Computer-Based Informated Environments: Emergent Forms of Work Organisation

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ABSTRACT

This research formulates the concept of a Computer-Based Informed Environment (CBIE) as an emergent anthropocentric form of work organisation; this is a computerised office environment which informates and empowers lower level employees. The study attempts to enhance our knowledge over the nature of CBIEs. It hypothesizes that with the current interest in IT-enabled empowerment there are more opportunities for the development of CBIEs. A missing element on studies in informed and empowered workplaces is employees’ interpretation of these forms of work organisation. A review of the literature on information technology (IT) in organisations supports the view that there is a need for further research on the meaning of technological and organisational changes. This study attempts to cover this gap while also making a contribution in the field of anthropocentric uses of IT in office environments. A structurational framework is developed to uncover the process and context of change and the linkages between the two.

Considering the research topic, the case study approach was adopted. Three service-oriented organisations participated in the research. All three had within the last few years introduced the system ImagePlus which is promoted for its potential to empower employees.

There have been two important findings about the nature of CBIEs. Firstly, it is found that the process and context of CBIEs should not be treated as mutually independent but as inextricably linked. Secondly, it is identified that CBIEs could occur without being anthropocentric-oriented. Informed employees are not necessarily truly empowered. When the 'empowerment' approach is diffused via IT, it is likely to be in forms that align more with managerial and organisational interests than those of employees.

Using structuration theory, the complex dynamics of the use of IT in organisations become evident. The study argues that the ‘determinism’ and ‘choice’ perspectives need to be linked for each has a vital role to play in enhancing our understanding of the use of IT in organisations.
To my Parents, who first taught me to stand for the
Democratisation and the Humanisation of society,
and to the Daughters and Sons of the Working class,
whose desire to be educated was blocked by society’s
capitalistic system.
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<td>API</td>
<td>Alpatros Insurance UK Ltd</td>
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<tr>
<td>APIU</td>
<td>Alpatros Insurance Is Us (Vision Statement)</td>
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<tr>
<td>BPR</td>
<td>Business Process Reengineering</td>
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<td>CBIE</td>
<td>Computer-Based 'Informated' Environment</td>
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<td>CS</td>
<td>Customer Services</td>
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<td>CSCs</td>
<td>Customer Services Centres</td>
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<td>DG</td>
<td>Director General</td>
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<td>EL</td>
<td>The Equitable Life Assurance Society Ltd</td>
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<td>IS</td>
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<td>MIS</td>
<td>Management Information Systems</td>
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<td>OFWAT</td>
<td>Office of Water Services</td>
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CHAPTER 1
INTRODUCTION

1.1 TOWARDS INTEGRATING INFORMATION TECHNOLOGY INTO ANTHROPOCENTRIC FORMS OF WORK ORGANISATION

When in the summer of 1987 I began working as a computer operator in a large tourist organisation I could not have imagined then that in a few years time the area of information technology (IT) in organisations would have formed the basis of my PhD thesis. It was, however, because of that college vacation job that I came to be aware that information technology could diminish human reasoning to a mechanical and a pre-programmed act. The present research focuses on people lower down the organisational hierarchy suggesting that the functioning of information technology needs no longer deny nor undermine human ingenuity and skill. In particular, this study explores the relationship between information technology and organisations in office environments and it examines the emergence of a new anthropocentric¹ form of work organisation based on the idea of the informate character of information technology (which claims for the textualisation of work and subsequently a wide information sharing across the organisational hierarchy; Zuboff, 1988) and the recent trend for IT-enabled empowerment (as the distribution of authority to lower organisational

¹ The word ‘anthropocentric’ derives from the Greek words ‘anthropos’ (human) and ‘kentro’ (centre) implying a primary focus on humans. The terms ‘anthropocentric’, ‘humane’ and ‘humanistic’ are used interchangeably within this thesis.
layers). In so-doing, it suggests a conceptual reorganisation of the different perspectives one encounters in the ‘information technology-organisation’ field.

This chapter reviews the potential of information technology to humanise work organisations as this has been identified in the literature. The specific objectives of the study will then be presented and an overview of the functioning of the forthcoming chapters will follow.

In his book “The Shape of Future Technology: The Anthropocentric Alternative”, Brodner (1985) coins the term anthropocentredness which places attention on the human side and not only on the technology side of a computer-based workplace. "Instead of emphasizing the potential of the technology itself and stressing the limitations of people, the anthropocentric ... concept seeks to develop the creativity and productive capabilities of human beings to a far greater extent through their work with machines ... Instead of imitating human abilities and reducing the human being him[her]self to functioning in the same way as the machine or indeed, displacing him[her] from the production process altogether, the intention is to combine the complementarity attributes of human being and machine in a productive way" (Brodner,1985:82).

Information technology has the potential of stimulating human creativity and human purposes by providing opportunities for knowledge sharing, learning and decision making. Mumford (1994) recognizes that since information technology can enable people to communicate effectively with each other, it can also
“support the human being in work, social interaction and the workings of democracy” (p. 395). However, there is evidence that with the adoption of new technologies, organisations tend to pay far more attention to the technical aspects and less attention to the human aspects of work (Clegg and Corbett, 1987), resulting in this way in a technocentric approach to work organisation. Even though a potential for multi-skilling has been identified in information technology, this is found to be rare or undetected in practice (Beirne and Ramsay 1992). Rosenbrock (1984), in particular, recognises that it is only in the rarest occasions that any thought is given during technological developments to the human element. In fact, information technology has been described as "a science in which human beings need not be the fundamental unit of analysis" (Leavitt, 1962: 92). Noble (1984) expresses a pessimistic view on this issue. As he puts it: "...the compulsion to automate continues to pace. As a result, we see, ... not the replenishing or irreplaceable human skills but their final disappearance, not the greater wealth of the notion but its steady impoverishment, not an extension of democracy and equality but a concentration of power, a tightening of control, a strengthening of privilege; not the hopeful hymns of progress but the sombre sounds of despair, and disquiet" (p. 353).

Studies on deskilled and machine-driven workforce reinforce the argument that the human element is undermined with the adoption of information technology in a workplace. The concept of deskilling has raised many discussions and debates in numerous studies since it was popularised by Braverman's book “Labour and Monopoly Capital" in 1974. Deskilling has been defined as the
process of removing knowledge, responsibility and discretion whilst leaving only
the most simple tasks to be performed by the workforce. Braverman (1974) thought of technology as a tool in the hands of capitalist managers. In his analysis, he indicates that technological advancements result from the need to control labour and to reduce managerial dependence on workers' discretion. Braverman clearly states that technology tends to dehumanise work since "the performance of tasks requires the exercise of few human faculties, people become appendages of machines and are controlled by these, and ultimately machines even replace workers and deny them the right to work at all" (p.108). A similar argument is expressed by Glenn and Feldberg (1979) who make reference to the proletarianisation of clerical skills as a result of an increasing application of computing technology in office environments. The workforce, as a result, becomes not only less skilled, but also less knowledgeable, and less involved in organisational activities. In Howard's "Brave New Workplace" (1985), deskillling is thought of as not only a narrowing of one's job but also a narrowing of jobholders' expectations: "It destroys motivation, initiative, even pride. For [the deskillled worker], the result is a 'constant inner struggle' that mirrors the outer conflict over control. [As a worker puts it:] 'Sometimes I feel like I should sue them for stealing my work... Stealing my pride, I guess you could say'" (Howard, 1985:44).

Regardless of the above criticisms, many of us would admit that we have by now been so used to information technology that we cannot or do not want to turn back. According to Penzias (1989:180), information technology has become so
pervasive that "it dominates much of the environment in which human beings live and work". As Cooley (1980:177) recognizes, however, "we should not allow ourselves to be so confused or wrapped up in the technology that we fail to assert the importance of human beings". An interesting declaration was also made by Penzias (1989) who stated that "as we review the needs and opportunities for advanced technology, we should also look for growth in human capabilities. Some of that growth can come from a better use of the tools technology provides" (p.164). So, let's promote the human factor along with its use, as we have so-far promoted technology alone. The deskilling tendencies of technological change have to give way in the face of skilled, responsible and motivated input of committed workers. Using technology to humanise the workplace enhances the dignity and responsibility of workers (Matthews, 1989).

There have been major studies looking into humanising information technology in factory-environments (e.g. the ESPRIT project, see Cooley, 1980, 1987 or Corbett, 1985; Brodner, 1985; also the DEMOS and UTOPIA projects, see Ehn, 1988 or Bansler, 1989). The present study emphasizes the need for humanising information technology in office environments in an attempt to improve the nature of work of clerical staff, the shopfloor employees of service-oriented organisations. Howard (1985) has praised the work of clerical force by suggesting that office work is intellectual "in the sense that it is a continuous exercise in problem solving - searching out and creating information in order to bring the general rules and procedures to bear in each particular set of circumstances" (p.59). This intellectual activity, creativity and motivation need
not end with the use of information technology in the workplace. This research hopes to contribute to this literature by presenting an approach according to which information technology is integrated into humane organisations and where office workers are informed and empowered. As Penzias (1989) explains, when lower level employees are given access to all relevant information and the power to act on it, this reveals a situation of a humanised workplace.

A simple definition to describe the concept of empowerment is the distribution of authority to employees lower down the organisation. In more explicit terms, empowerment can be described as the process of utilising and developing employees’ skills by giving them the power to use more judgement and discretion (Eccles, 1993: 185) and greater control over their workplace (Clement, 1994). Use of own judgement and discretion, autonomy and freedom of choice are therefore key elements that comprise the concept of empowerment.

Although “empowerment has had an independent, and relatively successful, life of its own for several years” (Grint, 1994: 185), it has been used widely in the recent information systems (IS) literature which describes the effects of information technology on new forms of work organisation. This has arisen at a time when business organisations are attempting to ‘reinvent’ themselves (Hammer and Champy, 1993). A need for organisational transformation via Business Process Reengineering (BPR) is emphasized strongly in the recent
information systems literature. According to Hammer and Champy (1993), BPR is identified by the replacement of existing organisational processes with entirely new ones so as to realise great improvements in performance. Information technology was found to play a vital role in the success of BPR projects (Davenport, 1993). Numerous researchers also agree that reengineering cannot succeed without empowerment (Hammer and Champy, 1993; Shrednick, Shutt and Weiss, 1992). For example, Hammer and Champy explain that processes cannot be reengineered without encouraging process workers to think, interact, use judgement and make decisions. The concept of 'empowerment' provides an excellent opportunity to break the patterns of deskilling within computer-based workplaces, for it provides shopfloor employees with the right skills and responsibilities to solve problems and action queries when they occur.

It must be admitted that thinking in empowerment terms enhances opportunities for promoting the emergence of a humane work organisation. Tom Peters (in Bowen and Lawler, 1992) notes that empowerment is a way for 'dehumiliating' work by eliminating those policies and procedures of an organisation which demean and belittle human dignity. Davenport (1993) made an important point by claiming that when organisations provide information to their employees to serve clients well, they also place a high degree of trust in them: "Customers and information about them, are many businesses' most important asset. To entrust this information to ... employees relatively low to the hierarchy requires an extraordinary degree of empowerment and trust" (p. 257). Empowerment as a concept acknowledges human capabilities and this is an invaluable opportunity
to bring the attention of the management and information systems specialists to those applications that do not have to undermine the people lower down the hierarchy.

However, a careful review of the BPR literature through which the concept of IT-enabled empowerment has been mainly promoted has shown that there is a focus on efficiency and effectiveness as well as on the competitiveness of an organisation (Conti and Warner, 1994; Mumford, 1994). All BPR and empowerment projects presented within the literature were found to begin with the company’s decision to be customer-oriented and to bring its staff closer to customers so as to improve competitiveness (e.g. Hammer and Champy, 1993). Limited reference is made to historical processes of work and power or other contextual factors and their influence on the new work configuration. However, empowerment (considering its dictionary definition as the distribution of authority) might not simply imply a different way for doing work, but it could involve a transformation of the traditional work and power relations within an organisation. Hence, empowerment should be understood as part of the broader context of the organisation in which it is embedded and supported by underlying organisational policies, strategies and ideologies. As Jones (1994:366) puts it: "It is important to recognise [empowerment] not as an isolated phenomenon but as part of a broader approach to the management of organisational culture".

Another gap identified within the literature regards employees’ attitudes on an
'empowered' workplace. A review of the BPR literature on empowerment shows that there is no-consensus on the meaning of empowerment. Considering that BPR is itself ill-defined (Jones, 1994), this could add to further inconsistencies in the use of the term. As Clement (1994) points out, there are at least two different meanings of empowerment: functional and democratic. `Functional' empowerment is oriented towards the improvement of performance in the interest of organisational goals which are assumed to be shared unproblematically by all participants. "Such empowerment is largely a matter of authorizing employees to assume much greater responsibilities, whether or not they choose to do so" (p.54). Democratic empowerment focuses on people's rights and abilities to participate as equals in decisions about affairs that affect them.

For Hammer and Champy (1993), an empowered workforce is self-directed. Employees are given the authority to decide how and when work is going to be done. Clutterbuck and Kernagham (1994) who wrote of the 'Power of Empowerment' suggested several definitions of the concept of empowerment, some being more implicit than others. Among those were (p.13): "... empowerment as: 'finding new ways to concentrate power in the hands of the people who need it most to get the job done...'; 'the delegation of responsibility for decision-making as far as down the management as possible'; 'the psychological energy that activates us'". In order, therefore, to understand what it really means for a workforce to be empowered, employees' viewpoints on this issue should be investigated. It is difficult to uncover the reality and profile of
empowerment if we ignore the views and perceptions of those who had been empowered.

1.2 THE STUDY

This study looks specifically at - what I call - a Computer-Based Informed Environment (CBIE) to describe a computerised office environment which informates and empowers lower level employees. The concept of a CBIE is introduced to take into account both the potential of information technology to manipulate and communicate information as well as the human and social aspects of computer-based workplaces by stressing the enhancement of human creativity and comprehension.

The study attempts to enhance our understanding with regard to the nature of CBIEs. It hypothesizes that with the current interest in BPR and empowerment, there are more opportunities for an informed and an anthropocentric computer-based workplace. The specific research question of this study is the following: "How is empowerment, under its different definitions and meanings, incorporated in the development of CBIEs?". In undertaking this investigation, the study will look for the meanings people at work attach to information technology, informed and empowered workplaces. This will focus attention not only on the location of ownership of information within this emergent form of work organisation but also on its significance. The ideas of structuration theory will be used as sensitizing devices in the analysis of this underlying theme.
The next chapter presents CBIEs as an emergent form of work organisation. This concept is introduced to emphasize the humanistic potentials of information technology at the workplace using the informate concept. The chapter identifies several studies which have utilised this concept and indicates that the consensus on the meaning of the concept is not a solid one. It attempts to reposition the informate concept in the information systems literature by looking closely at the factors that could comprise a CBIE. Chapter 3 presents a review of the literature on the concept of information technology in organisations. This review provides the basis for the development of the structurational model of computer-based environments as the analytical framework of the study. The model is used to synthesize the different perspectives in the 'information technology-organisation' field (as in Orlikoswki, 1992), and furthermore, it allows an investigation of the role of organisational frames on emergent forms of work organisation. The methodology, upon which the field work is based, is presented in chapter 4. Recognizing the limitations of the survey method in examining the process and context of change, it suggests the case-study approach in order to best understand the nature of CBIEs. This chapter also details the data collection techniques undertaken and elucidates why the organisations selected to participate in the present study are all users of the system ImagePlus. Chapters 5, 6 and 7 detail the field research at three case-sites. The cases are presented based on the structurational model of computer-based environments. Chapter 8 recapitulates the theme of information technology and emergent forms of work organisation and relates the findings to the arguments developed in chapters 2
and 3. Particular attention is given on understanding the nature of CBIEs. Finally, in Chapter 9, the lessons learned from this research are outlined and implications for research are discussed.
CHAPTER 2

PRESENTING COMPUTER-BASED INFORMATED ENVIRONMENTS

2.1 INTRODUCTION

This chapter introduces the concept of Computer-Based Informed Environments (CBIEs) to describe an emergent anthropocentric form of office work organisation facilitated by information technology. It addresses the problem of inconsistent meanings of the informate concept in the literature and it then focuses on those cases which, it is believed, show conditions of plausible informed environments. Finally, the chapter looks at those factors that when found together contribute to building a CBIE.

2.2 INFORMATED ENVIRONMENTS: BUILDING ON A HUMANISED OFFICE WORKPLACE

The concept of informed environments was first coined by Zuboff (1988) in her book “In the Age of the Smart Machine”. This `ugly' (Peters, 1992) but potent term claims for the textualisation of working processes with the use of information technology. This implies a widespread information across organisational layers which enhances the learning capabilities of the workforce to the point where new skills and knowledge are developed. In an informed organisation members can have faster access to relevant information on all aspects of their organisation. Due to the ability of information technology to
result in efficiency, time-savings and improved communications, people can broaden their access to and enhance their understanding of information-flow across their organisation.

The informate concept enables the complementarity between human and technology; it embodies that application of technology which allows users to generate meaningful information about organisational operations and enables them to take a more active and participative role in their work, rather than being simply machine-driven. Zuboff makes the declaration that an informated organisation relies on the human capacities for teaching and learning as well as criticism and insight. Information technology should, therefore, be used in ways that promote the development and growth of the human element and do not waste the human potential.

During the last few years, the informate character of information technology has gained accreditation among numerous management writers (e.g. Peters, 1992) and information systems researchers (e.g. Galliers, 1992a; Keen, 1991; Schein, 1994; Scott-Morton, 1991; Walsham, 1993). The distinction between informate versus automate applications reveals a dual character of information technology, therefore, questioning arguments in support of a deterministic impact of information technology on organisations. Zuboff in her study does not treat information technology impacts as inevitable but rather as a matter of managerial choice. In fact, Zuboff has been often seen as a supporter of the existence of organisational choices in decisions on technology impacts.
The usefulness of the informate approach to the information systems field also lies in its ability to rethink the concept of information technology in organisations in such a way so that its role as an information manipulator, generator and communicator is accredited. As Walsham (1993) puts it, Zuboff's work is “an insightful and well-researched piece of work on the current and possible future implications of the widespread use of information technology in modern society” (p.17). Several researchers (e.g. Galliers, 1992a; Scott-Morton, 1992; Walsham, 1993) agreed that the opportunities for producing new and different information are enhanced when the informate character of information technology is applied. An identification made by Galliers (1992a) is that too much attention has been paid to the `technology’ side of information technology at the expense of the `information’ side of it. The present study aims to enhance our understanding of the factors which encourage a particular use of information technology; that is the one which stresses the `information’ side and not merely the `technology’ side of it while emphasizing the need for information availability to the lower organisational layers. As it was mentioned earlier, the informate imperative is achieved when information technology is used in a way that complements the capabilities of the workforce to “know and judge when and how to use what kind of information as well as when to be critical of its assumptions and outputs” (Zuboff’s wording). It is found that this particular feature of the informate concept has been in several occasions overlooked in the literature.

Zuboff defines the informate concept as the textualisation of work where
organisational processes through information accessibility enabled by information technology become visible. In her study, Zuboff devoted a large part of her study to examining how the informate potential of information technology could shape employees' work. This however has been ignored by several users of the concept. Some researchers/users of the concept have emphasized information manipulation via information technology with inadequate reference to the human element at the lower organisational layers. Schein (1994) found that the majority of business executives tend to provide support to the 'informating up' potential of information technology rather than the 'informating down'. The 'informating down' vision is what Zuboff observed to be the distribution of knowledge power via the use of information technology throughout the workforce. Most of the executives, however, see the ultimate potential of information technology as being merely that of enabling top management to be completely informed about every aspect of every operation in their organisation, and hence 'informating up'.

Beaumont and Walters (1991) used the informate concept to emphasize the information content of administration and productive processes within an organisation. They have not made reference to informed individuals; rather to informed managerial teams. For instance, they explain that "the shift from automate to informate is one whereby the business moves from the use of information to evaluate and rationalize its activities towards using information to manage the business. An essential feature of this stage ... is that the focal point of control remains at a central point" (p.164). Also, Violano (1990) made
reference to the same concept in order to describe the capability of telebanking to create an information rich environment between a bank and its customers. As he puts it: "[Automated Voice Response systems] informate applications in cash management and balance reporting, corporate money transfer, credit card, customer services, merchant authorization and inbound collections" (p.53). Both studies by Violano and Beaumont and Walters speak about the ability of information technology to improve an organisation's strategic position when using its information more efficiently and effectively. They adopt the informate concept with limited reference to people at the shopfloor (a focal point in Zuboff's interpretation of the concept). Such use of the term runs the risk of creating inconsistent meanings among researchers and practitioners with an interest in this subject.

This chapter aims to reposition the informate concept in the information systems literature by incorporating in it a focus on people lower down the organisation. The study presents computer-based informed environments as a form of information technology applications and it takes a step further to identify their fundamental components which could subsequently be used to identify and assess true informed environments.

2.3 THE NATURE OF COMPUTER-BASED INFORMATED ENVIRONMENTS

The concept of computer-based informed environments (CBIEs) is introduced as a way for evaluating the humanisation of computer-based environments. It
is about technology and information, but also about knowledge acquisition and action taking. A CBIE is defined as that workplace (organisation, department or work-unit) in which information technology facilitates information sharing, enhances members' knowledge, supports and strengthens the capabilities of the shopfloor office employees. This new working environment encourages employees to gain knowledge of organisational policies and tactics, to comprehend decisions and actions undertaken by others, and to enable themselves to take effective actions.

It is believed that the notion that informed environments result in an empowered, action-oriented workforce seems plausible. Although as it was seen earlier the consensus on the meaning of the concept does not yet exist, there have been indications where environments with characteristics similar to the above encourage conditions where information is generated and used for decision and action-taking by employees at lower organisational levels. Peters (1992) reinforces this view.

Peters (1992) makes reference to the case of a railroad organisation, UPRR, that has cut out several layers of bureaucracy and encouraged employees to take decisions and relevant actions to serve customers better. The introduction of a computer-based system could informate track inspectors by allowing them access to all the railroad's financial and customer service data. "A track inspector previously had to go 'up' seven layers of operations management, then down four layers in the sales and marketing group before he could (indirectly)
connect with his customer. Now that inspector calls the customer straight away and even the thorniest problems are resolved on the spot 99% of the time (literally)" (p.227). The UPRR case reveals evidence that people at the front line have been empowered since they could take actions with no intervening layers of bureaucracy getting in the way. The front line person is "allowed to get on with serving the customer as he sees fit (empowered). And he can get on with serving the customer, because he has access to all the railroad's financial and customer service data (informed)" (p.227). This is an example which demonstrates the use of the informate concept in a situation where information technology had been accompanied by a better utilization of human skills and discretion. A CBIE therefore should be built upon the enabling nature of technology to complement as well as to further develop human mind's ability to communicate, think and act (hence, the name 'computer-based').

2.4 A TYPOLOGY OF THE FUNDAMENTAL COMPONENTS OF COMPUTER-BASED INFORMATED ENVIRONMENTS

From the discussion above, it follows that the informate potential of information technology is not fulfilled by simply feeding employees with information. Operators should also have the knowledge and ability to deal with unforeseen discrepancies. Employees should be able to obtain all information necessary to carry out their tasks and make judgements before taking any action. Without enabling information, employees might find themselves unable to carry out independent work. Rather, they would need to go to a colleague or supervisor
for guidance, or to pass the task to somebody else.

Three fundamental components of CBIEs are identified and presented below: level of information accessibility, a learning environment and from human factors to human actors. They all put emphasis on the human element within a computerised environment. It is important noting that these three factors are not unique to CBIEs. The concept of CBIEs simply brings them together. This will then result in a more explicit description of CBIEs.

2.4.1 Level of Information Accessibility

One of the most common pitfalls in the development of CBIEs is an insufficient release of information to employees at the operational level. Computer-based informed environments are all dedicated to release an increasing volume of information that reaches lower organisational levels. In such places the flow of information tends to be more liberal. This means that a wide range of information kept in a computerised-system becomes accessible to members across organisational layers.

Information accessibility should be assessed, however, based on two principles: a) the ability to reach information, and b) the ability to handle and understand information. This clarification is made to alert researchers of possible covert control that leads to 'pseudo-accessibility'. An organisation had been visited, at an early stage of this research (a pilot case study), where employees could view
on their system menu various accounting documents. The files were not password protected so employees could reach the company's accounting information. However, since they had not been trained adequately to use the accounting packages, they could neither handle nor understand the information presented. The case suggests that access does not necessarily imply use, and therefore the ability to reach information is insufficient to truly distinguish a high level of information accessibility.

Due to the element of subjectivity in the concept of information accessibility, this component alone cannot adequately assess the true nature of CBIEs. Some other components have been identified and presented below.

2.4.2 A Learning Environment

Informated environments could be distinguished in terms of their potential to enhance employees' learning capabilities. Learning is defined in this case as knowledge and skill acquisition with the use of information technology.

Learning is a key feature in an informed environment. According to Zuboff (1988), "the informed organisation is a learning institution and one of its principal purposes is the expansion of knowledge...Knowledge comes to reside at the core of what it means to be productive. Learning is no longer a separate activity...learning is the heart of productive activity. To put it simply, learning is the new form of labour" (p.395). CBIEs argue for the sharing of information and
knowledge across organisational layers. Knowledge is shared among managerial as well as non-managerial members. Since an appropriate action can only be made on the basis of the operator's interpretations of the information provided, it was important that this subject received careful consideration. Learning how to use the technology is fundamental. Learning how to use the information generated by the particular technology is vital and essential in order to create a workforce that is able to act as quickly and effectively as possible to the best interests of the clients. These two types of learning correspond to training and education respectively. According to Hammer and Champy (1993) "training increases skills and competence and teaches employees the 'how' of a job. Education increases their insight and understanding and teaches the 'why'" (p.71).

CBIEs, therefore, endorse an improvement in employees' learning capabilities by encouraging them to contribute ideas to their work rather than simply act as monitoring tools. Following information accessibility, operators can see a broader picture of organisational tactics and processes. Conditions like these encourage the merging of skills and knowledge by placing individuals into an ongoing process where they come across new information and new ways for interpreting information. The exercise of skill within this frame as an important learning process is linked to the third component of CBIEs which stresses the significance of integrating the doing and thinking practices of a job.

2.4.3 From Human-Factors to Human-Actors
"We shall not study human factors, we shall study human actors". This view was expressed by Bjorn-Andersen (1985) while urging for a better understanding of computer-based office environments. The two concepts have often been used interchangeably in the literature to connote the human element of organisations. A careful consideration however of the two reveals an indication of who is controlled and who controls (Bjorn-Andersen, 1985). On the one hand, a human actor is somebody who is directly involved in the end result of an event while on the other hand, a human factor is somebody who helps to bring about a result having either a direct or an indirect role. With these definitions in mind, it can be claimed that a CBIE looks at its members as actors and not merely as factors to stress the active role of human members in organisational activities. In CBIEs, information is available to everyone that needs it and employees are encouraged to use the information to take action.

This third component complements the previous two. Employees-members of a CBIE overpass the traditional roles of ‘doers’ and that of mere ‘learners’ adopting the new roles of ‘active participants’ and ‘contributors’.

2.5 OFFICE WORKERS: FROM THE BACKSTAGE TO THE FRONTSTAGE

Drucker (1988) argued that organisations of the future would make a move towards being ‘knowledge-based’ with knowledge resting in the minds and actions of employees at the lower levels of an organisation. A CBIE is geared towards refocussing the applications of information technology in office
organisations by transferring information and knowledge to people lower down the organisation.

The work by Corbett (1985, 1989a,b) on hybrid automation was found to be similar to the notions of CBIEs with a focus however on a factory environment. In Corbett's work, hybrid automation means the synergy between fast and accurate information handling on the one hand, and creativity, flexibility and skills of users on the other hand. He applied the informate concept on the use of computer numerically controlled (CNC) machines. While in automated factories operators' work is based largely on simple preset instructions by the machine designer, in informated (or hybrid) factories, operators are able to handle, in addition to the simple, routine tasks, unforeseen discrepancies and errors in the machining process. To do the latter, the operator must have knowledge of the whole machining process as well as understanding of the functioning of the machine. Such a working environment upgrades operators' skills, enables and encourages shopfloor workers to use their discretion for an effective functioning of the technology available. Corbett's study is a good example where employees' jobs have become more purposeful and meaningful with the use of technology.

The present study looks at CBIEs within an office environment. It suggests the use of information technology to facilitate the emergence of a new form of work organisation, one that emphasizes the focus on empowerment of employees and the 'sharing of information' phenomenon. This situation offers opportunities to
office workers to make a move from the 'backstage' of organisational practices to the 'frontstage'. CBIEs provide opportunities to clerical staff to increase their skills and knowledge. Within such environments, information technology enables office workers to see a job through from start to finish.

An element not covered by the work either of Corbett or Peters (1992) is an interpretation of the informated environments by the employees involved. It is certainly interesting to see that there are organisations that promote empowerment and multi-skilling to their people lower down the hierarchy, but it is also important to get the views of these people on such phenomena. This study that aims at gaining understanding of CBIEs will attempt to cover this gap by paying particular attention to employees' viewpoints.

2.6 CONCLUSION

A review of the information systems literature on the informate concept indicates that the consensus on its meaning is not a solid one. The anthropocentric nature of the concept has not been fully appreciated by information systems researchers. This chapter has developed a typology of the key characteristics of CBIEs upon which those organisations that claim for wide information accessibility will be assessed.

The following chapter aims at building a framework for analysing CBIEs. A review of the literature on the 'information technology in organisations'
phenomenon assists in this effort.
CHAPTER 3
THE CONCEPT OF INFORMATION TECHNOLOGY IN ORGANISATIONS

3.1 INTRODUCTION

The guiding question I have raised for the development of this chapter is 'why should there be a difference between organisations as to how information technology shapes the organisation of work'. The discussion in chapters 1 and 2, drawn upon various studies undertaken in the field of information technology and organisations, has shown that there are organisations that use information technology in more humanistic ways than others.

The literature in the field of information technology although rich in examining information technology in organisations is conflicting on this issue (Markus and Robey, 1988). Is it technology that determines the organisation of work? Or is it key organisational actors who influence the use of information technology in a particular organisation? Or are both technology and organisational actors important factors in shaping work organisation?

This chapter offers a critical review of the existing perspectives on the concept of information technology in organisations. The evaluation of these perspectives is based upon the extent to which they had contributed to the understanding of the relevant theme. The discussion emphasizes the need for a more synthesized approach for research in this field and recommends the use of a
The structurational framework to meet the purpose of this study.

3.2 THE MAIN PERSPECTIVES ON THE CONCEPT OF INFORMATION TECHNOLOGY IN ORGANISATIONS - AN EVALUATION

This section looks at the various streams of research with regard to the relationship between information technology and organisational change. The main perspectives relate to: a) change as a result of the deterministic character of information technology over organisations and b) change as a result of organisational choices with information technology acting as the medium for implementing those choices.

The concept of technological determinism is correlated with the argument which supports that external factors or events constrain or force people and organisations to behave in certain ways (Pfeffer, 1981). This perspective dedicates an influential role to technology over existing organisational conditions (Blau et al, 1976; Carter, 1984; Eldelman, 1981; Leavitt and Whisler, 1958; Woodward, 1965) arguing that technology and information technology in particular can have causal influences on human behaviour (e.g. satisfaction, skills, productivity), and organisational properties (e.g. structure, size, performance, competitiveness). Thus, with this perspective, information technology has been considered as the independent, external control variable that holds the potential for changing the forms of organisation.
For instance, Leavitt and Whisler (1958) claimed that information technology had a great impact on middle and top management. According to these researchers, organisations would become highly centralised as a result of information technology leading to the virtual disappearance of the middle management and to the degradation of line managerial or supervisory positions. The researchers urged managers to psychologically prepare themselves for the changes which would occur with the adoption of information technology. The 1958 study by Leavitt and Whisler has often been quoted in the literature; it is considered as a good example of hard-line technological determinism. In the decades that followed, however, studies on soft-line technological determinism made their appearance. Such studies tend to set contingent conditions that could mediate the effects of technology. For instance, there have been studies which stressed the need for user awareness and management commitment for a more effective use of technology in organisations (e.g. Hurst, 1991; Lucas, 1978). Other information systems researchers consider changes in organisational structure as appropriate moves towards greater efficiency in the utilisation of technology (e.g. Scott-Morton, 1991). The MIT 'Management in the 1990s' research program declares the ability of information technology to transform organisations. The success of this transformation is contingent upon changes in organisational structure, management practices and human resource strategies that should precede the introduction of technology in the specific organisation (Scott-Morton, 1991).

The contribution of the technological determinism perspective to the information
systems field is distinctive. Information systems researchers and practitioners have gained an understanding of the potential changes which could occur because of information technology. These changes are mainly concentrated on the organisational structure and management practices as well as the roles and skills of individuals. The introduction of any new technology (advanced or simple, hardware or software) implies at least some sort of change. If nothing else, the technological infrastructure changes and the individuals involved need to learn how to use it.

However, it would be naive to think that organisations are flexible and adaptive enough to exploit fully the potential benefits of technological change. The example cited by Storey (1987) on distributed-systems technology is particularly useful to describe this. This technology has the potential to allow greater decentralisation and autonomy within a workplace. However, as Storey has shown, its adoption does not necessarily mean decentralisation, for even if technical capacity may allow it, organisational politics may not. “Technology is not just a cause of change but is itself chosen, shaped, and utilised in order to engineer a certain desired pattern in organisational practice” (Storey, 1987:47). As Orlikowski (1992) puts it: "... [the technological determinism school] ignores the actions of humans in developing, appropriating, and changing technology. As a consequence, this perspective furnishes an incomplete account of technology and its interaction with organisations" (p.400).

The organisational choice perspective is introduced to contradict the basic
argument of the technological determinism perspective on the role of technology in shaping organisations. It goes beyond the rather prescriptive nature of technology-organisation relationship to a more pragmatic viewpoint of organisational practices. It suggests that there are strategic choices within organisations that influence the use of technology (Child, 1972). This perspective also includes the argument that technology is deployed according to the ideology, power and intentions of key stakeholders (Braverman, 1974; Noble, 1979, 1984) as well as the power of an organised workforce (Wilkinson, 1983). Wilkinson suggests that the design and use of technology depend on the political intentions of managers and engineers but also on the way workers respond, adapt and try to influence the outcome.

"Organisations provide a power base for individuals" (Zaleznik, 1970:48). They provide opportunities for people to exercise influence over others. These opportunities often derive from authority and control as well as from the possession and use of resources. The role and intentions of power holders and decision makers that direct investment in technological change have also been cited as determinants of the way in which technology is used in organisations (Buchanan and Boddy, 1983,1986; Child, 1985; Markus, 1983; Markus and Pfeffer, 1983; Pettigrew, 1973; Pfeffer, 1978; Robey, 1981; Schein, 1985). A source of power, which has been often taken up in the information systems literature is, the so-called, expert or knowledge power. The importance of power and political action has received significant attention in the information systems literature. A classic case study by Pettigrew (1973) on "The politics of decision
making" reinforces the argument that power and organisational politics play a substantial role in the choice of technology. The study shows how someone with respect to the organisation's flow of information is able to influence a decision about a computer purchase so as to favour his preferred choice. The work by Pettigrew (1972, 1973) is often used to support how those with access to and control over information have power in organisations. In a survey by Allen et al (1979), undertaken among 87 managerial personnel in the electronics industry in southern California, information has been identified as a political tool which is withheld, distorted or used to overwhelm another. Because information, as a decision making tool, could act as a source of power and authority, it is reasonable to suspect that the use of information technology would not merely be determined by technical experts, but also and in the main, by key organisational stakeholders who might wish to keep control over information transformation within their organisation.

There are therefore choices to be made as to the use of information technology in organisations. Zuboff's (1988) distinction between the automate and informate characters, which set up the duality of information technology, indicates explicitly that the impact of technology is neither fixed nor predefined; it is rather a consequence of managerial intentions and practices which would favour either an automated workplace or an informated one. Zuboff claims that one is more likely to find an automated work environment rather than an informated one because managers know far better how to automate rather than how to informate activities. She finds that the successful application of the informate
character of technology lies with management.

While in the general literature on information technology and organisations there are two major schools of thought, the literature which looks specifically on information technology within office workplaces is dominated by the organisational choice perspective (Braverman, 1974, Buchanan and Boddy, 1983; Cooley, 1977; Glenn and Feldberg, 1979; Storey, 1987; Willcocks and Mason, 1983; Zuboff, 1988). In this literature, some reference to the characteristics of the organisational context (e.g. values) in which information technology has been embedded, is evident. The reference made on this issue is concerned mainly with well-established ideologies and values among the upper human actors within organisations (e.g. managers). The studies by Braverman (1974), Appelbaum and Albin (1989) and Cooley (1977) fall into this category. Braverman claims that technology is used by managers, influenced by the capitalistic mode of work, to impose tighter control over the workforce. With particular reference to office workplaces, Braverman argues: "...as in manufacturing, the office computer does not become, in the capitalist mode of production, the giant step that it could be towards the dismantling and scaling down of the technical divisions of labour. Instead, capitalism goes against the grain of the technological trend and stubbornly reproduces the outmoded division of labour in a new and more pernicious form" (1974:328). The argument that there are managerial choices when introducing and using information technology in an office environment has dominated this body of literature. According to this view, the degree and direction of technological change would
depend on whether key powerholders support the potential change and on the reasons for which they do it. In contrast to Braverman’s views, Storey (1986) found, in a study on the introduction of new office technology in the insurance industry, that managers have avoided exploiting fully the control potential of technology. Managers instead have their own interests to protect. Branch managers, for instance, may resist a centralised computerised system especially when some branches face closure.

By reviewing the two main perspectives found in the literature, it has become apparent that research on the concept of information technology in organisations has produced conflicting results. It is believed that the findings of a study depend on the type of research approach adopted. The level of analysis of a research study (Markus and Robey, 1988) as well as the types and number of variables employed contribute to a study’s research approach. The discussion that follows explains the meaning of and worth for undertaking research at micro and macro level of analysis examining simultaneously a wide range of variables. In its conclusion, this section suggests a multi-directional and a multi-level approach when undertaking research on information systems.

Levels of analysis comprise a dimension taken up by Markus and Robey (1988) in order to examine the relationship between information technology and organisational change. They claim that researchers interested in technological determinism (especially those who examine technology impacts on structure, size, performance), are likely to adopt a macro-level of analysis whilst those
interested in organisational choice tend to analyse phenomena, in the main, at a micro-organisational level. Moreover, considering the literature on information technology in office environments which was found to be dominated by supporters of the organisational choice perspective, it is realised that far too much emphasis has been placed on the issue from a micro-level viewpoint and not enough from a macro-level approach.

Using Miles' definitions (1980), a micro-level focus comprises studies on the behaviour of individuals or small groups in a relatively isolated or immediate social setting. Research at this level takes individuals as the unit of analysis, and their behaviour or certain aspects in their behaviour are often examined at a particular point in time. A fundamental element of investigation is the individual. The notions of organisations and structures are either rejected or ignored. Studies on a macro-level perspective analyse the behaviour of members of major subsystems, subsystems themselves, organisations and their environment within their larger context. Macro-level research deals with an examination of the characteristics of the environment (organisational and social) in which a given phenomenon is embedded.

A focus on the 'information technology-organisation' relationship at a micro/individual level of analysis is rather narrow and tends to overrun the importance of looking at possible large-scale implications of technology on organisational processes. There might not solely be human actors who shape the use and implications of technology; even more crucial there might be the
context in which those actions take place. This view is reinforced by Pettigrew's argument (1979, 1985) that political interests of key organisational actors should not only be examined by taking a focus on individual drives and personality profiles. Rather, one should also consider the organisational context in which individuals operate. According to Strassman (1991), the way organisations design and operate computer systems reflect their structural principles; if they try to place responsibility where people do creative work, then this would be because of their willingness to decentralise. If organisations try to concentrate all decision-making in just a limited number of people, then this would reflect their willingness to centralise.

