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**How the uses of performance measurement  
systems constrain or enable organizational  
ambidexterity**

**By**

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A thesis submitted in partial fulfilment of the requirements for  
the degree of

**Doctor of Philosophy**



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The early part of this decade witnessed a resurgence of academic and practitioner interest in quality management tools such as LEAN and Six Sigma. These concepts and tools traditionally used in the manufacturing sector were introduced and deployed in the service sector in a bid to drive process improvement, and in turn achieve increased customer satisfaction and organizational performance. My interest in understanding how these manufacturing concepts were applied in the service industry inspired me to pursue a MSc in Management for Business Excellence. The course included key modules such as Process Improvement Using Six Sigma, Product Improvement Using Six Sigma, as well as Lean Principles and Application. Learning about how these tools and concepts were applied and their impact in a financial institution got me wondering about their effects on innovation. I felt enabling practices such as standardization, formalization and routinization could stifle creativity and innovation. After months of exploring various literature, I decided to examine how LEAN, a tool used to drive continuous improvement could impact radical changes that were being introduced at a financial institution as the focus of my MSc dissertation.

In 2013, after the MSc program, I wanted to explore the topic at a higher academic level and had the opportunity to meet and discuss my interest with Professor Pietro Micheli, my current supervisor. Pietro introduced me to the concept of organizational ambidexterity and the existence of paradoxes in organizational structures. After further exploration of literature, I was not only captivated by the phenomena but also identified significant gaps in the body of knowledge on the interplay between organizational ambidexterity and control systems such as performance measurement systems which further stimulated my interest. Finally, I decided to explore the topic; “How the uses of performance measurement systems constrains or enables organizational ambidexterity” as the focus of my PhD studies. After years of exploring this phenomena and engaging with the university, I have gained a wealth of knowledge and immensely enriched my experience in the world of academia. I, therefore, would like to acknowledge and express my sincere thanks to several amazing beings who made my studies possible and influenced my experience.

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## **DECLARATION**

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This thesis is the personal work of Daniella Abena Badu. This thesis is submitted in partial fulfilment of the degree of PhD in Management at the University of Warwick. The thesis has not been submitted for a degree at any other university.

## ABSTRACT

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Organizational ambidexterity (OA) has been associated with increased organizational performance and growth. However, it can be difficult to achieve, as organizations require systems and practices that can help them exploit their existing resources while, at the same time, explore new opportunities. Traditionally, Performance Measurement System (PMS) have been known to enable exploitative activities such as strategy implementation and organizational alignment. However, its role in facilitating or restricting exploration remains unclear.

Taking a realist perspective, this study employs a naturalistic case study to investigate the interplay between OA and the uses of PMS. Specifically, practices used in four departments of an automotive firm based in the UK were examined. Semi-structured interviews, documentary analysis and observations were used to gather data.

This research reveals that the uses of PMS can constrain OA, if deployed in particular ways. For example, if they are used to focus attention primarily on output and financial measures, if they reinforce old practices and processes, and if they are strongly linked to individual rewards or sanctions. However, this study also shows that the combined diagnostic and interactive uses of PMS can facilitate OA in four main ways: (1) performance information can be used to highlight areas that require both exploitation and exploration; (2) the collaborative development of performance objectives and targets helps align individual objectives to the organization's and discussions regarding targets can lead to activities that support both exploitation and exploration; (3) employee and project review sessions can also create fora to simultaneously discuss aspects related to exploitation and exploration; (4) Using lessons learnt from previous experiences can inform exploitative and exploratory initiatives. Interestingly, the data also reveals that the diagnostic use of PMS is critical for exploration because it can focus attention on creativity and innovation, align exploratory initiatives to the organization's vision and mission and provide a framework for new product development.

# GLOSSARY

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BP-Business Plan

BPR- Business Plan Review

BSC – Balanced Scorecard

DMAIC- Define, Model, Analyse, Improve, Control

ECM- Executive Committee Members

KPI- Key Performance Indicators

GEN-Y- Generation Y

LEAP - Leadership in Efficiency, Agility and Performance

PM- Performance Measurement

PMS- Performance Measurement System

RCA- Root Cause Analysis

R&D- Research and Development

SME- Small Medium Enterprise

TCDS- Technology Creation Delivery System

USP- Unique Selling Point

*“It is just that we should be grateful, not only to those with whose views we may agree, but also to those who have expressed more superficial views; for these also contributed something, by developing before us the powers of thoughts.”*

Aristotle

# CHAPTER 1: INTRODUCTION

---

Various studies have shown that ambidextrous organizations are those that can exploit and efficiently manage their current business operations and concurrently explore and adapt to environmental changes to ensure their future viability (Andriopoulos and Lewis, 2009; Gibson and Birkinshaw, 2004; Gupta et al., 2006). However, OA is difficult to achieve and requires control mechanisms that can foster exploitative activities such as strategy implementation, formalization, and alignment and at the same time enable exploration by creating opportunities for creativity and innovation (Henri, 2006; Koufteros et al., 2014).

