Systems Planning, *Journal of Strategic Information Systems*, 3 (3), pp 165-177
- IBM, 1975, Business Systems Planning - Information Systems Planning Guide, GE20-0527-4
- Ilggen, D R, Fisher, C D & Taylor, M S, 1979, Consequences of Individual Feedback on Behaviour in Organisation, *Journal of Applied Psychology*, 64, pp 349-371-
- Ireland, R D, Hitt, M A, Bettis, R A & Auld de Porras, D, 1987, Strategy Formulation Processes: Differences in Perceptions of Strength and Weaknesses Indicators and Environmental Uncertainty by Managerial Level, *Strategic Management Journal*, 8, pp 469-485
- Ives, B & Learmonth, G, 1984, The Information System as a Competitive Weapon, *Communications of the ACM*, 27 (12), December, pp 1193-1201
- Ives, B, Olson, M & Baroudi, J, 1983, The Measurement of User Information Satisfaction, *Communications of the ACM*, 26 (10), October, pp 785-793

- Jackson, M C, 1986, The Cybernetic Model of the Organization: An Assessment, in Cybernetics and Systems by R Trappl (Ed.), Dordrecht, The Netherlands: Reidel
- Jarvenpaa, S L, Dickson, G W & DeSanctis, G, 1990, Methodological Issues in Experimental IS Research - Experiences and Recommendations, *MIS Quarterly*, 9 (2), pp 141-156
- Jessup, L M & Kukalis, S, 1990, Better Planning Using Group Support Systems, *Long Range Planning*, 23 (3), pp 100-105
- Jick, T D, 1983, Mixing Qualitative and Quantitative Methods: Triangulation in Action, in Qualitative Methodology by J Van Maanen (Ed.), Sage, London, pp 135-148
- Johnson, J R, 1984, Enterprise Analysis, *Datamation*, December 15, pp 97-103
- Jones, D C, 1988, Executives say Information Systems & Corporate Strategies Mesh, *National Underwriter*, 92 (7), February 15th, p 43
- Jones, A M & Hendry, C, 1992, The Learning Organization: A Review of Literature and Practice, Centre for Corporate Strategy and Change, *Warwick Business School, University of Warwick*, UK
- Kaplan, B & Duchon, D, 1988, Combining Qualitative and Quantitative Methods in Information Systems Research: A Case Study, *MIS Quarterly*, December, pp 571-586
- Karimi, J, 1988, Strategic Planning for Information Systems: Requirements and Information Engineering Methods, *Journal of Management Information Systems*, 4 (4), Spring, pp 5-24
- Kay, R H, Szyperski, N, Klaus, H & Bartz, G, 1980, Strategic Planning of Information Systems at the Corporate Level, *Information & Management*, 3, pp 175-186
- Keat, R, 1981, The Politics of Social Theory, Blackwell, Oxford
- Kemerer, C F & Sosa, G L, 1988, Barriers to Successful Strategic Information Systems, *Planning Review*, 46, September-October, pp 20-23
- Kieckhafer, G V & Inderrieden, E J, 1987, Planning Information Systems for the Growing Business, *Business*, 37 (4), October-December, pp 18-24
- Kim, J S, & Hammer, W C, 1976, Effect of performance feedback and goal setting on productivity and satisfaction in an organisational setting, *Journal of Applied Psychology*, 61, pp 48-57
- Kim, J & Mueller, C W, 1978, Factor Analysis: Statistical Methods and Practical Issues, Sage Publications
- King, W R, 1980, Implementing Strategic Plans through Strategic Program Evaluation, *Omega*, 8 (2), pp 173-181
- King, W R, 1983, Evaluating Strategic Planning Systems, *Strategic Management Journal*, 4, pp 263-277
- King, W R, 1984, Evaluation the Effectiveness of your Planning, *Managerial Planning*, September/October, 26, pp 4-8
- King, W R, 1988, How Effective is Your Information Systems Planning, *Long Range Planning*, 21, October, pp 103-112
- King, W R & Cleland, D I, 1977, Information for More Effective Strategic Planning, *Long Range Planning*, 10 (1), pp 59-64
- King, W R & Cleland, D I, 1978, Strategic Planning and Policy, Van Nostrand-Reinhold, New York