Coleman (1986) recommends a move from a micro to a macro level of analysis and back again. As Coleman puts it, a micro-macro methodological perspective shows how common interests and values at the individual level are institutionalised into social settings. Concerning a macro-micro move, Coleman (1986:1323) explains that "all historical research on macro-social systems must move back and forth between macro and micro levels to show how the macro-level changes occurred". Van Velsen (1967) clarifies that such an approach does not imply the end of structural analysis; rather, structural analysis "should be supplemented and enlivened by an account of the actions of the individuals who operate the structure, i.e. the processes going on within the structure" (Van Velsen, 1967:140). Coleman recognizes that such an approach is a major intellectual hurdle with great significance, however, in contributing to, what he calls, "knowledge of relations".
As far as a micro-macro position is concerned, it is often important for researchers, when examining an organisational phenomenon, to understand the actions and intentions of individuals and groups directly or indirectly involved in that situation. Human behaviour is not only affected by internal factors (e.g. motives, needs, past experience, psychological characteristics) but also by external factors, like the phenomenon itself, and the environment in which behaviour occurs. The latter requires an analysis at a macro organisational level. It should, therefore, be recognised that collective and individual actions might reflect (and not necessarily influence) the context in which they belong.

Researchers who have studied the relationship between technology and organisations have often treated micro- and macro-levels independently from each other. However, in order to formulate a more comprehensive way of looking at the phenomenon, it is recommended that a synthesized approach to be adopted in such studies. The use of both levels (including the interrelationships between the two levels of analysis), is suggested for this area of research.

Another problem evident within this literature is the assumption that the relationship between information technology and organisations is uni-directional. For instance, among the most frequent stances taken involve examining the impact of 1) strategic choices on technology, 2) managerial goals on technology, 3) personal/political interests on technology, 4) ideologies on technology, 5) technology on organisational structure or vice versa. The `information
technology and organisations' theme may not always be vulnerable to single forces and, hence, it should not be examined merely from an uni-directional viewpoint. Such an approach might not be enough in examining truly and adequately the relationship between information technology and organisations. This literature also provides a rich and a diverse set of variables which have been used to explain the 'information technology - organisations' relationship (e.g. physical characteristics of technologies, organisational structure and size, politics and power, ideologies, choices by designers, managers, workers). Each of these variables, although as it was identified earlier have often been examined in separate studies, have surely made some contribution to the literature. They should not therefore be disregarded. A comprehensive perspective of the relation between technology and organisations should address a wide range of these variables. A multi-directional focus should be applied with regard to the concept of information technology in organisations. This is necessary in order to best understand the relationship between a given technology within a certain organisational context. This argument complements the need for a micro/macro level of analysis. Taken together, the arguments strengthen the view for a broad perspective in which to examine the 'information technology-organisation' relationship.

Organisations comprise a combination of diverse elements and forces. They combine influences and properties derived from the individual/micro level (e.g. human actions) and the macro level (e.g. structure, rules, procedures). As Giddens (1979) claims, human practices are not pure originators of action nor
are they simple products of the structural properties that surround them; rather, they comprise a combination of the two. An investigation of human actions from a micro viewpoint may end up revealing results which might be true on the one, but narrowly derived on the other. Similarly, an investigation of the impact of structural properties on technology may inadequately constitute reality unless human actions are taken into account as medium in the process.

The structuration theory developed by Anthony Giddens (1976, 1979), is therefore adopted to aid in this research. The theory, which had a tremendous contribution on studies in social sciences, has also gained considerable influence within management and organisational studies (see Whittington, 1992), while more recently it has begun to be used in the information systems field. An alternative to the technological determinism perspective and the organisational choice perspective, the emergent perspective within the information systems field (Pfeffer, 1981; Markus and Robey, 1988), has been influenced by the principles of structuration theory (Barley, 1986).

3.3 THE STRUCTURATION THEORY IN THE INFORMATION SYSTEMS FIELD

This part of the chapter starts with a brief synopsis of Giddens's structuration theory and it then explains its contribution to the study of information technology in organisations.
3.3.1 STRUCTURATION THEORY: A BRIEF OUTLINE

The theory of structuration (Giddens, 1976, 1984) provides an integrating picture of the ‘human action-structural properties’ relation, attempting a fair measure to both (Poole and DeSanctis, 1992), with structural properties being the rules and resources available within a social system. A key theme in structuration theory is that all structural properties of social systems are the medium and outcome of human actions (Giddens, 1984). They are the medium because structures provide the rules and resources individuals must draw upon to interact meaningfully. They are also its outcome because rules and resources exist only through being acknowledged, chosen and applied in social interactions; they have no reality independent of the social practices they constitute.

Giddens clearly distances himself from the notion that structural properties can exist independently. Structures cannot exist without human actors. They are internal to them in the form of memory traces. They lack a materialistic form but exist in the knowledge that humans draw on in order to take decisions and actions. They also exist in the meanings given to various organisational and individual activities. Moreover, structural properties are not fixed; they change over time and space and certainly via human actions.

Giddens has defined three types of structural properties which are interdependent and which can only be separated analytically: domination, signification and legitimation. Domination structure explains the distribution of
power in social interactions and is mediated by allocative and authoritative resources. The structure of signification reveals a framework of mutual knowledge that enables the understanding and interpretation of what people say and do. It is mediated through interpretive schemes which result in meaningful communication. Finally, the legitimation structure provides a normative frame of behaviour (DeSanctis and Poole, 1994) and institutionalises the reciprocal rights and obligations of the social actors (Macintosh and Scapens, 1990); it is mediated through sanctions. An example from the field of information technology in organisations may help to illustrate these concepts. When an organisation establishes a centralised data-entry unit with the introduction of a new technology, this might reflect its structure of signification for efficiency at the workplace. The new technology is interpreted in this case as a means for increasing productivity. At the same time, such a decision might reflect the structure of domination which represents an hierarchical distribution of power indicating the separation of thinking from doing to managers and clerks respectively. There is also the legitimation structure which defines the norms of interactions within the data-entry unit. Clerks are expected to get their work done with a minimum amount of speed, otherwise they would receive sanctions (e.g. no breaks, work longer hours, lose their job etc).

Giddens's theory of structuration has been prominent in the management and organisational field. "[Giddens'] insights have substantially informed both empirical studies of management action and a range of British and European texts" (Whittington, 1992: 693). One of the reasons that the theory has become
so influential is because of its integrative character to synthesize oppositional positions in social studies. Macintosh and Scapens (1990) explain that structuration theory can subsume "two fundamentally antagonistic theoretical positions, that of the structuralist who see social life as determined by impersonal objective social structures and that of hermeneutical humanists and interactionists who see social life as a product of subjective or intersubjective human activity" (p.456). Some studies adopted the theory to intertwine the antagonistic perspectives in their area of research (e.g. Yates and Orlikowski, 1992; Orlikowski, 1992). Macintosh and Scapens (1990) have also considered the theory of structuration as a valuable way to work through some of the debates and disagreements in management accounting theory and research.

In the section that follows, the reasons for using Giddens's theory in the information systems field are explained and the importance of the theory for information systems research is evaluated.

3.3.2 THE STRUCTURATION THEORY IN EXAMINING THE ‘INFORMATION TECHNOLOGY-ORGANISATIONS’ RELATIONSHIP

Several studies have employed structuration theory in the information systems field (e.g. Barley, 1986; DeSanctis and Poole, 1994; Korpela, 1994; Lyytinen and Ngwenyama, 1992; Poole and DeSanctis, 1989, 1992; Orlikowski, 1990, 1992; Walsham, 1993). Giddens’s work has also been acknowledged in Newman and Robey’s (1992) study who discussed the importance for understanding the social
process of information systems development. A few other studies have proposed
structuration theory as a theoretical model of research on specific information
systems areas (Lyytinen and Hirschheim, 1987; Robey and Zmud, 1989, Boland, 1989; Han and Walsham, 1989). Walsham and Han (1991) have
particularly proposed several possible applications of structuration theory in
information systems research. They have characterised the theory as "a
sophisticated model of social life and human society" and they have suggested
for its further use in the information systems field due to the shortage of
adequate theory on the social and organisational aspects of information
systems. As they put it, the theory "offers a new approach to theory development
in the information systems field" (p. 84).

Indeed, structuration theory has made significant contributions to information
systems. Particular attention is drawn to Barley's (1986, 1990) and Orlikowski's
(1992) studies which belong in the same category of information systems
research literature. Both researchers have been interested in reexamining the
concept of technology in organisations.

A distinctive viewpoint on the 'technology-organisation' theme has arisen with
Barley's work. Barley (1986) showed how technically identical CT-scanners in
two radiology departments occasioned a change in structural processes within
both departments and yet one department became far more decentralised than
the other. As Barley identified (1986): "technologies do influence organisational
structures in orderly ways, but their influence depends on the specific historical
process in which they are embedded" (p.107). He argues that technology is socially constructed. Although the technology-use was the same, the meanings given to it differed. With his work, Barley has contributed to the establishment of another school of thought, named "the emergent perspective" (Markus and Robey, 1988). This perspective takes a broad view of the concept of technology in organisations and accepts that both internal as well as external factors to an organisation influence organisational change. Barley suggests that technology interacts with structural properties only through a mediator (human agents) and he applies structuration theory so as to investigate "how the institutional realm and the realm of action configure each other". He treats technology as an occasion for structuring organisations.

The second study with a focus on structuration theory is the one by Orlikowski (1992). Based on Giddens's work, Orlikowski reformulated the concept of information technology in organisations to encourage a deeper and more dialectical understanding of the interaction between technology and organisations. Claiming that technology comprises a duality, the researcher has drawn attention to factors that objectify and institutionalize it. She explains that technology is the outcome of human actions since it has been developed and deployed by humans. However, technology is institutionalised, becoming a part of the structural properties of the organisation; this is because the people who deployed the technology are influenced by the institutionalised properties of their organisation. According to this model, institutional properties influence human actions which in turn influence the deployment of technology, that in turn,
influences institutional properties.

Orlikowski refers to the concept of 'interpretive flexibility' recognizing that there is flexibility in the design, use and interpretation of information technology. The factors that affect this flexibility are: a) characteristics of the physical entity (e.g. type of hardware and software), b) characteristics of the human agents (e.g. experience, personality), and c) characteristics of the context (e.g. social relations, task assignment, resource allocation). The issue of physical flexibility was missing from Barley's work who had used a type of technology with fixed applications (Orlikowski and Robey, 1991). In contrast, Orlikowski has employed a technology (CASE tools) which has this flexibility to allow an analysis of any physical modification during use and over time.

Orlikowski's Structurational Model of Technology

![Diagram of Orlikowski's Structurational Model of Technology]

Source: Orlikowski, 1992

Figure 3-1
Taking into account the above issues and on the basis of structuration theory, the so-called structurational model of technology was introduced. Orlikowski's study makes reference to the following relationships depicted in figure 3-1: a) Technology is the product of human action (arrow a); b) Technology mediates (facilitates and constrains) human action (arrow b); c) Human actions are influenced (enabled and constrained) by institutional properties in the organisation (arrow c); d) Technology influences (reinforces or transforms) institutional properties of an organisation (arrow d).

The use of structuration theory by Orlikowski can be viewed as a way for exercising critiques over the existing information systems literature of the relevant issue. As she also puts it, her model allows researchers to move beyond a critique to an alternative conceptual basis from which to conduct future research. A single glance at Orlikowski's model reveals an effort devoted to an attempt to integrate the different strands in the field: the technological determinism perspective, the organisational choice perspective and the emergent perspective. Orlikowski recognizes the various types of influence and nature of those influences on technology in organisations. She positions those factors on a round process to demonstrate the influence of variables at the individual level as well as at a contextual (structural) level.

Figure 3-2 brings together the principal relationships cited by the different perspectives. This figure can be used to support the use of structuration theory as a meta-theory, within which to locate, interpret and illuminate other
approaches (Walsham and Han, 1991:81).

The 3 Perspectives on Orlikowski's Model

![Diagram showing the 3 perspectives on Orlikowski's Model: Structural Properties, Technology, and Human Agents.]

Technological Determinism
Organisational Choice
Emergent Perspective

Figure 3-2

It is significant to note that all three perspectives on the 'information technology-organisations' theme have recognized the impact of technology on some kind of structural properties and individuals' roles and skills. Some perspectives, as it was seen earlier, have thought of technology as the dominant driving force of any change occurred (technological determinism); others have gone beyond this unidirectional relationship and found that practices and intentions of key organisational actors tend to influence the way technology changes organisational properties (organisational choice); further to this, there has been research which has shown that technology impacts result from an interaction of human actions and structural features (e.g. historical processes) within that
organisation (emergent perspective).

An attempt to reposition the three different perspectives on Orlikowski’s model reveals that Orlikowski did not choose to study the impact of human agents on institutional properties. This relationship has been taken up and supported by researchers who adopted the 'emergent perspective' approach. Barley (1990), for instance, claims that individual roles and actions influence role relations and thus role relations, in turn, affect the organisational and occupational structures. Decisions and actions, non-technological related, undertaken by key organisational actors could also have certain structural implications; hence relationship 'e' (see figure 3-2) evolves.

One may argue that Orlikowski fails to show which are the primary driving forces of the reciprocal relationship illustrated with her model. In other words, "which of those types of influence lead the process?". Technological determinism would claim that the most influential relationship is 'd' (technology influences organisational properties); for the organisational choice researchers, relationship 'a' is more important (human actions influence technology), and for the emergent perspective relationship 'c' (structural properties influence human actions) as well as relationship 'e' (human actions influence structural properties) are important driving forces of the degree of organisational change. Macintosh and Scapens (1990) similarly recognised that structuration theory does not answer whether agency has primacy over structure or vice-versa, or which dimensions of structure are primary and which are secondary. They added, however, that
"this may be a strength of structuration theory in that it does not attempt to privilege particular theoretical positions" (p.469). What is rather distinctive about structuration theory is that it attempts to synthesize different and antagonistic theoretical perspectives. From this perspective, structuration theory is not a theory in itself. It does not explain reality; it tells researchers where to search to understand reality.

An additional comment on Orlikowski's model is its heavy focus on the information technology 'evolution' in an organisation (Walsham, 1993). Her study aims for an understanding of the use and consequences of information technology leading to little understanding of the organisation and its members. The model was used to uncover the interactions between different organisational factors as a result of the adoption of technology in that organisation. It does not, however, amplify our understanding of social interactions within the organisation beyond the 'technology-frame' period (e.g. formal and informal communication patterns within an organisation), which may help in advancing our knowledge concerning the impact of technology on organisational properties.

The above comments should not be seen as diminishing the value and the significance of Orlikoswki's structurational model of information technology. Rather, they should be taken as opportunities for expanding the use of structuration theory in this field of work and give food for thought for researchers to expand the use of the theory in other information systems areas.
So, why was it important to base research in this field of information systems on structuration theory? It was earlier seen that studies with a focus on the deterministic nature of technology and the power of key organisational actors over its use have dominated the field on the impact of technology on organisational change. Something was still absent from the literature: that was an attempt to examine the combined influence of micro- and macro-level forces on organisational changes within a single study. Structuration theory assists in this effort. It provides the basis for reconstructing the premises of previous perspectives in a synthesizing endeavour. Technology does not simply belong to the individuals who work with it. It is a property of a whole organisation and subsequently, its use and shape depend on the types of functions, values and norms within that organisation. Hence, it would be incomplete to describe human actions without locating them in their wider organisational context.

An analysis of organisational processes based on this theory can bridge the macro-micro dichotomy (Riley, 1983) since it requires a back and forth analysis of the interactions between human agents and structural properties within an organisation. Walsham (1993) disagrees that structuration theory implies a mixed level of analysis. As he puts it, "[in structuration theory] an emphasis is placed on the way in which the various levels are inextricably interlinked and constituted by each other, whereas a traditional mixed level of analysis has tended to treat the levels rather more separately" (p.246). Structuration theory has the distinct advantage of synthesizing the two levels to a degree that permits us "to see the connection between ongoing human activities, social processes,
contexts of use, and enduring social structures" (Orlikowski and Robey, 1991:165). Besides, the theory complies with the definition accepted in Markus and Robey (1988) with regard to the mixed level of analysis, in which a mixed level research grounds macro level concepts in individual purposes and behaviour and vice versa.

In the studies by Barley and Orlikowski, interest has focused on the integrative nature of structuration theory. The two researchers have reinforced Pettigrew's argument (1979) according to which studies that investigate an organisational phenomenon (such as the introduction of new technology in an organisation), should not to be undertaken in isolation from the broader context in which it is set. The linkages to the factors that might have directly or indirectly influenced its choice and use should be explored.

Further to a broader scope of analysis, the theory incorporates a wider time spectrum which allows a contemporary and a retrospective analysis to take place. This means, for instance, that analysis is not based merely on consideration of the functions of the department in which a given technology is applied and of the people who have immediate contact with the technology. It encourages researchers to go beyond departmental boundaries and examine conditions of the whole organisational spectrum. Each department of any organisation is not independent of but is integrated to the mission, goals, decisions, ideologies, values and the many actions of the organisation in which it belongs.
It is believed, that the time at which the structuration theory was introduced in the information systems field was the right one. The decision to use this theory was taken after studies on the deterministic and organisational choice perspectives have been undertaken and their arguments have been well absorbed and understood; gaps have been identified and the need to refocus the theme in the field was recognised (Markus and Robey, 1988). Structuration theory acts as a dynamic theoretical base with considerable potential for gaining adequate understanding of technology in organisations. It has the ability to integrate organisational factors, tactics and processes. It can, therefore, unite previous perspectives and build on this unity a synthesized whole.

3.4 A STRUCTURATIONAL FRAMEWORK FOR UNDERSTANDING CBIEs

This part of the chapter explains how structuration theory will be used within the content of this study so as to increase understanding of CBIEs. It particularly attempts to set up a working framework for this purpose rather to base the analysis of CBIEs on straightforward structuration theory.

3.4.1 INTEGRATING SIGNIFICATION, WORK AND POWER THEMES

This study aims to develop an understanding of how IT-enabled empowerment schemes contribute to the generation of CBIEs. Studying patterns of signification structure is considered important for the purpose of this study. Giddens (1984) defines the structure of signification as the construction of
meanings which appropriate human actions within an organisation. It represents a framework of mutual knowledge which spreads around understanding and meaning of what people say and do. It is mediated through interpretive schemes which result in meaningful communication; these are well-established, shared scripts between organisational members which serve as vehicles for understanding human actions within a particular organisation. They might be expressed symbolically through language, visual images, metaphors and stories (Orlikowski and Gash, 1994). Trevino, Lengel and Daft (1987), who studied the communication patterns between 65 senior managers in 11 organisations, found that when managers promote the frequent use of face-to-face communication throughout their organisations they tend to strengthen the values of informality, teamwork, participation, trust, goodwill and caring, for face-to-face communication symbolizes these values. In such organisations, “the manager who congratulates a subordinate on 25 years of service with an electronic mail message may symbolize a lack of concern, leaving the subordinate feeling furious rather than cared about” (Trevino et al, 1987:558).

The language-in-use is an essential feature in creating shared meanings within an organisation and it can thereby uncover patterns of the signification structure of an organisation (Riley, 1983). It can help members to interpret and understand organisational practices. It is particularly important for a researcher who is interested in this field to be familiar with the language that goes around in an organisation prior to and during a new phenomenon, e.g. the introduction of new technology. New words, phrases and stories may make their appearance
to help people make sense of such a new phenomenon. In a study by Yates and Orlikowski (1993), it was found that the use of e-mail can give an opportunity for the evolution of new language and textual patterns among users. These researchers found that graphic devices as well as typographical errors were used as the basis for humour in electronic communication; such humoristic patterns did not exist in paper-based communication.

Although the information systems literature is still in its infancy with regard to empirical research in respect to the signification structure, there is an increasing body of work that acknowledges this theme. Several researchers have shown that system designers' and users' values, views and expectations on information technology, its development and implementation influence the kind of system to be designed as well as users' attitudes towards it (Boland, 1978, 1979; Ginzberg, 1981; Markus and Bjorn-Andersen, 1987). If, for example, there is a concern over an increased control as a result of the introduction of computing technology in an office, then users might develop a negative attitude towards it and resist to its introduction and use (Willcocks and Mason, 1987). They might assume that technology is a monitoring device and as a result they might be unwilling to spend time to learn the functionality of this technology and its potential to improve their work.

Scarborough and Corbett (1992) also agree that there is a need to understand the meanings given to technology by various groups when analysing the relationship between technology and organisations. They have argued that
technological choice is not solely a matter of social and political negotiation between actors holding different power positions. Rather, “the key to unlocking the general shaping of the technology process is the ideological ‘frame’ that lies beneath these negotiations” (Scarbrook and Corbett, 1992: 74). They suggest that "scientific rationality remains a highly influential ideology in technological and organisational design because it offers, simultaneously, techniques which control uncertainty (and therefore grants power to those who can apply it in the managerial interest) and a legitimating frame that appears free of political bias" (p. 89). Similarly, Brodner (1985) has referred to the ‘dogmas of machine-like thought’ which, as he puts it, might "block out any consideration of alternative forms of manufacturing and work organisations" (p. 115). Van Maamen (1986) drawing upon Savage and Lombard’s work (1986) where managerial assumptions for standardization, routinisation and automation were found to guide organisational change, agrees that technology means nothing without context and it cannot be separated from the meanings people at work attach to it. Pacey (1982) particularly argues that an examination of the more general meanings of the word ‘technology’ that would comprise organisational and cultural aspects, can result in a view of technology which is not value free and politically neutral. Feldman and March (1981) who analysed the symbolic nature of information in organisations, find that people in organisations do not only gather and use information to make decisions and choices; they may gather information but not use it, for information gathering alone symbolizes competence, confidence and intelligence. Similarly, organisations that establish information systems may do so for symbolic reasons.
A recent study by Orlikowski and Gash (1994) has examined the meanings given to Notes\textsuperscript{2} by various actors, technologists and users, to explain technology change outcomes. They use the term 'technological frames' to refer to the understandings that organisational members have about technological artifacts. The term refers to assumptions, expectations and knowledge these members have about the particular technology. As they suggest, looking closely at technological frames is a useful analytic tool for examining how and why people act around technology. They found that different people have shaped different views about the value and uses of the technology. For instance, technologists interpreted Notes as a group productivity tool which could be used for radical change, while users interpreted it as an individual productivity tool which could lead to incremental change. Subsequently, these different groups of people have taken action that was consistent with their interpretation of the technology.

Acknowledging the powerful role of 'frames' for analysing the interactions between organisational members and technology, this study will take a close look at the signification structure. A concern for the signification structure of a particular organisation encourages a look at the meanings given to technology but also meanings given to other factors and activities within this organisation which might exercise an influence on technology use. Orlikowski and Gash (1994) restricted their focus on meanings on information technology.

\textsuperscript{2} Notes is an integrated working environment that supports communications, coordination, and collaboration through such features as e-mail, computer conferences, shared databases, and customised views (Orlikowski and Gash, 1994).
Technological frames are not the only interpretive schemes available to actors. Meanings, ideologies and assumptions about other organisational conditions (e.g. strategy, company’s mission, communication patterns) can also influence social interactions and subsequently, when uncovered, they can enhance our understanding of the ‘information technology-organisations’ phenomenon. Signification structure is, therefore, identified within the present research as 'organisational frames' referring to shared meanings about factors and phenomena which influence a wide range of activities within an organisation. The example given earlier based on Trevino, Lengel and Daft (1987) shows that the cultural values of concern and caring encourage face-to-face communication rather than electronic communication, adopting both a facilitating and a constraining character. Walsham (1993) has identified the symbolic cultural metaphor of organisations as a potentially fruitful area of research in the information systems field.

Although the discussion in this section has, so far, focused on signification, the other two dimensions of structuration (domination and legitimation), will be used to supplement the analysis. Particular emphasis will be given to power relations, to relations of autonomy and dependency in human interactions (Giddens, 1979), and to the norms of work as the actualisation of rights and enactment of obligations (Giddens, 1976) within a workplace. Frames of meanings incorporate differentials of work and power. Signification structure cannot exist as an independent phenomenon. It could only be separable analytically either from domination and from legitimation (Giddens, 1984). Information systems
professionals, for instance, are found to possess a symbolic and a conceptual power over users, in addition to their technical and structural types of power (Markus and Bjorn-Andersen, 1987). These information systems experts can exercise technical power over users by selecting a system or a design methodology to which users might have no say (often due to their inadequate knowledge on information systems issues). Similarly, they can exert structural power by setting the rules and procedures to use a particular system. Concurrently and often without their awareness they exercise power conceptually and symbolically. For instance, they may choose a design methodology which does not encourage users’ involvement and which embodies Tayloristic practices or at the other end, they may promote a system as a means for teamworking and hence encourage participation and trust within an organisation.

Earlier in this chapter, it was noted that the power theme has received significant attention in the information systems literature. The organisational choice perspective has been influenced to a great extent by this theme. Power distributions have been considered as "long lasting and taken as facts by organisational participants" (Markus and Pfeffer, 1983:216). Markus and Pfeffer have also found that resistance to new information technology is a result of structural factors such as power distributions rather than a result of processual factors such as strategies and tactics of system implementation. An understanding of power structure is certainly important for the analysis of CBIEs; access to and control over information, whose flow plays an instrumental role
in the establishment of such an environment, is a source of power.

Further to the power theme, the structural properties of work organisation might also drive the decisions and actions of human agents in relation to the development of a CBIE. Awareness of the work design approach within an organisation, prior to and after technological changes, is important in enhancing our understanding of that organisation's context and in assessing the level of change at the organisation of work. Any changes in the work design approach of an organisation can be institutionalised when they become widely acceptable across the organisational pyramid. As a result, resistance by either upper or lower human actors could constrain the development of a new work structure. Kelley (1989) has studied the use of computerised technology, CNC machines and flexible manufacturing technology in US manufacturing organisations, and has found that in organisations with a detailed division of labour and a tendency for management to rely on bureaucratic means of organising the workplace, the machine operators are no more likely to be assigned any more responsibility than they had prior to the introduction of the new technology.

Johnson (1980) views work as a relationship of power. As he puts it (p.335) "when people enter into relationships of production they are at the same time, engaged in a political process, out of which emerge structures of domination and subordination, mechanisms of social control and forms of exploitation". It is also often the case where work is designed based on highly influential ideologies that exist within that organisational context. The deskilling notion, for example, is
based on the premise that managers wish to achieve tighter control over labour by removing all vestiges of labour's autonomy. It originates from the scientific management-based approach that tends to separate doing and knowing (Braverman, 1974). This approach limits the knowledge and planning competencies of lower level employees who primarily deal with the operation of manual tasks which require limited, if any, intellectual ability.

As power can be integral to the organisation of work, similarly the signification structure can be integral to the power and work themes. This is to say that the way power relations and work organisation are structured, are shaped and are conditioned by meanings. It may well be that a pre-existing, well-established ideology regarding organisational design will determine the concept of working environment as well as the position of power. Take the case of a strong capitalistic ideology in managing an organisation. Such an ideology, because it grants power to the upper organisational layers, to the managers and owners, the possessors of capital while it takes away power from the workers, it will exercise an influence on technological and organisational design so as to sustain the power distribution.

The three kinds of structures, work, power and signification, have been chosen to constitute the structural properties to be investigated within the present study. It is believed that the absence of any of these properties from an analysis might be a serious deficiency, resulting in an inadequate understanding of CBIEs.
3.4.2 THE STRUCTURATIONAL MODEL OF COMPUTER-BASED ENVIRONMENTS

In order to better understand the use of information technology in the form of a CBIE within an organisation the model shown in figure 3-3 is developed. The structuration theory acts as a catalyst for this framework. The model depicts that information technology interacts, influences and is being influenced by human actions and structural properties within an organisation. It is also believed that the deployment of technology in organisations is by no means simple. For the use of technology is not an outcome of sequential interdependencies (e.g. structural properties influence human actions which in turn influence technology). Information technology is rather positioned in a process of reciprocal interdependencies (e.g. structural properties influence and are being influenced by human actions and human actions influence and are being influenced by technology).

The role of the structurational model of computer-based environments will be to examine the choice, use and transformation of information technology in an organisation by looking at the human actions and the structural properties selected. In particular, the model will be used to a) examine the extent to which information technology informates the workplace, with reference to the level of information accessibility as well as the learning opportunities and action-taking arisen, b) examine how the choice, implementation and use of this technology have been affected by managerial and clerical forces as well as by the chosen
structural properties, and c) examine the extent to which the use of information technology has reproduced, modified or transformed these structural properties.

The model encourages a close look at information technology impacts on human agents and structural properties. This can, consequently, assist in assessing the deterministic, if any, character of information technology within a particular organisation. This is similar to Orlikowski's study. The model however has been expanded to allow an investigation of the relationship between 'upper' (e.g. directors and senior managers) and 'lower' human agents (e.g. supervisors and clerical staff) that constitute the human actors of an organisation.
The main difference to Orlikowski’s structurational model is found on arrow ‘e’. The model developed for this study allows an investigation of interactions between human agents and structural properties other than those related to technology. Organisations are developed and ran by individuals and/or groups. Hence, it is expected individual or collective actions to exert an influence on structural properties of organisations beyond issues on technology. According to structuration theory, human actions of any kind shape the character of structural properties.

According to this research, human actors comprise organisational members at both the upper and the lower levels. Arrows ‘f’ and ‘g’ reflect the relationships and communication patterns between managers and the workforce in an office environments. Power relations are reciprocal in nature (Orlikowski, 1991). This is referred to by Giddens as the ‘dialectic of control’ according to which “all forms of dependence offer some resources whereby those who are subordinates can influence the activities of their superiors” (Giddens, 1984:16). Arrow ‘g’ may reveal leadership patterns such as delegation of authority and responsibility and also directing and controlling. Arrow ‘f’ shows employees’ contribution to managerial intentions and practices. Their contribution might be communicated via acceptance and obedience but also via resistance, conflict and dissatisfaction which could modify the course of development of managerial choices. Wilkinson (1983), through a series of case studies, found that workers could resist to managerial plans for technological change. Employees’ resistance needs not always be organised. It could be informal and unorganised
Markus (1983) studied the case of a company's divisional accountants who were found unhappy and dissatisfied with the introduction of a new financial information system. As a consequence, the system was inadequately used by its intended users. Resistance was expressed by “writing angry memos, maintaining parallel systems, engaging in behaviour that jeopardised the integrity of the database and participating in a task force with the public objective of eliminating [the system] and replacing it with another one” (Markus, 1983: 438). The perspective undertaken within this study allows an investigation of resistance to other organisational practices. By investigating relationships ‘f’ and ‘g’, it is hoped that this will enable an identification of the human roles in the organisation. In particular, it is expected to understand the relationship between managerial and clerical staff and the extent to which the use of information technology has influenced this relationship.

In contrast to Orlikowski (1992), who started her analysis with the ‘human actions and technology’ relationship and then she incorporated structural properties in order to see how they had influenced that relationship, this study will start the analysis of data collected with the ‘structural properties - human actions’ relationship prior to any change. This serves two purposes:

1) Firstly, it is believed that since technology enters an organisational context which is often well-established to influence subsequent events, researchers must uncover traditional patterns of social interactions prior to the introduction of technology. This also allows an investigation of organisational frames and not technological frames alone. Thomas (1994) argues that structuration theory fails
to identify the purpose of technology in an organisation. In his own words: “the critical piece missing from structuration theory is an explicit treatment of purpose... structuration theory makes technology appear fixed. Even more ironically, technology comes to be treated as the motive force behind change” (p.227). With particular reference to Barley’s studies (1986, 1990), Thomas finds that the arrival of technology has not been questioned. The use of structuration theory within the present study to go beyond the technological period hopes to cover this gap and to identify the ‘why’ of technology.

2) Secondly, it broadens the scope in which the theme of "information technology and organisation" is placed. Given the limited character of our knowledge on informed workplaces, it is vital that a broad enough approach is employed to improve our understanding of the nature and development of CBIEs. The variables selected to be examined are not new. They have been previously identified in the literature of information technology in organisations. Structuration theory just brings them together. It is believed that this is the only study so-far that brings together all the above relationships in an attempt to investigate the informate character of information technology within office environments.

Finally, it should be stressed (once again) that the study does not aim to apply structuration theory as this has been introduced by Giddens. Rather, it makes use of the main principle of the theory on the duality of structure in an attempt to broaden the research perspective for looking at information technology in organisations.
3.5 CONCLUSION

The traditional perspectives on the concept of information technology in organisations, the technological determinism and the organisational choice perspectives were found insufficient. A major problem identified within these perspectives is their uni-directional nature. A multi-directional focus has been recommended for research in this field to best identify the relationship between a given technology within a certain organisational context. This argument comes to complement the need for a micro-macro level of analysis. Taken together the arguments strengthen the view for a broad perspective in which to place the ‘information technology-organisation' theme.

Following the above, and in order to sustain a broad enough perspective, this research synthesizes, via the use of a structurational framework, the various theoretical perspectives identified in the literature. For an adequate investigation therefore of CBIEs, the study has chosen to focus attention on the structural properties of work, power and signification and to examine how these have influenced and have been influenced by human actions prior to and after technological changes.

Based on the discussion within this chapter, chapter 4 justifies the research approach and the data collection techniques that have been chosen for the field work.
CHAPTER 4
RESEARCH METHODOLOGY

4.1 INTRODUCTION

The objective of this chapter is to justify the research methodology selected to meet the purpose of this study. The chapter describes the main alternative research paths adopted in the information systems area. It then differentiates between those research strategies that have been used to study the concept of information technology in organisations.

The chapter justifies the selection of the case-study approach as the one that best suits the research topic being pursued in the study. The chosen data collection techniques and the pilot study will also be presented.

4.2 INFORMATION TECHNOLOGY IN ORGANISATIONS: MAIN RESEARCH METHODS

Surveys and case-studies are among the most often employed empirical approaches in the information systems area (supported by Hamilton and Ives, 1982, as well as by Orlikowski and Baroudi, 1991).

Hamilton and Ives (1982) have studied the research methods in 532 MIS (management information systems) articles published in 15 journals between the
period 1970-79. The study finds that more than 33 % of published MIS research have adopted non-empirical approaches and focused on a single variable. The authors explained that non-empirical approaches are in the main conceptual works that rely on secondary sources or the writer's experience and knowledge on the subject so as to support conclusions. Empirical approaches comprise case-studies, surveys, field tests and laboratory studies. The case-study approach was the one most favoured by empirical researchers, 11.8 % of the 532 articles, followed by surveys with 7.9 %.

Orlikowski and Baroudi (1991) have studied the research approaches adopted in 155 information systems research articles published from 1983 to 1988 in four major information systems journals. The research articles were initially categorised in terms of their research design. It was found that the three main research designs are surveys (49.1%), laboratory experiments (27.1%) and case-studies (13.5%). The researchers have then attempted a further differentiation of the articles by time-period, concluding that static, one-shot, cross sectional studies are clearly the predominant form of research in information systems (90.3 % of the articles examined). Longitudinal and multiple time period studies accounted for only 4.5 % and 3.9 % of the sample respectively.

3 Hamilton and Ives used the term field studies instead of surveys. It is considered however that they were referring to the survey approach. A similar assumption was made by Galliers (1992b:142).

4 The four major information systems journals were the following: Communications of the ACM, MIS Quarterly, Proceedings of ICIS and Management Science.
Research studies that have examined information technology in organisations have either employed the survey or the case-study approach (Vitalari, 1985). Major studies pertinent to this study's focus, e.g. those on the impact of technology on work organisation (e.g. Kemp and Clegg, 1987; Noble, 1979; Wilkinson, 1983; Zuboff, 1988) have used the case-study approach. The recent literature on IT-enabled empowerment also uses the case-study approach to describe and explain the reasons for and impacts of an empowered workplace (Clement, 1994; Clutterbuck and Kernaghan, 1994).

The following section deals with a description of and a differentiation between surveys and case-studies. Laboratory studies which have often been used in the information systems field are not taken up further here. It is believed that the nature of this research topic sets bounds to this choice to those types of research methods that investigate phenomena within their natural organisational settings.

4.3 SURVEY Vs CASE-STUDY APPROACH

Survey is a research approach that aims to take a general view of a phenomenon. It investigates relationships between small or large number of preset variables within a large number of organisations. Given the large number of participants, generalisations can be made. Besides, due to the nature of the survey approach, that is to investigate preset relationships within a sufficient number of participants which represent the whole population, the results are
often used for predictability purposes. Take the case of a research that examines the impact of computing technology on employment. If it is found that in the majority of the participant organisations, the number of clerical workers have either been the same or have been reduced, then this finding might be used to predict that unemployment among clerical workers would be rising with the increasing use of office automation.

In survey research, data is collected via questionnaires or structured interviews and quantitative techniques are used for the analysis. The consequence of this is that the investigator ends up with little insight as to the causes or processes behind the phenomena under study (Galliers, 1992b).

A case-study approach encourages an in-depth investigation of a phenomenon in a single organisation or a small number of organisations. It can use multiple data collection techniques like interviewing, observation and documentary analysis. It often aims to explore and construct a coherent explanation of phenomena. Due to the relatively loose, non-systematic analysis of phenomena, this approach can stimulate insights into new areas and reveal variables that have not been identified before. Case-studies are, therefore, particularly useful in investigating situations that have not been previously explored. A case-study is also useful to establishing an authentic explanation of a sensitive phenomenon. Thus, if you wanted to know the impact of political interests on the development of an information systems project in an organisation you could not rely on a survey research due to the sensitivity of the issue; you would rather
have to draw upon a wider array of collection techniques. Documentary information, sustained observation in conjunction with interviewing are techniques that would possibly reveal the personal interests of key organisational actors.

Researches based on a case-study approach can go beyond a mere description to a detailed analysis and explanation of phenomena. They often aim for an understanding of the organisational context that surrounds a given phenomenon rather than for prediction. Case-studies permit detailed elaboration of organisational processes and activities. Causality may exist, but it is not unilinear as in a survey approach (Pettigrew, 1992).

The findings of research studies that have either adopted the one or the other approach are likely to differ. Different approaches adopt a different focus, seek answers to different type of questions and employ different research techniques. Yin (1984) claims that "survey approaches are advantageous when the research goal is to describe the incidence or prevalence of a phenomenon or when it is to be predictive about certain outcomes" (p.18). Generally speaking, a concern for the 'what' question of a phenomenon is likely to favour the use of survey techniques, whereas 'how and why' questions (especially those seeking sensitive answers) are better answered via a case-study approach. Thus, the question "What is the effect of firm size on the level of technological advancement in an organisation?" has been investigated based on a survey approach using a structured questionnaire (DeLone, 1981). Both small and large
firms have participated in that study. Besides, a survey questionnaire might be used to answer the question "What is the relationship between information systems structure and organisational structure?" (Ein-Dor and Segev, 1982). In depth interviews and direct observations would be preferred, however, in order to investigate "how and why does information technology influence power relations within an organisation?".

The above discussion on the distinction between survey and case-study approaches is by no means complete. Surely, other researchers can add to it to further distinguish between the two. However, the discussion covered some of the main characteristics of the two approaches and reveals the conditions under which each approach is appropriate.

It would be wrong to advocate that one approach is better than the other. The interests and capabilities of the researcher as well as the nature of the research topic and the purpose of the study are expected to have an influence on the selection of a study's research methodology.

4.4 THE CONTINGENT CHARACTER OF THE CASE-STUDY APPROACH

It has been previously argued that the nature of the research topic can and should shape the type of research methodology to be adopted in a study. This should not be taken to mean that if the same research methodology is undertaken by researchers interested in the same topic the findings would be
similar.

Studies that belong in the same field of research and have employed the case-study approach, have sometimes revealed different, even contradictory results. Reference is particularly made to the information systems literature. There are at least three different perspectives on the concept of technology in organisations. Researchers from all three perspectives have used the case-study approach to examine the role of technology on organisational change.