A PMS is noted to be a remarkable control mechanism that enables organizations to measure, monitor and control their performance, map out and implement their strategy as well as facilitate robust resource allocation, formalisation, and alignment (Hanson et al., 2010; Marchand and Raymond, 2008; Micheli and Mari, 2014; Miller et al., 2015) and, in so doing, could drive exploitation. Some authors, however, have shown that a PMS, with its related structures and policies could be detrimental to exploration, because it creates rigidity that diminishes employee creativity and autonomy, and reduces the agility organizations require to respond to changes in the external environment (Adler, 2009; Kolehmainen, 2010; Micheli and Manzoni, 2010).

Other authors, however, have contested these findings and have argued that PMS may support and drive exploration (Henri, 2006; Schermann, 2012). These researchers argue that this could be through the use of performance information that shows areas where an organization requires improvement, by creating platforms for discussions and debates, challenging the status quo, querying the reliability of current practices, encouraging selective intervention, and driving priority setting which prompts search for new options and opportunities (Arachchilage and Smith, 2013; Bedford, 2015; Koufteros et al., 2014; Saunila et al., 2013). They argue that the role of PMS could go beyond merely promoting organizational alignment, coordination and control but could also drive motivation, focus on continuous improvement, and used to facilitate transformation processes. Furthermore, they argue that the use of learning targets

aimed at encouraging employees to explore new knowledge and skill sets could instigate creative thinking (Arjaliès and Mundy, 2013; Henri, 2006; Oates, 2015).

On the other hand, some scholars have recently argued that it is not the task of management control system such as PMS to drive exploration. These authors explain that exploitation-oriented business units tend to have PMS in place, whereas exploratory units tend to use fewer measurement instruments, if at all. From this perspective, PMS neither enable nor constrain exploration, as they are simply unrelated. Indeed, these authors urge both academics and practitioners to ditch the notion that a PMS (specifically the BSC) can be used as a tool to trigger radical innovation (Hansen and Schaltegger, 2018).

This thesis aims to illuminate our understanding of the interplay between OA and the uses of PMS. It brings together the different experiences and views of stakeholders who deploy and use performance measurement tools and practices. The thesis highlights how PMS could be detrimental to OA. It also shows how the uses of PMS could enable OA and probes the notion that a PMS primarily plays an exploitative role and mainly constrains exploration. It significantly contributes to contemporary debates in the field of management and presents a new theoretical framework in which future studies can be built on. Accompanying the theoretical contributions are practical implications that organizations can adopt to ensure an efficient and effective utilisation of PMS.

**The thesis is structured as follows:**

**Chapter 2:** This chapter brings together two main areas of organizational studies, PMS and OA. It highlights the significance of OA for competitive advantage and survival (Tushman and O'Reilly, 1996; Gibson and Birkinshaw 2004; Duncan, 1976; Patel et al, 2013). It then delves into the different definitions and conceptualisation of OA, the difficulty in achieving it and how tensions embedded in it can be managed. It then explores factors that could affect an organization's ability to be ambidextrous. The literature review then takes a different turn and explores studies on PMS. It explores the concept of performance measurement (PM) and PMS and presents an extended overview of the main functions of a PMS and problems associated with it. The latter part of the review investigates the levers of control (LOC) framework which forms the bridge between both areas of study. In particular, it shows that PMS could

be used in two ways - diagnostic and interactive - and that the joint use could drive exploitation and exploration. The final part of this section shows the position of this study amongst others and articulates the research question and anticipated contributions.

**Chapter 3:** This section introduces the philosophical perspective taken by author. Specifically, a realist philosophical perspective stemming from an objective ontology and subjective epistemology underpins this research. This chapter also introduces the qualitative methodological and naturalistic single case study approach employed to uncover the interplay between OA and the uses of PMS. It clearly outlines the research instruments used (semi-structured interviews, documentary analysis and observation) and discusses the abductive analytical approach utilized in collecting and analysing data. It then explains some of the limitations encountered and solutions adopted. It discusses steps taken to ensure rigor and authenticity, and ethical considerations made. It concludes with a brief personal reflection.

**Chapter 4:** This section commences by providing a thick description of the case context. It presents an in-depth introduction of the history, mission, corporate governance framework, structure of the chosen company (DB) and the four departments examined.