- King, W R & Raghunathan, T S, 1987, How Strategic is ISP?, *Datamation*, **33** (22), November 15th, pp 133-137
- King, W R & Rodriguez, J I, 1981, Participative Design of Strategic Decision Support Systems: An Empirical Assessment, *Management Science*, **27**, pp 717-726
- King, W R & Sabherwal, R, 1992, The Factors Affecting Strategic Information Systems Applications: An Empirical Assessment, *Information & Management*, **23**, pp 217-235
- King, W R & Srinivasan, A, 1983, Decision Support Systems: Planning, Development, and Implementation, *Application of Management Science*, **3**, pp 87-107
- Kirk, J & Miller, M L, 1986, Reliability & Validity in Qualitative Research, Qualitative Research Methods Series 1, A Sage University Paper, Sage Publications, London
- Klein H K, Nissen, H A & Hirschheim, R, 1991, A Pluralist Perspective of the IS Research Arena in Information System Research: Contemporary Approaches and Emergent Tradition by H A Nissen, H K Klein & R Hirschheim (Eds.), North Holland
- Kling, R, 1980, Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research, *Computer Surveys*, **12**, pp 61-110
- Kolb, D A & Frohman, A L, 1970, A OD approach to consulting, *Sloan Management Review*, **12**, pp 51-65,
- Kriebel, C H, 1968, The Strategic Dimension of Computer Systems Planning, *Long Range Planning*, September
- Kudla, R J, 1980, The Effects of Strategic Planning on Common-Stock Returns, *Academy Management Journal*, **23**, pp 5-20
- Kukalis, S, 1991, Determinants of Strategic Planning Systems in Large Organisations: A Contingency Approach, *Journal of Management Studies*, **28** (2), March, pp 143-160
- Laing, R D, 1972, The Politics of the Family and Other Essays, Vintage Books, NY
- Langley, A, 1988, The Roles of Formal Strategic Planning, *Long Range Planning*, **21** (3), June, pp 40-50
- Large, J, 1986, Information's Market Force, *Management Today*, August
- Leach, S, 1994, The Local Government Review: A Critical Appraisal, *Public Money & Management*, January-March, pp 11-16
- Learned, E P, Christensen, C R, Andrews, K R & Guth, W D, 1965, Business Policy: Text and Cases, Irwin
- Lederer, A L & Mendelow, A L, 1986a, Paradoxes of Information Systems Planning, *Proceedings of the 7th International Conference in Information Systems*, Baltimore, pp 255-264
- Lederer, A L & Mendelow, A L, 1986b, Issues in Information Systems Planning, *Information & Management*, **10** (5), pp 245-254
- Lederer, A L & Mendelow, A L, 1987, Information Resource Planning: Overcoming Difficulties in Identifying Top Management Objectives, *MIS Quarterly*, September, pp 389-399
- Lederer, A L & Mendelow, A L, 1988a, Information Systems Planning: Top Management Takes Control, *Business Horizons*, **31** (3), May/June, pp 73-78