The case-study approach has been adopted by supporters of the technological determinism school (e.g. Schultz and Whisler, 1960; Reif, 1968; Whisler, 1970; Stewart, 1971)\(^5\), with a particular focus on changes in organisational structure as a result of the introduction of technology. Some reference has been made by these researchers to organisations' tasks environment. Researchers who claim support for the organisational choice perspective have adopted, in the main, the case-study approach. They prefer this approach due to the sensitivity of organisational politics and their impact on the choice and use of technology. Another reason reported for this choice is to enable historical investigation as well as close involvement with organisational members (Wilkinson, 1983). Buchanan and Boddy (1983) explain that the main reason for adopting the case-study approach in their study is to collect rich and interesting data and since information technology is relatively new, to generate ideas for future research.

\(^5\) These studies have been reviewed in Robey (1977).
The case-study approach has also been preferred by Barley (1986) who studied how the institutional realms and the realms of action configure each other with regard to the use of technology. The case-study has allowed him to adopt a multi-level analysis as well as to undertake both a contemporary and an historical investigation of the concerned phenomenon.

Clearly and very importantly, the case-study approach has a contingent character (this does not imply that other research methods such as surveys do not). A case-study might be contingent upon the logical structure of the study’s theoretical argument, the epistemological perspective and the time period of the study. An explanation of these contingencies is given below:

4.4.1 LOGICAL STRUCTURE OF THEORETICAL BASE

The way theoretical arguments are formulated is bound to influence the direction of the research process. Markus and Robey (1988) make reference to variance and process theories (Mohr, 1982) to describe the different logical formulations of theoretical arguments on research methodology.

Variance theory is based on causality explanation. Its characteristics are the following: 1) the precursor (X) is a necessary and sufficient condition for the outcome (Y); 2) it deals with variables; 3) it deals with efficient causes; and 4) time ordering among the contributing (independent) variables is immaterial to the outcome (Mohr, 1982). It is useful to identify within the variance theory those
studies where researchers adopted the technological determinism perspective. In variance studies researchers attempt no interpretation of the phenomena; rather they are interested in establishing causal relationships in the presence of specific contingent conditions (e.g. Whisler, 1970). Predefined, uni-directional relationships are the main characters of variance theory. Variance theory places too much attention on preset variables while an identification of other factors is restricted. It indicates an invariable relationship between input and outputs (Markus and Robey, 1988) which narrows the scope of the research to limited and unilinear relationships.

Process theory is based on the probabilistic re-arrangement explanation. Its characteristics are the following: 1) the precursor (X) is a necessary condition for the outcome (Y), 2) it deals with discrete states and events, 3) it deals with a final cause, and 4) time ordering among the contributing events is generally critical for the outcome (Mohr, 1982). Process theory is adopted in cases where we want to enhance our understanding of the 'what, how, who, where, and why' of an organisational phenomenon. This approach examines sequence of events and allows chance and random events to be taken into account. These studies are important in describing and explaining a sequence of events especially when those events are of an implicit nature that cannot be easily unfolded through straightforward questionnaires.

A complementarity between variance and process models has been recognised (Newman and Robey, 1992), whilst it has also been suggested that the two
models should be used separately. Mohr (1982) issues three warnings to those who plan to integrate the two types of models:

a) First, a process model should not be impeded if variables are thought to make events more or less likely. Thus, it would be wrong to conceive at the beginning of the research the deterministic nature of technology when undertaking a process model on organisational change. In such a case, change should not be conceived as an outcome but as a sequence of events in which the adoption of technology is just one of them.

b) Second, a process should not conceive of outcomes as dependent variables, as in the case of a variance model. In a process approach outcomes are the final cause of precedent events that have evolved over time. Thereafter, what is an outcome in the variance model might not necessarily be an outcome in the process model.

c) Third, variance and process models may be mutually informative but their results may not be easy to combine. For example, findings about the kinds of decision making style and their effect on the deployment of an information system project (variance) may not directly match to the findings about the influence of political interests on the decision making on new technology (process).

Although it is advised that the two models should not be directly combined in a single study (Mohr, 1982), it is important noting that the results of the one may
direct the focus of the other. For instance, the findings describing structural changes resulting from the introduction of new technology (variance model) may trigger the commencement of a process study interested in the sequencing of that change. So, process models can use the results of studies which have been carried out using the variance model in order to explore further certain events.

4.4.2 EPISTEMOLOGICAL PERSPECTIVE

Orlikowski and Baroudi (1991) make reference to the epistemological perspective of a research as another contingent factor to the nature of case-studies in the information systems field. The authors have distinguished three types of research perspectives: a) positivist approach, b) interpretive approach, and c) critical approach. Based on the results of this classification, positivism is clearly the dominant epistemology in information systems research, accounting for 96.8% of the studies in this field. Interpretive studies represent only 3.2% of the total number of studies followed by critical studies, which are not represented at all. The researchers have identified studies based on the case-study approach which have used either the positivist or interpretive approach.

The positivist approach concerns an examination of a situation to a limited number of variables, often predefined and fixed, trying to identify their level of interdependence. Such an approach places case-study research "within the framework of scientific method - to develop hypotheses, collect empirical data
and develop conclusions based on the analysis of such data" (Yin, 1993:47). Positivist studies have been divided into theoretical based studies and descriptive studies. The latter group refers to a straightforward presentation of facts without any interpretation. It was claimed that several case-studies research in IS field belong in this group.

Orlikowski and Baroudi (1991) claim that the major limitation when adopting a positivistic perspective in an information systems study is its disregard for historical and contextual conditions that surround an IS phenomenon. "The design and use of information technology in organisations, in particular, is intrinsically embedded in social-contexts marked by time, locale, politics and culture. Neglecting these influences may reveal an incomplete picture of information systems phenomena" (Orlikowski and Baroudi, 1991:12). The weakness of this approach is also indicated in Rowan's statement (1973:210): "Research can only discover one-sided things if it insists on setting-up one-sided relationships...You only get answers to those questions you are asking" (quoted in Orlikowski and Baroudi).

As opposed to the positivist perspective, the interpretive philosophy tries to understand reality within its social context. It regards the issue under consideration as a result of an emergent social process not as a fixed constitution of objects. The interpretive approach is described as an attempt aiming to understand how and why individuals interact with, relate to and participate in their social environment. Finding the meaning given by individuals
themselves is a primary requirement for using effectively this approach. Meaning is often found in various sources of data (e.g. language, symbols, stories). This demands a 'going beyond the surface' approach and looking far enough for the true determinants of a phenomenon. Interpretive studies are, thereby, advantageous in providing a deep understanding of a phenomenon.

The use of Giddens's structuration theory in the information systems field encourages the use of the interpretive perspective in a case-study research (e.g. studies by Boland, 1993 and Orlikowski and Gash, 1994).

### 4.4.3 TIME PERSPECTIVE

The time perspective has an influence on the nature of the case-study approach. Case-studies might either provide a snapshot or a longitudinal perspective to a phenomenon.

Case-studies might represent 'snapshots' of organisations simply because of a limited time period of study. Two examples of 'snapshot' case-studies are presented here. Firstly, such a case is likely to investigate solely the contemporary events about the phenomenon under consideration. For instance, a study that is concerned with the impact of information technology on working practices examines merely this relationship as a current phenomenon failing to undertake a historical investigation of the working practices traditions in that organisation. The latter would possibly give more depth into our understanding
of the current situation. Secondly, snapshots may occur when the study fails to take account of all the interest groups involved in the investigated issue. Thus, a study that simply takes the viewpoints of the management team on how, for instance, technology has changed working practices in an organisation is a 'snapshot' case. It is a case that takes account of management viewpoint alone and ignores the views of actual users (employees) of the technology. A single group representation in a case-study allows no comparison to take place as far as the consistency in opinions among different groups in a given setting.

In contrast to the 'snapshot' approach, case-studies that adopt a longitudinal character are concerned about historical and contemporary events as well as traditions and processes that surround that organisational phenomenon under investigation. As Pettigrew (1990) puts it, without longitudinal data it is impossible to identify the processual dynamics of changing the relationship between forces of continuity and change. Furthermore, these studies tend to comprise the viewpoint of all relevant groups involved in that issue. The longitudinal approach emphasizes the capability of a case-study approach to fully analyze a phenomenon. In the information systems field, a longitudinal study could contribute to "fully incorporate the reality of time-dependent change" and thereby provide insights into many of the perplexing issues surrounding information systems research (Vitalari, 1985).

Pettigrew (1990) claims that a longitudinal research by means of the case-study approach can be completed over a three year period of intensive analysis. For
doctoral students, a field research of this nature might not always be feasible nor achievable especially when the research purpose requires a multiple case-study approach. For reasons of funding and time constraints, doctoral researchers who attempt a longitudinal study by means of the case-study approach often need to restrict their period of research to only a few months carrying out an intensive analysis of retrospective and contemporary elements. Attention is drawn to Wilkinson's work. Wilkinson (1983) has attempted with success four case-studies covering both historical and contemporary events, as well as considering the opinions and efforts of all interested parties. His research adopted a longitudinal character without the need of being with the companies throughout the change period. Therefore, the time perspective of a research, which itself is dependent on other factors (e.g. cost, deadlines, life spectrum of the object to be examined), influences the character of the case-study approach.

The case-study approach has certain potentials that lack from other research designs e.g. multi-linear causality, multi-level analysis, contemporary as well as historical analysis. It is found, though, that not all case-studies have aimed for this type of multi-level and multi-directional analysis. The time factor, the theoretical base and the epistemological perspective as well as the researcher's will, skills and persistence for a 'beyond the surface' investigation are factors that influence the character and direction of a case-study approach.

4.5 WHY HAS THIS STUDY EMPLOYED THE CASE-STUDY APPROACH
With particular reference to information systems research, Benbasat et al (1987) recommend the case-study approach. They explain that "[information] technology is relatively new and interest has shifted to organisational rather than technical issues. For example, case-studies have been helpful in identifying the causal chain that led to the success or failure of an information system by revealing in chronological fashion the various actors and events that influenced the final outcome" (p.382).

The case-study approach is the chosen approach for this study. The study justifies research of information technology in its natural application setting since it aims to investigate CBIEs within the context of the organisations in which they are embedded. This point instantly excludes laboratory research. Further to this, there are other reasons that support the argument that the case-study approach best suits the research topic to be pursued:

1) The study takes an explorative character. It investigates a relatively new phenomenon in which relevant variables are still unexplored in the literature. Although there has been reference to the informate concept in the literature and several examples of 'informed' workplaces have been given, the factors that underlie the evolution of CBIEs have not been adequately examined.

2) The study aims to provide a contextual analysis of CBIEs. The case-study approach with the ability to capture 'reality' in greater depth (Galliers, 1992b) allows such an investigation to take place. Besides, the use of a structurational
model in the study implies a processual orientation of the research strategy. It drives the research strategy away from the positivist, uni-linear approach of analysing phenomena. It looks for an understanding of processes in addition to inputs and outputs. It was felt that the best possible way to study the interactions and interdependencies between human actions, technology and the structural properties within that organisation is through a case-study analysis. Such an approach provides an opportunity for uncovering the meanings people at work attach to technological and organisational changes. It provides a scope to reveal multiple sources and causes of CBIEs and to depict the level of connectivity between them. As Pettigrew puts it (1973), "if the researcher is interested in covert activity, ... it is essential to be close to the ground of the action" (p.56). Processes are often covert activities. People tend to speak more easily about what they did than how they did it and why. Overt reasons are rather the answers to 'what' questions.

3) The case-studies will aim to cover events over a broad period of time covering the period before, during and after technological changes, and will take account of all interest groups involved (i.e. managers, clerical force, system specialists). The studies will evolve around an investigation of the phenomenon in the context in which it has been set and its relations to other organisational facts covering a wide time spectrum of study so as to also allow examination within the context of its past. It has been affirmed "never to underestimate the magnetism of the past and the forces of inertia upon which it thrives" (Zuboff,1988:p. xv). Current and past processes should not be examined separately, because more often
than not, the present reflects the past. A case-study approach of this kind results in a deeper understanding of organisational phenomena by going beyond the peripheral perspective to an examination of historical as well as contemporary events.

4.6 LIMITATIONS OF THE CASE-STUDY APPROACH AND HOW TO OVERCOME THEM

Although a case-study approach is the best approach for the topic being pursued, it is certainly not without limitations, which however could be limited after they have been identified.

Deceptive interpretations of the findings is regarded as one of the main limitations of the case-study approach. Since the data is often collected in a rather unstructured form, this enables investigators to 'see' what they want to 'see', and of course to interpret phenomena the way they want to interpret them. Knight's view (1992) that organisational processes are always 'open' to being interpreted differently, reinforces the above argument.

Prejudices about how organisations are managed are with researchers before entering the field. They often result from researchers' past experiences or things that have been heard. However, being suspicious, critical and a careful observer of gestures, expressions and language used might help to restore a less subjective interpretation of organisational phenomena. Loose and flexible
research techniques in data gathering permit researchers to persist in explanations of answers without the need to follow a preset, rigorous structure. Questions like "why was that important?" and "can you clarify your answer with an example?" are simple ways that can be used to reduce subjective interpretations when they are used adequately and at the right time.

The deployment of the case-study approach enables the investigator to deal with a variety of evidence. A multi-dimensional method (triangulation) in gathering information may be used ranging from documentary analysis to interviewing and observation techniques. Hence, a variety of different perspectives on the issue concerned may be collected. An adequate representation of all these techniques may limit the risk of ending with wrong, misleading interpretations of the findings. As Benbasat et al (1987) put it: "Using multiple methods of data collection offers an opportunity for triangulation and lends greater support to the researcher's conclusions" (p.374).

The development of 'thin' generalisations of findings is another major concern about case-studies (Miles, 1979). Yin (1984), however, explains that the purpose of the case-study approach is not to generalise findings to the whole population. Since the study takes the view of only a few participants that often do not correspond to a fair sample to represent the whole population, surely generalisations cannot be made. Case-studies may not lead to generalisations of findings but they lead to 'evidence' based on a specific number of case-studies and hence lead to generalisations of theoretical frameworks. These are
developed and tested for the exploration of organisational phenomena, are specific enough to guide the research analysis but quite broad and flexible to fit the processual analysis in different organisations. Yin (1989) talks about analytic generalisations where a pre-developed theory is used "as a template against which to compare the empirical results of the case-study. If two or more cases are shown to support the same theory, replication may be claimed" (p.4).

Indeed, the case-study approach has the disadvantage of limited generalisability of findings. However, there is a need to think whether the generalisability of the findings is vital under all circumstances. Case-studies can not only describe relationships; they can also explore phenomena. Defending the case-study approach, Knights (1992) claims that this particular approach has the power to constitute rather than simply represent reality. He argues that this method is advantageous in providing an insight and an integrity of meaning of organisational phenomena by taking account of their context and the contingencies with which they depend upon. This argument should not be taken as a criticism of the survey approach but rather as a condition that strengthens the appropriateness of the case-study approach to carry out in depth analysis.

Further to the above, another concern when using the case-study approach is the lack of control over the large number of variables that can influence the findings (Buchanan and Boddy, 1983). Organisations are so rich that it was actually claimed, that anyone who observes them can find sufficient puzzlement to last for a productive career (Daft, 1983). Due to time and resource constraints
researchers must set out indications that would restrict the depth of the study. The development of a theoretical framework on the issue to be examined prior to the commencement of the actual case-study is recommended. Such a framework would aim to direct the focus of the investigators' attention to those organisational factors that are of his/her interest. It is likely to result in a more explicit specification of the data needed to be collected. It is often claimed that ‘the way you see the world depends largely on what kind of lenses you put on’. The development of a theoretical framework prescribes a specific way of looking at organisational phenomena. Such a framework has the capacity to direct our thinking towards a particular set of concepts. According to Yin (1993) "good use of theory will help delimit a case-study inquiry to its most effective design; theory is also essential for generalising the subsequent results" (p.4).

Daft (1983) suggests that a few variables that form a coherent whole and depth of meaning constitute an ideal research framework. Daft distinctively states that research should take the form of a poem and not that of a novel that covers many events with often little depth. In contrast, "poetry means a research design that includes only a few, perhaps two, three or four variables... A research poem also must have depth". In brief, such an approach aims to a deep understanding and holistic comprehension of a tiny piece of organisation reality. The case-study method allows such an understanding to evolve by moving back and forth among historical and contemporary events that relate to a given phenomenon.

Following the above point, research questions should, on the one hand, be
specific for 'guidance' purposes, but on the other hand, wide enough so as to enable investigators to rephrase them if they think that this would be necessary. Case-studies should aim to elaborate and challenge and not solely to confirm the developed framework.

Besides, predetermined causal relationships among variables should be avoided when aiming to get a comprehensive picture of a phenomenon. This tendency to distinguish the dependent from the independent variables limits the focus to unidirectional relationships and bears the problem of increasing bias in the interpretation of findings.

In sum, case-studies allow a rich, detailed examination of organisational activities. This is less likely to be achieved within the rigorous structure of a survey research. However, because phenomena are mainly explained based on the researcher's own interpretation such an approach runs the risk of wrong or limited interpretation of findings. They are highly recommended, though, in cases where an examination of organisational processes is required with an interest to explore how various factors interact among themselves, influence and are being influenced by others.

4.7 THE FIELD WORK PROCESS

The present study views information technology as an organisational phenomenon which can not be analyzed on its own. Its role and significance
can be understood by considering its relation to the conditions that surround it. Literally, when seeking for an understanding of organisational phenomena, it is wise to expand the data collection techniques rather than assume that all questions can be addressed equally well based on the same tool e.g. structured interviews (Van De Ven and Huber, 1990). Semi-structured interviews, direct observation and documentary analysis are used in this study to collect all relevant data. The analysis of the collected data are guided by the structurational model of computer-based environments developed in chapter 3.

The field work process (which began after the theoretical grounds for this study were established), comprises the following stages:

### 4.7.1 Preliminary Visits

At an early stage of my research, I had visited a number of firms (ten in total) in West Midlands and Warwickshire. Preliminary visits were chosen for convenience, i.e. they were companies that had contacts with the university, and managers were willing to talk with me about the way they use technology.

These visits took the form of unstructured interviews of approximately an hour each with senior managers and/or owners of the firms. During this period of my research, I had the opportunity to get to view the alternative ways for the use of information systems in different organisations. Also, I wanted to find out the reasons for which the system was adopted, who particularly benefited from the
system, the effects on the clerical force and other organisational members. Findings were interpreted in terms of the automate and informate potentials of IT. Firms with integrated as well as stand-alone systems had been visited. The preliminary visits offered invaluable insights to the subject under consideration. They helped to redefine my research questions and rethink my conceptual frameworks; also, to decide on the criteria for choosing the case-studies. Besides, they constituted a unique experience for me in interviewing people which enhanced my confidence and prepared me for the actual case-studies that were soon to follow.

4.7.2 Pilot Study

After the development of the conceptual frameworks and an illustration of the research process, a pilot study was carried out. This was an opportunity to rethink the data collection techniques with respect to the relevant research topic and questions that seek answers. It was important to identify and correct possible weaknesses on the research process at an early stage of the research.

The pilot study was held in one of the companies that was visited during the preliminary field study period. The company was a small computer supplier firm (employing less than 15 people), and it was using a customer contact database that was accessible to everybody. The system encompasses, in the main, sales and maintenance records with a complete on-line computerised file for each client. The system itself permits an equal participation in sales and engineering
issues by all organisational members. However, the system was only used on
the `need to know basis'. It was concluded that within this company there were
limited information use and knowledge acquisition despite wide information
accessibility. Historical background, size, level of standardisation and
formalisation and communication patterns were examined. The study involved
in the main interviewing techniques, semi-structured interviews ranging from 40-
60 minutes. Information was also gathered from published material on the
cOMPany and its activities. Harrison's questionnaire on culture and observation,
however limited, were also used.

The pilot study showed that there are inconsistent meanings as to the concept
of CBIEs. Explanations about high level of information accessibility were
incompatible. It was evident in the end of the study that 'access' and 'use' are not
necessarily consistent. Organisational members had access to information which
they were not using. This situation revealed that there might exist different types
of 'informated' settings and that I had to be more careful when people were
trying to convince me that the level of information accessibility was high in the
company.

Based on the outcomes of the pilot study and the comments received
throughout the study-period, I reformulated my interview questions. It was not
enough to find the extent to which information is accessible by lower
organisational members; it was more important to identify whether they knew
how to use that information.
The pilot study was needed to reinforce the explanatory power of the structurational model to be used in the thesis. Also, for an evaluation of the research techniques in collecting relevant and sufficient data. The study revealed which questions were difficult to answer. Other factors examined were the appropriateness of the question sequence, understanding of questions and time required to complete each interview. During the pilot period, answers to questions were highly related to respondents' facial expressions to reveal true feelings of respondents' understanding of and reaction to the questions.

4.7.3 Site selection

In any research, the choice of sites-participants is shaped by the research topic and questions to be answered. Since my interest has been to look at CBIEs, I initially wanted to select sites that illustrate the 'informate' nature of information technology.

The experience with the pilot study and the preliminary visits showed how difficult and risky it could be to search for true CBIEs before carrying out a case-study (or a small survey). Instead of this, I decided to investigate organisations which use a system which in its nature encourages wide information accessibility but also it has the potential for employees' empowerment. The IBM ImagePlus system (see section 4.7.3.1) was claimed to possess these characteristics.

Three organisations in Britain were proposed by IBM. All three were considered
by IBM, the supplier of the system, as successful users of ImagePlus; as a consequence they are all used as reference sites for potential IBM clients. Furthermore, the three organisations have within the last few years introduced ImagePlus to support core organisational activities.

Visits to these firms have taken place prior to any agreement with them to participate in the research. An interview with senior or middle level managers, that ranged from one to three hours, as well as a demonstration of the use of the system preceded the actual site selection. These short visits aimed to ensure that the sites were willing to participate in the research. With the agreement of the participant-organisations, their identification characteristics did not need to change. Also, the names of two companies remained unchanged.

Some common characteristics were identified within the three organisations. They are all service-oriented and they all use ImagePlus in a core organisational unit which is customer related. It is believed that these could strengthen generalisability around the use of ImagePlus in organisations.

A description of this IBM system, ImagePlus, is provided below. The emphasis is on its key features and potentials as these had been identified and promoted by the supplier organisation.
4.7.3.1 Describing ImagePlus\textsuperscript{6}

ImagePlus is an IBM image processing system which uses computer technology to capture, store, retrieve, and process electronic versions of paper documents. Image processing involves the transformation of paper documents into images which can then be assessed via the computer. A document is scanned (through a scanner) and within seconds it appears on the screen as an image which can then be rotated, or enlarged with the push of a button. The scanned documents can also be stored ready for quick retrieval. These represent major savings in terms of both space and response time.

IBM integrated the storage and retrieval process into a sophisticated work management system - hence the name ImagePlus. This function of the system is called workflow management. It enables documents to be moved electronically rather physically around the organisation; it also allows work to be prioritised and routed to the appropriate business sections. ImagePlus has the potential for making information available to employees at the point of contact with customers. It, therefore, gives the opportunity for completely revising workflow and creating an environment that supports empowerment.

ImagePlus has first been introduced in North America. It arrived in Europe early

\textsuperscript{6} The description of ImagePlus is based on information gathered a) during conversations I had with IBM consultants, b) at a seminar on introducing ImagePlus organised by IBM consultants in March 1993, c) from a video clip on the use of ImagePlus in one of the case organisations used as a promotion tool and d) from IBM leaflets and newsletters.
1990s. Severn Trent Water Ltd, The Equitable Life Assurance Society and the Alpatros Insurance UK Ltd (not the real name) were among the first European organisations which adopted the system. Since then, they have all been used as reference sites for promoting ImagePlus to potential clients.

Apart from organising visits to these companies, a video clip on ImagePlus was produced demonstrating the image environment of Severn Trent Water Ltd. The clip which is used as a promotion tool shows that the level of customer service, staff satisfaction and company's overall efficiency had all been benefited from the image system.

Multi-access and instant-access to information are some of the benefits of using the system. According to an IBM leaflet "your staff now have all the information they need, displayed in front of them, without having to search through the filing cabinet. You can start to think about locating different functions and working in different ways to suit staff and organisation, rather than the paper". The video clip also showed that multiple access to images has eliminated many of the delays involved in moving paper between offices throughout the Severn Trent Water Ltd.

An article in the 'IBM UK News' entitled "Alpatros Insurance pioneers paperless processing" states among others: "One of the UK's largest insurance companies has taken the plunge into paperless claims-processing, with a multi-million pound investment in IBM's Image systems. [It is] the first major insurer to
transfer its entire claims operations to Image ... The Image system is fully integrated with the company's existing systems to achieve the maximum benefits in terms of effectiveness of claims handling, improved customer service, greater productivity, and operational flexibility".

Severn Trent Water Ltd, Alpatros Insurance UK Ltd and The Equitable Life have been considered by IBM (at the time of the study) as the most successful users of ImagePlus.

4.7.4 Interview Procedure

Interviewing was the main data collection technique used within this research. Although documentary analysis and observation were also used, these had aimed to supplement and back-up the data collected from the interviews rather than to contribute significantly to the field-work. It was therefore important during interviews to gather information on strategic choices and human intentions before, during and after the introduction of ImagePlus as well as information on shared ideologies, traditional working practices and power relations.

Interview questions have been generally determined prior to interviews. The purpose of the predetermined questions was threefold: to ensure that the needed information was collected, to ensure a degree of standardisation between the case-studies and to allow comparisons to be made. The questions constituted the base for the interviews. The interviewing process was
characterised by some straightforward questions (e.g. what is your job here?), as well as by several "why" questions (e.g. Why do you think the system has been introduced?). The question "Could other organisations benefit from the use of ImagePlus and why?" is an example of a projective technique which indicates an indirect way of questioning. It enables respondents to project their beliefs and feelings on the possible constraints of using this particular system onto a third organisation. Under such circumstances, individuals are expected to interpret the situation within the context of their own experiences, attitudes and personality (Zikmund, 1986).

The interview questions remained open-ended in an attempt to record the views and perceptions of the respondents. Interviews were therefore semi-structured. This allowed questions that were only revealed during the interview with the participant to be asked.

I was often interested in people's views on organisational practices, new technology and the changes related to it. Therefore, the use of naive questions, such as "why was this important" was made more than often. Open-ended questions encouraged participants to talk about their concerns and reveal information that wanted to talk about but maybe, they have never had the opportunity to do so.

When interesting information was revealed for a first time, e.g. resignation of a deputy director, I was insisting to find out more. The structure of the interview
was flexible enough to allow this to happen. However, I was always making sure that the interview was completed only when participants' own reaction to the use of information systems as well as their views on the factors that had contributed to the use of the systems were uncovered.

Interviewing was a four step procedure (see appendix A-2):
1) Interview with a company's representative to gain a fair understanding of the use of the system. Interview at this stage often included a demonstration of the system;
2) Interview at a senior level in an attempt to gather information on the objectives and functions of the organisation under study as well as the objectives and functions of the department that deploys the system. Besides, information on company's overall information systems strategy was collected at this stage.
3) Interviews with middle and line managers aiming to understand the functions and goals of particular work teams: how information technology is used, reactions to the system, effects of the system to the organisation and the clerical force.
4) Interviews with clerks/operators in an attempt to understand the actual use of the system, the real level of information accessibility and operators' reaction to the system.

The participants in this research were chosen to represent different organisational layers; directors, senior managers, departmental managers, system specialists, supervisors and clerks from all the three organisations have
participated in the research. Although one of the study's objectives is to uncover employees' viewpoints on empowered and informed workplaces, it was also important to talk to people across the hierarchy to get their own point of view on the changes and also understand the role that they had before, during and after the changes.

Senior members of the organisations (e.g. directors, senior and middle managers) who were indicated as having a key role in the decision-making and implementation processes of the information systems project were contacted in advance. Most of the lower grade employees were chosen by the company's representative who was assigned to assist me in the data-collection. On certain occasions that had to be in agreement with their supervisors. Male and female employees were interviewed. It is worth noting that the clerical force within all the three organisations was female-dominated.

Interviews lasted from 40 to 90 minutes and were all tape recorded with the permission of the interviewees. When participants were talking, interruptions were in general avoided. My view is that a researcher should listen at least twice as much as s/he talks since his/her aim is to gather rather than to give information. Both Zuboff (1988) and Wilkinson (1983) pointed out when they discussed their research design that most people are looking for opportunities to talk about their work and hence welcome listeners. So, I decided that my role should be one of a good listener to people's stories and perceptions of the situation. I made it clear to them that I was not there to criticise, nor to praise.
organisational practices, but rather to learn and that I was looking forward for their own views and attitudes as to the changes in their workplace. It was known that I was there to improve my understanding of organisational context and its influence on the deployment of technology.

4.7.5 Observational Techniques

Observation of the use of technology in the workplace also took place to obtain a better feeling of the operator's experience of a working day. Such a technique complemented the data collected from the interviews. Observation of the relationships between clerks and managers was also recorded during field-work. My attendance at several team briefings was permitted. Observation techniques included recording discussion and recording of what was seen e.g. facial expressions and exchanged glances.

The majority of the interviews had taken place in the interviewees' office (in the case of managers) or at their desk (in the case of clerks). That allowed a) interviewees, mainly clerks and supervisors who constantly work with computers, to demonstrate how they use the system and b) close observation of their working environment. With regard to the latter, it is generally known, that employees tend to personalise their working environment with photographs of their loved ones, postcards, cartoons, drawings, posters etc. Observing one's desk and office, for instance, could reveal their personal interests, thoughts and character.
4.7.6 **Documentary analysis**

Documentary analysis was needed to reveal background and historical information about the organisations and their systems.

Information from the following documents were used and extracted:
- published material on company's performance (i.e. annual reports) prior to and after computerisation;
- an organisational chart;
- reports on alternative information systems (if available) prior to final choice and also evaluation reports on the effectiveness of the chosen system;
- training manuals;
- documents on organisational or departmental strategies;
- articles in newspapers or industry's journals.

These documents have been written to meet different purposes and audiences than the purpose of the case-study being pursued. Nonetheless, such documents were an invaluable source of data. They were used: 1) to assess, confirm or question, the validity of the data collected during the interviews. When the latter, further and deeper investigation was followed; and 2) to raise new questions especially on events identified in the documentary analysis but not mentioned by the interviewees (Yin, 1981). Furthermore, the documentary analysis can reveal information that participants consider irrelevant to the study, or forget to talk about them or do not want to refer to them for political or other
4.7.7 Presentation of Collected Data

The data collected from the participant-organisations provided the basis for the preparation of a ‘content report’ for each case. Each content report was based on the outline depicted in figure 4-1. It aimed to provide a comprehensive picture of each organisation. It is used to describe the organisations and the environment in which they function, and to outline the organisational history as well as the historical relationship between information technology and the organisation. Focus was also placed on the department or work unit in which ImagePlus has been introduced. Its objectives, functions, and traditional structure were reviewed. The changes occurred prior to, during or after the
introduction of new technology were described and their implications were reported.

Before the start of each case-study, it was agreed that the content report of each organisation would be presented to its management team. This served two purposes:

1) to ease access in the company. From the company's point of view, it was vital that the company will benefit from the research;

2) to check the accuracy of my own interpretations. This is an invaluable way for checking up that vital information had not been omitted.

The significance of the content reports lies on the fact that they provide the themes to be analyzed via the structurational model of computer-based environments. The three case-studies are presented in the chapters 5, 6 and 7. Within this thesis, the presentation is structured so as to first comprehend the context of each organisation prior to the introduction of ImagePlus. This means reference to traditional structural properties and any key decisions and actions taken during this pre-image period. Thereafter, attention is drawn on the period of technological and other changes. As it was explained in chapter 3, this division among different time-periods serves to identify the reproduction, modification and transformation of structural properties as a result of the changes. The discussion on the period of technological changes refers to the interactions that took place within this period between a) structural properties and human agents, b) human agents and technology, and c) between
technology and structural properties. Because of the broad nature of a structurational perspective, it was thought to take a step at a time and to identify all possible interactions between the above factors, before trying to integrate them and make sense out of their synthesis. Each case-study ends discussing the emergence of a CBIE within that particular organisation. Also, the discussion refers to those factors that encouraged or constrained the formulation of a CBIE.

4.7.8 The Limitations of the Field-Work

The impacts of ImagePlus as well as the implications of the emergent forms of work organisation within the three firms were examined soon after their implementation. Therefore, the study reveals their short-term impacts. Unfortunately, due to time constraints, I could not see whether these practices continued in the longer term and what were the people's reactions on these.

Furthermore, at the time of the study the implementation of empowerment within the Customer Services Directorate of Severn Trent Water was still in progress. I was not able to know whether the Customer Services strategy was implemented as planned.

Also when towards the end of the research, it was found that some more data was needed to be collected and some clarifications had to be made about the third organisation studied, the management was no longer willing to cooperate.
4.8 CONCLUSION

In any research certain questions are aimed to be answered. The design of a research process is a preliminary but yet a key step towards obtaining sufficient answers. If the research techniques chosen are insufficient this would reflect on the validity and reliability of the research findings.

After considering and evaluating the various methodological paths widely used in the related information systems field, it was felt that the case-study approach best suits the aims of this research. Given the nature of the topic being pursued, and the little that is known about computer-based informed workplaces, a relatively flexible research methodology was important. The case-study approach was chosen to comprise observation, interviewing, as well as documentary analysis techniques. This approach also has the advantage of enabling researchers to get a contemporary as well as a retrospective view of phenomena.

The following three chapters comprise the individual case-studies. They are intended to be descriptive rather than analytical (although some analysis inevitably takes place), in order to familiarise readers with the events prior to, during and after the introduction of ImagePlus within these organisations, before they are confronted with the analytical chapter.
CHAPTER 5

THE FIRST CASE-STUDY

Using ImagePlus in Severn Trent Water Ltd

5.1 INTRODUCTION

Severn Trent Water Ltd (STW) was the first and the main participant organisation within this study. After contacts with IBM consultants, I was informed about Severn Trent Water Ltd, a water utility organisation in the Midlands, which it claimed that it ‘empowered’ its clerical force via the use of IBM ImagePlus system. The system was introduced in the Customer Services department and front-line employees, who had constant contacts with customers, had access to a broad range of information. It was, therefore, possible that this department was a CBIE.

Contacts with the management of the department started in the end of May 1993 and a visit was arranged for me at the beginning of June where a demonstration of the Image system took place. The next step was to get access to the company so as to carry out a case-study. A confidentiality agreement was signed and a member of the department was assigned to arrange the

7 From this chapter onwards and until the reality of ‘empowered’ organisations is uncovered, this (and its related terms) will appear in inverted commas.

8 Despite this agreement, I was given permission by the Deputy Managing Director to use the company’s name in this thesis.
appointments with the people that I wanted to interview.

The field study was executed over a period of three months. 28 interviews were carried out with people across organisational layers. All the interviews were tape recorded and then subsequently transcribed. The interviews were tailored to each participant's role in the organisation, focusing on their own reaction on the technological and other changes in the organisation.

Two team briefings were attended and a documentary analysis was carried out. The latter had incorporated access to the "Image Requirement Study, November 1990", "Delivering Customer Service-October 1993", the "Customer Service Strategy-August 1993", OFWAT reports on “Levels of Customer Service”, guide manuals and reports on the use of the various systems in the department, annual reports, articles in newspapers and the 'Water Bulletin' with regard to the changes in STW.

Because of the large number of changes that had been taking place within the STW case, the case is presented based on three time periods:
A) STW prior to technological changes, covering the time period 1987-1990; B) STW during the period 1990-1992, a period that has marked the history of the company in terms of the large number of technological changes, and C) STW during the period 1992-1993, which has marked the beginning of major structural changes within the Customer Services directorate.
Figure 5-1 provides an overview of the changes which took place during these time periods.

5.2 THE RESEARCH SITE

Severn Trent Water Ltd constitutes the primary business of Severn Trent Plc being the founder of the group after the privatisation of 1989. In 1989/90, the company's turnover was £541.6 million, that represents some 80% of the turnover of the group. With privatisation, the company was converted to a public limited company status. Since then, STW operates as a local monopoly in a regulated, however, industry and its performance is assessed by the Office of Water Services.
STW is the second largest water company in the UK and the fourth largest in the world. It serves a population of 8,300,000 across an area of 8000 square miles in Central England. The company provides water and sewerage services to nearly 3 million households and commercial and industrial companies across the region. Its principle activities consist of the supply of water and the treatment and disposal of sewerage.

Before describing the Severn Trent Water case as a user of ImagePlus, reference to the water industry in the UK is made.

5.3 THE WATER INDUSTRY IN THE UK TODAY

The UK government privatised the water companies and water and sewerage companies of England and Wales on September the 1st, 1989. As a result, the water authorities have been converted into 10 large public companies, whose however prices are regulated by the government. The companies are also banned from territorial expansion in the UK.

Privatisation has been accompanied by the establishment of the Office of Water Services (OFWAT) undertaking the role of an industry watchdog for the protection of customers’ interests. One of its key tasks is to monitor the quality of service provided by the water-only and water and sewerage companies.

Thus, in contrast to the past, the water industry is regulated from outside and not
by its own procedures. The Director General (DG) of OFWAT monitors and regulates the companies under the Water Act 1989. One of the DG’s principal tasks is to use his power to promote efficiency amongst appointed companies. The companies are required to provide information on a series of specified levels of service indicators (DG standards). These indicators are not performance or efficiency measures in themselves. They enable the DG to make performance and efficiency comparisons between the companies and over time in respect of water and sewerage services and customer services. It is imperative that information on the levels of service is submitted annually by all the companies to the DG. The indicators are set out and explained briefly below:

DG1: **Raw Water Availability** identifies the population whose calculated water resource availability is below the reference level.

DG2: **Pressure of Mains Water** identifies the number of customers' properties that are at risk of receiving mains water pressure that is below the reference level.

DG3: **Interruptions to Water Supplies** identifies the number of customers' properties that have experienced a loss of supply for longer than the reference level without reasonable notice from the company.

DG4: **Water Usage Restrictions** identifies the population who have been subject to water usage restrictions.

DG5: **Flooding from Sewers** identifies the number of customers' properties where the risk of flooding from public sewers is worse than the reference level.

DG6: **Response to Billing Queries** identifies the banded response time for
meaningful response to customers' billing queries.

**DG7: Response to Written Complaints** identifies the banded response time for meaningful responses to customers written complaints.

Price control is central to the regulatory regime. The annual increases water companies can make are limited by a formula laid down in their license of appointment. OFWAT checks that the increases do not exceed the charges bill. The formula is: \( RPI + K \), where RPI is the rate of inflation in November prior to the beginning of the charging year (April) and \( K \) is a figure set for each company for each year and reflects what a company needs to charge to finance the provision of services and its capital expenditure programme. The Secretaries of State for the Environment and Wales set down the current charging limits. (They were last reviewed by OFWAT in 1994 and new charging limits came into effect in April 1995).

OFWAT has made it clear to the water companies that service since 1989 would be taken into account when price limits are reset in 1994. According to the Director General, with water charges increasing in real terms to finance improvements in services, customers will want to see that higher bills do reflect higher levels of service. Customer Services Committees have been set up on a local basis within OFWAT to better protect the consumers' interests.

A frequent criticism of the water industry before privatisation was that it was one driven by engineers who decided what they thought was good for customers.
Since privatisation, the industry has been moving slowly to one in which the customer is a very important figure. OFWAT's role is to secure quality customer service. As a result, the Guaranteed Standards Scheme had been in operation under which customers are entitled to claim payments of £5 (since April' 93 the amount has increased to £10) for company's failures to meet certain specified standards of service.

Another key decision made by OFWAT refers to the billing system by the rateable value of a property which has been in operation for several years. This will cease by April 2000. Although alternatives have not been chosen yet, the majority of the water companies have already introduced the meter-option.