**Chapter 5:** This section presents the research findings. In particular, it shows that PMS constrained OA, if used in particular ways; for example, if it was used to focus attention primarily on output and financial measures, if some indicators reinforced old practices and processes, and if they were linked to individual incentives or sanctions. It also shows that the combined deployment of the diagnostic and interactive use of PMS could facilitate OA by (1) using performance information, (2) through collaborative development of performance objectives and targets, (3) through employee performance and project review sessions, and (4) by using lessons learnt from previous experiences. Interestingly, the data explored also revealed that the diagnostic use of PMS was not only necessary, but critical to exploration because it could focus attention on creativity and innovation and ensured that exploratory ideas and initiatives were aligned to the organization's vision and mission. It also provided a framework for new product development.

**Chapter 6:** This chapter merges the empirical findings with conclusions drawn from the literature review and discusses the implications of these findings for management theories. It elaborates on how PMS could constrain OA and identifies some dysfunctional practices. It reveals how the diagnostic and interactive uses could drive OA and concludes by discussing how the diagnostic use could enable exploration. The latter part of the discussion refutes previous claims that PMS primarily play an exploitative role or may be unrelated to exploration. The chapter also proposes a new theoretical framework for PMS.

**Chapter 7:** This section presents the concluding remarks and suggests avenues for further research. It summarises how PMS can be deployed as a dynamic mechanism to foster OA and practices that should be avoided. It also highlights significant gaps in the literature on which future studies could focus, for example how the balance between exploitative and exploratory activities should evolve over time to adapt to environmental turbulence, or considerations that should be made when tailoring measures to respond to tensions embedded in OA. It then closes by highlighting vital practical implications and considerations that should be made in the development of a robust PMS.

## **CHAPTER 2: LITERATURE REVIEW**

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### **2.1 Introduction**

This chapter presents an extensive review of literature on OA and PMS. The first part of this chapter introduces OA, explains its different conceptualisations, how tensions in OA can be managed and factors that may influence an organization's ability to be ambidextrous. The second part introduces and extensively examines PMS. It explains the concept of PM and PMS and presents an extended overview of the main functions of a PMS and problems associated with it and examines the LOC framework (in particular the diagnostic and interactive uses of PMS). The chapter concludes by assessing the interplay between these bodies of knowledge and reveals significant knowledge gaps that will be addressed through a naturalistic single case study.

### **2.2 Organizational Ambidexterity**

OA refers to an organization's ability to engage in exploitative and exploratory activities (Wang and Rafiq, 2014; Pellegrinelli et al., 2015; Tinco 2014; Chandrasekaran et al., 2012; Zimmermann et al, 2015; Sohani and Singh, 2017). Exploitation enables an organization to use its competences, capabilities, and resources efficiently. It involves improving their existing products by engaging in incremental product or process innovation (Andriopoulos and Lewis, 2009; Gupta et al., 2006; Jansen et al., 2009; March 1991; Tinco, 2014). Exploitation drives processes that enable increased customer satisfaction by offering existing customers high quality, reliable and consistent products (Tinco, 2014). Organizations with an exploitative orientation take feedback from customers about their preferences regarding their existing offerings and merge it with existing knowledge to ensure enhancements in efficiency and efficacy (Caniëls et al., 2017). These organizations are able to configure products quickly and reliably from an existing set of solutions for customers (Salvador et al, 2014; Laplume and Dass, 2015; Gualandris et al., 2018; Santoro and Usai, 2018) and improve established designs with the aim to strengthen customer ties (Jansen et al., 2009). Exploitation also involves enriching and extending existing knowledge (Andriopoulos and Lewis, 2009; Lavikka et al., 2015; Santoro and Usai, 2018). It facilitates learning through internal search (Gupta et al.,

2006; Matthews et al., 2015) and enables incremental innovation by highlighting where and how value can be created in the short term and how activities should be organized and streamlined to deliver value (Birkinshaw and Gibson, 2004; Herzallah et al., 2017). Exploitation promotes centralisation (Jansen et al., 2009) and stability (Adler et al., 2019). It involves decision making regarding organizational processes such as procedures for minimising variation, implementing rules and practices in the way in which targets are set and changed, and incentives given (March 1991).