- Lederer, A L & Mendelow, A L, 1988b, Convincing Top Management of the Strategic Potential of Information Systems, *MIS Quarterly*, December, pp 524-534
- Lederer, A L & Mendelow, A L, 1993, Information Systems Planning and the Challenge of Shifting Priorities, *Information & Management*, **24** (6), June, pp 319-328
- Lederer, A & Sethi, V, 1988a, The Implementation of Strategic Information Systems Planning Methodologies, *MIS Quarterly*, **12** (3), September, pp 445-461
- Lederer, A L & Sethi, V, 1988b, SISP: Easier to say than Do, *Computerworld*, **22** (42), October 17th, pp 107, 112
- Lederer, A L & Sethi, V, 1988c, Pitfalls in Planning, *Datamation*, **35** (11), June 1, pp 59-62
- Lederer, A & Sethi, V, 1991, Critical Dimensions of Strategic Information Systems Planning, *Decision Sciences*, **22** (1), Winter, pp 104-119
- Lederer, A & Sethi, V, 1992a, Root Causes of Strategic Information Systems Planning Implementation Problems, *Journal of Management Information Systems*, **9** (1), Summer, pp 25-45
- Lederer, A & Sethi, V, 1992b, Meeting the Challenges of Information Systems Planning, *Long Range Planning*, **25** (2), pp 69-80
- Lee, G, 1993, An Integrated Framework for Information Systems Planning, unpublished PhD dissertation, *University of Leeds*, UK, September
- Lenz, R T, 1987, Managing the Evolution of the Strategic Planning Process, *Business Horizons*, January-February, pp 4-39
- LGMB, 1993, Local Government Generic Information Model, *Local Government Board*, Luton
- Lichfield, N, Kettle, P & Whitbread, M, 1975, Evaluation in the Planning Process, Pergamon Press, Oxford
- Lin, F M, 1991, The Orientation of Information Systems Planning: The Construct, Measurement, and the Evaluation of Information Systems Planning Systems (Firm Size), unpublished PhD dissertation, *State University of New York at Buffalo*
- Lindsey, W M & Rue, L W, 1980, Impact of Organization Environment on the Long Range Planning Process: A Contingency View, *Academy of Management Journal*, **23**, pp 385-404
- Locke, E A & Latham, G P, 1990, A Theory of Goal Setting an Task Performance, Prentice Hall, Englewood Cliffs, N J
- Locke, E A, Shaw K N, Saari, L M & Latham, G P, 1981, Goal setting and task performance: 1969-1980, *Psychological Bulletin*, **90**, pp 125-152
- Lorange, P, 1979, Formal Planning Systems: Their Role in Strategy Formulation and Implementation, in Strategic Management: A New View of Business Policy and Planning by D Schendel & C Hofer (Eds.), Little, Brown & Co., Boston, pp 226-241
- Lorange, P, 1982, Implementation of Strategic Planning, Prentice Hall, Englewood Cliffs, N J
- Lorange, P & Vancil, R F, 1977, Strategic Planning Systems, Prentice Hall, Englewood Cliffs, N J
- Lucas, H C, 1978, Unsuccessful Implementation: The Case of a Computer Based Order Entry System, *Decision Sciences*, **9** (1), January, pp 68-79
- Lyles, M A & Lenz, R T, 1982, Managing the Planning Process: A Field Study of the Human Side of Planning, *Strategic Management Journal*, **3**, pp 105-118

- Martin, J, 1982, Strategic Data-Planning Methodologies, Prentice-Hall
- Martino, C A, 1983, Information Systems Planning to Meet Objectives: A Survey of Practices, *Cresap, McCormick & Paget Publication*, New York
- Mason, R O, 1978, Measuring Information Output: A Communication Systems Approach, *Information & Management*, 1 (5), October, pp 219-234
- McFarlan, F W, 1971, Problems in Planning the Information System, *Harvard Business Review*, March-April, pp 75-89
- McFarlan, F W, 1984, Information Technology changes the way you compete, *Harvard Business Review*, May-June
- McFarlan, F W, McKenney, J L & Pyburn, P, 1983a, Information Archipelago - Plotting a Course, *Harvard Business Review*, January/February, pp 145-161
- McFarlan, F W, McKenney, J L & James, L, 1983b, Corporate Information Systems Management, Irwin
- McKinsey & Co, 1968, Unlocking the Computer's Profit Potential, *McKinsey & Co*, New York
- McLean, E R & Soden, J V, 1977, Strategic Planning for MIS, John Wiley & Sons, New York
- Meiklejohn, I, 1986, Who are the IT Strategists, *Business Computing & Communications*, May, pp 47-55
- Michael, D A, 1973, On Learning to Plan and Planning to Learn, Jossey Bass, London
- Mintzberg, H, 1988, Crafting Strategy, *The McKinsey Quarterly*, Summer, pp 71-90
- Mintzberg, H, 1994, Rethinking Strategic Planning. Part I: Pitfalls & Fallacies, *Long Range Planning*, 27 (3), pp 12-21
- Mitchell, T R, 1985, An evaluation of the validity of correlational research conducted in organisations, *Academy of Management Review*, 10, pp 192-205
- Morgan, G, 1980, Paradigms, Metaphors and Puzzle-Solving in Organisation Theory, *Administrative Science Quarterly*, 25
- Moser, C A & Kalton, G, 1989, Survey Methods in Social Investigation, Gower, UK
- Mumford, E & Pettigrew, A, 1975, Implementing Strategic Decisions, Longman, London
- Nadler, D A, 1977, Feedback and Organization Development: Using Data-based Methods, Addison-Wesley Publishing Company
- Nath, R, 1989, Aligning MIS with the Business Goals, *Information & Management*, 16, pp 71-79
- Newman, J, 1994, Beyond the Vision: Cultural Change in the Public Sector, *Public Money & Management*, April-June, pp 59-64
- Niederman, F, Brancheau, J C & Wetherbe, J C, 1991, Information Systems Management Issues in the 1990's, *MIS Quarterly*
- Nissen, H A, Klein, H K & Hirschheim, R A, 1991, Information System Research: Contemporary Approaches and Emergent Traditions, *Proceedings of the IFIP TC8/WG 8.2*, December 14-16, Copenhagen, North Holland
- Nolan, R L, 1979, Managing the Crisis in Data Processing, *Harvard Business Review*, 57 (2), March-April, pp 115-126