As a result of privatisation and the establishment of OFWAT, the British water authorities have transformed themselves from public sector bodies to profit making Plcs. In response to new imperatives to cut costs and improve financial performance senior managers in the water industry have sought to refocus and improve the ways in which their organisation was governed and controlled so that much greater salience was given to the economic implications, particularly in terms of costs, of management decision-making (Ogden, 1995:198). The chapter presents how one of these water authorities, STW, has managed to transform itself.

5.4 TIME-PERIOD A: SEVERN TRENT WATER '1987-1990' - The Pre-Image Period
This section explores the interactions between structural properties and human forces within STW during the period 1987-1990. It makes reference to the structure of the organisation when this was still a local authority and to the reorganisation that took place within this period. It also covers the period after privatisation but before the introduction of any major information system. Reference to the time period 1987-1990 helps in understanding the conditions that preceded organisational changes.

### STW: 1987 - 1990

![Diagram showing structural properties and human actions from 1987 to 1990](image)

Three particular events are distinguished within this period:

i) the shift from ICL to IBM in 1987;

ii) the reorganisation of 1988; and

iii) the privatisation of the UK water industry in September 1989.
The three time-periods, period till 1988, 1988 - 1989 (Jan-Aug), 1989 (Sept-Dec) - 1990, are depicted in figure 5.2.

The history of STW goes back to 1974 when the various water boards in Central England were brought together to form the Severn Trent Water Authority. Since then (and until 1989), the company was wholly owned by the government.

Until 1988, Severn Trent Authority was structured into eight multi-functional divisions. Customer services had been a responsibility of the customer accounting unit that was under the directorate of finance. These services meant billing and receiving the charges as well as dealing with customer queries.

Customers with queries about their bills could either contact the department by telephone or in writing. Queries by phone could usually be dealt with immediately with the help of Visual Display Units which could retrieve information from the billing system. Many customer queries were in writing. After they had been dealt with, they were stored in customer files.

Telephone bank operators, correspondence, and file maintenance people constituted the main group members of the department. The telephone operators had the most frequent contact with customers, acting both as a source of information and as a channel to other areas of the business. They were responsible for answering over the phones and ‘action’ as many queries as they could deal with. If they could not provide help with a query, they had to pass a
message to the appropriate section. The file maintenance section dealt with
apportionments, instalments and refunds. Their job was to maintain the
accounts. The correspondence section dealt with sorting out the incoming post;
reading, indexing and sending the documents to the relevant sections for ‘action’
comprised the main tasks of this group.

STW customers fall into two broad categories for billing. 'Unmeasured' describes
the normal domestic user, constituting to about 80% of the company’s
customers, the majority of whose charges are based on rateable value.
'Measured' customers are the remainder 20% of the customers whose charges
are based on actual metered consumption.

For several years the billing correspondence filing system was manual. The
paperwork was stored in customer reference number order mainly in lever arch
files. The shelving of all these files required the occupation of valuable floor
space. Besides, operational problems were evident. It was easy to misfile and
even to lose documents.

In 1985, Severn Trent Water Authority decided to start microfilming the
documents. The idea was to film every letter on receipt, simultaneously indexing
the customer's identification code against the microfilm roll number and frame
location, and storing this on a dedicated mini-computer. For later reference, the
customer's code was entered into the mini-computer and the system responded
with a film number and frame number - this was known as computer aided
retrieval system, that was introduced around the same time. The film was loaded into an associated reader and the frame number entered and after searching automatically the screen showed a reenlarged image of the original document. Pressing a button could initiate a hard copy printout, if required.

During that time, customer services were handled on a geographical (regional) basis. Each of the eight divisions/districts (the previous water boards) was responsible for dealing with its 'own' customers, the company's customers located within that district's boundaries. Billing and charging customers as well as answering to all their queries were the responsibility of these autonomous divisions. One of the old employees in a current satellite office remembers: "at that time we were doing every function within the division, which involved in addition to the billing and the telephone bank, file maintenance, changes in the rateable values, charging status of properties and debt recovery".

The structure of work that existed until this period implied a power distribution among the various divisions of the company, on an equal basis. During that time, there was a decentralisation of power.

As a result of a reorganisation that took place during 1988 the company's divisions were reduced to four (Birmingham/centre, Derby, Shrewsbury, Leicester). The divisions started operating on a functional basis. Things like billing, chemical analysis, project analysis, project design and computer management were moved to the centre (Aqua House in Birmingham).
The 1988 Reorganisation

The reorganisation in the 1988 (the main elements of which were centralisation, functionalisation and specialisation) had several implications for the structure of the customer accounting department. Firstly, it meant a departmental structure where different groups of people were dealing with different groups of customers depending on whether they were metered or not. Secondly, it implied the centralisation of the billing and the telephone bank. The entire measured (metered) side was brought together under one roof in the centre (Aqua House). This meant that billing the measured customers, answering to their telephone and postal enquiries, and file maintenance (apportionments, instalments, refunds) were all centralised. Tariffs were kept in the satellite office in Leicester.

With regard to the unmeasured side (which covers the customers that are billed on a rateable value), the billing and the telephone bank services had been centralised. It is important to note at this point that although both the measured and the unmeasured sides had been transferred into the same premises, they were located at different floors; the third and the first floors respectively.

The various functions of file maintenance for the unmeasured customers were allocated between different groups in the centre and the two satellite offices in Derby and Shrewsbury. This meant that each group was dealing with one function only.
In 1989, STW customer accounting department was responsible for the billing and processing of 3 million customer accounts. The billing head office was based in the centre of Birmingham (Aqua House) with three satellite offices situated at Derby, Leicester and Shrewsbury. By that time, it was clear, that a major change in hierarchical power was implied by this reorganisation. Power shifted from the divisions to the centre. There was a centralisation of power.

This reorganisation also caused a change in work structure. The range of tasks and level of skills required by each post was determined by the organisational hierarchy. Shopfloor employees were carrying out a limited range of tasks which were in the main simple and routine. Furthermore, lower organisational layers comprised routine, fragmented tasks and no autonomy and freedom of action.

The 1988 reorganisation was also the cause of a differentiation between the measured and the unmeasured units within customer accounting. There were those few (about 30) on the third floor who dealt with the measured customers and the many (about 200) on the first floor who dealt with the unmeasured customers. The measured side was responsible to ‘action’ complicated queries and hence had more variety and responsibility than the unmeasured side. According to an employee in the measured unit: “it can be boring downstairs. Dealing with an unmeasured supply the charges do not vary as such because of the fixed charge”.

As an authority, the management of the STW had to comply with the decisions
and actions of the government at the local and national level. In fact, with the
organisational changes of 1988 the company became a typical government
body, a bureaucratic, multi-layered organisation. For instance, the power
structure revealed that people at higher organisational layers had the authority
to make the decisions and to influence organisational practices as well as the
power to allocate resources among various organisational members. This
bureaucratic, multi-layered organisation also provided the means for raising
understanding among members about the reactive approach of decisions and
practices. This way of managing created a passive attitude especially among
lower organisational members towards decisions and actions: the climate was
not encouraging a proactive approach. At that time there were no standards to
be met. "It was a crisis management" according to an employee. It was very
difficult to manage the work especially during peak periods. "You were not sure
exactly what was done and how well" (supervisor). A manager admitted that
people then had not been given much responsibility and that morale was low
within the organisation. Human actions and behaviour were therefore
reproducing the structural properties of their bureaucratic organisation.

From ICL to IBM

Severn Trent Water Authority used to be a 'loyal' ICL site and one of ICL's
largest customers. At the beginning of 1987 and halfway through a massive
computerisation project involving five new ICL mainframes which aimed to
computerise its billing system, the company announced that it was making a
massive investment in IBM hardware.

A systems person, who was around at the time, explains the company's decision to switch to IBM: "Around 1984-85, we were looking at introducing a very large customers accounting system. At that point in time, ICL machines were considered inadequate in terms of capacity to cope with the volume of transactions that we were dealing with. It was probably around 1985, that we started talking to different manufacturers...My understanding is that we have switched to IBM because of transaction volumes and capacity requirements at that particular time".

ICL had provided a billing system which was not big enough to fit to the company's needs. At that time, the unmeasured and the measured sides used to operate on different systems. Several other members of the management team have related IBM switch to the desire to have a single customer database and a single method for billing people for both the measured and the unmeasured customers. A customer accounting manager had given the following explanation: "In about 1987, we decided on a dual supplier policy. In practice that meant to come closer to IBM, that was the market leader...Dual supplier policy meant that we didn't want to put all our eggs in one basket and we didn't necessarily want to be totally ICL or totally IBM".

The information technology manager of STW at the time, AJ, was very instrumental into the shift from ICL to IBM. "He, together with the then finance
director, were the people who were the major players in that decision” (systems manager).

The Privatisation

The UK government’s decision to privatise the water and water and sewerage industry in September 1989 put new demands on the management of STW. As it will be seen soon, the demands had more relevance to some aspects of the signification and power structure rather than to the work structure.

Privatisation had been accompanied by the establishment of the Office of Water Services (OFWAT) which undertook the role of an industry watchdog for the protection of consumers' interests. One of its key tasks was to monitor the quality of service provided by the water-only and water and sewerage companies. Hence, the performance of STW was assessed via the regulations (known as DG standards) set up by the Director General of OFWAT. The DG standards (1-7) embodied norms of organisational activities and served as the defined obligations of the organisation. They legitimated the rights of OFWAT to keep control over the company's activities as well as the company's obligations towards its customers. These standards could directly and to a great extent affect the organisational practices since the company operated in a regulated environment. This set of rules constituted an important element of the structure of signification. With respect to customer services, DG6 and DG7 (see p.108 for their description) could be added to the signification structure within the
customer accounting department. They provided organisational members with the means of understanding the level of customer service achieved by their organisation. They distributed shared understandings of the company's obligations towards its customers and they served as quality consciousness among its members.

Moreover, the existence of the DG standards had an effect on the power structure; again, with particular reference to customer services, a new post was created to review, monitor and report the department's performance on a monthly basis in respect to the DG6 and DG7. The person who holds this post, and whose title is 'quality development officer', says: "I am the big brother of the company - I am responsible to keep a watch over the company...If we find discrepancies then we [he and his team] speak either to the person who has dealt with it or to their supervisor".

During this time period (sept.1989-1990), there were no variations in organisational processes of work. Yet, important variations occurred in terms of the organisational context. Immediately after privatisation, a group holding company, called Severn Trent Plc, was established with STW serving as its core business. STW was the only regulated company within the group. Such a structure freed the remainder of the subsidiaries from the constraints of a regulated environment whilst allowing the group to diversify outside water supply.
Severn Trent Plc was managed by a Board of Directors who acted in the shareholders' interests and aimed to achieve the group's mission which indicated the aim of the company to be the best utility in the UK as well as a profit oriented, customer service business. The 'vision and mission statement' was developed by the Board of Directors. It specifically referred to an increase in quality customer service, efficiency and capital productivity, and internal and external communications. It stated that the aim of Severn Trent Plc was to be a world leader in the water business, to establish itself as a successful international corporation, founded on a strong home water utility base, and to develop a substantial earnings stream in other appropriate businesses. The mission was set up with the establishment of the corporation, immediately after privatisation.

The mission statement was introduced to guide the future of Severn Trent Plc and its subsidiaries. The statement revealed a strong desire to make a difference and dominate in the national as well as the international market. Furthermore, the establishment of the holding company had refocussed the power structure within the organisation; the decisions and actions of the Board of Directors could exert power over the management of STW. After privatisation and as a result of the transition away from being a local authority, the directors of STW had got more delegated power than they have ever had in previous years. A customer accounting manager has explained: "the directors do not necessarily need to go back to the Board of the group to get approval; the Board recognizes that their directors manage the organisation between them and that
each of the directors manages their part of the organisation”. Nonetheless, the Board of Directors still had an influential role over the activities of STW. Decisions of a strategic nature needed to be approved by the Board.

The change in ownership, as a result of the government's decision to privatise as well as the establishment of an industry watchdog were significant changes for STW. This meant to encourage a switch from an engineering based to a customer-oriented organisation.

With privatisation, although there had not been any modifications on the structure of work, the language-in-use within the organisation was modified. Being privatised, it was important for STW to function in ways so as to take account of the shareholders, the Board of Directors, its competitors and OFWAT.

Although the activities of the organisation remained the same, the emphasis of the organisational mission had changed. The management of STW had the responsibility to ‘action’ the decisions of the Board of Directors who in turn were serving the interests of the shareholders. In addition to the role of the Board of Directors and the shareholders, the role of OFWAT on organisational performance as well as the DG standards were widely spread to and known by members across the organisational hierarchy.

In structurational terms, the above are interpreted to mean that human agents
in the upper hierarchical levels, bearing in mind external forces (e.g. competition, and OFWAT) encouraged the transformation of the signification structure to the one that aims to upgrade customer status, and modified certain aspects of the power structure with the establishment of Severn Trent Plc and STW as its subsidiary. These modifications, however, were more relevant to the upper human agents rather than the lower human agents. There were the members of the managerial team who had to show direct concern for the shareholders, the decisions of the Board, the activities of their competitors as well as the role of OFWAT in the water industry. The language-in-use of the lower organisational human agents had been affected by the role of OFWAT and the DG standards so as to create shared meanings among the shopfloor about the company's regulating environment. Terms like 'OFWAT', the 'industry watchdog', 'the DG', 'DG standards' and more specifically the 'DG6' and 'DG7' had been mentioned by almost all the participants in the research. For example, a supervisor explained the need for constant monitoring of work as follows: "Before privatisation there were no standards to achieve...Since we have been privatised, there is the watchdog body, OFWAT, that monitors our work, and gives us certain standards that we need to achieve".

The privatisation of STW and the establishment of Severn Trent Plc had refocused the role of the managerial team of STW, so as, for instance, to be more active and responsible to the company's shareholders. No modification in the power structure occurred with regard to the sharing of power across the various hierarchical layers. Rather, the ability to make decisions and to manage
and control were held as before at the upper organisational levels (e.g. directors, managers), and those who continued to be controlled and carried out instructions were the people at the lower layer (e.g. the clerical staff and the telephone operators in Customer Accounting).

5.5 TIME-PERIOD B: TECHNOLOGICAL CHANGES IN THE STW CUSTOMER ACCOUNTING AREA ‘1990-1992’

The discussion for time period B incorporates the concept of technology in the STW organisation. The focus is on how the structural properties at the end of the previous time period have been reproduced, modified or transformed as a result of the technological changes. The discussion is built upon the structurational model of computer-based environments and is based on the following relationships:

a) human agents-technology and vice-versa, b) structural properties-(human agents and technology), c) technology and structural properties. Along with this analysis, the relationship between ‘upper’ and ‘lower’ human agents is examined.

5.5.1 Human Agents - Information Technology

The emphasis of this section is shown in figure 5-3 (see continuous lines). This section focuses on the impact of human agents on the introduction of new
technology in the Customer Accounting department and the impact of technology on the human force within this organisation.

Aiming for a unification of the measured and the unmeasured sides of the Customer Accounting department (in the longer term), the company was looking to buy a new billing system so as to have a single customer database across the department. Further to this system, the company was looking for a document storage and retrieval system which could allow access to all customer correspondence (postal and telephone enquiries) throughout the Customer Accounting department. CAST, a standard billing system for utilities and the IBM ImagePlus were the chosen alternatives.
CAST

A standard accounting system was introduced in April 1990 as the new billing system in customer accounting. Set-up on IBM mainframes, the system was refined to meet the particular needs of STW and was called CAST, Customer Accounting Severn Trent.

The original decision to bring in CAST was a joint decision involving the computer systems manager, the director of finance and the then customer accounting manager. A specification was drawn of the sort of system the company was looking for, and then visits to several organisations around the world took place to view several billing systems. The way the system was actually implemented was to modify it to meet Severn Trent’s specific requirements. That involved people (supervisors and middle managers) from the customer accounting side who had been taken off-line in order to help programmers to adapt the package to the company’s requirements. They were people who knew the business and the facilities that the staff expected. Between them, they worked very hard to modify the original package so that when it was introduced, it gave the required functionality.

CAST was originally developed for the measured customers in 1990 with version 1 to replace the previous measured billing system. The latter had been with the company since the decision was made to try out the meter option for billing customers. The system had an on-line enquiring facility but no on-line real time
updating facility; hence, the information provided was out of date. The introduction of a more comprehensive measured billing system was vital with the rateable value no longer existing after the year 2000. CAST had been enhanced several times to meet user requirements. Suggestions for improvements or changes on the CAST system could come from people at various organisational layers and often from the clerks. Systems enhancements were the responsibility for the CAST project team. The latest version, CAST 3, was an enhancement of the measured billing system to welcome the unmeasured billing system. Prior to that, the unmeasured side of the business was operating on a different system, called STUBs. Since then, both measured and unmeasured customers have been located in the same system.

![Participants in the CAST Project](image)

**Participants in the CAST Project**

CAST

- Initiative
- Approval
- Implementation
- Post-Implementation

ACTORS

- Board of Directors - ST Plc
- Directors - STW LTD
- Systems People/Programmers
- Customer Services Managers
- Supervisors
- Clerks/Operators

Figure 5-4
Figure 5-4 above summarises the various roles undertaken by the participants in the CAST project.

**IMAGEPLUS**

Early in the year 1990, the company started looking for a document storage and retrieval system which would allow access to all customer correspondence throughout the Customer Accounting department. It was clear that the regulatory environment had a role to play to these technological changes: OFWAT required that all customers' queries were dealt with within 20 working days from the day of the call. This made it important to have a system in which outstanding work could be followed easily. As a middle manager puts it: "The big driver was the increasing pressure from the customers to respond to documents quicker and to improve our turnaround times. It was important to improve the time for dealing with the documents...". A similar explanation was given by the then director of computer systems according to whom the system was introduced to deliver immediate improvements in the speed and quality of response to customers (Financial Times, 30/1/92: 12)

In order to identify the right system, the director of finance appointed a systems person as the image project manager. In turn, this project manager recruited his team members forming a project group that was called the Image project group. In looking for a solution, he had set up three major priorities: 1) a solution that
was compatible with Customer Accounting's existing line of business applications, 2) a solution that was flexible enough to meet future changes and 3) a solution that could provide a level of service acceptable to Customer Accounting and its customers.

The image solution, and particularly ImagePlus, was recommended by IBM. The system was used at that time in North America and it was new in Europe. A feasibility study in partnership with IBM was undertaken to look at ImagePlus. The study was a joint responsibility of Severn Trent and IBM and it was known as the "Image Requirement Study". The purpose of the study was to establish the customer accounting requirements for image processing and to develop an implementation plan which identified the key issues and resources needed. It basically pointed out control and operational uses of the image system. The study identified three key areas in which ImagePlus could benefit Customer Accounting: 1) benefits in terms of customer services, i.e. by providing a faster and a more efficient service to customers; 2) benefits in terms of improved productivity, e.g. by reducing the time needed to distribute, control and handle pieces of paper, and 3) benefits in terms of management and control, e.g. by providing accurate and up-to-date information on the amount of work outstanding.

A team of 8 people was assembled to carry out this work. Two people were from Customer Accounting, three were systems people and the other three were IBM consultants. The study was carried out between October and November 1990.
The study showed that ImagePlus could provide the levels of functionality required. The project was approved in November 1990 by the Board of Directors.

Figure 5-5 illustrates the participants and their roles in the ImagePlus project.

**Implementation**

The decision for technological improvements at an operational level was made by the upper human agents, i.e. directors. Their approval by the Board of Directors was important because of the high level of expenditure involved especially in the case of the ImagePlus. The implementation of both systems was passed over to the systems department but under the responsibility of the
director of finance, since the Customer Accounting department was under his
directorate, and the director of computer systems. Two separate project teams
were established undertaking the responsibility for implementing the two
systems.

CAST and image processing technology made their appearance in the
customer accounting department of STW almost simultaneously. It was realised
by the systems specialists that careful implementation was important for the
most effective use of both of the systems. It was vital to ensure that CAST and
ImagePlus implementation did not conflict. It was also decided that work should
start immediately due to the pressure the company was facing by the DG to
improve its customer services.

Both project teams consisted of users from the Customer Accounting
department and systems people. The Image project team, in particular,
consisted of user-staff from the Customer Accounting department, technical
staff, application developers as well as two IBM consultants. In the early days,
there were about 30 people on the image project team.

The first signs of staff participation into the occurring technological changes
were evident with the establishment of the two project teams. Several staff
members within the Customer Accounting department, mainly with a supervisory
background, had participated in the implementation process, while after
implementation all members were encouraged to point out areas that could be
The Image System In-Use

Some key functions of the image system are described below:

- All incoming letters once sorted, were indexed and scanned onto the system. The latter meant that the image of the paper document was stored on the computer.

- Telephone messages were keyed directly onto the system rather than being handwritten onto paper documents. Screens automatically prompt the telephone operator for all the details needed to add the document to the ImagePlus system. Therefore, there was no further need to manually index and scan telephone documents.

- Staff no longer were receiving work via paper documents. Instead they could request work from the system which automatically assigns to them the highest priority item of work they were qualified to process.

- Work was routed through the use of queues. It was also given a priority to determine its position in the queue relative to other documents. As time passed the priority of the document automatically increased and it moved higher in the queue. Different types of documents had different priorities that take into account their urgency and importance.

- Staff was able to view the document on special screens whilst concurrently viewing and updating the customer's account. If staff needed to view other documents relating to that account they would be able to view all previous
archive material from their desks. This information was easily accessible and could assist staff in preparing a comprehensive reply to the customer.

- Staff could be identified onto the system and was given the ability to take work from other queues. Supervisors were able to monitor the size of queues and the priority of the items outstanding. Most urgent work was processed first to ensure adherence to DG standards.

Indexing and scanning were new functions that have been introduced with the image system. People who were working in the microfilm section became the indexing and scanning people.

The image system had changed the way customer inquiries were dealt with and had offered the opportunity to significantly reduce the time it took to make a response. Staff no longer received work via paper documents. Instead, they could request work from Imageplus which could automatically assign to them the highest priority item of work they were qualified to process. This could allow telephone bank staff to positively confirm receipt of a customer's letter and identify who was dealing with it. If a customer had a query concerning a letter that he had received from the company, the telephone operators were able to view the document on an image terminal to deal with the question in full.

The new technology had also affected supervisors' work. The supervisors’ roles had been strengthened. Supervisors within Customer Accounting had continued to have the responsibilities for staff performance and for the management of
their team but the ways in which they accomplished their job and the tools they used had changed. The most obvious change to the supervisor's role was the requirement to manage the queues for their team. This involved allocating staff to queues initially and changing the allocation as necessary. This was similar to what was done with the paper-based system, but it required supervisors to be completely familiar with the queue management aspects of the system. The supervisors had much closer control over the backlogs and the types of work being 'actioned' by their team than before due to the information provided by the system (e.g. how many documents in each queue, what each person was actually working on at a particular moment, who put a particular document on hold etc). According to a manager, the system helped to focus that supervisors should be doing more of their supervisory tasks rather than doing a job and also supervise: "The system gave us some of the capabilities to do that more effectively".

The ability of the system to refocus supervisors' role and thereby to be able to monitor and control operators' work was realised at an early stage. Clear reference to this was made in the "Image Requirement Study" prepared in November 1990, a formal study which had been reviewed by the STW directors and the Board of Directors of Severn Trent Plc prior to the approval of the image system.

Another area in which the impact of ImagePlus was evident was at the middle management level. The system increased the ability to control the workflow. In
particular, a) accurate and up to date information on the amount of work outstanding and its urgency could be available on the screen, b) staff could be quickly reallocated to others as necessary, and c) there could be a clear record of the processing that had been carried out on each document in the event of a problem.

Reactions to the New Systems

As it was initially aimed, the introduction of the new information systems affected the way work was carried out in the Customer Accounting department. To quote a revenue manager: "Before we had image, if we used to have problems in either Derby or Shrewsbury there were two ways to handle them: either to get boxes of paper and drive them 50 miles away down to Birmingham to be dealt with, or take people from here to those satellites. Neither of which was good because people do not like being moved and moving paper takes time. By the time you got the staff there, you realise that you do not have the resource [skills] to deal with it. With ImagePlus, literally, we can switch on and off tasks; we can have people in Derby working on Shrewsbury's queues or Shrewsbury working on Birmingham's queues. It gave us much more flexibility in terms of having the resource available without location being a barrier".

A manager within the department explains:

"ImagePlus was the first move in terms of changing the way work was done [and particularly] in terms of integrating activities. It was well received because
it was new and there was nothing to replace”.

A revenue manager at the middle level explains:

“It made my job a lot easier. I can go and have a look at any time at queues or whatever and then I can very quickly get a feeling of how well my section heads are doing and then I do not need to look at it at all. It freed up a lot of my time for me to actually be able to go and look at longer term things that are now important to us where are we going to be in the future, e.g. the customer service strategy and quality”.

One of the telephone bank staff explains:

“The process is a lot quicker now. For us on the phone bank, we get more satisfaction. Before we could not even set up a payment booklet. Before, we were saying to the customer ‘yes we will send this payment booklet to you’ and we were putting a message across to the instalment people to do that. Now we can do that all ourselves and we are sure that the booklet will reach the customer in a few days time. We are sure that all the work has been done and there are not so many routes to do the job”.

The new systems constituted new ways of doing the work within the Customer Accounting department. They provided new tools to clerical staff in order to do their job more efficiently and effectively. Training was important to make this happen. Some roles had been refocused (supervisors), created (e.g. technical advisors), reestablished (e.g. departmental managers) by allowing them to deal
with more tasks of a strategic nature, and some others have even disappeared (e.g. microfilm staff).

It is also important to stress that none of the changes which took place during this period and which had an effect on operators', supervisors' and managers' roles have come as a surprise to the managers of the Customer Accounting department. The functional uses of the image system were realised during the period of the feasibility study and were reported in the "Image Requirement Study".

Although it seems that most of the systems implications had been intentional, some feelings of dissatisfaction as a result of the technological changes had been identified among employees at the lower level. As a clerk has put it: "the system dictates really how we work". Another said: "since the work has been functionalised, we are not allowed to go downstairs to meet the customers who call in for queries; we are told that this is not our job"; "It is tiring to work on the computer all the time". Such feelings have been more noticeable in the previously multi-functional satellite offices where employees' resistance to change had been more evident rather than in other areas. A clerk on file maintenance, in one of the satellite offices explains: "[because of the new technology] we ended up doing one function and it was not popular. We had a lot of staff changes [especially during the period 1991-April 1993], people were leaving looking for jobs with more variety".
A new word was introduced by the managers-members of the implementation team during the implementation of ImagePlus. The word was ‘empowerment’ and revealed the potential of the image system to give ‘empowerment’ and enhance the capabilities of the workforce. However, ‘empowerment’ had not been achieved. According to a supervisor in a satellite office “the word ‘empowerment' was used a lot at the initial stages of the systems implementation”. The smile on her face indicated that the reality was not like that, while a cartoon making a joke about ‘empowered’ employees was decorating her desk.

From the information provided within this section, on the relationship between people and technology, there is support for the organisational choice perspective (Child, 1972; Buchanan and Boddy, 1983). The ImagePlus system was not the only available image technology and certainly not the only system to meet company’s needs. It has been however, considered by key organisational players (i.e. directors, systems people), as the best alternative to improve performance. ImagePlus was an IBM product and IBM, in practical terms, was the only supplier. The system was promising to increase response rate to customers’ queries and also to give more status and prestige for STW in the entire European market since it was going to be the first European firm to acquire the system.

5.5.2 Structural Properties - ‘Human Agents-Information Technology’
Figure 5-6 illustrates the emphasis of the discussion within this section. It looks at how structural properties had influenced the introduction of new technology.

In general, technological changes were welcomed as a result of the pressure from OFWAT and the need to improve customer services. Members of the lower organisational level who had been interviewed, realised the importance of the new technology in their workplace as the means for improving customer service. DG6 and DG7 were widely spread and known by then and this helped in making sense of the technological changes. For instance, the project team, which worked on the 'Image Requirement Study' drew on the structure of signification arising from the DG standards as interpretive schemes to suggest the introduction of image technology within the Customer Accounting department.
One of their conclusions was the following: "ImagePlus provides facilities that allow automatic prioritisation of work according to its age and type. This can assist Customer Accounting in ensuring that... DG guidelines are fully complied with" (Image Requirement Study, Nov.1990:27). The language-in-use which preceded technological changes was pervasive and it served as "a vehicle for achieving practical effects" (Pettigrew, 1979:575); it legitimated the introduction of new technology. This was also evident at the lower organisational level: "We are responsible to the DG and he is answerable to the government. We have standards to achieve... The management wants us to use the system to answer as many queries as possible..."(supervisor).

‘Empowerment’, another new word that had been introduced during the period of technological changes by the Image project team, did not take a substance form; for its implementation required modifications in the work and the power structure of the organisation. As it will be seen in the following section, modifications had not occurred in these areas.

As it has been explained in the previous section and shown in figures 5-4 and 5-5, top level organisational members have participated in key decisions on the implementation process. For instance, the Board of Directors drew on the power structure arising from their powerful position within the holding company, to give the 'go ahead' for CAST and image technology.

Furthermore, the power structure intervened in the selection of the people who
participated in the project teams. As a result, where people other than the directors were involved in taking actions with regard to the use of technology, these had to be approved or chosen by the directors or other members of the organisation at the upper organisational layers. It has been noted earlier that several staff members were asked to participate in the implementation process. These staff members were holders of supervisory tasks who were trained to be 'side captains' and who in turn trained the clerks. The power structure had intervened again in this selection. They were selected by their section heads and approved by middle managers. Front-line employees were only asked to participate after implementation by indicating aspects of the system that could be improved or enhanced. Suggestions had to be discussed first with their supervisors, and the supervisor in turn was passing over the ideas to the relevant project team (either CAST or Image). This communication process between organisational members reflects structural properties that existed at the time the company was a government body. It draws upon the power structure where members at the upper organisational layers can exercise power over the lower layers.

Also, the decision to use ImagePlus reflected those patterns of the signification structure which emphasized the need for gaining competitive advantage. As a manager puts it: "There is an aspect of giving us competitive edge in terms of differentiating ourselves from other PIs". It has been very clearly stated in the company's vision and mission statement that the company aims to differentiate itself in the market.
The focus of this section is depicted in figure 5.7 (see continuous lines). The section aims at uncovering any technology impacts on structural aspects of the organisation under consideration.

It was claimed by the majority of the interviewees (upper and lower) that they would, by no means, like to go back to the previous way of working. By that time, the technology had been well-established. It served as a communication medium between the staff; instead of sending hand written messages around, the allocation of work was computer-based. This necessitated the establishment of new rules and procedures with regard to the processing of work. The work
structure was in the main reproduced with slight modifications as a result of the new technological tools. It remained a functional-based structure as before.

The power structure has been reinforced in certain instances because of the new systems in the Customer Accounting department. ImagePlus, in particular, has been a major facility for the reproduction of the power structure providing a base for differentiation between clerks and supervisors. A distinctive example is the use of technology to differentiate and clarify supervisory tasks. Supervisors acquired different menus than the clerks and could use the system to view and monitor their work. An employee's comment reinforces the above finding. With particular reference to the culture of the organisation, he found that with all the technological changes, the culture of the organisation had been transformed from an 'uncontrolled' role culture to a 'controlled' role one.

It was widely recognised among the members of the department that the best way to measure the improvements in the quality of service was by considering the reports produced by OFWAT. As in the year 1990/91, "very poor" performance was also reported for the financial year 1991/92. However, it was identified that there have been some improvements in the response times of billing queries and complaints comparing to the performance of the previous years.

The OFWAT rule according to which when a company takes longer than 20 days to respond to a complaint, customers can claim a payment of £5 (since April
1993 the amount has risen to £10) was also important to the company. For the year 1990/91, STW had 5 per cent outstanding billing queries and 5.4 per cent outstanding written complaints after twenty days. For the year 1991/92, there were 2.6 per cent outstanding billing queries and 0.6 per cent outstanding written complaints. It was evident that the company was steadily improving its customer services.

For the period 1992/93, STW performance on customer queries and complaints had moved from 'very poor' to 'good' on OFWAT ratings. Also, in September 1992, STW was awarded the UK Government Charter Mark Award for customer service. The award was a recognition of the company's efforts to improve the quality and speed of response to customers.

Further to the above, the new information technology had an effect on areas other than the working practices within Customer Accounting. In April 1992, Severn Trent Plc had announced the acquisition of Computer Systems and Applications (CS&A) as part of its continuing expansion into international markets. CS&A specialises in providing computer software packages to utilities focusing on customer information and billing systems. It has become part of Severn Trent Systems which is a Severn Trent subsidiary, but it particularly aims to market the full range of utility systems developed in STW. A marketing directorate was established within STW to assist in this effort. The new technology within customer accounting was used for public relations purposes as well as for promoting the systems to other companies. "We have a part of our
business that aims to sell these systems. So, part of our organisation is actively involved in promoting our systems with the view to market them. Organisations from all over the world come to us via IBM to view the ImagePlus system. We are a reference site for IBM. We show them the technology that we have and talk to them about the benefits that brought to us. It is a market opportunity to sell that system to those people. We also promote the CAST system. That has only recently begun to take off. We bought the company that has originally provided us the billing system" (manager).

During the period 1990-1992, the reproduction of structural properties had become apparent. Although there had been several technological changes during this period, these were used to preserve rather than to alter the structural properties, especially the power structure within the organisation. The changes reinforced and strengthened the structural properties that existed within STW even prior to privatisation. No major structural change had occurred with the introduction of technology (e.g. hierarchical structure, task specialisation and fragmentation). Rather, information technology had acted as an occasion for the reproduction of the company's structural properties.

5.6 TIME-PERIOD C: SEVERN TRENTH WATER LTD '1992-1993' - The Post-Image Period

As a result of its customer-orientation program, STW had established, towards the end of 1992, the Customer Services Directorate which was an integration of
the accounting and operational sides of the business. Customer Accounting and Operations (which provides services to new customers, e.g. installation of water pipes, deals with supply problems etc) were until then two separate departments. The new post that was created for the Director of Customer Services was assigned to MU, who had been with the organisation for more than 20 years. The decision to establish a Customer Services Directorate has been drawn upon the power structure, having been authorised on the one by the Board of Directors and legitimated on the other by the norms for improving customer services.

With his new role as the Director for Customer Services, MU recognised that the new information technology had failed to improve effectiveness to the degree required. According to the new director the emphasis over the technology side of the projects was not enough: "a great deal of attention and effort and investment had gone in the technology side of business but that the organisational aspect did not enable that technology to deliver". He recognized that reorganisation was important for two reasons: to shorten the response time to customer queries and to reduce the number of the workforce. According to a senior manager: "[comparing to the other water companies] we are double-staff ... We are over-peopled ... we need to change the organisation, change the responsibility and accountability of employees in customer services and get the numbers [of employees] down".

The solution involved the 'empowerment' of front-line employees as well as the
people in the districts and satellites so that they can take action in response to customer queries. This, consequently, means less work passing around. Therefore, the 'empowerment' potential of ImagePlus has only managed to take a substance form during this time period. The Customer Service (CS) Strategy which was established to promote this, was initiated and driven by a key organisational player, the Director of Customer Services who also held the role of the Deputy Managing Director of STW. The objectives of the strategy (extracted from the document: "Delivering Customer Service - October, 1993) were to achieve higher levels of customer satisfaction, higher levels of employee satisfaction, a major contribution to STW efficiency gains, whilst sustaining the levels of excellence with regulatory requirements. The strategy looked at all three areas of customer services: core products, individual services, and relationships with society.

It was important to get the support of other directors as far as the CS strategy was concerned. As the Customer Services Director puts it: "We needed to sell it to other directors to make sure that they are comfortable with it and can live with it". It was important to articulate and communicate what would change in respect to customer services and get everyone (key organisational players, e.g. other STW directors, Board of Directors, shareholders) to sign on. A conference was arranged for this purpose with about 300 attendants to 'sell' the strategy. They were senior people who work directly and indirectly with customers. Members of OFWAT Customer Service Committees were also among the participants. A written report was distributed to the participants. The conference
was also taped and copies of that tape were sent to senior people who did not participate.

It was inevitable that with the CS strategy the 'information technology' theme was taken on board again. "We have got the technology but we have not worked out how to interface and interlink it with the people in the organisation, and together to get the best out of it" (Director). Even with the technology available, response times could be slow at remote locations with low line speeds and limited access. Moreover, although the existing systems for customer interaction were comprehensive, they were not integrated. For instance, a customer could not speak to a single contact who can answer both operational and billing queries. So, delays meant to occur.

The CS strategy stressed that more information should be made available to the local district offices and the satellites, so that to shorten the response time to customer queries. Another issue that was mentioned in the CS strategy was to bring telephone skills to a higher level so that more queries can be answered at the point of contact. That would then imply less work passing around and shorten response time. The CS strategy was stressing the significance of a customer accounting multi-skilled person who could be able to handle both measured and unmeasured enquiries, tariffs changes, meter options and refunds.

At the time the CS strategy was developed, there had been a change in the
management of the department to a deputy director that was supportive to the
director's plans for structural changes.

During this period, there has also been an attempt to improve communication
patterns by encouraging more frequent interactions between upper and lower
organisational members. "They [managers] have recently, started to listen to the
people down the line" according to a staff member. The director explains this
action: "I don't know how to do the job. They are the ones who know the
problems and what's wrong with us".

In the managerial report "Delivering Customer Service" the following statement
has been found, that reinforces the above: "We are a company service business
and customer service comes from the hearts and minds of staff at all levels.
There needs to be a strong element of involvement from all employees".

"They have asked our opinion this time, what would WE like. The last time that
they wanted to do something on the system they have asked us what we
wanted, what would help us. We all filled in a questionnaire on what WE find
helpful. It has never been done like that before. People who have never worked
in here developed the system without realising what we, the people who do the
job, really need. This time they have come to the people who are doing the
work. I think it is better, because they get a better idea of what we want"
(telephone bank operator).
The new director suggested that it was important to look at the people down the line and get their opinion as to find what was wrong and what was needed to be done to put it right: "By talking to our people, we have reached to the conclusion that all the problems that we had were related to interfaces. Everytime we have an interface between two parts of a function we have got a gap; and there was a potential to lose information within that gap. As soon as you need to pass information from one group to another you have the potential of problems".

The strategy acts as the foundation for the formation of a CBIE within the Customer Services directorate. It talks among others about the ‘empowerment’ of the workforce and it suggests the use of the various systems already in existence to facilitate in this effort. According to the Director of Customer Services: "what technology does is to enable the person to provide the service. For instance, the person on the phone bank can be on line and respond to customers queries. If you don’t give empowerment, then I think you are reducing the chances for doing well that job and the extent to which she can provide good customer service. If you train them however, and I stress that empowerment does not come without training - because at the end of the day it is down to judgement - then, the empowerment complements the technology".

Furthermore, MU attempted a transformation of the power structure with the decision to decentralise and allocate work on a geographical basis. This has been resulted from the sharing of information and knowledge across the directorate. This should not be taken to mean that managers/supervisors have
lost control over the workforce. It is true that they may no longer hold information power, but they have strengthened their legitimate power. Even with the structural changes that have been taking place within the directorate and the emphasis on employees’ ‘empowerment’, supervisors and managers can still use the technology to monitor work. Therefore, a significant amount of power still remains at upper organisational layers. Supervisors and managers may no longer have the information power, due to the sharing of information, but they have certainly kept their legitimate power over employees.

The power structure within STW has been further transformed with the establishment of the Customer-Services Directorate. The company’s mission statement puts it this way: "We are a profit-oriented, customer-driven business, developing markets, meeting our obligations, and quality and service objectives". This means that the Customer Services directorate has become dominant outside the scope of its own functional area (Wilson and Rosenfeld, 1989). It is therefore, expected that the Director of Customer Services would be more influential (indeed, he has proved so-far that he is quite influential with the launch of the Customer Service strategy) and more successful in achieving desire outcomes than other directorates, even though organisational hierarchy positions the various directorates at the same organisational level. Following the above argument, MU has also managed to become more powerful than those who were previously holding managerial posts in the customer accounting department, e.g. the head of customer accounting. The link of the accounting and the operational sides of business into the Customer Services directorate
made him responsible for 5000 of the 7000 employees of the organisation. Furthermore, the fact that he is also the Deputy MD has strengthened his saying within the whole organisation.