- Nunnally, J C, 1978, Psychometric Theory, Englewood Cliffs, N J: Prentice Hall
- Nutt, P C, 1980, On Managed Evaluation Processes, *Technological Forecasting and Social Change*, 17, pp 313-328
- Nutt, P C, 1982, Hybrid Planning Methods, *Academy of Management Review*, 7 (3), pp 442-454
- Nutt, P C, 1983, Implementation Approaches for Project Planning, *Academy of Management Review*, 8, pp 600-611
- O'Brien, J A, 1994, Introduction to Information Systems, Irwin
- O'Connor, A D, 1993, Successful Strategic Information Systems Planning, *Journal of Information Systems*, 3, pp 71-83
- Oppenheim, A N, 1986, Questionnaire Design and Attitude Measurement, Gower, UK
- Orlikowski, W J & Baroudi, J J, 1991, Studying Information Technology in Organisations: Research Approaches and Assumptions, *Information Systems Research*, 2 (1), March, pp 1-28
- Ormerod, R J, 1993, On the Nature of Information Systems Strategy Development, *Journal of Computing and Information Technology - CIT* 1, 4, pp 285-293
- Osborne, D & Gaebler, T, 1992, Reinventing Government, Addison Wesley, Reading, Mass.
- Palmer, A J, 1993, Performance Measurement in Local Government, *Public Money & Management*, October-December, pp 31-36
- Parsons, G L, 1983, Information Technology: A New Competitive Weapon, *Sloan Management Review*, Fall
- Pearce, J A, Freeman, E B & Robinson, R B, 1987, The Tenuous Link between Formal Strategic Planning and Financial Performance, *Academy of Management Review*, 2 (4), pp 658-675
- Pearce, J A & Randolph, W A, 1980, Improving Strategy Formulation: Pedagogy by Recognising Behavioral Aspects, *Exchange*, 3 (4), pp 7-10
- Peattie, K, 1993, Strategic Planning: Its Role in Organizational Politics, *Long Range Planning*, 26 (3), pp 10-17
- Pedler, M, Burgoyne, J & Boydell, T, 1991, The Learning Company: A Strategy for Sustainable Development, McGraw-Hill Ltd, Berkshire
- Pellegrinelli, S & Bowman C, 1994, Implementing Strategy Through Projects, *Long Range Planning*, 27 (4), pp 125-132
- Peters, T J & Waterman, R H, 1982, In Search of Excellence: Lessons from America's Best-Run Companies, Harper & Row, London
- Pettigrew, A M, 1972, Information Control as a power resource, *Sociology*, 6, pp 187-204
- Porter, M E, 1985, Competitive Advantage: Creating and Sustaining Superior Performance, Free Press, New York
- Porter, M E & Millar, V E, 1985, How information gives you competitive advantage, *Harvard Business Review*, July-August, pp 149-161
- Premkumar, G, 1989, Evaluation of Strategic Information Systems Planning: Empirical Validation of a Conceptual Model, unpublished PhD dissertation, *University of Pittsburgh*