The Customer Service strategy reflects a conscious effort on the part of the Customer Services Director to transform organisational processes as well as some of the existing structural properties. It is important noting that this transformation was not unintentional. It was the director's objective to 'empower' the front line employees so as to shorten response times to customer queries and to reduce the number of employees in the directorate so as ultimately to reduce costs and maximise profits (there has been a 21 percent decrease in full time equivalent from October'93 to July'94).

5.7 DISCUSSION

The case of STW focuses attention on the contextual character of technological changes. The use of technology was found to reflect the knowledge, interests and conditions that existed at the time of its implementation. A clear priority that emerged from privatisation and from the establishment of the industry watchdog has been customer service. The tight control exercised by OFWAT has concentrated minds on the inadequacy of existing billing arrangements. The turn

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At the time this research was carried, the implementation of these intentional changes was still at an infant stage. It was not therefore possible to identify any major unintended consequences of these changes.
to IBM imaging technology was thought as important for customer services efforts.

Furthermore, when the image system was initially introduced, customer services were viewed in terms of billing arrangements. This had subsequently shaped technological frames. The system was viewed as an aid to speed up billing issues ignoring any possible use of the system in other customer related services. Improvements in billing arrangements had not been however enough for the company to shift emphasis from an engineering-driven to a customer-driven organisation. Therefore, despite the huge investments in information technology the separation between the accounting (billing issues) and the operations (customer-operational related issues) sides still remained. The link between these two sides of the business, which took place in time period C with the establishment of the Customer Services Directorate, has broaden the scope in which the issue of customer services was placed and this, as a consequence, has expanded the use of the image system in activities other than accounting related ones.

The changes that had taken place within STW in efforts to be a customer driven organisation were found to be both incremental and radical. The initial changes which followed the introduction of ImagePlus were incremental. They were found to involve variations of the status-quo with some minor improvements on the way the jobs were carried out. With strategic choices becoming more definite and human actions more purposeful, the changes in period C have been more
radical. As a consequence, there has been a shift to fundamentally different practices, skills and norms in the workplace.

The concepts of incremental and radical change can reveal the nature of the changes and the differences between the two time periods B and C. Within time period B, changes meant to improve speed in customer service, productivity and control of work, leaving the then work structure unchanged. Information technology was the main contributor to these changes. Within time period C, senior management intended to improve even further customer services. The OFWAT reports found that STW still needed to improve its customer services. Transforming business processes, with information technology enabling this transformation, was the key characteristic of this period.

The discussion in now turned on an interpretation of the changes in the customer services area of STW in terms of the concept of CBIEs. Until the end of period B, there was no sign of the formation of a CBIE; although there have been various technological changes, neither the nature of work nor work processes have changed. It was stated in an earlier chapter that the fundamental components of CBIEs are the access, learning and action taking factors. It is important to clarify here that although information access and learning in terms of training were evident in time period B, with the introduction of technology, these alone could not be signs of CBIEs for the following reasons: 1) access to customers' files were allowed prior to technology when the job was still paper-based. What technology had done was to mechanise the process so
that instead of searching for arch files and fiches, a customer account could be retrieved immediately with the press of a button, and 2) the work had been functional-based since 1988. This type of work structure implied that the clerks needed to know only one aspect of the whole job. More learning in respect to the work itself was not necessary.

Rethinking basic working practices and listening to people who do the work at the front line meant that on the one hand the Customer Service strategy was implemented while on the other hand a CBIE was developed. This is a workplace that allows front line employees who traditionally process information (e.g. take a message and pass it around), to access information and take action. In the case of STW, this approach intends to ensure that when customers contact the company they are dealt with more effectively and efficiently by providing front line employees with a wider range of information and by ‘empowering’ them to take required action at the initial point of contact. It seeks to utilise abilities of the lower human workforce through their work with the information technology available.

A distinctive difference between periods B and C was in respect to employee participation during the change period. The lack of employees’ participation in the implementation of ImagePlus during time period B had resulted in the system being implemented as it was intended and according to the Image Requirement study with small variations. Employees quitting their jobs, resulting in this way to a high job turnover, especially, in the satellite offices, was an
unintended consequence of these changes which indirectly affected the effective use of the systems. During period C all front line employees were encouraged at an early stage of the changing process to contribute ideas for a better reorganisation of the Customer Services directorate. In cases like this one where users are encouraged to get involved in the implementation of a system, there is an increased likelihood that the technology will be used more flexibly (Orlikowski, 1992).

An interesting finding is that in addition to the immediate structural properties, historical, pre-existing structural properties were found to have had an impact on the use of information technology. The establishment of a CBIE within the Customer Services Directorate of STW reflects the history of the company, which has come from various autonomous water boards and which is still alive in the minds of those people (a large number) who have been working with the organisation for more than six years. This is illustrated in figure 5-8 where key working practices of the past are seemed to be coming back.

Figure 5-8 summarizes the changes that had taken place within the STW between the period 1987-1994.
This outcome, that former but still well acceptable structural properties (among shopfloor employees) within an organisation might have an impact on the use of information technology (in this case the formation of a CBIE), would not have been identified if the structurational framework was used as in Orlikowski (1992). Orlikowski used the structurational model of technology to examine the concept of technology in organisations, and she focused her analysis around the period of technological changes only. A model like that restricts a case analysis in looking beyond current structural properties. Rather, the initial decision to use the structurational model to gain better understanding of the organisational environment prior to any technological change had contributed to the above finding.
In order to meet the new 'face' of STW from a public sector to a profit-making organisation, a series of changes in the company's mission, management practices, and in information systems have taken place. The changes either incremental or radical were interlinked and in accordance with the managers’ language of profits and efficiency, as well as their chosen work and power relations.

5.8 CONCLUSION

The case of STW demonstrates a persistent attempt to improve customer services. The initial efforts were oriented towards technological solutions, but it was realised that changes of a technological nature alone could not deliver the level of service required. During the years 1990-1992, new technologies were introduced while the nature of work and the actual processes involved have not changed. It was only in the mid of 1993, with the establishment of the Customer Services Directorate that it was evident that further changes were needed in order to improve customer service.

The STW case reveals that an identical system can be used to enable both incremental and radical changes within a single organisation at different periods of time. Reference to the characteristics of these periods in which the system was used, is found to be significant in gaining understanding of why that happened. It is strongly believed that the STW case could not have been adequately understood without reference to its external environment in which
the company had to find its way. The meaning of privatisation, the shift to a profit-making organisation, the roles of OFWAT and of shareholders were all important in gaining understanding of the timing of and the reasons for the changes.

Chapters 6 and 7 will present two other organisations/users of ImagePlus. These organisations operate in an industry that it has not experienced the radical change of the water industry. As a result, and without undermining the importance of the impact of the external environment on organisational changes, their presentation focuses more on internal to these organisations phenomena rather than external.
CHAPTER 6

THE SECOND CASE-STUDY

Using ImagePlus in The Equitable Life

6.1 INTRODUCTION

The Equitable Life Assurance Society (EL) in the UK has been the second organisation selected to participate in this research. This case-study was carried out between the period October to December 1993, soon after the implementation of ImagePlus. The data collected covered the period 1987-1993. There were 11 in-depth interviews with people across organisational layers. Participants were both business and technical people as well as managers and clerical staff. A senior manager was interviewed twice. There were also several informal discussions during lunch breaks. Annual reports, articles in newspapers and extracts from systems reports particularly with regard to the implementation process, were studied so as to provide additional background information.

In contrast to the Severn Trent Water case where major structural changes have occurred almost a year after the implementation of the new information systems, in the EL case structural changes had accompanied the technological changes. As a consequence, two time periods are investigated: a) the period 1987 - 1990 which implies the pre-image period and b) the period during the changes, with particular reference to the years 1991 - 1993. The redesign of customer services processes
along with the introduction of new technology feature within this period.

6.2 THE RESEARCH SITE

The EL is the oldest mutual life assurance company in the world. It has been around for more than 230 years. It has half a million UK clients and some 900,000 policies. The main goals of the Society are to provide financial products to the upper class of the market place and to grow more satisfied customers. The EL is to be found among the leaders in performance tables for several of its policies during this period. In 1993, new annual premiums increased by 10% to £ 323. m from £ 294.2 m in 1992 and new single premiums grew 17% to £1,087 m compared with SP £ 931.7 m in the previous year. This success is presented as the natural result of policies it had been pursuing since it was founded in 1762. One of its principles is to provide innovative products to its clients. It introduces its own new product lines and from time to time it makes modifications to its existing products to best appeal to its target market. Apart from the general market force of customer service, the company operates in a legislative framework. The Financial Services Act requires the organisation to behave in a particular way with its customers and to provide the right advice. Also, the discussions with the clients need to be documented in a particular way. In fact, as a financial institution, EL needs to work inside a heavy legislative environment.

6.3 TIME PERIOD A : THE EQUITABLE LIFE ‘1987-1990’ - The Pre-Image
This section explores the interactions between structural properties and human actions within the EL during the period which preceded the introduction of major technological changes and till 1990. Within this period, the traditional structure of EL as well as its main principles of operation are examined. The two time periods, the period till 1989 and the period till 1990 are depicted in structurational terms in figure 6-1.

Traditionally, the organisational structure of EL was product and functionally based with a large number of small units of staff concentrating on particular functions for one particular product. Each individual unit worked on a very self-contained basis using a traditional administrative set-up.
Figure 6-2 gives an illustration of the traditional structure of the Client Servicing Area.

The traditional product and functionally based organisational structure was also evident within the Client Servicing Area. The client servicing staff at the chief administrative offices of EL were dealing with individual policies and were organised in fairly specialised units, each unit dealing only with one or a small range of policy types. There were 8-9 groups of products and a senior manager was in charge of each product. Each group was then split into three main functions constituting different departments. These functions were those of new business processing, servicing, and payment out, and each had its own departmental manager. Each department was split into a number of units depending on the variations of the
policies. Each unit had a unit manager.

At that time, there were up to 7 levels of management with a narrow span of control, 7 staff members to 1 manager. This meant slow communication among members of different organisational layers as well as slow response to customer queries especially when questions covered more than one product or functional area; that was the case because more people from different units were involved.

This multi-layered, bureaucratic organisation also had an effect on the work structure which as a consequence became highly specialised and functionalised especially at the lower organisational layers (see figure 6-3). Fragmentation and
homogenisation of tasks as well as tightening of supervisory structures were common characteristics for the lower layers.

The organisation's salary system also revealed the bureaucratic nature of the society. The system was a traditional salary scale one. There were a number of salary scales and within each scale there were annual increments. So, every year each employee's salary was going up.

The company had expanded rapidly within the last ten years. More products and activities were added to its business line. In order to be able to cope with the work more people were recruited. The increasing numbers of staff were reproducing the bureaucratic work and power structures of the organisation.

The company's information systems strategy was determined in 1987 with the help of external management consultants. The strategy looked at the development of major policy administration systems within the Client Servicing Area. A plan was set to acquire a group policy administration system, a pensions one, and a life one. These were called CPAS 1, CPAS 2 and CPAS 3 respectively; CPAS stands for Centralised Policy Administration System. Being an ICL user, CPAS 1, the first system to be introduced within the Client Servicing Area, was installed on ICL equipment. It was introduced in 1989 to be used only for group pensions.

At that time, the work within the Client Servicing Area was in the main paper-
based. The company had carried out details of its policy holders in individual files and whenever an enquiry was received from the client, his/her file would have to be obtained before any work could be carried out. Even with the introduction of CPAS 1, there was quite a lot of paper work to be carried out. A clerk explains: "We had to fill in a computer input form for every change that we wanted to make in the customer files. The form was then going through a couple of other areas before somebody else puts the information on the computer. It would then take quite sometime to get all the information through; this varied from 3 days to 3 weeks depending on the information. It was frustrating because no information was up to date; if there was another change to do shortly after the first change, then, you couldn't do it because the information hasn't come through".

At the beginning of 1990, a document called the "User Requirement Document" was published internally to pinpoint the systems requirements with the Client Servicing Area as the user. The decision to carry out this study was initiated by the senior management. It was driven by the needs identified for the development of computer systems within the information systems strategy of 1987.

Around that time, a business systems department was established. The new department became responsible for systems development by looking at the flow of work. Prior to that, there was an information systems department which was more for the maintenance rather than the development line.
Following the above, various alternative software packages began to be evaluated. A standard package from a UK based company was selected since it was felt that it could meet business needs. The system built around that package was called CPAS 2.3. It was named 2.3 because it combined CPAS 2 and CPAS 3. CPAS 2.3 was introduced to handle all the clients' records, contracts and accounts of all individual business and was installed on IBM hardware. CPAS 2.3 could not run on ICL equipment. At that time, a formal decision was taken by the management of the Society to go from ICL to IBM encouraged by the new head of management services AJ. AJ came into the organisation in 1989.

Further to CPAS 2.3, another system was required to improve the storage and retrieval of customers' documentation. Following a recommendation from the new head of the management services department (AJ), the IBM image processing system, ImagePlus was considered as an alternative solution. The deputy Managing Director, RR, had arranged a visit to a Swedish organisation to see the system in operation. The decision was thereafter made by the senior management to use imaging to improve customer services. Image was introduced to mechanise the paper handling and distribution of work.

To the question why image technology as opposed to any other computer based system, the following answer was given: "probably because before image we had a big problem; we couldn't get the backups since quite a few of them were lost in some other areas" (unit manager).
A senior manager explains why ImagePlus in particular: "When we discovered ImagePlus, we had recently become an IBM user for our policy systems. Previously to that we weren't an IBM user. IBM had ImagePlus, we were new to IBM, and we evaluated ImagePlus as a product and we found it satisfactory. We felt that we were reducing risks by working with IBM to implement ImagePlus; we are a big customer for IBM for ImagePlus, and they would not let us fail. Therefore, for us it represented a low risk approach. If we used other image suppliers there would always be possible conflict if there were problems that the image manufacturer would say it is an IBM problem [hardware supplier], and IBM would say it is the manufacturer's problem. Finally, IBM made it financially attractive to us."

The introduction of both image and CPAS 2.3 constituted a corporate, top management decision including the Board of Directors' approval. As a senior manager had put it: "Both projects required a significant capital expenditure and they had to go through appropriate authorisation". The power structure had, therefore, interfered in this initial period of technological changes. Upper human agents, possessors of the legitimate power, had a participative role in the decision making processes with regard to the introduction of the new technology.

The decision to introduce the two new systems was accompanied by the start of a new era for the Equitable Life; an era that had marked the 'going the IBM way'. The information systems strategy had been modified to support the IBM route. The new head of management services, who hold a favourite attitude towards IBM, had
encouraged this move. He drew upon his legitimate as well as his expert power (he used to be the information systems manager for a larger organisation in the UK\textsuperscript{10}), when supporting the move towards IBM. Since then, any new technology acquired by EL was software and/or hardware related to IBM.

Furthermore, modifications had occurred in the signification structure of the EL. The shift from ICL to IBM had an implication on the language-in-use especially among the middle and top organisational layers. The 'going towards IBM' was often used by various members at these layers to justify and explain the introduction of ImagePlus within the Client Servicing Area. For instance, "the decision to use ImagePlus was never in doubt, because strategically we are IBM" explained a systems person. The same person, however, recognised that there were other products in the market which might have offered more functions than ImagePlus.

Apart from the above alterations within the patterns of the signification structure, the work and power relations of the EL were in the main reproduced during this period 1987 - 1990.

6.4 TIME PERIOD B: THE CLIENT SERVICING AREA OF EL ‘1991-1993’ - The Image Period

\textsuperscript{10} This information was initially found in a national financial newspaper and was confirmed by an EL IS manager. It was thereafter found that AJ used to work for STW prior to his recruitment in EL.
The emphasis of this division lies on the technological and other changes that occurred within EL. I investigate, here, how the structural properties that existed at the end of the previous time period had been reproduced, modified or transformed as a result of the technological and other changes. Changes which accompanied the introduction of the new image system and were related to its applications are also taken into consideration within this division.

6.4.1 Human Agents - Information Technology

This section takes a focus on the relationships between the human agents within the EL and the new technology. It aims to examine the role of the human factor in the implementation of the new technology as well as the technology impacts on organisational members across the hierarchy.

With the retirement of the then managing director (MD), a new MD, RR was appointed in July 1991. He used to be the deputy MD. RR who had done most jobs around the company, joined EL in 1953. He was appointed Deputy Actuary in 1972, then Joint Actuary in 1982 since when he had been the Appointed Actuary. He became the MD aiming to drive the company away from the traditions in the bureaucratic managerial and organisational structure which were barriers in the growth of the organisation. In particular, he made his mark by emphasizing the need for slimming down the company's administration. Although on the one hand,
it was important to grow the business on the other hand, due to the recession there was a need to keep the number of people employed down.

The new MD initiated the establishment of a new vision and mission statement for EL. The new mission paid particular emphasis on prompt and quality service to customers. It was stressing the aims of the company to continue the principles of paying no commission to intermediaries, to provide innovative products and to target net worth business (large premiums). Moreover, the mission was looking to strengthen the ability of the company to respond to customers' enquiries the same day they arrive, to continue to grow and finally to make customers more satisfied.

During the period that followed the appointment of the new MD, and as a consequence of the new mission statement, some modifications in the signification structure had occurred. The language-in-use during that period paid particular attention on the client and the service provided to clients. As a senior manager puts it: "Previously, we used to be required to administer somebody's pensions - now [with the new vision under way], we are required to serve (my emphasis) somebody's pension. We are very much oriented to provide a service".

A 3-days management conference was arranged by the MD aiming to communicate his ideas for the new direction of EL to the rest of the management in the organisation.
A senior manager within the Client Servicing Area, PS, started putting a plan together for reengineering work processes within the department to implement the vision within client services. As he recognised "it is all very well having the idea, but you have to actually make it happened ... The MD accepted my plan and I started to carry it out. We had several briefings to staff and had sent them memos. The briefings started to become training sessions and the training sessions became discussion groups... We transformed the ownership of the systems to the staff so that they all felt the new things were theirs". The new vision was similarly communicated to the rest of the organisation -outside client services- via memos and discussions with the staff.

During this phase the term 'reengineering' had often been used within EL to imply the reorganisation to come. According to PS who had introduced the plan, reengineering had three elements: 1) shortening the time-scale, 2) reducing the effort and 3) assuring the quality of the job. As he explains: "[reengineering] means that we examine the way in which we deliver the service to customers in detail and that we eliminate unnecessary steps from the process, seeking to shorten the time of scale from start to finish. In many of the stages in the way we used to do the work there was a waste of time. The time that was spent actually adding value to the customers' job was small. So, one purpose of reengineering is to reduce the time scale from start to finish, and a second is to reduce the effort that somebody has to put into dealing with the job so as to decrease the cost of providing that service. The third element of reengineering is to identify in the old way of doing
things all the points which put quality at risk and either eliminate them if they are unnecessary or if they are necessary to put the appropriate control at the place so as to minimise the risk”.

Therefore, in conjunction with the technological changes, the Client Servicing Area was reorganised with the aim of creating an environment where any fully trained staff member would be able to deal with any routine enquiry from any client. The need to reengineer business processes, and to throw away some of the historical traditions with respect to customer services was welcomed and driven by the new managing director. By looking closely at the potentials of ImagePlus, the MD saw the opportunity for organisational flexibility by reorganising processes of work without moving people. He also saw the system as an enabler for reducing the management layers.

The needs identified by the new MD for a more efficient customer service and smaller workforce had influenced the implementation of the new computer systems which were introduced within the Client Servicing Area during the previous period. As a consequence, during this time period, there were three projects under way: the CPAS project, the Image project and the reengineering project. The reengineering project was under the responsibility of PS who initiated it. During the project, staff-members within the Client Servicing Area were encouraged to contribute in building users procedures, workflows, and in designing the physical layout of the department. The other two projects are explained below. Figures 6-4
and 6-5 demonstrate the actors who played a role at the various stages of the project organisation of CPAS and ImagePlus respectively.

**CPAS Implementation**

A CPAS project team was established to implement CPAS 2.3. In the project team, there was a mixture of senior managers from the accounts, business, actuarial, valuation and also the IT area. There were also users from the lower organisational layers and a couple of system consultants from the supplier organisation. At the top of the project team, there were a business person and a computer person. They had a joint responsibility for the CPAS project.
The development of CPAS 2.3 was closely monitored by the senior managers in the User Panel (figure 6-4). This Panel was established at an early stage of the implementation process, consisting of senior managers from the various areas of EL. According to a project member, all the direction was coming from them, who in turn were responsible to the MD to whom they reported. They also needed his approval for key decisions and actions.

After several changes had been identified to be made on the system, it was felt that keeping the suppliers' consultants was dangerous. A member of the project team explains this decision: "We kept relying on them to give us the information as opposed to learning it by our mistakes. At that stage, we took a quite brave decision; we kicked the consultants out, well before implementation. At that stage not all the details have been written and we were still trying to identify where the package didn't meet our needs. We came to a mutual agreement to proceed without the consultants. We were on our own at that stage and from there on we went through all the changes".

Several modifications on the package had occurred. There was also some analysis to be done prior to its implementation for different policies. Once business requirements were specified at the lower level, the programmers were doing the program changes and passing then onto the testing team. The team of about 20 people was made up of people from all parts of the organisation, but half of them were from the user's area. The testing team had to make sure that what was in the
program was on line with the business requirements. The User Panel wanted to see the tests before signing the start of each implementation. As a project person notes: "We had a checklist that everything had to be approved before going live".

**ImagePlus Implementation**

Along with the development of CPAS 2.3, an image project team was established. This team was responsible for image implementation. The team consisted of six IT people, four users (people drawn from the Customer Servicing Area), and one IBM consultant (figure 6-5).

**IMAGE Project Organisation**

The image project was managed by the Managing Director, with input from the Project Manager and End User Manager. The project team consisted of Project Manager (Systems), End User Manager (Business), Technical Architect, Application Development, User Support, and IBM. The image project was divided into two main areas: implementation and testing. The implementation phase involved the development and testing of the image system, while the testing phase involved the evaluation of the image system against business requirements. The project team worked closely with the end users to ensure that the image system met their needs. The project was completed on schedule and within budget.
The need to keep an IBM person within the team was explained by one of the project (systems) managers: "It was important to have an IBM consultant on the team for a number of reasons: 1) technically, ImagePlus is a very complex product. It also had some very new components like optical storage. Since we were not changing ImagePlus to a great extent as with CPAS, it was important to have somebody who knew how it worked and what it did. If he did not know what to do, he knew a man who would; 2) he understood a lot about sizing the system in terms of optical storage. He could do all that work and we gave him responsibility to do it, and 3) the most important reason is that it showed commitment on both sides; a commitment from IBM to make a success for the project; and we were committed to make it worked. We had a very open relationship during that period".

The image project team was reporting to a Steering committee which was chaired by the MD (see figure 6-5). The Steering group had representatives from both the information technology and the users area. The users/participants were active members of the project team, removed from the working environment to purposely participate in the implementation process. Some of the users used to be technical managers who knew the work or were technical experts (knew the procedures) within the area.

The image project started in June 1991. It had a tight schedule since it had to follow largely whatever the CPAS project team did. A small prototype was built with the IBM assistance. The aims of the prototype have been explained by the project
manager: "The prototype aimed to get the users/members of the team understand image, to get them manipulating documents. We also used it as an opportunity to brief all the potential users of the system. They all came to have a look at it and to play with it". In parallel with the prototype, a 'functional design' manual was prepared to describe (in words) exactly what the system would do. It also highlighted what the system would be used for.

Image implementation was live. No pilot implementation took place. "We never intended to do a pilot because if we had done a pilot, we would had run the risk of merely trying to adapt the system to what was happening then. If we had an organisation of only 100 people and we get the 20 people on image and left the other 80 to use the paper-based system, we would keep the procedures very largely the same. You run the risk then of not adopting the technology because you cannot assess it to its full potential. So, we decided to go for image in one whole area of the business personal pensions which employed then 105 people. When we put image in, that was scaled for 70 people and which meant a reorganisation overnight. So, a new structure occurred doing new jobs and which didn't work quite as we intended but that allowed us to get the fullest benefit of the system later" [systems person].

Both Image and CPAS 2.3 came together in phases over the period from June 1992 to June 1993 to minimise the effect on customers and staff. Indexing, scanning and workflow management were introduced simultaneously.
Training preceded every implementation. Prior to the implementation, everybody was taken into a room with terminals and had about 2 days of formal and 2 days of informal practice time. Training was needed because although they knew about the job, the mechanisms for doing that job had changed. So, training was focussed primarily on how to do the job using the new system.

A project manager admitted that there were mistakes during that initial training period: "we tried to teach them [the users] how to do the new jobs as well as how to use the new systems. So, somebody who knew how to set up a new business, was also expected to do servicing or renewals or claims-work as well on day one. That didn't work, because it was just too much for the staff to take in, new systems and effectively new jobs as well. The vision is that any piece of work can be done by anybody. We tried to go too far towards that on day one. Too much to take in".

The adoption of the two systems initially commenced with their introduction for Personal Pension administration in July 1992. In October of the same year, the new systems were introduced for the company's annuity business and then, in November, for retirement annuity, individual pensions and free standing additional voluntary contribution contracts. The final area where the systems were implemented was 'life contracts’ in the summer of 1993.

**The Systems In-Use**
Figure 6-6 pictures the route of work within the Client Servicing Area as it appeared to be after the changes.

As a result of the technological as well as the structural changes, every member within the Client Servicing Area (180 people) could be exposed to all products/policies of the company. It was no longer necessary for a given customer enquiry to pass through many hands before a response can be given, even if it concerned policies of more than one type. With the current technology and structure the company aimed at working towards a position where work was carried out on the day of receipt, with a reply being despatched to the client that day or on the following one.
As shown on figure 6-6, the Client Servicing Area now consists of three sections: the 'papers in' section (PIPS), the 'client servicing centre' section (CSC) that consists of 17 units, and the 'papers out' (POPS) section.

The 'papers in' section deals with all the incoming post. Reading, coding and scanning the documents are carried out within this section. Each PIPS member can carry out all these tasks and write comments to the CSC group about the handling of the documents. All PIPS members have been trained to carry out these activities.

After scanning, the image system puts the documents into the right queue and sends them for action at random aiming at an even distribution of work among the 17 CSC units. The queues have been set up on a functional basis, that is neither geographical-based nor policy-based. For example, a document that requires a direct debit action, is sent to a queue for direct debits. The various jobs within this queue are then distributed randomly among the CSCs groups. All CSCs can action direct debit queries.

The work in the queues is prioritised based on the date-in or urgency. Urgent tasks or those requiring special attention are routed to one of the 17 CSC unit manager's own queues from where the unit manager can prioritise as appropriate. The idea of the unit managers' queues is to handle urgent jobs as they come in, or also things that people in PIPs do not know where to send them. The unit managers do not action the urgent or special queries; rather they redirect them. For instance, they
may route an urgent query to a member of their team who can do it and s/he is available.

A CSC unit manager explains the need for developing a queue for urgent queries: "although the system allows you to prioritise work, if there are 3 urgency levels on the system, it is possible that there might not be anybody attached to that queue at that particular time. So, although people would scan it on to the system, no one may pick it up, and it needs to be brought to the manager's attention that there is this urgent case that needs action and it is up to me to make sure that somebody is assigned to it".

The whole of the Client Servicing Area consists of three senior managers and manages 5-6 CSC units each with their own manager. Each unit manager runs a multi-functional group (at varying levels) of about 10-12 staff members. All CSC units have access to all queues thereby ensuring that any outstanding customer queries for the client that they are dealing with may be actioned if directly related. Each staff member also has access to a word processing system which houses a large number of standard responses. Staff members can, however, draft an individual response if this is required. The quality of the services and responses are reviewed by the unit manager. The unit manager's role is to allocate work, to

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Within the EL, the term 'supervisor' is avoided. The title used is that of a 'unit manager'. Unit managers supervise a small group of employees and they are treated within this study as part of the lower human agents.
identify training needs and to review the quality of work carried out within their group. As a unit manager explains: "we are responsible for managing resources, making sure that we have the right number of staff and the right skills at any time, planning future events and making sure that people catch up with training...we do not use the word supervisor here".

At the time the research was carrying out, some CSC units have been specialised dealing with only one product e.g. annuities only. Other areas deal with a different group of products. The aim is to move towards each unit dealing with all products. A CSC unit manager clarifies that: "The aim is to give the opportunity to everybody to learn everything".

The 'Paper Out' section deals with the outgoing post. It handles the printing and posting for both the PIPS and the CSCs. It is also responsible for attaching together any blank forms and other documents requested by the client.

A telephone desk that deals with the incoming calls from the branches or directly from clients is also part of the department. In cases where the telephone desk members cannot action a call, they take a note that is then passed to the PIPS section for scanning.

The Customer Servicing Area is also supported by the 'Product Information Group' and the 'System Support Team'. The 'Product Information Group' consists of
people who are knowledgeable of the various products/policies provided by the company. Their role is to assist the CSC members with policies information. Queries or problems in regard to technological issues are handled and dealt with by the Systems Support Group. The systems support group also looks at any enhancements of the systems to adequately meet the requirements for handling the current products, but also any new products that have been added on the line.

Due to the changes that occurred within the client services, and which resulted in no recruitment of new staff during this time period, the salary system was modified. This was suggested by PS, who also had the responsibility for a human organisation project for the development of staff. It was approved by the top management. According to the new salary system, employees are paid for the knowledge and skills they got and for the job they do in the organisation. As it was explained, the new system was one of a salary-point. Each employee got a salary point (which is closest where they used to be with the old system), and they stay on that point until they move to the next bigger job, and then, they get a change in the salary. So, salary is fixed with no increments anymore. Various bonus systems were also introduced.

Reactions to the Changes

Initially, it was rather hard for the staff to adjust to both the structural and the systems changes. A systems person explains that this was largely a training issue:
"It was just too much for the staff to take in, to learn how to use the new systems but also to be responsible for new jobs".

A unit manager also describes employees reactions to these changes: "There had been grievances about the level of training... Also grievances about the flattening of the organisational structure; we got a lot of people who were previously [unit] managers but who are not managers anymore. There had also been grievances about how you move up the organisation; the current concept is that you need to grow a whole range of skills in order to move upwards".

Almost a year after these implementations took place, and while this field study was under way, it was felt that employees have become more comfortable. "I think they cannot remember the situation as it was before. Now they can action a piece of work the same day, previously they might have taken them a week to get the computer record in front of them, because then they had to write a request which went to the data processing department and sent it back" (unit manager).

All the participants in this case-study admitted that as a result of the changes they can give a client immediate response. However, some employees commented that: "We don’t do anything differently, just faster". A unit manager reported in an interview that during the monthly meetings with the employees there were complaints by employees that as a result of the changes people do not think as much as they used to.
6.4.2 Structural Properties - ‘Human Agents-Information Technology’

Many strategic decisions and actions had been undertaken within this time-period by key organisational agents. This section examines whether their actions had been independent of or had been reinforced or constrained by structural properties that existed within the organisation prior to the changes. It aims to uncover whether the occurrence of the changes had reproduced, modified or transformed structural properties.

As it was seen in the previous section, top management had a participative role in the implementation of the technological and other changes within client services. Both, the User Panel that was responsible for the CPAS implementation and the Steering group that was responsible for the image implementation, consisted of senior managers; they were the ones who agreed the what and how. For the CPAS project, for instance, all the direction was coming from the User Panel who in turn was responsible to the MD to whom they reported and needed his approval.

Additionally, the reengineering project, which as it was seen in the previous section was initiated by an upper human agent (PS), had drawn upon the existing power structure for its success. PS explained that although he was the one who initiated the project and had the whole responsibility, he needed to consult with and involve in the project other senior managers for the success of the project. He pointed out that "There were many corporate decisions to be made with regard to the project."
We had many team efforts, and there was no single individual who had total responsibility for lots of things. We had lots of team involvement with different people influencing different groups. Clearly, I was in a central role. Someone was giving me the image system, someone else was giving me the CPAS system and I had to make it all fit together. But, I did not do it all on my own because I needed the top management input on the corporate decisions. Taking away layers of management is not something I can do. Changing the salary system is not something I can do”.

The human actions with regard to technological and organisational changes were intentional and they were not independent of the structural properties that existed at the time. It was vital for the senior managers-drivers of change to acknowledge the role of other key powerholders for an effective implementation program. For instance, although the initiatives for changes within the Client Servicing Area came from a senior manager, his actions to first get the backing of other top managers prior to any implementation made the location of power and control apparent. In fact, if top management was not involved there was a risk that new forms of organisations would never be successfully implemented.

Furthermore, the formations of the Steering Group and of the User Panel showed commitment from the top management side to help guide the project. It further showed the dependence of the project teams on the top management. The MD had a central role in both projects and key decisions needed his approval.
6.4.3 Information Technology - Structural Properties

This section examines the role of technology and other changes on the structural properties of the EL.

Patterns of the signification structure, especially those on a client-oriented environment, played a role in the implementation of the changes. The vision for a customer-oriented organisation had eased the occurrence of the changes. The reasons for the changes were by then known and accepted by members across organisational layers. A CSC unit manager gave the following explanation for the introduction of new technology: "...Computerisation offered one big edge and that was in terms of customer service".

The implementation of technology had reinforced those patterns of signification structure which took a focus on a customer-oriented environment. The benefits which occurred as a result of the changes have been interpreted in terms of the level of service provided to clients by members across organisational layers. Recent statistics on the performance of the Customer Servicing Centre, have shown that 65% of all customer queries via phone, were resolved immediately; about 27% were answered the same day and the rest which was 8% were so complex or time consuming that it was not cost-effective to deal with them in the telephone desk, and they were passed to the CSCs. The percentages were
thought by the senior management to be improving all the time because the staff were becoming more confident and competent. Besides such improved and improving rates, the company saw significant reductions in the number of staff required to run customer-related services. Only a year after the first implementation of the new system, there was a staff reduction of about 30%. Fewer people were therefore dealing with a greater number of policies and transactions and providing a better service (EL Annual Report, 1993).

As a senior manager explained: "The main stimulus of the changes was the need to replace our systems because they were very old; the vision of our MD comes in to play to make us realise of what we should be doing. It was stressing that on the old structure, with the function and product structure, we were very restricted in what the staff can do. We had a lot of barriers to service. The MD's vision made it clear that all these barriers were broken down, and we didn't need them any more. They were designed originally to help [the organisation], but in fact now, they were hurting us. We could work without them, and move to the new structure without causing any harm and with a lot of benefits".

Furthermore, with the technological and other changes the signification structure has been further modified. Terms like 'multi-skilling' and 'empowerment' have been widespread across the clients servicing area. In fact, the changes occurred within the department have been interpreted in terms of these two concepts. For instance, a CSC unit manager claims: "technology provided the opportunity to the
staff to be multi-skilled. Previously, [with the traditional structure], there was no way to become multi-skilled ... ImagePlus has allowed to take work to people rather than take people to work”.

Modifications in the signification structure have been accompanied with the transformation of the work structure. A multi-skilled workforce could not occur without the alteration of at least some of the working practices. Changes in roles, tasks and skills have resulted in the reduction in the number of management layers as well as in the transformation of a narrow span of control to a wider one.

In particular, the relationship between the CSC unit manager with the CSC clerks had moved from the traditional one, where the former used to monitor and guide the clerks' performance. A CSC manager in particular claims: “I do not know how to work most of the things that the employees are doing. I can only do a bit of a job on the system. So, the employees cannot come and say: 'I'm doing this job, how do I do this on the system?'. I could not answer that question. Rather asking this, they come and say: 'I cannot do this, whom can I go and ask?'. So, it is my job to know who is able to answer a certain types of questions. Rather answering myself, I know whom to get to. It is not the core job of the CSC managers to know how to do the job; their core job is managing the work, managing resources, to make sure you have the right skills at anyone time and planning future events, as well as making sure that people catch up with training, also dealing with people".
The power structure was also modified. With an ‘empowered’ shopfloor the middle level management was weakened; it was possible to reduce the number of management layers and hence to shorten lines of communication among members. "Between me as Managing Director and the newest clerical assistant in our image processing based servicing area there are now just three managers" (general manager, senior manager and unit manager) claims the new MD. A further major change has been the removal of a management tier - the ratio of staff to managers now having risen to 10/11:1 from its previous 7:1.

6.5 DISCUSSION

The EL case could be seen as a successful case of business process reengineering. The literature on process reengineering as well as studies on IT-enabled ‘empowerment’ emphasize the need to reduce organisational hierarchy (Hammer and Champy, 1993). As a result of the changes within the EL case, the hierarchy has been flatten. The managerial layers have been reduced and there was no supervisory level running in the way.

Regardless of the above, the study's focus on the changing nature of work allows an interpretation of the case-study in terms of a CBIE. It is known by now that in a Computer-Based Informed Environment there should be wide information sharing among lower level employees; this is a learning and an action taking environment. These characteristics have been evident within the EL case after a
series of technological and structural changes. The case illustrates that there was a great amount of organisational choice with regard to the technological and structural changes within EL. The new mission of organisation to be a customer-oriented organisation as well as the efforts to keep the number of employees down while growing the business have shaped the use of technology. Key actors have decided on the kind of organisation they wanted EL to be; members of the user department also got involved in the implementation of these changes. As a senior manager puts it: "We transformed the ownership of the system to the staff so that they all felt the new things were theirs". Despite user involvement, though, some degree of employee dissatisfaction was identified. User participation therefore is not always appropriate to avoid resistance (Markus, 1983). Therefore, the organisational changes, though intentional, had intended as well as unintended consequences which were found to have been influenced by members' knowledgeability of the company's signification, power and work structural properties.

The competitive market in which EL operates had a role to play in the changes which had taken place: “We aim to provide a fast, accurate and efficient service to all customers to truly and markedly differentiated us from our competitors...” (EL Annual Report, 1993). In contrast, however to the STW case which relied to a great extent to its external regulatory environment, EL had not consulted its lawyers about its legislative framework when deciding whether or not to retain original paperwork. All original papers are destroyed and EL relies totally on the image
6.6 CONCLUSION

The EL case demonstrates a concurrent change in the work organisation and the technology within a core department. Although the decision to introduce new information technology preceded any other attempt for change, the decision to reengineer business processes so as to improve customer services, to reduce costs and the number of staff influenced the systems implementation.

In contrast to the traditional specialisation and fragmentation of work, the changes resulted in multi-skilled and responsive employees. The radical change within the customer services area was accompanied with changes in company's direction, objectives, organisational structure and technology. A combination of information technology and other organisational changes at both the individual and the structural levels resulted in the EL CBIE being implemented more readily.
CHAPTER 7
THE THIRD CASE-STUDY
Using ImagePlus in Alpatros Insurance UK Ltd

7.1 INTRODUCTION

Alpatros Insurance UK Ltd\textsuperscript{12} (API) was the third organisation selected to participate in this research. Contacts with the management of the company started in mid December 1993, and the case-study was carried out between the period April to September 1994. The research involved the period from 1986 to mid 1994. There were 12 in-depth interviews, demonstrations of the system in an area branch while informal conversations were held over lunches and coffee breaks. Annual reports, articles in national newspapers, internal memos, copies of the company's internal newsletter and the company's vision and mission statement have also been studied for additional information.

The case presentation is structured in 3 periods as follows: a) the period prior to the introduction of image and until 1991, b) the period during technological changes with particular reference to the years 1992-1993, and c) the post-image period, and

\textsuperscript{12} Although I was given permission to use the company's real name, the management stressed that they would feel uneasy if I was using some of the information provided. Because this information (the MD's resignation) was found important for the purposes of this study, I decided to keep company anonymity.
until August 1994, that covers the establishment of the new vision and mission statement as well as the recruitment of a new MD who had initiated the new organisational vision.