- Premkumar, G & King, W R, 1991, Assessing Strategic Information Systems Planning, *Long Range Planning*, 24 (5), October, pp 41-58
- Premkumar, G & King, W R, 1992, An Empirical Assessment of Information Systems Planning and the Role of Information Systems in Organizations, *Journal of Management Information Systems*, 9 (2), pp 99-125
- Premkumar, G & King, W R, 1994a, Organizational Characteristics and Information Systems Planning: An Empirical Study, *Information Systems Research*, 5 (2), pp 75-109
- Premkumar, G & King, W R, 1994b, The Evaluation of Strategic Information Systems Planning, *Information & Management*, 26, pp 327-340
- Pyburn, P J, 1981, ISP - An Contingency Perspective, unpublished PhD dissertation, *Harvard University*
- Pyburn, P J, 1983, Linking the MIS Plan with Corporate Strategy: An Exploratory Study, *MIS Quarterly*, 7 (2), June, pp 1-14
- Quinn, J B, 1980, Strategies for Change - Logical Incrementalism, Irwin
- Quinn, J B, 1981, Formulating strategy one step at a time, *Journal of Business Strategy*, 1 (3), pp 42-63
- Quinn, R E & Rohrbaugh, J, 1983, A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organisational Analysis, *Management Science*, 29 (3)
- Rackoff, N, Wiseman, C & Ullrich, W A, 1985, Information Systems for Competitive Advantage: Implementation of a Planning Process, *MIS Quarterly*, 9 (4), pp 285-294
- Raghunathan, T S, 1985, An Empirical Evaluation of Information Systems Planning and its Relationship to Information Systems Performance, unpublished PhD dissertation, *University of Pittsburgh*
- Raghunathan, T S & King, W R, 1987, The Impact of ISP on the Organisation, *Journal of Management Science*, 16 (2), pp 85-93
- Raghunathan, B & Raghunathan, T S, 1988, Impact of Top Management Support on IS Planning, *Journal of Information Systems*, Spring, pp 15-23
- Raghunathan, B & Raghunathan, T S, 1990, Planning Implications of the Information Systems Strategic Grid: An Empirical Investigation, *Decision Sciences*, 21, pp 287-300
- Raghunathan, B & Raghunathan, T S, 1994, Adaptation of a Planning System Success Model to Information Systems Planning, *Information Systems Research*, September, 5 (3), pp 326-339
- Raimond, P & Eden, C, 1990, Making Strategy Work, *Long Range Planning*, 23 (5), pp 97-105
- Ramanujam, V & Venkatraman, N, 1985, Eight Half-Truths of Strategic Planning: A Fresh Look, *Planning Review*, 13, January pp 22-27
- Ramanujam, V & Venkatraman, N, 1987a, Planning System Characteristics and Planning Effectiveness, *Strategic Management Journal*, 8, pp 453-468
- Ramanujam, V & Venkatraman, N, 1987b, Planning and Performance: A New Look at an Old Question, *Business Horizons*, May-June, pp 19-25
- Ramanujam, V, Venkatraman, N, & Camillus, J C, 1986, Multi-Objective Assessment of Effectiveness of Strategic Planning: A Discriminant Analysis Approach, *Academy of Management Journal*, 29 (2), pp 347-372
- Reck, R H & Reck, V P, 1989, Steering IS Committees Straight, *Datamation*, October 15, pp 89-92