7.2 THE RESEARCH SITE

Alpatros Insurance UK Ltd is a subsidiary of Alpatros Insurance Holdings PLC. It is an insurance company with branches throughout the UK. In 1991, the company was employing about 7000 staff through a network of area and local branches insuring over 2.5 million homes, more than 1.25 million vehicles and 250,000 businesses. With a total premium income of £1,618 m it pays out annually over 1 billion in claims. API operates through a range of distribution channels but has particularly strong links with major financial services intermediaries such as the country's largest building societies and banks.

During the years 1990 and 1991, the company faced serious operating losses. In the years that followed, the company aimed to strengthen its position in the market. The Group Chief Executive characterised those years as being: "the year of Repair" for 1992, during which API commenced the implementation of the business improvement programmes, "the year of Preparation" which saw a return to profitability for 1993 and "the year of development" for 1994, during which API built on the strength of the base that was put in place over the past two years in order to grow the business profitably and produce enhanced returns for shareholders.
This section explores the interactions between structural properties and human actions within API during the period that preceded the introduction of ImagePlus.

Traditionally, the company had 'profit units' in every major town in England, Scotland and Wales with a total of 76 units. That meant that the company's expertise was widely spread. Each branch had to provide all company's services to customers. They were not, however, treated as autonomous since every time they were faced with a difficult case of customer or a complex query they had to refer it to the head office. Although members at the various branches had a broad knowledge of familiarity with all services and policies provided by their company, they were not experts enough to handle complicated cases. The experts as well as those with authority to make difficult decisions were located in the company's head offices.

In 1986, following a recommendation by an external consulting organisation, the company decided to establish 12 centres of expertise across the country as area branches. Each area branch would have about 400 staff serving 5-6 small satellite offices with only 20 staff each. It was suggested that the branches would function on a geographical base serving the company's clients within their area boundaries.
With the organisational restructuring, authority was pushed down to the area branches so that they could make decisions themselves rather than referring them to the centre. It was said that people in general liked the way the organisation was restructured. "I think it was seen as positive; people in the area branches got more authority" (assistant manager in public affairs, head office).

1988 saw the establishment of the first vision and mission statement named: "Alpatros UK is its People". The mission was the following: "Our purpose is to be the most successful UK General Insurance Company. To achieve this TOGETHER we will a) feel proud to belong to our organisation, b) earn respect from our customers, c) set the highest possible standards, d) increase our insurance profit and e) be a caring and responsible member of the community. For our customers we will a) provide an outstanding quality of service, b) settle claims fairly and promptly, c) be resourceful and imaginative in meeting their needs and d) keep expenses at a competitive level consistent with quality. For ourselves, we will a) reward achievements, b) develop each individual as fully as possible and c) be open to new ideas and adaptive to change".

During this time period, the company had committed itself into investing in information technology to improve its marketing expertise. For each category of intermediaries e.g. banks, building societies, brokers etc. who had strong links with individual and corporate clients, API decided to develop its capability to establish electronic links involving advanced systems and software programmes. A couple of
years later, an IT Steering Group, which involved the general manager and senior managers in the company, was established to aid in the development of IT-related projects. It was explained by a manager that "When a business need is identified, we turn to the specialists to form a project team. This project team would put forward a report which would include things like what is available, a cost/benefit analysis, the time-scale involved and the capital expenditure. This report will then go to the IT Steering Group who is given all projects with regard to IT, and they would make a decision to take it on Board or not. It would first go to the directors of Alpatros Insurance Plc in which API UK is part of and then it will go to API Holdings for final approval".

The Claims Operations Department within API

The Claims Operations department is a key department within API. Its objective is to provide a good quality service to the clients and to handle claims in a fair and reasonable manner. Also, the department has the responsibility to investigate the claims thoroughly and to reach settlements which are acceptable to both Alpatros and its clients.

With the reorganisation of 1986, the department had been geographically spread across the UK in all 12 area branches of the company (in 1994 it had about 1000 staff). Each area branch had its own local area manager who was responsible for the claims operations within the area boundaries. All area managers were
responsible to three senior managers in the company's head office who dealt with technical, planning and analysis, and operational issues, respectively. These senior managers were reporting to the Claims Operations Director.

Within each area branch, the Claims Operations department was divided into three units. There was a property claims unit which handled all types of domestic and property claims (e.g. storms, burglaries), the motor claims department that handled all types of motor and damage claims and technical claims which handled claims like employers' liability, public liability and motor-person injury claims.

Work within Claims Operations was paper-based. Every piece of paper that was coming in had to be attached to the relevant file before being acted. All files and papers were kept in a filing cabinet. The actioning of the claims was under the responsibility of the claims handlers. Each handler was receiving on a daily basis a pile of claims to handle. Their work was closely monitored by a supervisor who in turn had to report to a unit manager (see figure 7-1).

Figure 7-1 illustrates the highly fragmented and specialised work structure of the Claims Operations Department as a whole.
Figure 7-1 gives an indication of the power structure that existed within the organisation and within the claims operations in particular. There was a narrow span of control within Claims Operations. It was said that the technical claims units had even narrower span of control than other units. A unit manager in a technical claims explains: "I have 4 supervisors and each has 3 people reporting to them. That is a low supervisory ratio; in the other units which handle motors and property claims the ratio is slightly different. That is because of the technical [and more complex] nature of the work that we do here. In the other units, there are probably
6-7 handlers reporting to each supervisor."

A supervisor in the technical claims unit at an area branch explained his role: "Within technical claims we have a higher level of experience than other functions across the claims operations. Therefore, my job is really on the workload management side ... My team sees me as a referral point to provide a technical back-up to what they do and what they achieve. This, in fact, constitutes my major function as well as the monitoring of work, to make sure that work is done correctly although this is less because of the experience of the staff here". It was stressed that all supervisors had similar duties, in the sense that they were used as referral points by their team members and that they monitored their work.

Traditionally, the department had been highly hierarchical with a status driven structure. Staff-members were awarded based on how long they had been with the company. "This is a historical thing that we have carried around with us" according to a member who has been with a company for a long time.

The meaning given to the role of Claims Operations within the whole organisation can reveal some patterns of the signification structure. Several people said that the quality of the company was judged by its claims service. A senior claims manager explained: "Insurance is not cheap. We need to fulfil the promises set out when we sold the policies, efficiently and in a professional manner ... we are judged by the quality of the claims service provided".
During this period, the department acquired a new claims handling system. This was a system for recording the life of a claim, generating standard letters and issuing payments. The system also provided the members of the department with an accurate history of everything that had happened on a claim. The system was considered by the company as being advanced for the 80s; this was explained by a senior manager as a result of: "We are a serious company when it comes to information technology".

Significant changes had occurred in API between the years 1986 to 1991. Some shifts within power structure had been evident with the removal of some hierarchical layers in local branches. The 1986 reorganisation gave a flavour of decentralising expertise to area branches. During this period, the first mission statement was developed to guide the activities of the organisation. Concurrently, the company had committed itself to information technology which for the senior members meant an improvement in competitiveness. It became apparent that the structure of the Claims Operations department, which has a key role to play within API, was influenced by the new shape of the organisation, reorganised on a geographical base and moving towards an IT-based environment.

Towards the end of this period, API, as the rest of the UK insurance industry, faced serious financial losses due to external factors (e.g. extreme weather conditions, a large number of fire losses) raising substantially the work load of the Claims Operations department.

The emphasis of this division lies on the technological changes that have occurred with the introduction of ImagePlus within API.

7.4.1 Human Agents-Information Technology

The discussion that follows in this section takes a focus on the interactions between human agents and ImagePlus.

The need to introduce a new system to support Claims Operations was realised after the introduction of the claims system in 1987, which was found not to be efficient enough on its own to improve performance standards. A claims manager explained the reasons: "The claims system that we currently got controls the claims in terms of the registration, the current estimants, the current work load. The missing link was actually the file itself...you had to find the client's file for being able to action the outstanding claim. But the file might not be there for a variety of reasons. Also, if the individual dealing with the claim wasn't there, that is another problem". There had to be another system to supplement the claims system.

Although "the claims system was always built with image in mind" (image project co-ordinator), the then mainframe technology was not so sophisticated and cost
effective, therefore the accomplishment of that idea was not feasible. The technology available could not provide the facility to move work around the country. The idea was then put on hold until a mainframe solution had been developed and when in late 1992, the technology with the required features was developed the matter came again onto the surface.

The image system was aimed for the Claims Operations department as opposed to any other department, for two primary reasons according to a member of the project team. The Claims Operations department depends heavily on paper; everything is generated on paper. It is also the end of the business process with a client, and this has a great influence on how clients would see the organisation. "If they get a good service, they are more likely to stay with us, and if it is a bad service then they would go to somebody else".

Being heavily IBM oriented, the IBM system ImagePlus was considered as an option. Visits to organisations in the United States to see the system in application had taken place by several senior managers of API. A senior claims manager explains: "IBM was happy to come with us, after having the system in the United States. By that time [end of 1992], no European organisation had implemented the system fully. I have personally gone to the States to talk to IBM and to look at the system in operation in US organisations".

According to another manager:
"We always had a very long standing relationship with IBM. But rather than just go to IBM only we looked around in the market. We found that some of the IBM hardware was good but some of the software wasn't at the standard we wanted. So, we mixed them up. We took IBM hardware, we produced some software. So, it is a completely hybrid system".

Before making any decision, the image system had been evaluated by people in the IT department and the Claims Operations department as the user. A cost-benefit analysis had been carried out over 3-5 years payback period. The project was approved by the Board of Directors of Alpatros Insurance Plc and the final decision was made by the Board of the Alpatros Holdings. The latter's approval was important not so because of the type of system, rather in terms of the release of capital.

**Implementation**

In 1993, a roll-out programme commenced to put the entire Claims Operations onto image technology. The implementation of ImagePlus was undertaken jointly by the IT department and the user department. A project implementation group was established and consisted of 8 people from various departments. Its chairman was the Assistant General Manager of the Alpatros Insurance UK, who is also the Claims Operations director. Another senior manager within Claims operations was the director of the project group. Other team members were four systems analysts,
an image project co-ordinator who was responsible for the non-technical aspects of the systems implementation and a person responsible for the review of working methods. The IT people - members of the group - were responsible for the technical aspects of the system, e.g. ordering the equipment, cabling and developing the system. The involvement of the Claims Operations department was thought necessary in briefing the members of the department for the changes to come and in providing the training required. The image project co-ordinator also had an important role to play. Her role was to make sure that the premises were capable of supporting the equipment. Things like air-conditioning, lighting, floor-space etc, had to be considered to the best functioning of the technology.

It was decided by the project team that a pilot was important before going live. The pilot took place in an area branch which was seen as having a general representation of all 12 areas in terms of functional activities. Following the pilot, an "Image Procedure Manual" was prepared to detail the best practices when using the new technology. Five people were involved in the production of this manual. These were: the image-project co-ordinator, one IT person, two representatives of the area branches, and one from the organisation methods department.

The pilot implementation was an opportunity to test user friendliness and to highlight aspects for development. The installation was generally successful and further implementation started taking place based on the policy of adding image to only one branch at a time so as not to disrupt the whole Claims Operations. The
director of the project group explains "The company is too big and too widely spread. Certainly, imposing a new system at the 12 area branches at the same time would have put too much strain on the IT department and the supporting department. Secondly, in introducing any new system there is an element of disruption. We could not afford to disrupt all 12 areas at the same time".

Each implementation was under the responsibility of the project implementation team. The team took responsibility for individual branches. The image project co-ordinator worked very closely with those analysts in organising each individual implementation.

Not all implementations were alike. Each area branch had its own problems. Some of them had buildings which were making it difficult to put the equipment. Some had different portfolios of work, different structures which could affect the distribution rules. It was a requirement of the team that each implementation had to match with each area's needs. Before the introduction of the new system there was a three-month lead time for each area office. At the beginning of that lead time, the image project co-ordinator and an analyst would go to the area office to have preliminary meetings with the area management and to explain to them what would happen in the next three months. The image project co-ordinator was consistent to all implementation while different analysts were used.

The image project co-ordinator explained the tactics that she used during the
preliminary visits to the area branches: "We were always using the same approach; we were selling image on its positive side. We were honest with people and that helped a lot. There were concerns about the image environment and people ask us about those. But that goes with the overall package and the advantages outweigh any minor concerns".

During the 3-month implementation period for each branch, the procedures involved in terms of how the work was done were reviewed. The opportunity was taken to think of better ways for doing a job whilst Image was coming on live. Some of the working methods alterations were specifically because of Image, e.g. the introduction of indexing and scanning. There were however, other new working methods that have not been determined by the system, e.g. instructions to external staff as to how they should deal with some items of mail.

A member of the project team referred to her role in implementing these working methods: "I deal with the branch users. I talk to the area staff to prepare the ground. I refer to the options open to them in terms of the way the actual mail is distributed on the image system. Something that is taken into consideration is that each area branch might have different requirements for distributing the work".

The 'Area 10' branch was the first branch to receive image after the pilot implementation. This is one of 12 area branches of Alpatros Insurance. This branch was established after the reorganisation in the 1986 in new premises in this
area. The way the branch premises were built and furnished made the implementation easier. They had already had air-conditioning and lighting systems. Besides, the role of the then area claims manager was significant during the implementation period. He was very much in favour of the new system and he was keen to see it implemented.

A claims manager at the Area 10 branch clarified that the order of the implementation depended on the configuration of the premises. Also, it depended on good air-conditioning due to the extra heat that the technology introduces into the premises. "[Within this branch] we have the air conditioning, and did not need to have any alterations at all before the implementation of Image. While with some of our other locations, the buildings needed some form of alterations to be able to accommodate the technology".

Image was implemented in the 'Area 10' branch at the beginning of July 1993. Prior to the actual implementation for about 3 months, a working party had been set up with area branch employees who were involved into the pilot study to review the existing working methods. They had to decide whether the existing working practices at that time were still appropriate.

Every implementation aimed among others to incorporate Image to the existing claims system. A unit manager explains: "There are some new routines which were built onto the claims system with the introduction of Image. For example, the
management control routine which includes the reporting routine and which provides the mail analysis figure; some other routines like the index and scan routine, were built into the claims system to enable claims handlers to do their work. The two systems are linked with a routine code”.

There was consensus with regard to the need for improvements on the system. It has been particularly stated that implementation is an on-going learning process. When a suggestion for improvements comes from the handlers this is discussed with other members of the team and the team's supervisor. If there is a consensus on the floor, it is transferred by the supervisor to the head section meeting that takes place once a week. It is therefore discussed among the supervisors and the managers, who will among themselves decide whether to take it further up.

With regard to the role of IBM in the implementation, that was only limited to the technical aspects of the system - that is to the systems development rather than the establishment of the new working methods. As it has been put by a project team member "there has not been a big deal of involvement there; I suspect that we were very much driven as a company [to achieve the change]".

Training

Each person in the area branches, member of the Claims Operations had three separate half days of training. At first, head office IT people provided training to
trainers who could then train others. In the ‘Area 10’ branch, for instance, there were 3 people who were trained to become trainers for the rest of the department. "They spent about a week at the head offices being trained and when they came back they shared their knowledge with the rest of the team ... Each member of staff had a half day theoretical training on the use of ImagePlus, and the routines which incorporated the claims system as a resource to ImagePlus; then, they had a half a day training on new working methods and a half a day practical day on the use of the equipment. So, everybody here at the ‘Area 10’ office had a day and a half minimum training before we went live" [unit manager].

Training was mainly of a technical nature on the use of the system. Some training was provided with regard to new working methods. In addition to these, training was provided to supervisors on the necessity not to let the technology to intervene between the supervisor and the handlers. It was recognised that there was so much you could do on the system that there was a possibility that people might stop talking to each other. Supervisors were hence asked to keep talking to people face to face, not via technology.

As the image project co-ordinator puts it: "Image was always going to happen so there was always going to be a directive approach but we still wanted to have an underlying philosophy of educated people of the benefits of image. We spent a lot of time briefing people, showing them videos and how ImagePlus works elsewhere, in America primarily. To be honest, I am acknowledging their concern to fear. So,
we tried not to push them; we tried to listen to them, to give them answers. If they ask us something that we didn't know the answer, we will say 'We don't know, but we'll find out'. Most areas felt that it was refreshing to have briefings. We spent a lot of time explaining to them about the new technology. I don't think that users can be confident from day one about what to do with the system. If you ask them, however, if they wanted the paper back, the answer would be `No".

**The Image System in-Use**

As a result of the introduction of Image, several changes at the work place had taken place. With the new system, handlers within the Claims Operations department could capture all the incoming post onto the image system even in cases where the work had not yet been dealt with. An indexing and scanning section was established within each area branch, a section which did not exist before.

An area branch manager explains: "*what the implementation of Image has done is to replace the paper file with computer display screen. Therefore, what used to be the paper file is now contained on an A3 Image screen. Now all claims handlers and supervisors work with two monitors, one for the claims system and one for the image display*".

Other changes were related to the new working methods and their impact on the
organisation of work. A principle new working method is that all incoming work can
go through a pool. Thereafter, it is distributed out to individuals on a priority order
basis. The distribution of work is done and controlled by the supervisors in the area
branches. According to a project team member "this works better [than the previous
system where work was distributed on an alphabetical order], because work can be
controlled locally by the area branch. So, if they have for instance, a situation where
they get a large number of claims maybe because of a storm in the area, instead of
having the previous rigid alphabetic split rules, they simply change locally the rules
of the pool, so as to move handlers around. They can therefore, move handlers
who maybe deal with one kind of business here to deal with claims in a different
pool. This can be used very simple".

Another change that occurred in working methods was the use of the image system
to direct new claims after scanning them into the system directly to the supervisors;
claims of this nature are considered to require special attention. Existing claims as
previously are passed directly to the claims handlers.

Among the implications of the use of the new system, it has been the possibility to
‘empower’ the area-branches. A project team member explains: "I think that we
have given them flexibility and ability to respond more quickly to any situation which
arises. We have also in theory, got the ability to help each area-branch to move
work electronically rather than moving files around the country. We have also given
them the ability to be flexible about that. We enhanced the reporting facility, we
have liberated them from the time consuming tasks, so as they can do other things. There is quite a lot being achieved”.

Reactions to the Changes

The image project co-ordinator identifies the following benefits in the system: “The clerical tasks which handlers find boring, are taken away from them - so they spend much more time doing the job that they are paid for on the first place...it also means in a very high volume of operation they had the opportunity to lose papers, and files - this is no longer happening. It also allows us productivity gains, where you can deal with a higher number of claims without increasing your staff. So, we give a better service for a low unit cost”.

A senior manager within Claims Operations was positive about the changes as a result of ImagePlus: "It enables us to be far more professional in terms of less time to establish what's actually the outstanding work; we can now easily identify whether we are meeting service standards, how much work is over service standards and what is the age of the oldest claim".

The use of the image system within the Claims Operations department had also provided the ability to monitor and control the flow of work better than before. It was particularly claimed by a unit supervisor that: "We never lose a file now. If someone refers to me on the system, I know who has done the work; I can also
identify training needs as well as plan and show to people their developments and achievements with the system”. Before the introduction of the system it was not always easy to identify who has done what. Rather, people had to rely on what was said on the paper. Now if the staff has any queries about a claim, they can refer to their supervisors; this tactic can help to identify who is good at what and any training needs.

As far as the supervisors’ role is concerned, it was found out that the nature of their tasks has not changed; however the emphasis has changed. "I now need to make sure that I speak to my staff because the system would make it possible not to having to communicate between them but only through the electronic images. So, I try to take time and speak to them and get their views. I have to place quite a lot of emphasis on that" [supervisor].

With regard to the impact of the new system on claims handlers, one of the supervisors says: "While before, people could easily avoid handling the difficult claims by putting them aside, this does not happen any longer, because the system does not allow the handlers to do that. Work is allocated on priority order, and it comes up next on their in-tray. They have to do it. So, [personally] I would see that as a plus. I am not sure about the handlers whether they see it as a minor, instead. The system has given more order to the work. People know where they are, where the sources of work are coming from and I know exactly what kind of work is in the 'basket', waiting to be handled". 
A claims handler within the technical claims unit at the Area 10 area office expresses her own opinion about the introduction of the image system: "I like it. In technical claims, we deal with a lot of paper. We can miss things quite easily. Now, all the mailing is attached and it is got to be actioned. It is a great improvement". She agrees with the others that not many things have changed as far as the nature of work is concerned. As she puts it, "we still deal with the claims in the same manner".

During the period 1992-1993, major technological changes and changes in working practices took place, initiated, driven and implemented by various human agents in the organisation. The extent to which the changes were influenced by the then structural properties of the company and how those changes, in turn, affected structural properties are discussed below.

7.4.2 Structural Properties - ‘Human Agents-Information Technology’

This section aims to understand any influence that had been exercised by the traditional structural properties of API on the use of ImagePlus within Claims Operations.

The decision to introduce the new system was drawn upon the power structure. The approval had to come from the Board of Directors. It was clear that the use of Image was a company's choice. As a supervisor had put it: "The company took the
decision to implement Image and we [members of the department] have to live with it".

Some aspects of the signification structure, those that emphasised the vital role of the Claims Operations within API, had played an important role in welcoming the new system. It was known among members that Claims Operations needed a new system more than any other area in the organisation due to its closed contacts with customers. Quality customer care was regarded as key to the company's future success and the image initiative was a way to achieve the superior quality of service to give the company a competitive edge in an overcrowded market. According to the Image project co-ordinator: "We are a large insurance company and under threat from a lot of direct rivals. We are not going to compete in terms of price, rather in terms of quality of service that we provide. Image processing allows us to do that because we can deal with claims handling so much more quickly".

An area branch unit manager explains: "Claims Operations is very important for the whole operation. At the end of the day, customers will judge the product which they buy and the service which they get. They might be provided with a policy document when they make a purchase, but it is when they have a claim, that they actually value the service. Equally, it would be the impact of every pound that we save in claims, that is a pound that we save on the bottom line of our company". Image was generally seen with a positive view. It has been characterised as the way forward.
7.4.3 Information Technology - Structural Properties

The use of ImagePlus within the Claims Operations was found to reinforce the traditional hierarchical power structure.

"With the systems capability for better monitoring and control at work, when work on new claims comes in, this goes via the supervisor who can look at it and split it out if they choose to alphabetically to the handlers themselves. That gives them two options. It gives them the option to simply glance at the mail and distribute it via the system to individual people, or they can look at it and make recommendations for action and put it on to the incoming pool from which the handler can then get it. It was said that "many areas feel more comfortable with that extra delivery point. All the mail will go to the handlers eventually, but it gives them more feeling of control of the work and there is an opportunity to monitor the mail" (project team member). A claims handler had described this as a sort of rearrangement at the workplace rather than an introduction of a new thing.

A senior manager within Claims Operations (operational side) gave an overview of the impacts of ImagePlus on the organisation of work within the department:

"With image we can see the current stage of a claim. As long as all the incoming post had been captured onto the image system, even thought a piece of work has not been dealt with, we can say to an insurer that 'yes we have receive it', because we can easily access the system...Secondly, in terms of monitoring our outstanding
work, instead of having to ask individuals to count how many items of mail they got outstanding, if we are able to image and scan all of our post, as it comes in, the same day, we can easily know how much work is outstanding, because the machine is counting it”. A third benefit was identified: “The supervisors can spend their day supervising at the level we expect them to do. The claims handlers are spending their day handling claims and we have not got any unproductive times in terms of chasing up files or searching for queries only because the paper is not there. With the touch of a key you can see what is happening”.

The work structure was also reinforced with the introduction of ImagePlus. There was a general feeling among the staff that the work remained the same. According to a claims handler: “I think the work is the same. That hasn't changed. It is just that some working methods have changed... [for instance] all new claims come to the attention of the supervisors on image system. They can look at them, add any notes if they need to and then pass them onto the handlers to deal with them. Before, you could actually action a claims form without the supervisor seeing it; it could be on you desk straight from the post. Now, it tends to eliminate that, it all goes through the supervisor before you [the handler] actually see it”.

During the period covered, API had experienced significant technological changes within a core department. Despite however, some changes on how the work was done, the nature of work itself across the hierarchy as well as the nature of power relationships remained the same. The adoption of ImagePlus, as a completely new
system in Europe, within the claims operations, has further strengthened the image of the department and its important role within the activities of the organisation. A feeling of ownership of the image system was by this time widespread across the organisation. In fact, staff members tend to name it as the API image system rather than ImagePlus. It was explained that ImagePlus is simply a standard software package but the company did not adopt it as such. Rather it had only used some features of the IBM system while it changed others.

7.5. TIME PERIOD C: Alpatros Insurance UK ‘JAN.- AUGUST 1994’- The Post-Image Period

This time-period is marked with the establishment of a new mission statement for API. The emphasis of this section is illustrated in figure 7-2.
In mid 1992, and at the time that technological changes were still under way, a new MD was appointed. The new MD has been with the company in all his working life. He was the Deputy MD prior to being an MD for approximately a year before that. The ex-MD left the company 'pursuing the business interests' as it had been explained to the organisational members. In fact, he had a disagreement with the Holdings Board and chose to resign. He felt that the Board was interfering too much into his direction of the company so he chose to resign.

The new MD, soon after his appointment, carried out a staff attitude survey aiming to identify "what staff think of the organisation". The survey involved a lengthy questionnaire which all members of staff were asked to complete anonymously.
There was a 70% return ratio which had been interpreted to mean that the majority of the staff considered it important to complete it and send it off. Out of that survey also came the indication that staff members found their company as being too hierarchical and a status-driven one.

Early in 1993, the new MD contacted the senior managers to seek their views about a new mission statement. It was said by a manager of the General Management Services Unit that the new MD wanted a new mission that would provide inspiration and reflect the changing culture of the company and there needed to be a link between the values expressed and people's everyday jobs. It was explained that the new MD aimed to make API a flatter organisation where there would be no status issues, and where management style would no longer be directive: "He is getting there, but it takes a long time to change the organisational culture. Having said that we cannot afford to take too long because we are talking about survival. The insurance market is not growing for a number of reasons (e.g. competitiveness). Market share is under threat and people are more concerned with quality of service and price. We cannot compete on price, but we are determined to compete on the service. This has been put together by the new MD and a team of people that he chose of all levels no simply of the managerial level, to establish the company's new vision which comprises everything for which we stand for".

A manager in the Public Affairs explains the importance of introducing a new vision
statement few years after the development of "Alpatros UK is its People": "The ownership of the old one was not good enough in the sense that there was a fairly high theoretical idea. The newest is very much an action-based. The old was very much a statement of words. Although it stressed the company's values, it did not necessarily make us (the members) to live with those values. The new vision is action based, and we have to live to the values. They have a different focus".

The new vision was about the company's purpose, its intentions, its aims and its actions. Its purpose is to be the best general insurance company in the UK. To do this, further improvement in the standards set with regard to its members, its customers, shareholders and its community.

A report entitled "Alpatros Insurance is Us" (APIU) was published and each member of staff received a personal handbook containing the statement and details of how it links into strategy, general plans and individual targets. As it was stated by the new MD in that report, the vision provided a sense of common purpose and a clear focus on the business goals that should be shared and understood by all members so as they can all make a contribution.

The report was also referring to specific objectives that needed to be achieved during the year 1994. With regard to claims, extracting benefits and improved productivity from image processing would be a priority. The overall aim was to minimise the leakage and to improve still further the quality of customer service.
The mission statement was found to refocus the signification structure of the organisation by strengthening the emphasis on customers and the importance of quality service.

Furthermore, regarding the company's information systems strategy, efforts would be concentrated on moving towards new technologies and build upon the substantial similarities which exist within underlying processes.

It was also stressed in the report that everyone in the company has a vital role to play. As it was put "the attainment of the objectives and values set out in our statement is the sum of all our individual achievements". The contribution of different members across the hierarchy is illustrated in figure 7-3 below:

Figure 7-3
Source: "APIU", Alpatros Insurance (UK) Ltd, 1994
According to a member who had closely worked with the new MD in the past, the new MD "is very accessible and visible and he demands that his managers and his senior staff are all the same. He is also very keen in people being awarded of what they do...[In contrary to the past] we do now have a performance related pay-structure...Information accessibility used to depend on whom you knew. It doesn't any more. Information accessibility is getting better...people used to get a bit protective of what they knew because they thought of information as power. I don't think that this is the case anymore. Or at least, this begins not to be the case".

Each Area Manager was asked to formally launch the APIU vision to their staff members encouraging to bring forth further little visions to make the APIU initiative come to life. The following are extracts from an internal newsletter, August 1994 describing how various area branches keep the [APIU] spirit alive (newsletters words):

- In 'Area 1', a steering group has been formed consisting of representatives of all the Area's offices and departments. It's purpose is to take forward the objectives of APIU and make staff aware of what needs to be done to achieve its aims.

- In 'Area 2', huge boards have been set up proclaiming statements from APIU. The boards have been mounted in strategic locations throughout the Area branch and are part of a series of local initiatives to keep up the momentum of APIU.
- In 'Area 10', groups of staff were split into five teams and asked to consider how the APIU philosophy could provide an outstanding quality of service...The brainstorming sessions produced over 100 different ideas of how both individual and team efforts could be channelled in providing a truly outstanding service....Out of APIU, the "Area 10' FISH" was born - a novel communication concept in explaining the role of APIU in achieving the company's business plan (figure 7-4). The concept being that equal concentration on our people and business issues is required to achieve our plan. The various 'scales' of FISH enable us to put into context the initiatives under way locally and nationally. Shoals of departmental FISH are now coming into 'plaice'. This enables all staff to consider their contribution to the Business Plan and what they can do to ensure its successful completion. Its a communication exercise that has certainly caught on.
A Career Mapping pilot was introduced in another area branch. Essentially, the Career Map is a snapshot produced and updated regularly, jointly by staff members and their line manager, recording: a) current skills, knowledge and experience - "Where I am"; b) agreed realistic 1-3 year aspirations - "Where I am going? and c) a development plant - "How I might get there?". The Map serves as a common reference point for the individual, their manager and Personnel department - "we are all singing off the same hymn sheet" as one person put it.

According to a business analyst in another area branch: "Overall, the APIU initiative has been an overwhelming success giving colleagues a greater feeling of involvement in, and positive contribution towards change".
The APIU aimed to promote a team-driven effort on quality, not an individual one. Based on the planning process figure, this still has a sense of hierarchical structure.

Further to the area branches, all the departments within the Head office were asked to develop their own attributes for team-members. "We are changing from an organisation which is hierarchical structured to an organisation where teams become more important...When you have a team culture in an organisation, it is important that people understand the effect of team members on quality. That is what the IT department started doing to develop attributes of a team member. We are asking all departments to do this. The IT department is the first. Each department may develop different attributes for team members. Again this idea for teamworking has been a result of the new mission. We realised that we should all look at the customer. The customer is concerned about the service that they get, not what happens behind it. So, we need to have teams to focus on customers". Based on this idea the IT department initiated the role of `The excellent team member'. In summary, the profile of the excellent team member consists of three facets, personal qualities, professionalism and communication skills. "The excellent team member's personal qualities would include a pleasant personality, a high degree of commitment and they would be self motivated, which retaining their individuality. Their professionalism would show in their impact or 'first impression' organisational ability and technical knowledge. The third aspect, communication, brings together the other two and covers formal and informal, written and verbal skills".
The 'Area 12' branch was also a pilot for a team based work with image. While image in the format that was put into was helping their activities, it was felt by the branch members that they needed to take it further. The distribution of work that was promoted with the implementation of image was about new claims going to one place and existing claims going into another which are then handled by different individuals. Instead of having individual handling, 'Area 12' preferred to have team-handling. This means that depending on the type of work which is being looked at this goes into different pools; different teams work different pools depending on the experience level and ability of its members. Besides, handlers can work on items according to ability, work is varied as handlers rotate amongst the work group while handlers can follow a logical progression from group as their experience grows. According to a project team member: "It is too early to draw any conclusions. However, the management and the staff in 'Area 12' are very pleased with the way it has been working so far, because it gives them much more flexibility with the way they actually approach their work".

The changes at the 'Area 12' branch reveal a move from an individual to a team-based work. "The idea of this kind of use of ImagePlus implies how people at this branch who came out with this idea have changed their approach to work as a whole. It is not simply facilitated by image but I think that it is a lot more indicative of the culture that we try to engender in the company as a whole".

Reference was also made, by an interviewee at the upper organisational layers, on
the role of ImagePlus in changing the organisational culture: "I think ImagePlus belongs very much in a team environment. Historically, claims handlers used to have their own work load which they kept protected. Now, we are going more and more towards having people working in teams, which image is ideal for. It helps to generate team culture rather than individual cultures".

APIU had also played an important role in reforming organisational structure in addition to changes in operational and departmental plans. A company's communication officer explains: "Each area branch now has claims, services, marketing operations and personnel all within the same branch. We realised though that there is duplication of effort. What we will be doing [in the near future] is to leave only one expertise for each area branch. For example, ‘Area 12’ will be a centre for household claims only. The branch in Area 5 will specialise in water claims". The aim of the reorganisation will be the concentration of expertise in one location looking for improving quality of service to customers and reducing costs. "It will give us better organisation and allow our staff to have a promotional path. We are currently working towards this. It is beginning to happen. The plan should be implemented within the next few years. The Image system already in operation would allow this happening".

Many decisions and actions have been initiated and encouraged by the human actors of the organisation. From the examples given above with regard to the plans made by various area branches it seems that the APIU initiative has been so well
promoted that it could guide the thinking and practices of every single member of the organisation.

To what extent however, are these independent of the structural properties evident within the previous period? The planning process pictured in figure 7-3 (see p.224) reflects the traditional hierarchical structure that existed within API prior to the technological and other changes, a structure where decisions and planning are made at the top and execution of work is done at the lower layers. This is further supported by the constant monitoring of work as well as by the fact that work is distributed first to supervisors and via them to handlers.

7.6 DISCUSSION

If I was to interpret the API case within the CBIE concept, then certainly and until this research was carried out, there was no adequate sign of an ‘informed’ environment. Some changes in working practices occurred within the Claims Operations department as a result of using the image system, e.g. moving work electronically via pools. This work, however, is initially accessible by supervisors who then distribute the work to the handlers in consideration of their ability and the nature of tasks. Most of the handlers have been trained to carry out certain types of claims only. Even if they had had access to the working pool, they would not have been able to do the job. Restricted information accessibility as well as inadequate training and knowledge of a broad range of organisational practices, the
continuation of the narrow span of control and of the functional-based work design are conditions that could not support the establishment of a CBIE within Claims Operations.

I had earlier in this study related CBIEs to employees' empowerment. Some reference was made to empowerment when discussing possible implementation strategies of the company's APIU mission in one particular area branch (see "the fish", figure 7-4). In general, however, the senior members contacted made no reference to an 'empowered' workforce. Furthermore, the plans for centralising expertise and hence 'weakening' the area branches are expected to make the realisation of an 'empowerment' scheme difficult. It was gathered from those interviewees who referred to time period C and from the internal memos provided and the newsletters published during this period, that there are managerial intentions to enhance teamworking among employees. It is expected that there would be more cooperation between employees in API than in STW and the EL, where the 'empowerment' vision needs employees to start and finish a job and hence encouraging an individualistic culture.

It is recognised that several changes have occurred on the organisation of work within API and more specifically within the Claims Operations as a result of the introduction of ImagePlus. The use of the system had reinforced the already by then highly autonomous area branches. The system had also given the opportunity to rethink some of the working practices that existed in the organisation until that
ImagePlus has thereby challenged the user-organisation on looking at new and more efficient ways of doing the work. As a result of that opportunity, there have been plans for using image to take skills and expertise away from the area branches in an attempt to concentrate expertise in one location.

Figure 7-5 pictures the variety of activities undertaken by the area branches
throughout the recent history of the company. It shows the shift, which took place in 1986, from the many small local branches to a few large area branches. The area branches have continued carrying out the same kind of activities as the local units with a larger number of customers and more autonomy. With the plans to concentrate expertise, change in area branches is expected to be even more radical. This change would allow each area branch to deal with nation-wide customers, imposing however restrictions on the number of activities to be carried out within each branch.

7.7 CONCLUSION

There has been an incremental change within the Claims Operations in API as a result of the initial implementation of ImagePlus. The system was used to support the status-quo with no fundamental changes in the way the work was organised. Similarly to the STW case, when strategic choices became more definite some further uses of the system have been planned. With the forthcoming changes the work at the lower level of Claims Operations is expected to be even more fragmented and specialised. The ultimate aim would be to narrow the scope of activities carried out by the area branches so as each of them to specialise in a single claims operation.

It is expected that with this change, each area branch would have to deal with nation-wide customers and not merely with customers within the area boundaries.
as it has traditionally been the case. The information on the forthcoming radical change made reference to the area branch level and not at the individual level. However, the use of ImagePlus for instant access to customer information regardless of location as well as for standardisation of working processes which have begun with the implementation of the system are expected to limit the scope for variety, information accessibility, learning opportunities and action taking among individual employees. The use of ImagePlus to encourage teamworking rather than the development of informed and ‘empowered’ employees reveals its flexible character.

The findings from this case-study as well as those from the other two case-organisations are compared and discussed in the following chapter.
CHAPTER 8

COMPARATIVE ANALYSIS

8.1 INTRODUCTION

Severn Trent Water Ltd and Equitable Life were found to be closer to the CBIE concept than Alpatros Insurance UK Ltd. They have used ImagePlus so that employees in their customer servicing areas may have instant and multi access to information and may enhance their responsibility at the workplace. As a result of training and on-going support, employees have become more knowledgeable about their company's operations and the services provided to the various clients. They have become capable of taking action without the need to pass messages around for assistance and approval.

Each case-study made some contribution towards understanding the concept of CBIEs. Firstly, the STW case provided insight into the fact that the development of a CBIE might be dependent on the immediate (and also on the former) organisational context. Similarly, the EL case illustrates that the formation of a CBIE could be context dependent. This case also makes us rethink and question the anthropocentric nature of CBIEs. The API case reminds us that not all the potentials of information technology may be realised. In contrast to the STW and EL cases, within the API case ImagePlus did not result in informating employees. The system was rather used to automate the already fragmented and functional-based work structure. From the experiences drawn
from the use of ImagePlus within the three organisations, information technology reveals its dual (Zuboff, 1988) and flexible (Orlikowski, 1992) character yet again. ImagePlus was used differently by different user-organisations, by different contexts of use and by the same users over time. Chapter 8 focuses on the analysis of the case-studies and discusses themes related to the issue of information technology and changes in the organisation of work arising directly from this material. Particular emphasis is given to the development of CBIEs.

The chapter consists of two main parts. Part A takes a contextual approach for the discussion of processual changes in the three organisations. Part B discusses in detail the nature of CBIEs. It concentrates on the reality of employees’ ‘empowerment’ and on the anthropocentric scope of the CBIEs evident within this study.

8.2 PART A

This part investigates the interactive processes between structural properties and human actors within the three case-studies as a result of the introduction of ImagePlus and the development of CBIEs. The discussion also involves an appreciation of the use of structuration theory in the study.

8.2.1 IMAGEPLUS ON EMERGENT FORMS OF WORK ORGANISATION

All organisations studied have been users of the IBM system ImagePlus.
Customer services constituted the core of the firms' operations. The organisations utilised all functions of ImagePlus prescribed by the supplier contributing to the establishment of a new form of work organisation within their customer services area. As a consequence of this, and according to the supplier, the companies have successfully implemented the system and have been used as IBM reference sites for potential buyers.

This section aims to identify the role of ImagePlus on emergent forms of work organisation. The structurational model of computer-based environments, which was introduced in chapter 3, is modified to stress the focus of the discussion (see shadowed area in figure 8-1). Figure 8-1 illustrates the interactions identified in the case studies with regard to the use of ImagePlus in the three organisations and its role in shaping the emergent forms of work organisation.
Figure 8-1 gives an illustration of the main points of the discussion below. It pictures the deterministic impact of the image system on the organisation of work, but also the implications of the system as these had been influenced by the goals and interpretations of upper human agents and their knowledgeability of the structural properties of their organisation. It is important noting that the way the arrows in figure 8-1 are numbered should not be taken to mean a priority order. The arrows are numbered merely for identification purposes. Due to the amount of complexity involved in technology use in organisations, it has not been possible to place them in a priority order since it is difficult to distinguish which had influenced what. This could be a strength of the structuration theory (Macinstosh and Scapens, 1990) for it tends to show the interdependency between structural properties, human actions and technology, rather than to select a particular theoretical approach on the 'information technology - organisations' theme.

**Arrow 1: ImagePlus as a Human Choice.** Although all three organisations were IBM-sites, the ImagePlus system was not imposed upon them by any external factor. Their decision to be IBM-users but also to be loyal to IBM obviously had an important role to play in the choice of ImagePlus. In the case of EL, there had been a major influence by a single person during the decision making process. The system was proposed by AJ, a newly recruited IT manager. Prior to his recruitment at EL, AJ was a STW IT manager where he was also found to be an IBM supporter (Computing, Jan. 8, 1987). The data collected were not that detailed to identify the relationship between IBM and AJ
(as in Pettigrew, 1973). AJ was seen however as having the relevant expertise and knowledge to make decisions on information systems related issues. With his legitimate power as the Assistant General Manager of Management Services and his expert power, he was able to influence the decisional outcome. An EL systems manager explains: “AJ is the most senior IT person in the company ... He is responsible for the whole IT function development, operation and strategy and he reports directly to the MD”. A STW systems manager also remembers: “He [AJ] together with the finance director were the major players in the discussion and decision to shift from ICL to IBM”.

The huge investment in image technology had attracted the attention of key organisational players, e.g. the MD in the cases of API and EL, and the director of finance and director of business systems in the case of STW. These senior organisational members had undertaken on-sites visits and had demonstrations before an ultimate decision to be made. It was important for them to know that the system could benefit their organisation. Approval by each company’s Board of Directors was also necessary due to the amount of capital involved in the project.

Besides, this system was introduced to achieve pre-set purposes, e.g. to increase productivity and to improve the response rate to customer queries. As an API supervisor puts it: "ImagePlus is too expensive. Not many companies can afford it. You have got to be very sure of your objectives. There is no point trying to implement it without knowing why". According to a STW clerk: "The system
was introduced with the customer in mind", and another employee explained that "it was introduced to provide quick and better service". More explicit was the following explanation: "We are responsible to the DG and he is answerable to the government. We have the DG standards to achieve... The management wants us to use the system to answer as many queries as possible" (STW clerk). Therefore, the use of this technology was directed in such a way so as to achieve those purposes. The STW image procedure manual had also stressed the need to use the system to improve efficiency. In EL, a Steering Committee was formed to review and administer the image project but also, as it is often the case (King, 1977 and Robey and Markus, 1984), to ensure that its implementation is directed towards meeting the strategic plans of the organisation. Consequently, the use of ImagePlus was a human choice, an action of various organisational members at the top level who expected information technology to have certain pre-set impacts on organisational performance. This interaction is demonstrated with arrow 1 in figure 8-1.

None of the three organisations planned to use ImagePlus as part of a radical organisational change. Rather, the initial plans were about variations of the status-quo with specifically some minor improvements on the way the jobs were carried out. This, as a consequence, has had an impact on the nature of the relationship represented by arrow 2 (figure 8-1).

**Arrows 2 and 3: The impacts of ImagePlus.** ImagePlus, as a standard system was designed to have certain capabilities, e.g. to capture, store, retrieve and
route data electronically, which in turn influence human actions. Having introduced image technology, some aspects of work organisation are immediately shaped (arrow 2 in figure 8-2). No matter who is involved in the decision making process (and why), these functions occur. These mostly involve changes to the way the work is done (i.e. new tools) and not changes in the nature of work (i.e. roles and responsibilities). This is not to deny the symbolic uses of information technology in organisations. Control over information can symbolise status, enhance authority and shape careers (Pettigrew, 1973). As it was also discussed in Trevino et al (1987), Feldman and March (1981) and Robey and Markus (1984), information technology may be introduced in an organisation for symbolic purposes, e.g. to signify a high-tech environment, rather than as a tool for managing information processing. Feldman and March (1981) explained, though, that however symbolic the initial reasons might be when introducing a new technology, organisations are unlikely to remain neutral with regard to the use of this technology. Regarding a system such as ImagePlus, indexing and scanning are the first functions to be ‘discovered’, for the system cannot perform without them.

The standardised features and pre-set procedures of the system could prevent users from forming any other preferences as to the process of work with regard to information storage and retrieval. The image solution embodied certain practices that could constrain the choices made in relation to impacts on working practices. In all cases, some staff members had to be trained to perform the indexing and scanning of documents. Besides, telephone operators in STW and
EL (where there were attempts to bring front-line employees closer to customers and subsequently to respond quickly to customers’ queries) required keyboard skills to ensure that they could take telephone messages quickly and efficiently. It has also been recognisable to API employees that everything had become quicker: "The speed is something that you do notice. The claim can be dealt within a day, instead of a week. That’s the main thing". One of the most obvious impacts of ImagePlus within API is that the system controls the priority of work. According to an API clerk: "I do not think that we have seen many changes. We still deal with the claims in the same manner. Obviously, things are prioritised for you and you cannot get passed a difficult claim".

By viewing the changes in the work process, it can be claimed that image technology played a role in the reconfiguration of clerical tasks as well as the establishment of new procedures concerning the processing of work using ImagePlus. The image system has enabled new forms of doing the work. At the same time, it has restricted previously available ways of working: "employees do not want to go back to paper" (STW manager). Even if they wanted to use the paper-based system, they could not do so. There was a conversion exercise which preceded the system's implementation and which put most of the customers' files on the system. Therefore, the use of ImagePlus has "closed certain doors that were once opened" (Weizenbaum, 1984:38).

In addition to its direct effects, the system could continue having an influence as long as human knowledge and meanings are shaped by its use (hence arrow 3).
Scarbrough and Corbett (1992) have made reference to the impact that knowledge of the potentials of technology can have on an organisation. In the cases studied, the organisations had all relevant information about the possible applications of the system. Apart from written material and oral presentations on the use of the system, IBM's contribution on this issue involved the arrangements of visits to organisations which had successfully implemented the system in North America and Scandinavia.

ImagePlus, in addition to storage and retrieval, is an enabler of workflow management. It has the capacity of moving work (e.g. documents) electronically either directly to clerks or via their supervisors or other managers. This feature of the system is expected to have more human interactions of political nature, which will be explained with arrow 5. "ImagePlus was a catalyst for change" (EL senior manager); "It gave the opportunity for multi-skilling" (EL unit manager). The system was therefore interpreted as a means through which opportunities for information sharing are created regardless of time and space: "With this system you can work anywhere" (STW supervisor).

Knowledge of the real value (i.e cost) of the system could also influence interpretations towards its use. When asked what could be the constraints on other organisations to adopt this system, most of the interviewees made reference to its cost: "ImagePlus is not cheap". The fact that it is an expensive system could encourage the organisations to look for further ways to expand its utilisation in addition to its basic functions. According to a STW middle manager:
"...I think there were cheaper solutions but this helped us to be able to make further benefits by reviewing the way the organisation will function in the future in terms of increasing demands on the way we operate, efficiently and effectively. Maybe, there is an aspect of giving us a competitive edge in terms of differentiating ourselves from other Plcs and certainly this type of technology can give us a market edge".

The system also influenced employees' behaviour at the workplace. Employees have become more responsible for their actions since their work could easily be seen by their supervisors: "Now, the responsibility is even greater because the work can be seen", "the old system was not very efficient...It was very difficult to control. Somebody could easily put it in the bin and the supervisor never knows". Zuboff has called this increased visibility of work behaviour via information technology, the 'information panopticon'. Information technology can change the traditional ways of managing people; it can provide information about employees' behaviour and efficiency at the workplace without the need for face-to-face communication (Zuboff, 1988). The ability to provide instant and multi access to information and to distribute work electronically, and the flexibility in physical location would be difficult to accomplish without the use of information technology. According to an API supervisor: "it is human nature to avoid those things that are difficult and to put them on one side. The system does not allow the handlers to do that". Apart from the fact that technology, being 'nonhuman', cannot hide any outstanding work, it can also direct and control human work. This electronic communication encourages employees to be continuously alert
since they could be controlled at any time.

During the initial stages of the implementation program in all three organisations where acquaintance of the system and its functions were important, there were IBM consultants within the image project team. This indicates that it was important to have the relevant knowledge regarding the capabilities of this particular information technology to accompany the implementation process for the most effective use of the system. With reference to the above, the extent to which IBM consultants could exercise power over its client-organisations in respect to the use of the system is examined. In a study by Markus and Bjorn-Andersen (1987), it was found that systems professionals, either inside or outside the user firm, do have power over users. In the three cases, IBM could exercise power in two ways: a) it was the only hardware and main software supplier for the organisations and this had an impact on management’s decision to add another IBM product, and b) ImagePlus was a software with features especially attractive to large organisations which face difficulties in storing and distributing information. ImagePlus was promoted only by IBM and it was new in Europe. As an EL senior manager puts it: “... we are a big customer for IBM [for ImagePlus], and they would not let us fail”. ImagePlus was an expensive product and the assistance of the IBM consultants, those who were experts in the systems applications, specifications and capabilities, was needed especially at the beginning of the implementation process. IBM has not merely promoted ImagePlus for its technical capabilities to manipulate information efficiently. ImagePlus was also promoted as a system with embedded ideas about job
design and organisational performance by improving quality and speed in customer service. Shifting emphasis from a traditional bureaucratic organisation to an ‘empowered’ and a customer-driven organisation constituted to the symbolic values of ImagePlus. This reinforces the existence of the symbolic exercise of power by information systems professionals (Markus and Bjorn-Andersen, 1987). The symbolic nature of ImagePlus could shape users’ attitudes and beliefs about new alternative forms of organising. To what extent, though, could the client/organisation achieve the full potentials of the system as defined by the supplier? Arrow 4 that represents the influences that had been exercised by organisational structural properties on the use of this new technology looks at this issue.

**Arrow 4: Structural Properties influence Human Actions.** From the case-studies, it was found that during the image introductory stage of the image system, staff members in the three organisations worked within the constraints of the then power, work and signification structures of their organisations (arrow 4 in figure 8-1). In all three organisations, the image project teams drew on a procedure manual prepared prior to any implementation and approved by senior managers. The manuals were designed on the basis of knowledge of traditional power structures and norms of work organisation, reinforcing the view for efficiency, control and quality customer service. Therefore, although key human actors were found to have exercised an influence on the kind of technology to be used in the organisation (as it was seen with arrow 1), their initiative for the use of new information technology was drawn upon structural properties for
approval and acceptance. The senior manager of EL who was responsible for the reengineering project admitted the need to get directors’ approval for the changes: “... taking away layers of management is not something I can do; changing the salary system is not something I can do...” (see chapter 6, p.189). The establishment of the Steering Committees also reveals the dependence of the project teams on top level management.

The new patterns of signification structure had reinforced the changes. For instance, the privatisation of the water industry, the existence of OFWAT and the DG standards were used as interpretive schemes by STW managers and employees for understanding the organisational changes (see chapter 5, p.123). Similarly, “the going the IBM way” was used to interpret and justify the introduction of ImagePlus by the EL managers (see chapter 6, p.171). The vital role of Claims Operations, as a core department within API which could influence company’s image towards its customers, was used to interpret and welcome the need for the new system.

During or near to the period of changes all three organisations decided on the establishment of a new or revised mission statement. Despite the differences that depended on each company’s market sector, the organisations were all concerned through their mission to be a customer-oriented organisation. Once these missions had been shared across the hierarchy, they became institutionalised and they could influence human actions and meanings given to various organisational activities. The use of the system, therefore, as well as the
changes in working procedures within the customer services area, were directed towards the achievement of the company's mission.

Traditional forms of organising work and control mechanisms had also influenced the intentions and actions of human agents within these organisations. In the API case, there was management persistence to keep the traditional hierarchical structure within its revised mission (evidence of this is found with figure 7-3, p.226, which illustrates the kind of planning to be undertaken at the different hierarchical layers). Furthermore, although it might seem that within the 'empowered' workplaces of STW and EL, the structure of work has been transformed, the discussion in the second part of this chapter provides evidence that this was not exactly the case.

**Arrow 5: Human Actions influence Work Organisation.** Knowledge of structural properties as well as knowledge of the potentials of ImagePlus and meanings given to this new system, especially as a facilitator of shaping power relations, were found to be prerequisites for further organisational changes at working practices within the three organisations.

As it was discussed in chapter 3, the way technology is interpreted by the various users might differ and hence the implications may be different. In the STW and EL cases, key organisational players had interpreted the technology as the key to an 'empowered' workforce, while in API the same system was seen as enabling the concentration of expertise to individual area branches. These
emergent forms of work organisation were strongly influenced by the legitimate power of a new director on whose authority technical staff and users were able to draw to obtain approval and technical and financial resources. In the EL case, for instance, the new MD chaired the Steering group. As it was said in one interview: "he owned the ideas and wanted them to happen".

The new director of customer services of STW, drawing upon his knowledge of the systems' capabilities and on structures of signification for a customer-driven organisation, declared:

"What I saw when I picked up this responsibility was that a great deal of attention and effort and investment had gone in the technology side of business but that the organisational aspect did not enable that technology to deliver. I think it was natural that technology being in place, it provided the opportunity to look at the whole organisation of customer accounting. So what I saw was a lot of problems in the structure within the department. It was a multi-layered and a very fragmented organisation. Many walls between different parts of the business, people not talking to each other".

Employees' ‘empowerment’ has not been an immediate outcome of the introduction of the system. Image alone could not initiate such a change in information distribution. Because the control of information is a source of power, the sharing of it is often in the centre of political discussions (Pettigrew, 1973). In STW, the key driver of the changes had managed to remove managerial resistance by educating them or even on certain occasions by removing them
(see chapter 5, p.148). A senior manager within the EL who referred to the
timing of the changes explains: "Technology came first. But because at the time
it arose, there was a physical external constraint on our ability to continue to run
our old systems and therefore there was a physical influence to change the
systems. It was only really as a result of that opportunity that there was
stimulation to think about structure. Although the system change was forced
upon us, for external reasons, that was seen as an opportunity...Since we have
decided to use new technology, we had a choice, either to use the new
technology and the old structure or we could consider changing the structure;
we changed the structure".

Knowledge of the system's capabilities to enhance visibility of employees'
performance was also utilised by supervisors in all three organisations in order
to identify training needs. As an API supervisor put it: "We can use the system
to develop people".

**Arrow 6: Human Actions on Structural Properties.** Arrow 6 represents the
influence that was exercised by human actions on structural properties as a
result of the use of ImagePlus and the establishment of new emergent forms of
work organisation.

Key actors within STW and EL decided to move towards a multi-skilled
workforce and to ‘empower’ front-line employees. As a consequence, the
signification structure of these organisations was transformed to involve the
concepts of 'empowerment' and 'multi-skilling' while their power structure has been loosened due to the decentralisation of responsibility. Changes in power relations were more evident in EL where the organisational hierarchy had become flatten, following the introduction of ImagePlus. In contrast to the other two organisations, upper human agents within API made plans for moving power and expertise away from the area branches. Instead of being autonomous in their dealings with the area customers, the area branches would have more specialised dealings with a single service for nation-wide customers.

The changes in both STW and EL modified another aspect of work structure. There has been more emphasis on individuality and less on teamworking. With the new work structure which resulted in an informed and an 'empowered' workforce, employees needed to work on their own. They have to answer to customers' queries and take actions themselves. They were not encouraged to pass messages around for other people to do the work. Along with the constant monitoring of work, this could reduce the amount of social interactions at the workplace: "you end up not speaking to one another; if the mother of the girl who sits next to you has died, you wouldn't know" (STW telephone operator).

The reason for this individual way of working was explained by the Director of Customer Services: "... all the problems that we had were about interfaces. Everytime you have an interface between two parts of a function you've got a gap. You've got the potential to lose information in between that gap. As soon as you need to pass information from one group to another, you have the
potential of problems”.

In all cases, the technological and other changes have reinforced those patterns of signification structure stressing the need for quality customer service and efficiency. Since then, service to customers has been evaluated by considering the response rate to queries.

As a concluding remark to this discussion, it can be claimed that the technology itself has not managed a major modification on work organisation. With the exception of some impacts on basic working practices, that resulted from the introduction of new procedures for doing the work and which accompanied the use of ImagePlus, most of the changes (including those which involved the ‘empowerment’ of lower-level employees) have been initiated and driven by key organisational players drawing upon structural properties and enabled by the technology. The fact that these changes have not occurred with the initial system implementation, indicates clearly that technology alone could not deliver them. Even though the system had been promoted as having the potential for employees' 'empowerment', it could not determine such kind of change. The distribution and use of information uncovers the hierarchical structure of an organisation. The more the information accessible and used by an individual, the less s/he would depend on others for action taking. For bureaucratic and highly hierarchical organisations such as the ones studied, any modification in the distribution of information would mean changes in the structural properties of work and power. Modifications of this kind are not technologically determined.
In the organisations studied, these were driven by human agents who had interpreted technology as a means for achieving a customer-driven organisation. However, as long as human interpretations were influenced by knowledge of the potential of technology, the latter could still exercise some deterministic impacts (Scarborough and Corbett, 1992).

From the discussion in this section it is identified that a single perspective is not enough in examining the relationship between technology and organisations; rather, a broad perspective by which to look at technology in organisations is preferred (one that can conceptualise the findings so as to take account of technology's impacts, human actions and reactions and structural influences). When a narrow perspective is taken, the findings run the risk of being incomplete. The model in figure 8-1 is therefore found to be different from the main perspectives in the information technology and organisation literature, which share at least one of the following characteristics: a) they are deterministic in nature; b) they are unidirectional and single-level based and c) they do not adequately consider human intentions and meanings given to technological and other changes.

The model in figure 8-1 (p. 240) supports Orlikowski's argument (1992) that previous perspectives on the concept of technology in organisations are not wrong. At several occasions, as indicated in this section, there was support for these perspectives. It has also been indicated that these have been correct within certain frames of analysis, e.g. managerial choice is correct if the analysis
deals only with the relationship between people and technology without reference to the context of the organisation in which that relationship is placed. Therefore, Orlikowski’s argument (1992) that these perspectives are only partially correct is right. The study has also reinforced Barley’s argument that historical processes of work impact on meanings given to technology which subsequently shape organisational restructuring (Barley, 1986). Structuration theory has an invaluable input into these findings.

Structuration theory urges attention to the interactions between structural properties and human actions which had taken place within the organisation in which technology was introduced. Within the present study, there was also a focus on the periods prior to and after technological change. This allowed me to identify the ‘why’ of technology; that is its purpose within the organisation. This was missing from Barley’s and Orlikowski work which focussed on the period of technological change alone. Furthermore, the use of structuration theory within this study permitted a better understanding of the contingent character and flexibility of technology-in-use.

The following section focuses the discussion on the process of change in the context of CBIEs.

8.2.2 THE PROCESS OF CHANGE IN THE CONTEXT OF CBIES

The establishment of a CBIE was found to be a multi-faceted process that was
not restricted to the actions and choices of a single person, no-matter how high in the hierarchy s/he was positioned. It was found that for change in the form of a CBIE to occur, this emerges from a complex of interactions in which human actions, mediated by the work, power and signification structures, were engaged.

It is certainly important to have a key person to initiate and drive change; but change of this kind (i.e. cutting layers of management, enhancing employees’ responsibilities) based solely on a persons' beliefs and choices could be inadequate. A managing director in API had to resign because he could not handle the interferences from the Board of Directors. What this suggests is that the seniority and power of a person are not always enough to manage change in the desirable direction. The case-studies have uncovered that it was important for senior people to value the role of structural properties as well as to be willing and able to transform them to suit managerial choices.

In all three organisations, there has been a modification in the signification structure to the one that stresses customer service. Again, that has been initiated and driven by the key actors illustrated in each case. This finding supports Korpela’s (1994) statement that changes in structures of signification on the functioning of an organisation, are often prerequisites to other structural changes. However, although change at the signification level was apparent in all cases, it was only in STW and EL where change went further than this to modify some aspects of work and power structures. In both STW and EL there
was at least one senior manager who had initiated and driven the establishment of an informed environment at the lower levels. To get everyone concerned across the hierarchy to believe in the importance of such a change and to get particularly the directors to sign on it were viewed as necessary. In neither of the STW and EL cases could existing structural properties accommodate a CBIE approach to carry out the organisational functions. Both STW (as an ex-local government body) and the EL (with a history of more than 200 years) were highly bureaucratic and multi-layered. Even the major, innovative technological changes evident within both organisations were not enough to change the structural properties which existed at the time. In both cases, the drivers were key human agents at the upper layers of the organisational hierarchy, who committed themselves to the changes to come. The CBIEs therefore in STW and EL were not unintentional. They were planned not only in terms of content (i.e. the range of skills and responsibilities required), but also in terms of context. The initiators and drivers of this form of work organisation being knowledgeable of the structural properties about their organisations drew upon the power structure (e.g. getting the approval of the directors) and the signification structure (e.g. a customer-oriented organisation).

As in the first two organisations, in API there was a key actor (the new MD), who had introduced a new mission statement for the organisation, and aimed for a customer-driven and team-based organisation. From the information gathered, though, it seems that his attempts had concentrated onto ‘selling’ it to the ‘floor’ (the area branches and the lower level employees) and not to the Board.
Employees were asked to participate with ideas to shape the direction of the organisation. Their suggestions could only, however, be implemented at the operational level. As a result, key structural properties (e.g. power) remained unchanged. Even if there had been an intention to informate the workplace, the hierarchical planning process pictured in the APIU report (see chapter 7, p.226) was not designed to encourage such a change. The strategic direction had already been planned to reinforce the power structure that existed at the time.

Hence, the conclusion to this section is that, in the context of CBIEs if managerial and strategic choices are to be realised, there is a need for at least some transformation of structural properties, particularly those of power relations.

8.3 PART B

The detailed character of the case-studies provides invaluable insights into the key issues which could surround a humanistic route of information technology in the organisation of work. This second part of chapter 8 highlights the factors which could act as constraints or enablers to the development of anthropocentric CBIEs.

8.3.1 ARE CBIES PRAGMATIC?

STW and EL are found to have managed an establishment of a CBIE within
their organisations. They had both used information technology to informate their workforce at the lower organisational layers. These two cases provide evidence of significant changes in the workplace away from the traditional, bureaucratic and hierarchical nature of work. Work has been organised into broad, multi-skilled jobs with the majority of workers being able to handle every kind of task as well as to carry a job from start to finish. As a result of the reorganisation, employees in both cases have broadened their knowledge of the products/policies provided by their company as well as the various functions associated with customer services. Access to all customer files was possible and was encouraged.

A unit manager within the EL explained:

"Before you [the clerk] didn't work on your own and you weren't responsible for the job that you did, somebody else was going to look at it afterwards. It was going to be checked. Whereas now, it goes straight out the door - you are responsible for it. If the client comes back to complain, you are the one who will be caught to it, not the managers".

Environments such as CBIEs give shopfloor members broad access to organisational practices. They create conditions of learning about the organisation and its functions and result in new skills and knowledge acquisition. In addition to this, they bring their members closer to the organisation by encouraging them to learn more about it. In the two CBIEs, employees have indeed broadened their knowledge and have acquired abilities to enable them
to comprehend organisational processes of work and to deal with multi-functional activities.

For the people lower down the organisation, wider information accessibility and multi-skilling meant more variety and more interesting jobs. Clerks within STW made the following remarks:
- "it made my job more interesting. I can follow the whole process, not having to pass on work to different people";
- "I prefer to have a mixture of work and being trained on different areas of work".

Training has played a key role in the transformation from a single- to a multi-skilled workforce. In such workplaces, on-going learning is required to up-date employees' knowledge about new and modified policies and services provided by the company. It is important in an environment like this to keep the employees very well informed about internal practices and procedures so that they, in turn, provide the best service to customers. In fact, both companies aimed at improving customer services by ‘empowering’ their front-line shopfloor employees to take action to customers’ queries.

In an attempt to understand the reasons for the establishment of CBIEs within STW and EL, the interpretations of the latest organisational changes by the people at the upper layers of both organisations are illustrated.
Senior managers within STW interpreted the rationale of information sharing and a multi-skilled workforce in terms of improvements in efficiency, which was mainly assessed in terms of speed in customer services. The Customer Service Strategy approved by the directors and other senior members of the organisation, for instance, declared: "we intend to ensure that when customers do contact us they are dealt with more effectively and efficiently by providing our front-line staff with a wider range of information and by empowering them to take required action at the initial point of contact". As the director of Customer Services notes: "... we used to have three different groups of people to do a job that one could have done. We then got the idea to get one front-line person to actually action many of the things that the letters are asking to be done". The latest organisational changes were also interpreted by the MD as being "the foundation for future success for meeting OFWAT requirements and the company's goals of being the best water utility company". In general, the senior managers within STW interpreted the changes as an opportunity for a customer service driven organisation.

Similarly, a senior manager within EL interpreted the changes in terms of efficiency in customer service: "Currently, 65% of all calls are answered immediately, about 27% are answered the same day...These percentages are improving all the time because the staff becomes more confident and competent".

Senior managers' understanding of the evolution of a CBIE within their customer
servicing department was in general consistent. Managers in both organisations related structural changes to improving efficiency reflecting their company's strategy to be customer-oriented. Managers' primary focus was on customer service. In fact, it must be recognised that in both organisations the formation of CBIEs was achieved only after top management had showed concern for customer-related processes of work, which were previously shaped by the traditional organisational structure.

According to Dichter (1991), organisations of the '90s are moving away from the 'command and control' principles [of the 1910s] of Taylorism. Instead, they go for a customer-led approach, ‘empowerment’ and use of creativity by the workforce. STW and EL could be characterised among Dichter's organisations of the '90s; they have become customer-oriented via an ‘empowered' workforce. Yet, there is evidence that the 'commands and control' principles have not been eliminated, for ‘empowerment’ and flat structures have been accompanied with simplified and shorter work processes. The following two sections are based on this argument.

8.3.2 EMPLOYEES’ EMPOWERMENT: FROM RHETORIC TO REALITY

Employees' empowerment as the distribution of authority to the lower organisational layers is an ideal to believe in (Altkinson, 1988). It is only when we look closely at the meanings given to it that we can understand its true role in an organisation. Since the field work was carried out shortly after the
establishment of the 'empowered' workplaces of STW and EL, the issue was fresh in peoples' minds, and more details on their implementation could be revealed. As a result of this, but also because of the emphasis of the study on employees' viewpoints on the changes in their organisations, the reality of 'empowerment' could more easily and effectively be uncovered.

It has been identified that in one of the case-studies the concept of 'empowerment' was used during a period of time when there was no managerial intention for the sharing of authority or even responsibility among shopfloor employees. The word 'empowerment' became widespread within STW prior to the development of the Customer Services Strategy, which was stressing the importance of an 'empowered', multi-skilled workforce while work structure was still based on task fragmentation and specialisation. The following cartoon (figure 8-2), with the slogan "you are empowered to do what you are told", was decorating a clerk's desk in one of the satellite offices. People in satellite offices could more easily understand the true meaning of 'empowerment' (prior to the 1988 reorganisation, the STW satellite offices were functioning on an autonomous basis), than those who had been working in the company's head office, which historically was bureaucratic and hierarchical.
With the introduction of a multi-skilling policy, the 'empowerment' concept has been even more widespread. Meanings given to 'empowerment' are analyzed to see the extent to which they were formed in the context of organisational structural properties.

As it was discussed in the previous section, upper human agents looked at 'empowerment', multi-skilling and information sharing as a way of replacing bureaucratic regulation and improving customer efficiency. Du Gay and Salaman (1992) claim that customers' orientation reflects a broader discourse of enterprise. As they explain, the enterprising way in managing organisations...
involves “cultivating enterprising subjects, autonomous, self-regulating, productive and responsible individuals” (Du Gay and Salaman, 1992: 626) through the development of an ‘empowering vision’. These characteristics have been evident within STW and EL. It seems then (following from Du Gay and Salaman’s point) that these organisations in their attempt to cope with the environmental challenges and competitive threats have promoted an enterprising culture through an organisational restructuring.

Meanings given by senior members within both organisations were also found to have been influenced by knowledge of and acquaintance with Tayloristic practices of managing organisations. The two cases of ‘empowered’ organisations have the appearance of rationality supported by Taylorism. The decision to develop an ‘empowered’ workplace was justified by the Tayloristic economic values of efficiency and productivity. Hence, the management goals have not changed significantly from the traditional ones as they are still motivated by the concerns of profit, economic growth and efficiency. Even if a new work configuration has been introduced with some new patterns of signification structure, which emphasize an enterprising and a customer-oriented culture, the goals remained the same.

Interpretations made by people lower down the organisation were influenced by the new patterns of signification structure. In general, staff members agreed that the real value of using technology was for information sharing and action taking. The employees have also seen improved customer service as important for their
organisations. With respect to the multi-skilling policy within EL, a clerk noted:

"It is certainly better for the customer; if they phone up with several queries that one person can answer, it is a lot better for them. Some [clerks] will like it and some not".

In the case of STW, some positive views were identified, influenced by employees’ knowledgeability of the highly autonomous satellites offices of the organisation which were in operation until a few years ago. According to a supervisor in a satellite office: "You see, years ago we used to work like this. Everything to do with the customer used to be dealt within one area unit. It is like we are going back in time ... but with more technology". Another comment was: "Most people have welcomed it back".

In the EL case, clerks interpreted the changes by comparing them to the working practices that existed prior to the introduction of new technology. For instance, a unit manager within the EL declared: "The current concept [multi-skilling] is that you need to grow a whole range of skills rather than simply moving upwards. We got a lot of people who were previously managers but are not managers anymore".
Meanings on 'Empowerment'

<table>
<thead>
<tr>
<th>Upper Human Agents</th>
<th>STW</th>
<th>EL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directors/ Senior Managers</td>
<td>Action at the initial point of contact with customers</td>
<td>Improve Competitiveness</td>
</tr>
<tr>
<td></td>
<td>Speed in customer service to meet OFWAT requirements and be the best utility organisation</td>
<td>Speed and Quality in Customer Service</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Human Agents</th>
<th>STW</th>
<th>EL</th>
</tr>
</thead>
</table>
| -Supervisors/ Clerical force | A shift to old working practices:  
- having a mixture of work  
- starting and finishing a job |  
- "Yes, responsible but the computer dictates ... ",  
- "Is it real progression?" |

Figure 8-3

Figure 8-3 summarizes the meanings given to ‘empowerment’ by different human actors in the two ‘empowered’ organisations.

By looking at figure 8-3, it is realised that meanings given to ‘empowerment’ are influenced by human knowledgeability of the historical and current context of the organisation in which they are embedded. Human actors have drawn upon a diverse set of interpretive schemes, norms and facilities to make sense of the changes (e.g. new technology, historical processes of work, company’s strategies, performance and market conditions). Boland (1993) gives support to this finding. He claims that managers do not merely rely on one set of reports (e.g. management [accounting] reports as it was pointed out by Macintosh and
Scapens, 1990) but upon a broad range of conditions. What this study has shown is that different groups of human actors have focussed on different scripts, i.e. upper human actors have given attention to norms of efficiency, profitability and predictability, while lower human agents have given attention to their roles and skills within their workplace and were concerned about the quality of working life.

An important finding is that ‘empowerment’ and multi-skilling were seen by senior managers as the one best way for reorganising customer services in both organisations. The need to be multi-skilled was widespread in the departments. Clerks did not have the freedom of choosing between multi-skilling and something else. To be multi-skilled was the only option available to the people who wanted to continue working for the organisation. An employee in STW who works in the measured unit (for the distinction between the measured and the unmeasured units, refer to chapter 5, p.115), talks about the idea of linking the measured and the unmeasured sides: "It is horrible downstairs [in the unmeasured unit]...I do not think that we will have any say in the matter. I think that the next step will be to move down there even if we said that we did not like the idea". One may argue that the reality of ‘empowerment’ should be evaluated in terms of managers’ willingness and efforts to provide the means for empowering their employees, regardless of whether employees have chosen to be empowered or not. At an early stage of this thesis though (see chapter 1, p.6), discretion, autonomy and freedom of choice were identified as being fundamental features of the concept of empowerment. Therefore, "power is
nothing if it is not power to choose” (Weizenbaum, 1984:259). Without giving the power to employees to choose between alternative ways of work organisation and more specifically to choose between ‘empowerment’ and something else, this could not be true employees’ ‘empowerment’. Even though STW employees claimed that the management had begun to listen to them, they still felt that they had not gained any power within their workplace. Such finding coincides with Bowen and Lawler (1992) and Eccles (1993) arguments that there might be different levels of ‘empowerment’ namely those of 1) suggestion involvement, where employees are ‘empowered’ to recommend, and management decides whether or not to implement; their day to day activities remain the same, 2) job involvement, where employees adopt a variety of skills and get involved in various aspects of their job, and 3) high involvement, implying involvement in total business operations and organisational performance. The one evident within the STW case is found to be a mixture of suggestion and job involvement ‘empowerment’ programme.

The BPR literature through which the concept of ‘empowerment’ has recently been promoted (see chapter 1) attaches insufficient importance to individual-job interactions in determining employees' reactions while there is a tendency to promote ‘empowerment’ as the one-best way for organising the work. According to Hammer and Champy (1993), for instance, reengineering cannot succeed without ‘empowerment’. It is interesting but yet worrying that reference to ‘empowerment’ in the literature is related to Tayloristic practices.
The new salary system that was introduced in EL in parallel to the multi-skilling policy was used as a motivating tool to make people more easily accept the new policy. As a result, the clerks’ interpretation was also influenced by knowledge of the introduction of this new salary system: "There are people who want to learn and keep learning. You also have those who are motivated by money - the more they learn the more money they get". Money as a key motivator at work is a classic Tayloristic approach (Taylor, 1911).

The supporters of BPR take a focus on efficiency and effectiveness as well as on the competitiveness of an organisation (Mumford, 1994) with little reference to the need for understanding the relationship between humans and technology (see for example the work by Clutterbuck and Kernaghan, 1994). The latter is of significant importance when attempting to promote the human element, especially when the frequency of human-computer interaction increases to a great extent as it had happened in the cases studied. "It is tiring to work on the computer continuously" according to a STW clerk, while an EL employee made the point: "The only thing not so interesting about multi-skilling is to be sitting with the screen all day". A similar concern was expressed within the API case: "It can become a bit disturbing when working with two screens all day". None of the managers/participants within the research referred to ergonomic aspects of work organisation. It was also observed that most of the clerks had not been provided with screen filters even though they work continuously with computer screens. Screen filters have been identified as ergonomic devices which are
provided to computer users to reduce the problem of screen reflections\(^\text{13}\) (Cakir, Hart, Steward, 1980).

According to Braverman, "...management seeks to maximise its control over workers and to minimise its dependence upon them. Management grasps control over the production process for itself by gaining knowledge of production and by reducing workers to mere executors of work" (quoted in Attewell, 1987:324). Following from Braverman's point, it is important to examine whether those who have knowledge of working processes can also exercise control over others. Clearly, in the STW and EL cases, it became evident that supervisory control is no longer extended to the direction of work itself as it was previously the case with the fragmentation of work. Employees in customer services have acquired skills and knowledge which enable them to handle the work themselves. Yet, although employees have gained this kind of knowledge, this does not mean that they simultaneously have control over their workplace. Their performance is closely monitored by their supervisors to improve efficiency - an explanation given by the management side. A STW employee gave the following interpretation of the changes: "we used to be an 'uncontrolled' role culture; we are moving towards a 'controlled' role culture". Furthermore, the direction of work which is provided by the system itself should not be ignored. Because there are preset, expected guidelines to be followed, clerks can exercise limited, if any, judgement and discretion. Apart from the clerks, supervisors (and unit

\(^{13}\) Even quality screen filters have limited value though; although they can reduce screen reflections, "[this] is invariably accomplished at the expense of reduced character brightness and resolution" (Oborne, 1987:298).
managers in the case of EL) can exercise limited discretion. The system prioritises work and the supervisors’ responsibility is to delegate tasks appropriately. They are themselves directed by the system which in turn reports their performance to managers. In the STW case, supervisors in the Customer Services are responsible to the Quality Development Officer (see chapter 5, p.122) who can control their work at any time (hence, supervisors along with clerks are placed at the lower organisational levels, see figure 8-3).

Two unit managers in EL agreed on the following:

"Unfortunately, because there are specific ways of getting the job done on the computer, people don’t think as much as they used to; for instance, prior to the changes for a termination of a policy or a death, you had to think very much about what the terms were and compare them. You still compare them, [now with all these changes], but the computer works that out for you. If for instance, you go to terminations, the computer will give you directions of what you should do, whereas previously, you had to think about it".

From the example above, it seems that in EL the system is used to deal with the quantitative nature of work. But not only that; it also gives guidelines as to what the worker should do next. This particular feature of the system restricts workers’ judgement and creativity. It is becoming clear that systems in the so-called ‘empowered’ workplaces are set up by managers to standardise work processes. Standardised computerised procedures (as in the STW and EL cases), impose constraints upon the user in the sense that both "the dialogue
and the decision-making process are expressed in terms of the machine-understandable rules" (Gill, 1990).

A concern was expressed by a unit manager in EL about the knowledgeability potential of information sharing as a result of the company's 'empowerment' policy:

"We need to consider the future and see where people are moving to. People will say 'OK, I can learn another queue on the system, but is this going to be the same as the one that I am doing? I want to learn. I want to use my brain, I want to have challenge. It is difficult to learn; the challenge has been presented [by senior managers] as when you learn more and more products and more and more business events. But that is all very well. If they are all the same, it is all just pressing buttons. Is it the kind of thing that I want to do? Is it real progression? Is it going to challenge me? Does it change my job? People want to move towards progression, to do a job that is expanding, that is becoming different and bigger".

According to the management side, the area of discretion within clerical work derives from customers' queries. However, even if dealing with customers' queries constitutes a large proportion of the clerks' total workload, especially of those in the STW telephone bank, there was a great amount of subordination and dependence in relation to the computer. The clerks therefore do not need to do much thinking. The computers tell them what to do. For complex queries or difficult customers they are often helped out by their supervisor; "if I see that
they are on the phone longer than they are supposed to, I intervene" (supervisor). It was explained that operators in the unmeasured side should not take more than three minutes for a normal call.

An EL unit manager, who although agreed that the workforce had become more responsible as a result of the changes, uncovered a negative side of this impact: "It means more responsibility but...the job is fairly easy to do. Ok, it is responsible, but...it is not particularly challenging because you don't have to decide very much about what you are doing - the system does. The system tells you what kind of a job you should be doing. Things are more compartmentalised than they were before. It is also the fact that while before you could do some calculations - this is not a matter now. It is a matter of picking the right numbers and typing them in the system and the system does the calculations for you...You are able to do more work but there is less to it in the process; that is the concern of the people".

Too many worries were revealed by the 'empowered' employees and too many questions to be answered about the nature of 'empowered' workplaces. It has become evident that training and learning as a result of an IT-enabled 'empowerment' policy takes the form of knowing which buttons to press rather than developing skills for using own creativity and judgement. In effect, and as a result of the establishment of rules and regulations to help people decide what to do "people no longer [have] to decide for themselves the optimum means to an end; rather optimum means had already been discovered and were
institutionalised in roles, regulations and structures” (Ritzer, 1994:19).

Multi-skilling has been a major concern for the establishment of new working practices in STW and EL. Although, in the 1990s, two decades after Braverman's classic work on deskilling, there has been some alleviation of the deskilling syndrome, there remains a concern that the reality of ‘empowerment’ is that this is not a completely worker-centred or enskilling approach (Panteli and Corbett, 1995).