- Reid, D M, 1989, Operationalising Strategic Planning, *Strategic Management Journal*, 10, pp 553-567
- Reponen, T, 1990, Management's Role in Information Management, *The Finnish Journal of Business Economics*, 4, pp 316-331
- Reponen, T, 1994, The Role of Learning in IS Planning and Implementation, *Proceedings of the Conference on Information Technology and Organizational Change*, Nijenrode University, 28-29 April.
- Richardson, G P, 1991, Feedback Thought in Social Science and Systems Theory, University of Pennsylvania Press, Philadelphia
- Rockart, J F, 1979, Chief Executives Define Their Own Data Needs, *Harvard Business Review*, 57 (2), March-April, pp 81-93
- Ruohonen, M, 1991, Stakeholders of Strategic Information Systems Planning, *Journal of Strategic Information Systems*, 1 (1), January
- Saaksjarvi, M, 1988, Information Systems Planning: What Makes it Successful?, *Proceedings of the Australian Computer Conference*, Sydney Convention and Exhibition Centre, Darling Harbour, September 21-23
- Sabherwal, R & Tsoumpas, P, 1993, The Development of Strategic Information System: Some Case Studies and Research Proposals, *European Journal of Information*, 2 (4), pp 240-259
- Sambamurthy, V, Venkataraman, S & Desanctis, G, 1993, The Design of Information Technology Planning Systems for Varying Organizational Contexts, *European Journal of Information Systems*, 2 (1), pp 23-35
- Schaffir, W B, 1976, Strategic Business Planning: Some Questions for the Chief Executive, NY, pp 15-16
- Schein, E H, 1969, Process Consultation: Its Role in Organisational Development, Addison Wesley
- Schein, E H, 1990, A General Philosophy of Helping: Process Consultation, *Sloan Management Review*, Spring, pp 57-64
- Scott-Morton, M S (Ed.), 1991, The Corporation of the 1990s: IT and Organisational Transformation, Oxford OU Press
- Sekaran, U, 1992, Research Methods for Business: A Skill Building Approach, Wiley, NY, 2nd edition
- Selig, G J, 1983, Strategic Planning for Information Resources Management: A Multinational Perspective, UMI Research Press, Michigan
- Selto, F H & Grove, H D, 1984, Assessing the Effectiveness of Management Information Systems Planning, Working Paper, *School of Accountancy, University of Denver*
- Senge, P M, 1990, The Fifth Discipline: The Art & Practice of The Learning Organization, Century Business, MacKay, Chapham, Kent
- Senn, J A, 1992, The Myths of Strategic Systems: What Define True Competitive Advantage?, *Journal of Information Systems Management*, 9 (3), Summer, pp 7-12
- Sethi, V & King W R, 1991, Construct Measurement in Information Systems Research: An Illustration in Strategic Systems, *Decision Sciences*, 22, pp 455-472
- Shannon, C E & Weaver, W, 1949, The Mathematical Theory of Communication, University of Illinois Press, Urbana

- Shaw, K, Fenwick, J & Foreman, A, 1994, Compulsory Competitive Tendering for Local Government Services: The Experiences of Local Authorities in the North of England 1988-1992, *Public Administration*, 72, Summer, pp 201-217
- Simon, H A, 1960, The New Science of Management Decision, Harper & Brother, New York
- Simon, H A, 1965, The Shape of Automation for Man and Management, Harper & Brother, New York, pp 54-56
- Sinclair, S W, 1986, The Three Domains of Information Systems Planning, *Journal of Information Systems Management*, 3 (2), Spring
- Singleton, J P, McLean, E R & Altman, E N, 1988, Measuring Information Systems Performance: Experience with the Management by Results System at Security Pacific Bank, *MIS Quarterly*, June, pp 325-337
- Sinha, D K, 1990, The Contribution of Formal Planning to Decisions, *Strategic Management Journal*, 11, pp 479-492
- SOCITM, 1992, IT Trends in Local Government 1992, *Society of Information Technology Managers*
- Soden, V & Tucker, C C, 1976, Long-Range MIS Planning, *Journal of Systems Management*, 27 (7), July, pp 28-33
- Somogyi, E K & Galliers, R D, 1987, From Data Processing to Strategic Information Systems - A Historical Perspective, *Journal of Information Technology*, March
- Srinivasan, A, 1985, Alternative Measures of System Effectiveness: Associations and Implications, *MIS Quarterly*, September, pp 243-253
- Stata, R, 1989, Organizational Learning - The Key to Management Innovation, *Sloan Management Review*, Spring, pp 63-74
- Steers, R M, 1975, Problems in the measurement of organisational effectiveness, *Administrative Science Quarterly*, 20 (4), pp 546-558
- Stein, E W, 1995, Organizational Memory: Review of Concepts and Recommendations for Management, *International Journal of Information Management*, 15 (2), pp 17-32
- Steiner, G A, 1979, Strategic Planning: What Every Manager Must Know, New York, Free Press
- Stewart, J, 1989, The Changing Organisation and Management of Local Authorities, in The Future of Local Government by J Stewart & G Stoker (Eds.), Macmillan, Hampshire
- Stewart, J & Walsh, K, 1994, Performance Measurement: When Performance can Never be Finally Defined, *Public Money & Management*, April-June, pp 45-49
- Stoker, G, 1988, The Politics of Local Government, Macmillan, Hampshire
- Straub, D W, 1989, Validating Instruments in MIS Research, *MIS Quarterly*, June, pp 147-169
- Sullivan, C H, 1985, Systems Planning in an Information Age, *Sloan Management Review*, 26 (2), Winter, pp 3-12
- Sullivan, C H, 1988, The Changing Approach to Systems Planning, *Journal of Information Systems Management*, Summer, pp 8-13
- Szewczak, E J, 1991, Evaluating the Impacts of Information Technology in Organizational Systems, in Management Impact of Information Technology: Perspectives in Organizational Change and Growth by E Szewczak, C Snodgrass & M Khosrowpour (Eds.), Ideal Group, Pennsylvania, pp 25-47

- Taylor, D E, 1979, Strategic Planning as an Organisational Change Process - Some Guidelines from Practice, *Long Range Planning*, 12, October, pp 43-53
- Thomas, J B, McDaniel, R R & Dooris, M J, 1989, Strategic Issues Analysis: Nominal Group Technique and Decision Analysis for Resolving Strategic Issues, *The Journal of Applied Behaviour Science*, 25 (2), pp 189-200
- Ugboro, I S, 1991, Top Management Involvement and Strategic Planning System Performance: A Validation Study, *SAM Advanced Management Journal*, Autumn, pp 38-42
- Venkatraman, N, 1985/1986, Research on Management Information Systems Planning: Some Guidelines from Strategic Planning Research, *Journal of Management Information Systems*, Winter, 2 (3), pp 65-77
- Venkatraman, N, 1989, Strategic Orientation of Business Enterprises: The Construct dimensionality and Measurement, *Management Science*, 38 (8), pp 942-962
- Venkatraman, N & Grant, J H, 1986, Construct Measurement in Organizational Strategy Research: A Critique and Proposal, *Academy Management Review*, 11, pp 71-87
- Venkatraman, N & Ramanujam, V, 1987, Planning System Success: A Conceptualization and an Operational Model, *Management Science*, 33 (6), June, pp 687-705
- Venkatraman, N, Henderson, J C & Oldach, S, 1993, Continuous Strategic Alignment: Exploiting IT Capabilities for Competitive Success, *European Management Journal*, 11, pp 139-148
- Vitale, M R, Ives, B & Beath, C M, 1986, Linking Information Technology and Corporate Strategy: An Organizational View, *Proceedings of the Seventh International Conference on Information System*, San Diego, CA, December 15-17, pp 265-276
- Waema, T M & Walsham, G, 1990, Information Systems Strategy Formulation, *Information & Management*, 18, pp 29-39
- Waibel, K J, 1987, The Effectiveness of Information Systems Steering Committees for Information Systems Planning: An Exploration of User Attitudes and Perceptions, unpublished PhD dissertation, *University of Texas-Austin*
- Wallace, R S O & Mellor, C J, 1988, Non-Response Bias in Mail Accounting Surveys: A Pedagogical Note, *British Accounting Review*, 20, pp 131-139
- Walsham, G, 1991, Reading the Organisation: Metaphors and Information Management, ESRC seminar on Information Management and Organisational Processes, *University of Warwick Business School Seminar*, 14 October 1991
- Ward, B, 1990, Planning for Profit, in *Managing Information Systems for Profit* by T Lincoln (Ed.), Wiley Series in Information Systems, Wiley & Sons, Chichester, pp 103-146
- Ward, J M, 1988, Information Systems and Technology Application Portfolio Management - An Assessment of Matrix-Based Analysis, *Journal of Information Technology*, September, pp 205-215
- Ward, J, Griffiths, P & Whitmore, P, 1990, *Strategic Planning for Information Systems*, Wiley Series in Information Systems
- Watson, R T & Brancheau, J C, 1991 Key Issues in IS Management: An International Perspective, *Information & Management*, 20, pp 213-233
- Weber, M, 1947, *The Theory of Social and Economic Organization*, Free Press
- Wiener, N, 1948, *Cybernetics or Control and Communication in the Anima and the Machine*, Wiley