What it is seen then, is a case where information accessibility, learning, ‘empowerment’ and responsibility acquisition have been accompanied by process simplification via the use of technology. It has been clearly expressed by the EL clerks that they may know more about company's products and its customers than before, and in addition, they have become more responsible for the end results of the functions that they perform, but the process of reaching that outcome has become simplified and been eased. Besides, they do not need to use their judgement and decide what to do next, rather the computer provides even the most simple directions. So, the level of thinking during the process is restricted to a great extent.

An argument made in chapter 2, which reviewed the literature on the informate concept, was that the technology's ability to informate can encourage employees to create a more comprehensive, explicit knowledge of work (Zuboff, 1988). A key finding of this research is that when the informate character of information
technology is followed by a high standardisation of work, then the rise of new knowledge is restricted. Access to information does not always result in, what Zuboff called, ‘intellective skill development’. In order for one to become an ‘intellective master’, s/he should be able to interpret the accessible information and to add value to its contents (Zuboff, 1988). Employees in both STW and EL were encouraged to use customer information to take action, but they were not simultaneously encouraged to utilise the information to create knowledge. Their actions have instead become mechanistic, largely directed by the system. The fact that they could deal with nation-wide customers and not simply to deal with customers within their area boundaries does not justify knowledge acquisition. The process for dealing with each customer regardless of time and space is always the same. Information technology has been used to make information transparent and instant, and also to direct people on how to use this information and which buttons to press. The research therefore reveals that although, on the one hand, information technology can be used to informate work processes people by broadening people’s access to information, on the other hand, the potential to narrow human creativity and knowledgeability still pervades. This argument is pictured in figure 8-4. It stresses that use of information cannot always be power. It illustrates that when the possession and use of a wide range of information, where employees become capable of starting and finishing a job, is accompanied with the standardisation of working practices, then they tend to exercise limited choice and discretion (Job C in figure 8-4)). A broad range of information along with use of discretion and freedom of choice mobilise power acquisition within a workplace (Job D in figure 8-4). An example of Job A, which
involves one or a few tasks and high standardization, is that of a machine-operator or a data-entry clerk. A specialist's work (e.g. software designers) could be an example of Job B (Willcocks and Mason, 1987:94) which is characterised by one or a few tasks and high level of discretion.

Further to the above, the detailed information on the way the system was implemented in the three organisations uncovers people's involvement on implementation. People lower down the organisation had a very limited involvement during the implementation phase. This reveals another issue related to the 'empowerment' theme: that employees' 'empowerment' is narrowed down to a specific business process (e.g customer services) and employees are not
encouraged to participate in other activities of the organisation beyond this process.

Figure 8-5 summarizes the driving and enabling forces which were found to influence the reality of 'empowerment' as this was described above. It also outlines the constraining factors to true empowerment.

**Empowerment: The REALITY**

<table>
<thead>
<tr>
<th>DRIVERS</th>
<th>ENABLERS</th>
</tr>
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<tbody>
<tr>
<td>- Quality Service to Customers</td>
<td>- Technology</td>
</tr>
<tr>
<td>- Speed in Customer Service</td>
<td>- Continuous Training</td>
</tr>
<tr>
<td>- Reduction of Employment Level</td>
<td>- A revised payment system to encourage acceptance of multiskilling policy</td>
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<table>
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<tr>
<th>CONSTRAINTS OF TRUE EMPOWERMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Managerial Tayloristic Practices</td>
</tr>
<tr>
<td>- Empowerment as the One Best Way for work Organisation</td>
</tr>
<tr>
<td>- Empowerment: decided and approved by managers and executed by clerks</td>
</tr>
<tr>
<td>- Standardization of Work via Computerised-procedures</td>
</tr>
</tbody>
</table>

Figure 8-5

An aspect from structuration theory could be particularly useful here in understanding employees' behaviour at the workplace; that is what Giddens called 'dialectic of control' according to which all human agents, managers and employees, can exercise some sort of power even the power of defiance.
Evidence of this was seen in the STW case where in the satellite offices there was a high job turnover prior to the development of the Customer Services Strategy and hence the ‘empowerment’ policy. This was interpreted to be a way for expressing job dissatisfaction and disagreement to changes at the workplace. Employees’ attitudes have become more positive with the implementation of the ‘empowerment’ policy which was integrated in the Customer Services Strategy. In none of the cases, there was evidence of resistance from the bottom line during the implementation of the ‘empowerment’ policy. ‘Empowerment’ as a concept tends to create positive attitudes for the changes to come. It was only after ‘empowerment’ was implemented that some employees began questioning whether this was authentic (Clement, 1994).

In the EL case, some degree of disapproval by clerks when they were talking about the reality of ‘empowerment’. It was found that while it could be very exciting at the beginning as long as you practise it for a while it becomes routine and monotonous. This resistance and disapproval of the ‘new’ status-quo has not yet been practised. At the time this case was carried out the first worries were uncovered. It may soon be the case where employees show their dissatisfaction more openly; because when using an information technology to ‘get performance under control’ this may not only reduce the discretion and choice individuals have in taking actions and making decisions but it may also inhibit the achievements of performance (Argyris, 1987). “The smaller the space of free movement, the greater the probability that the actors will feel tension, anxiety and frustration. If they are not able to reverse the process, the other way
to reduce the tension is to become less involved in the work" (Argyris, 1987:105). This is a type of power held strongly by people lower down the organisation and which allows them to act as agents within their organisation.

One of the main implications of the 'empowerment' concept according to the management side was that of enhancing employees' responsibility within their workplace. Employees were trained to use more information and were responsible to serve customers more efficiently and effectively. Adding responsibility, however, is not new in the literature of work organisation. Job enlargement and job enrichment are concepts that have been around for many years. If ‘empowerment’ is implemented to merely distribute some level of responsibility to people lower down the organisation then, academics and practitioners may run the risk of introducing a trendy new title for the same old practices.

A term used by Teng, Grover and Fiedler (1994) is 'informational empowerment' to mean "access to corporate databases and freedom to communicate more widely with electronic mail which enhances employees' ability to make more informed decisions with less reliance on formal vertical information flows" (p.28). In fact, the word ‘empowerment’ alone could be misleading. Applegate (1994) argued that the concept of ‘empowerment’ should cease to be used due to its implicit meaning. Empowerment, in its rhetoric form, means the distribution of authority. What it has been certainly seen is the distribution of information to people at the front desk so as to enable them to provide quick and quality
customer service. Unfortunately, there is not enough evidence to support the realisation of true employees empowerment. If terms like job enlargement and job enrichment are not "fashionable" anymore, it would be more appropriate and ethical - if we continue to see more distribution of information rather than authority - to call this `informational` or as Clement (1994) suggested `functional` empowerment. Another way for dealing with this is to specify the level of `empowerment` involvement (i.e. suggestion, job, high) as identified by Bowen and Lawlen (1992) and recognised by Eccles (1993).

As it was found, IT-enabled `empowerment` represents a continuity in organisational practices stretching back to well-established organisational theories and including the principles of scientific management. Maybe Applegate (1994) is right and that there is a need to look for a more concise term to mean the distribution of power via information and responsibility to the shopfloor. Perhaps there could be a more descriptive term. Certainly, a more consistent view of `empowerment` is needed to be adopted in the literature of information systems and work organisation. But in the meantime, we should continue making efforts for promoting the human element along with the use of information technology. What should not happen is to let the newly `empowered` organisations to develop into an emergent form of *technocentric* approach to work organisation.

The following section turns the discussion to the potential anthropocentric nature of CBIEs.
8.3.3 CBIEs: Are they serving as an anthropocentric route for information technology?

The study began with a discussion of the humanistic, anthropocentric potentials of IT. It made the assumption that since the concept of empowerment has been so widespread, there are more opportunities for anthropocentric applications of information technology. The anthropocentric route of information technology supports the establishment of working conditions which function without being at the expense of the human element and most importantly by ‘empowering’ it. An ‘empowered’ and a multi-skilled workforce have been the results of the introduction of ImagePlus in two of the three organisations studied. ‘Empowerment’ has particularly resulted from the ability to access a wider range of information, and training to deal with multi-functional activities. So, lower-level employees have been capable of dealing with more functions and be highly responsive to almost all, if not all, customers' queries. Due to these characteristics and based on the typology developed in chapter 2, the two organisations, STW and EL, were found as being CBIEs. In both cases, the functioning of a computer-based information system could function while providing opportunities for multi-skilling, responsibility and variety.

Following the discussion on the reasons for developing CBIEs as well as on the reality of employees' ‘empowerment’, we have got to be very conscious in arguing that the CBIE cases of STW and EL are truly anthropocentric forms of work organisation. The following statement made by an employee in one of the
organisations studied summarises the reality of technology-in-use, ‘empowerment’ and CBIEs on the individual level: "Technology speaks for itself and people can sort out problems with the technology...[it seems that] the only way of empowering people is perhaps by trivialised the job on the system. Whereas the job previously involved calculations, now it is just pressing buttons”.

In a computerised workplace which is anthropocentrically designed, employees maintain initiative while evaluating working situations and deciding on the actions to be taken. Technology is used in these places to assist employees in their above role (Brodner, 1985). The use of ImagePlus to direct operation sequences is in contrast to attempts to maintaining human initiative and thinking. As long as thinking knowledge is formalised and operations are controlled, the continuation of the ‘automate’ potentials of information technology seems highly promising even in today’s 'empowered' workplaces. Hence, within the organisations studied, the primacy of technology has remained unchallenged.

In embarking upon this study, a typology of the key features of CBIEs was established. Having gained evidence of some true examples of CBIEs and bearing in mind what should constitute an anthropocentric CBIE, a revised typology is recommended. The typology refers to different levels of CBIEs, the levels being identified in terms of the three characteristics, information accessibility, learning and action taking as well as in terms of their anthropocentric nature.
It is believed that any setting that 1) authorises increased accessibility to information, 2) involves some sort of learning about the organisation and its activities and 3) encourages action taking and enhances employees responsibility is a CBIE. An anthropocentric workplace would involve in addition to the above, opportunities for using own discretion and judgement, freedom of action and choice. The organisations which share all the above characteristics could be identified as anthropocentric CBIEs (H/H in figure 8-6). This is the case where employees do not simply know how to manipulate and communicate information but they also take a more participative role in the shape of their working environment. They are listened to; they are responsive and creative. They are smart people working with machines and not people serving smart machines (Zuboff's wording, 1988). To obtain the former the machine should merely deal with the quantitative elements of the work and leave the opportunity for the worker to deal with the qualitative, subjective judgements. As Cooley (1987) puts it: "If we regard it as desirable to enhance human skill and ability, we have to design systems which are responsive to human judgements and which respond to the persons using them rather than acting upon them" (p.172).

The cases of STW and EL CBIEs have shown evidence of the three main features of CBIEs. They lacked however evidence of anthropocentredness. Hence, they are positioned at H/L in figure 8-6. At this level, there is a scope for
wide information accessibility, learning opportunities and action taking. However, these alone do not necessarily imply an anthropocentric use of information technology. Standardisation of working practices as well as the simplistic notion of action taking can restrict the amount of discretion that could be exercised by employees. The cases of STW and EL CBIEs fell under this category. "The system does all the calculations for you" and "the system tells you what to do next" were some of the employees' complaints in these CBIEs. Furthermore, the system eliminates the need for mobility and consequently the need for social interaction. Complaints about having to work all day long with the machine were expressed in the organisations studied.

One of the key criteria for anthropocentredness is concerned with the extension of operator's choice and control (Ainger and Murphy, in Murphy, 1989). This
implies that "the person should control the machine rather than the machine controlling the person" (p.146). In EL, although masses of information has become available to the operators, and hence, they have been more knowledgeable, there is no evidence to support that employees can exercise control over the new systems. Scarbrough and Corbett (1992) suggest that human locus of control can be either proactive or reactive. The former implies that humans plan their actions beforehand and act in ways to carry out those plans using technology as an aid tool. However, human actions could also be directed in a reactive sense by guidelines given by a computer system. In the CBIEs under investigation, a situation was seen where human capability for control has been squeezed because the machines have been set up to lead their thoughts and actions.

The STW and EL’s decision to ‘empower’ and informate people lower down the organisation was taken upon a realisation that a reduction in labour cost was essential. In fact, as a consequence of this, no recruitment of new staff has taken place within the two organisations. Further to this, the number of existing staff was reduced by 30 % a year after the implementation of the first new system within the Client Servicing Area of EL. The employment issue is another area of concern which could define the degree of anthropocentredness of a CBIE. The success of anthropocentric CBIEs depends to a great extent on the cooperative endeavours of individuals taking greater control and responsibility over their workplace. Job security is important to improve and sustain employees’ cooperation and commitment.
From the discussion so-far, it can be claimed that although more CBIEs of this level may be evident, CBIEs with an anthropocentric nature would be rare. The continuation of Tayloristic practices for efficiency and control at the workplace as well as standardisation of procedures which minimise the amount of discretion which can be exercised by people lower down the hierarchy could act as constraints to the development of an anthropocentric CBIE. Corbett (1989b) identified that, in addition to management ideologies, such workplaces can be constrained by the tendency of organisations and their accountants to quantify the benefits in monetary terms. Sterling (1985) explained that a major obstacle to the establishment of humanised workplaces is the risk of reducing the efficiency of most information systems. "Their inclusion will increase overhead in terms of design effort, complexity of procedures, and execution of time. It may even be necessary to add to the physical resources of central computers (to provide a larger memory, a greater ratio of input to output, and so on)" (p.166). According to Sterling, "the utility of humanising procedures may not be revealed in ordinary cost-benefit calculations but in the quality of life" (p.166). For anthropocentric CBIEs to be realised, the 'people' aspect of an organisation should be the primary focal point.

When employees have access to a broad range of information, but they only use this information in rare occasions, e.g when another employee is absent, then this is a case of a low CBIE. When while they do use this information, they can exercise own discretion and have the power of choice and action, then this could be the case of an anthropocentric workplace (L/H in figure 8-6). Cases of broad
information accessibility and limited use, which are also characterised by inadequate exercise of action taking, responsibility and discretion are found at level L/L on figure 8-5.

The framework presented within this final section of this chapter hopes to enhance our knowledge over the concept of a CBIE. It provides a means for clarifying the meaning of the informate nature of information technology. It is also useful in explaining its degree of anthropocentredness. It shows that what is important for an anthropocentric CBIE is not information and responsibility alone but also how much one puts in the process.

8.4 DISCUSSION AND CONCLUSION

We have often heard and seen statements like “information can empower those who have it” or “information is power” (e.g. Large, 1984). The results of this study enable us to indicate not when information is power but rather, when information cannot be power. Access to information is not enough to give power, for this could imply pseudo-accessibility (as indicated in chapter 2). Knowing how to use this information is still not enough to empower information users. Employees may be able to access and use a wide range of information to take action, to add to this information, to modify it and move it around. Within the cases studied, the high standardization embedded within the computerised systems and the constant monitoring of work were found to restrict the exercise of choice, discretion and creativity at the workplace and to block power
acquisition by the workforce.

The computerised systems in the three organisations studied were found to possess all customer files, they have been assigned to do all the calculations and to tell employees what to do next. With the new technology, employees cannot choose to do a task differently to the manner specified in the technology nor can they choose not to do the task at all. It seems however that it is not only the employees who are dependent on technology. The whole functioning of the customer servicing departments (and claims operations in the case of API) has become dependent on technology. When the systems go out of order, then employees cannot do their work and the entire customer processes are disrupted. It is certainly the case that as a result of the changes in work organisation the systems have been empowered (Panteli, 1995a). They handle all customer information and other important support tasks and further to these, they have the capability to control when and how to work. The training and skills given to employees become inadequate to allow them to go on with their work in the case of a system break down.

The experiences of the three organisations with ImagePlus indicate how information technology can be intertwined into actors’ daily activities. In addition to information processing, identification of training needs, delegation and monitoring of work have also been computer-mediated. Prior to the introduction of the image system, employees, to an extent, could exercise control over their work. They could pass a difficult claim or query, hide it or put it aside. Now, they
cannot do so. Coordination and control have been embedded within the system. Orlikowski (1991) identified the emergence of technical control and the augmentation of personal (direct supervision), social structural (rules and procedures) and cultural (values) forms of control through electronic mediation. Although information technology can encourage the development of information integrated organisations, it can simultaneously reinforce traditional forms of control and power distances. In fact, information technology cannot simply reflect the status-quo; it can even strengthen control mechanisms for it can fuse previously separated mechanisms and it can also extend them across time and space (Orlikowski, 1991). As a result, not only individuals but entire core business processes (as in the cases studied) become ‘trapped’ into this electronic mediation.

Within this study, a contrast between the concept and the reality of ‘empowerment’ has been identified. It has become evident that IT-enabled ‘empowerment’ cannot be separated from the broader context of the organisation and from the meanings people in organisations attach to it. Knowledge of technology potentials can shape people’s interpretations. From this perspective technology is not neutral. Some changes were found to be technological determined (i.e. introduction of indexing and scanning). For the majority of the changes though which had taken place within the organisations studied, it is difficult to distinguish with accuracy which had been determined by the technology and which had been purely chosen. Meanings given to the emergent work organisations were not solely shaped by technology; market
conditions, strategic and human choices and traditional structural properties of
work and power have played a role.

The above suggests that individual, organisational and technological attributes
influence the use of information technology in an organisation. This study
therefore provides evidence, similarly to Orlikowski (1992) and Barley
(1986, 1990) that information technology is often socially constructed for its
meaning is constituted by its context of use. Looking closely at technologies
such as CT-scanners (Barley, 1986), CASE tools (Orlikowski, 1992, 1993) and
ImagePlus, it can be claimed that some information technologies allow far more
flexibility than others in terms of their physical characteristics and functioning.
CT-scanners, on the one hand, were found to allow no physical flexibility during
use, due to their fixed and standardised functions and features. CASE tools on
the other hand are found to possess high physical flexibility. Because CASE
tools are developed within the internal environment of an organisation, they
become vulnerable to the social context in which they are embedded. Individual,
organisational and technological attributes appear to exert a significant influence
to system developers (Orlikowski, 1993). The development of CASE tools
depends on the intentions and actions of developers and other human agents
(senior staff); also development needs differ from one organisation to another.
Given therefore a technology such as CASE tools in Orlikowski’s study (1992),
little scope was needed to investigate any direct deterministic impact of
technology on organisational restructuring. ImagePlus was found to have a
‘medium’ physical flexibility. Its design and use was based partly on a series of
standardized features embodied within the system (by the designer/supplier) and partly on the context of its use and on the meanings given to it by human agents. The indexing and scanning functions are fixed, but the workflow feature is contingent on the intentions and actions of, and the meanings given by human actors and its social context. This finding comes to complement the argument that both the technological determinism perspective and the organisation choice perspective can contribute in making sense of the ‘information technology-organisations’ phenomenon. For a coherent understanding of this relationship the different perspectives need to be interlinked. The use of structuration theory has maintained this link within this study.

Chapter 9 highlights the contributions of this study while the implications for further research are explored.
CHAPTER 9

CONCLUSIONS

9.1. LESSONS LEARNED

It was argued in chapter 1 that more research into anthropocentric uses of information technology in office environments was needed. The study formulated the concept of Computer-Based Informed Environments (CBIEs) as an emergent anthropocentric form of work organisation which informs and empowers lower level employees in office workplaces. This study hypothesised that with the current interest in IT-enabled empowerment there are more opportunities for CBIEs. An element from previous studies of informed and 'empowered' workplaces has been employees' interpretation of these forms of work organisation. A review of the literature on information technology in organisations has also supported the view that there is a need for further research on the meanings given to technological and organisational changes by different users and by the same users over time. The present study attempted to fill this gap while also making a contribution to the field of anthropocentric uses of information technology. It employed a kind of technology (ImagePlus), which is promoted by its supplier as having the potential for empowering employees, and it examined, through a comparative case-study approach, how human actors within the same organisation and in three different organisations interpreted its potentials and use.
It was found that CBIEs could occur without being pure anthropocentric applications of information technology. Informed employees are not necessarily truly empowered employees. Although they are able to access and use a wide range of information, this does not imply that they simultaneously have power and control over their workplace. This argument is based upon the result of a discussion on the concept and the reality of IT-enabled ‘empowerment’. It was found that the following constitute the reality of today’s ‘empowered’ workplaces: individuality, standardization of processes (not tasks anymore), information with limited knowledge and responsibility without authority. Furthermore, it was found that when the ‘empowerment’ approach is diffused via information technology, it is likely to be in forms that align more with managerial and organisational interests than those of lower level employees.

The discussion of the meanings of technology, information sharing and empowerment affirms the need to look for the use of symbols and language which legitimate technological and organisational changes. What this study has also shown is that human actors at different organisational layers tend to focus on different sets of interpretive schemes, norms and facilities in making sense of emergent forms of work organisation. Bearing in mind the characteristics of today’s ‘empowered’ workplaces, the contribution of CBIEs to work humanisation via information technology is questioned.

This research makes another contribution to the theoretical area of information technology and organisation literature. It goes some way towards reaffirming the
importance of using structuration theory in researching this field. Using structuration theory to uncover the process and context of change and the linkages between the two, the complex dynamics of the use of information technology in organisations have been analysed. The historical aspect is an integral element of the context and a major influence on human actions. In contrast to Thomas (1994) who claimed that structuration theory cannot be used to uncover the ‘why’ of technology, this research has been able to identify the purpose of technology in the organisations studied: it has done this by extending the analytical time-frame to cover the period prior to the introduction of technology. This enabled the context within which technology is introduced (as well as the kind of interactions between structural properties and human actions which preceded its introduction) to be explored. The ‘why’ of technology therefore depends on how researchers use structuration theory rather than on the theory itself.

The system used within this study, ImagePlus, was found to have certain standardised features (i.e. indexing and scanning). These features have been used by all three organisations studied (it is also expected that all other user/organisations will make use of these two features). However, the system itself does not determine how the work process is arranged in order to achieve the desired outcome (i.e. indexed and scanned documents in this case). In the organisations studied, a particular group of people was assigned to deal with indexing and scanning (see for example figure 6-6, chapter 6, p.182). This resulted in the continuation of the specialisation and fragmentation of work.
However, a different way of reorganising the work to involve indexing and scanning could have been established through job rotation. Thus, although technology may ‘demand’ the introduction of certain tasks in the work process, it does not ‘demand’ a certain arrangement of these tasks within the work process. This is an outcome of the interactions between structural properties and human actions within the organisation in which the system is embedded. The use of structuration theory has been invaluable in uncovering the complex and interactive nature of technology use in organisations. This complexity will not be alleviated if a different kind of technology is used instead.

Due to its partly standardized and partly flexible nature, ImagePlus was found to have ‘medium’ physical flexibility. Even when a technology has a high physical flexibility (e.g. CASE tools), knowledge of its existence and potentials can shape the meanings people at work attach to it. Hence, although technology use is found to be socially constructed, technology itself is not neutral. This suggests that the different perspectives on the ‘information technology-organisations’ theme are not obsolete. Yet, there has been very little communication between them in the literature. The ‘determinism’ and ‘choice’ perspectives need to be integrated for each has a vital role to play in enhancing our understanding of the use of information technology in organisations.

Following from the above point, the study emphasizes that the context and process of CBIEs should not be treated as mutually independent but that as being inextricably linked to each other - each is generated, constrained or
reinforced by the other. This is expected to be true for other kinds of emergent forms of work organisation (as seen in the API case for example). This is also expected to be true for other kinds of information technologies which are introduced within office environments (e.g. groupware). Zuboff (1988) talks of the duality of information technology to imply that all different kinds of information technologies can both informate and automate. ImagePlus has been one of the vehicles for informating and ‘empowering’ employees. It has been an exemplar of the emergence of informated and ‘empowered’ work organisations. It has also been an exemplar of the need to bridge the ‘determinism’ and ‘choice’ perspectives when doing research in the field of information technology in organisations.

In substantive terms, this research has also provided some indication of how new emergent forms of work organisation may be managed in computer-based environments, and why managers might feel that this type of work organisation is necessary. Managerial credibility is an important prerequisite for the establishment of a new form of work organisation. In the case-studies, managerial credibility was established prior to any change through a process of climate setting. The study confirms a previous argument that changes in structures of signification on the functioning of an organisation are prerequisites for other structural changes (Korpela, 1994). However, this is not always enough to manage change in the desired direction. In the context of CBIEs, if managerial choices are to be realised, there is also a need for at least some transformation of power relations (e.g. reduction of organisational hierarchy).
Rearrangement of the payment system has been an important source of power for senior managers. The case-studies demonstrate how a payment system acts as a powerful inducement to employees to accept the ‘empowerment’ schemes. What has been distinguishable within these ‘empowerment’ schemes is that salary increments have been directly related to one’s skills and responsibility at the workplace whilst previous work experience becomes trivialised; “we got a lot of people who were previously managers but are not managers anymore” (see chapter 8, p. 268).

Hopefully, this research has made some contribution to the existing literature on information technology and work organisation and anthropocentric forms in particular. However, there is a great deal of future research needed in this field.

Below, the implications of this study for further research are discussed.

**9.2 IMPLICATIONS FOR RESEARCH**

I would like to begin this section by stressing the need for a multi-disciplinary approach in the information systems field. A multi-disciplinary approach is an opportunity to redefine and refocus information systems research away from the traditional technical focus. It was identified in the information systems literature that too much attention has been paid on the ‘technology’ side of information technology and less on the ‘information’ side (Galliers, 1992a). This phenomenon derives from the tendency to consider information technology as a primarily
technical topic. A multi-disciplinary perspective can direct the orientation of both researchers and practitioners towards a more balanced view of the technical and social implications of information technology in organisations. As a consequence, the information systems field can become an area of a broad identity. The multi-disciplinary approach can offer fresh insights and knowledge directly derived from the use of other disciplinary theories in the information systems field. It is further expected that this will contribute to the advancement of investigation instruments and methods for researching information systems issues. Within this study it was found that structuration theory has a profound impact on the way we think of the role of technology in organisations. It encourages in-depth and multi-level research away from the uni-directional nature of the traditional perspectives in this field. It allows an investigation of both the ‘technology’ and ‘information’ sides of information technology and this provides a comprehensive picture of the process and context of technological and organisational change.

With respect to the use of Giddens' work, further research would be useful to achieve a ‘thicker’ use of structuration theory in the information systems field. Within the present study, structuration theory was applied rather partially. My analysis concentrated on selected organisational structural properties (i.e. work, power and signification) whilst ignoring other social structures (e.g. economic and political) which might exercise an instrumental role on human actions (e.g. level of unemployment on employees’ resistance to change). According to Whittington (1992), structuration theory has generally been applied partially.
Although as he puts it "there is no need for theoretical purity", the influence of structuration theory on management and organisational research could be even more substantial if there was consideration of multi-dimensional social systems. "This account of [human] agency based upon plural social structures entails a more explicitly sociological commitment in management research" (Whittington, 1992:707). A similar use of structuration theory in the information systems field might prove valuable especially when attempting to understand the use and implications of information technology at a cross-national level.

The structurational framework developed in this study has aided in focusing and structuring the analysis as well as providing concepts with which to interpret phenomena. Structuration theory, though not the only theory for uncovering meanings (actor network theory [Latour, 1987] could be an alternative), is distinctive because it traces relationships between structural properties and human actions (Jones and Nandhakumar, 1992). Within the present study, it has also helped to indicate that the technological and other organisational changes were not so rational; resistance of a direct and an indirect form was evident. According to structuration theory, all members of a social system are agents. However, are all human actors influenced by structural properties to the same extent? And are all organisational members agents to the same extent? The study has shown that although lower human agents offered some resistance, this was more passive than active. Maybe, upper human agents need less time to modify the structural properties of their organisation than lower agents. Further research is needed to provide answers to these questions.
The fact that CBIEs are not necessarily anthropocentric has a number of implications for future research. The framework developed in chapter 8 identified four different levels of CBIEs. This study has only presented examples of one form of CBIEs. Further research will be needed (and more examples should be reported) to enhance our understanding of the various forms of CBIEs.

The portrayal presented early in this research on the characteristics of CBIEs has obviously aimed to enhance our knowledge over this concept. The three components of CBIE development (information accessibility, learning capabilities and humans as actors) can be used for assessing the level of the informate character of computer-based work organisations. However, the three components are not sufficient to assess the anthropocentric character of an informed workplace. To adequately assess the anthropocentric nature of CBIEs, more research is required in order to develop a comprehensive typology and a more explicit list of the components that comprise an anthropocentric CBIE. Perhaps, employees should become more actively involved in the design of their work organisation as in the Human-Centred Systems (Cooley, 1980) and Work-Oriented Design (Ehn, 1988) approaches. Office workers have the skills for designing systems. Clement (1993) has identified cases where office workers (secretaries) designed the office systems at their workplace informally and effectively relying on their own locally developed and shared expertise.
Drawing on the above point, CBIEs could be interpreted to imply an attempt to bring human-centredness into service-oriented organisations. The human-centred systems approach (Cooley, 1980) has mainly focussed on manufacturing environments. Yet, with the number of service organisations increasing more rapidly than manufacturing organisations (Business Monitor PA1003, 1994: 19), there is a need for further research into the humanistic potentials of computer-based office environments.

Nevertheless, with its predominant focus on manufacturing settings, human-centredness could also benefit from the results of this study. Much of the attention of human-centredness has been on designing the interface between the machine software and the human operator (e.g. Corbett, 1985). As it was noted though in McLoughlin and Clark (1994), research on human-centred system design “has usually been concerned with developing new design criterion and methodologies through demonstration projects, sometimes involving interested collaborators (e.g. commercial banks, national government, EC), but external to potential adopting organisations” (p.257). As a result, “their application is in effect a simulation rooted in the design stage of the process of change (Badham, 1991). What has not been, and cannot be, simulated is the social shaping of organisational outcomes which would occur if the human-centred technology was installed and then subjected to the organisational realities that accompany the implementation and operation of any new system within an adopting organisation (McLoughlin, 1993)” (in McLoughlin and Clark, 1994: 257). A human-centred system therefore needs to be integrated to
the context of the organisation in which it is embedded. Particular emphasis is drawn on the role of structuration theory to critically examining the use of technology in organisations. By seeing technology design and use in terms of interactions between human actions and structural properties, this will enable researchers with interest in this field to attribute the notion of human-centredness within a contextual framework and thereby enabling human-centred systems to gain a more secure position in an organisation. Structuration theory provides a framework to critically and carefully examining technology in both office and manufacturing organisations.

A further concern lies within the area of ergonomics. In all the case-studies presented within this research, it was found that with the transition to computer-based work there has been an increase in the degree of interactivity between human and machine. No workplace can be called humanistic if it does not make provisions for a healthy environment. Computer-based workplaces often raise issues of noise, illumination, glare (Oborne, 1987), availability of ergonomic devices (e.g. chairs, wrists-rests, foot-rests, screen-filters), number of hours people work with keyboards/screens and number and duration of ‘screen’ breaks (Khiji and Smithson, 1994; Panteli, 1995b; Pascarelli and Quilter, 1994). It would be interesting to see cases of organisations which have adopted the humanistic route in their application of information technology from both an informating and an ergonomic perspective. The literature on humanistic applications of information technology has not yet sufficiently ‘touched’ on ergonomic issues. The two fields need to be linked in order to improve the quality of working life in
computer-based environments.

A final issue that came out strongly from my research is that it is important to approach the issue of IT-enabled empowerment in a realistic way. Considering employees’ attitudes, this study has shown that it is a common misconception that empowerment means the emancipation of the workplace. Even if this new trend does indeed provide opportunities for information sharing and multi-skilling, we should not forget that it has only been recently that organisations started moving towards empowerment. It is not yet known how flexible this kind of work organisation could be, and for how long learning would be continuous. Clement (1994) warns that “it is not yet clear how far [the staff] will be able to go...It is not even clear to what extent organisational changes are permanent, in the sense that old patterns for subordination may reassert themselves” (p.61). Longitudinal studies need to be undertaken to assess their degree of continuity.

It is important to recognise that the findings are derived from only three case-studies. It cannot therefore be claimed that all empowered organisations share the characteristics identified within this study. There is undoubtedly a need for research into larger samples if these findings are to be generalised.

Considering the findings of this research, I cannot be optimistic that computer-based workplaces will soon be humanised - neither I am pessimistic though. As long as there are people in organisations who proudly claim that they “want to learn, use their brain and want to have challenge” (extracted from an interview
with an employee) then there are still hopes. Information technology can indeed provide the means for enhancing human creativity and comprehension. It now very much depends on us, the Humans (as agents), to take the challenge and make this a reality for a Computer-Based Informed and a truly EMPOWERED workplace.
ADDENDUM

The following papers have been written as a direct result of the research described in this thesis:

1. Panteli, A. "Understanding Computer-Based 'Informated' Environments", AI & Society, Accepted and Awaiting Publication


   - An earlier version of the above paper was presented at the International Conference on "Ethical Issues of Using Information Technology", ETHICOMP'95, Leicester, De Montford, 28-30 March, 1995, UK


   - This paper was also submitted for publication to New Technology, Work and Employment, August 1995


I first came across ImagePlus in March 1993 during an IBM exhibition. My interest in the system started when I was informed of its potential to empower office workers. A few weeks later I was invited by IBM to attend a workshop on ImagePlus with representatives from several potential client organisations. The workshop was organised and presented by two IBM consultants and it aimed to acquaint participants of the key functions of the system and its benefits to organisations, especially to large, service-oriented and heavily paper-based organisations. During the workshop, a 30 minutes video-clip was shown presenting the use of ImagePlus in Severn Trent Water (STW) Ltd. Three months later, I was given permission to carry out my first case-study at STW.

STW was the first and the main case-study within this research. Being the first organisation that I was visiting which had introduced ImagePlus, meant that I had to spend time to absorb and understand the various features and functions of the system. The extensive changes that had been experienced within this company during the last few years also implied further research beyond the period of technological changes.

In September 1993, during a meeting with a senior IBM consultant I was
informed about two other organisations that had successfully utilised ImagePlus. These organisations were also large and service-oriented as the first organisation studied. They had not, however, experienced the major changes experienced by the external environment of STW. Therefore, interviews with participants from these organisations concentrated on the internal organisational and technological changes.

Table A-1 illustrates the number of people who were interviewed for this research.

**No. of Participants:**

<table>
<thead>
<tr>
<th></th>
<th>STW</th>
<th>EL</th>
<th>API</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Managers</td>
<td>1 *</td>
<td>1 *</td>
<td>2</td>
</tr>
<tr>
<td>Systems People</td>
<td>2</td>
<td>1</td>
<td>1 *</td>
</tr>
<tr>
<td>Middle Managers</td>
<td>4</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Supervisors</td>
<td>12</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Clerks</td>
<td>9</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

Table A-1

* = interviewed twice

** = Due to organisational restructuring, there was no middle management.
A-2 INTERVIEWING QUESTIONS

Interviewing had taken place at four organisational levels: senior managers, departmental managers, supervisors and clerical staff. It aimed to collect information about the whole organisation and concentrate on the department that deploys the IBM system ImagePlus.

INTERVIEWING AT THE SENIOR MANAGEMENT LEVEL

Company Information:

Explain the main objectives and functions of this organisation?

How successful is the company in achieving its objectives?

Describe the external environment in which this company operates.

Any major changes that have taken place in the organisation in the last 10 years?

Information Technology

In general, who is responsible for decisions on new technology?

How important is IT for the organisation?

Which areas of the organisation have been computerised?

Why has the company decided to computerise Customer Services?

Why ImagePlus?

Who was involved in the implementation process?

How was the system implemented?
What kind of changes have occurred within the department as a result of ImagePlus?

To what extent has the organisation benefited from the use of ImagePlus?

How would you compare the organisational (and the departmental) culture prior to and after the introduction of ImagePlus?

To what extent is the system used effectively?

What are the factors that have contributed to this kind of use?

Would you recommend this system to other organisations? What kind of organisations?

What do you consider as being the constraints for the introduction of ImagePlus in other organisations?

INTERVIEWING AT THE DEPT. MANAGEMENT LEVEL

Background Information/Dept. Level

Explain in brief the objectives and functions of this department?

How would you relate this dept to the whole organisation?

Who usually decides on changes that will take place in this dept?

What are the functions of each unit and how do they relate to each other?

Information Technology

Why was computerisation necessary?

(How was the job done prior to computerisation?)

Why ImagePlus?
Who has been involved in the decision making process?
.........................implementation process?

(who within this department?)

What kind of changes have they occurred as a result of computerisation?

How have your (managerial) tasks changed by the introduction of ImagePlus?

...supervisory tasks?

...clerical tasks?

What are the characteristics of a good supervisor?

What are the characteristics of a good operator?

How would you compare the departmental culture prior to and after the introduction of ImagePlus?

To what extent has the dept benefited from the use of ImagePlus?

To what extent is the system used effectively?

What are the factors that have contributed to this kind of use?

Could you recommend this system to other organisations? What kind of organisations?

What do you consider as being the constraints for the introduction of ImagePlus in other organisations?

INTERVIEWING AT THE SUPERVISORY LEVEL

Explain in brief the functions and objectives of your section/unit.

What are the supervisor's tasks?

Have the supervisor's tasks changed after computerisation?
How important is supervision? Has the level of supervision changed because of computerisation?

What were the factors that have reinforced the introduction of ImagePlus?

What was the supervisors' role for the choice and implementation of this new system?

How important is ImagePlus for...
- the organisation?
- the department?
- supervisors' work?
- clerks' work?

What was clerks' reaction to ImagePlus?

Why have they reacted in this way?

What kind of training is/was provided? (where, how long, for whom, by whom?)

Do you find any instances of boredom among the clerks?

Who is a good clerk?

To what extent is the system used effectively?

What are the factors that have contributed to this kind of use?

Would you recommend this system to other organisations? What kind of organisations?

What do you consider as being the constraints for the introduction of ImagePlus in other organisations?

INTERVIEWING AT THE LOWER LEVEL (CLERICAL STAFF/OPERATORS)
Describe your job and what you use the system for?
(ask for examples where there is evidence that there is high accessibility of information)
Is there any other information that you would like to have access to but you do not? Who has access to that information instead?
Basically, in a job, people do things and learn things; to what extent is your job involved with the 'doing' aspect, and to what extent is it involved with the 'learning' aspect?
How often do you need to consult the supervisors before taking any action?
Describe for me the relationship between managers, supervisors and clerks in this department.
Why do you think ImagePlus has been introduced?
What kind of changes have they occurred as a result of computerisation?
What have been your reaction to ImagePlus?
Why have you reacted in this way?
What kind of training is/was provided? (where, how long, for whom, by whom?)
Do you find any instances of boredom among the clerks?
To what extent is the system used effectively?
What are the factors that have contributed to this kind of use?
Would you recommend this system to other organisations? What kind of organisations?
What do you consider as being the constraints for the introduction of ImagePlus in other organisations?
A-3 SAMPLE CORRESPONDENCE WITH PARTICIPANT-ORGANISATIONS
Dear ..... 

I am writing to enquire about a short visit to your department to discuss with you the reasons for the introduction and implications of the ImagePlus system for the overall organisation and maybe to view the actual application of the system.

I am undertaking a doctoral research that is concerned with the impact of information technology on the workplace. The study takes a particular focus on those conditions that encourage the use of technology in a way that results in an empowerment of the workforce. IBM Warwick has informed me that your organisation is one of the companies that have reached this stage with the introduction of ImagePlus.

According to Galliers (Journal of Strategic Information Systems, March 1992) too much attention has been put into the technology aspect of information technology and not so much on the information aspect of it. This study aims to enhance our understanding of the factors that encourage a use of information technology that stresses the ‘information’ side and not merely the ‘technology’ side of it.

I do hope that you will be willing to contribute to this important piece of research by providing information to me, about the company’s actions and reactions concerning the introduction of ImagePlus.

I will contact you by phone during the week beginning ...

Thanking you in anticipation.

Yours sincerely,

Niki Panteli (Ms)
Phd Student
Tel: 0203-524465/523914
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