- Wightman, D W L, 1987, Competitive Advantage through IT, *Journal of General Management (UK)*, 12 (4), Summer, pp 36-45
- Willcocks, L & Margetts, H, 1994, Risk Assessment and Information Systems, *European Journal of Information Systems*, 3 (2), April, pp 127-138
- Wilson, R M S & Chua, W F, 1993, Managerial Accounting: Methods and Meaning, Chapman & Hall, London
- Wilson, T D, 1989, The Implementation of Information Systems Strategies in UK Companies: aims and barriers to success, *International Journal of Information Management*, 9 (4), pp 245-258.
- Wong, B K, Monaco, J A, Sellaro, C L, 1994, Determining Priorities for Projects with Uncertain Benefits: An Application to Data Management, *European Journal of Operational Research*, 76 (1), pp 206-217
- Wood, D R & LaForge, R L, 1979, The Impact of Comprehensive Planning on Financial Performance, *Academy of Management Journal*, 22, pp 516-526
- Yadav, S B, 1983, Determining an Organisation's Information Requirements: A State of the Art Survey, *Data Base*, 14 (3)
- Yin, R K, 1989, Case Study Research: Design and Methods, Applied Social Research Methods Series, Volume 5, Sage Publications, London
- Young, J, 1987, Manager's Corner: Ways to Win Top Brass Backing, *Computerworld*, 21 (44A), November 4, pp 9-10
- Zachman, J A, 1982, Business Systems Planning and Business Information Control Study: A Comparison, *IBM Systems Journal*, 21 (1), pp 31-53
- Zani, W M, 1970, Blueprint for MIS, *Harvard Business Review*, 48 (6), November-December, pp 95-100
- Zeller, R A & Carmines, E G, 1978, Statistical Analysis of Social Data, Rand McNally, Chicago
- Zeller, R A & Carmines, E G, 1980, Measurement in the Social Sciences: The Link between Theory and Data, Cambridge University Press, Cambridge
- Zmud, R W, 1979, Individual Differences and MIS Success: A Review of the Empirical Literature, *Management Science*, 25 (10), October, pp 966-979
- Zmud, R W, Boynton, A C & Jacobs, G C, 1986, The Information Economy: A New Perspective for Effective Information Systems Management, *Data Base*, 18 (1), Fall, pp 17-23
- Zutshi, R K, 1981, Strategic Planning Systems Evaluation Methodology: A Systems Approach, unpublished PhD dissertation, *University of Pittsburgh*
- Zviran, M, 1990, Relationships between organisational and IS objectives: Some Empirical evidence, *Journal of Management Information Systems*, 7 (1), Summer, pp 65-84

Case Study: Supporting Documents

Cheshire County Council

<i>Document #</i>	<i>Document Title</i>
CCC#1	Cheshire County Council Information Systems Strategy: Finance & Management Group, March 1992.
CCC#2	Guidelines for Group IS Plans 1993-94, August 1992.

Cheshire County Council - Fire Brigade

<i>Document #</i>	<i>Document Title</i>
FB#1	CIS Planning Unit Report into ISS within Fire Brigade, September 1992
FB#2	IS Plan 1992/93
FB#3	SMT Discussion Paper - ISS for Cheshire Fire Brigade
FB#4	ISS 1993/94
FB#5	IS 1994-97 Briefing Document, December 1993
FB#6	Business Plan 1994/95
FB#7	Members Induction Document

Cheshire County Council - Social Services

<i>Document #</i>	<i>Document Title</i>
SS#1	CRRIS review Management Summary
SS#2	Systems to support Social Services practices
SS#3	Social Services Group Information Strategy 1994-95
SS#4	County Children Plan
SS#5	County Community Care Plan, April 1992