Exploration, on the other hand, enables firms to move quickly toward new opportunities and to adjust to volatile markets (Birkinshaw and Gibson, 2004; Pellegrinelli et al., 2015) and to meet the requirements of emerging customers or markets. It also involves offering new designs and products in a bid to attract new customers (Caniëls et al., 2017; Jansen et al., 2009; Laplume and Dass, 2015; Li, 2013; Salvador et al, 2014). Organizations with an exploratory orientation regularly analyse their customer transaction data to identify novel product innovation opportunities (Salvador et al, 2014). They are not afraid to depart from existing knowledge in search for new knowledge, technologies, and customer competences (Gupta et al., 2006; Jansen et al., 2009; Lavikka et al., 2015). Learning occurs through processes of risk taking and planned experimentation (Gupta et al., 2006; Andriopoulos and Lewis, 2009; Lavie et al., 2010; Lavikka et al., 2015; March 1991).

OA has been positively linked to increased performance, innovation, growth, and survival (Bravo et al., 2018; Brix, 2019; Chuen et al., 2018; Duncan, 1976; Li, 2013), and numerous scholars have emphasised the need for firms to be ambidextrous (Matthews et al., 2015; Sohani and Singh, 2017; Lin et al., 2013; Raisch et al., 2009). However, OA can be difficult to achieve and comes with challenges and tensions that stem from the varying, contradictory, and fundamentally incompatible demands of exploitation and exploration (Bravo et al., 2018; Chandrasekaran et al., 2012; Gupta et al., 2006; Jansen et al., 2009; Lavie et al., 2010). OA mandates that firms maintain a level of balance between competing objectives of exploitation and exploration, efficiency and flexibility, alignment, and adaptability (Zimmermann et al., 2015). These opposing activities tend to compete for scarce organizational resources (Gupta et al., 2006; Jansen et al., 2009; Lavie et al., 2010) and rely on organizational routines that are radically different (Gupta et al., 2006). Stimulating and facilitating OA poses significant challenges to organizations and senior executives who are tasked with

resolving such strategic pursuit whilst managing the operational functions they are responsible for (Jansen et al., 2008; Li, 2013). Such managers are faced with the dilemma of whether they should manage the trade-offs, seek balance, or attempt to achieve both exploitation and exploration simultaneously (Cao et al., 2009; Jansen et al., 2008).

The difficulty in pursuing OA could result in organizations strategically embedding themselves in either extreme, leading to severe reduction in performance (Tinco, 2014). Exploitation at the expense of exploration could lead to competency traps because leveraging existing capabilities may result in immediate profits but could lead to eventual stagnation leaving firms unable to respond to market and technological changes (Andriopoulos and Lewis, 2009; Gibson and Birkinshaw, 2004; Chandrasekaran et al., 2012). For example, in the 1980s, Lloyds TSB Bank in the United Kingdom delivered spectacular shareholder returns as a result of CEO Brian Pitman's focus on return on equity. However, he paid very little attention to understanding the volatile needs of customers and the morale of the workforce. This eventually undermined the organization's performance and, from 1998 to 2003, Lloyds TSB Bank lost 60% of its market value (Birkinshaw and Gibson, 2004).

On the other hand, a firm could also be prone to failure by gravitating towards exploration. Such firm may take increasing risks with the aim of reversing previous exploratory failures whilst ignoring their core competencies and therefore end up focusing on future opportunities at the expense of current operations (Andriopoulos and Lewis, 2009; Chandrasekaran et al., 2012; Lavie et al., 2010). This could lead to unending failure that is challenging to break, where organizations do not learn from previous mistakes (Tinco, 2014). An example is the crush of mobile telephone company Ericsson, a leader in the technological development of mobile phones and one of the first to develop the analogue mobile system. Ericsson had an impressive growth in sales but this hid high costs generated from their large organizational structure. At its peak, the R&D function employed 30,000 people in nearly 100 technology centres with significant duplication efforts. Exploration and adaptability took precedence over exploitation and alignment. A crush in the telecom industry resulted in Ericsson laying off a considerable number of employees and closing the majority of its centres in a bid to restore the profitability of its existing business operations (Birkinshaw and Gibson, 2004). Excessive exploration led to

experimentation costs without gaining the perceived benefits. Organizations that fall into this trap tend to produce too many undeveloped new ideas with very little distinctive competence (Herzallah et al., 2017; March, 1991).

Studies have shown that the challenge to achieve a balance is usually in favour of exploitation as it is associated with greater certainty of short-term success, unlike exploration which by its nature is linked to unavoidable increase in ideas that have to be proven and has the likelihood of failing (O'Reilly and Tushman, 2013). Unlike exploitation, the returns from exploration are less systematic and more distant in time. Furthermore, what may be good in the long run may not always be good in the immediate term. Organizations also tend to focus on exploitation due to the proximity, speed, and clarity of feedback that ties exploitative activities to its consequences than in the case of exploration. Local search tends to have more certain outcomes and more definitive effects as opposed to search for new markets or relations that have less certain outcomes. However, a primary focus on exploitation could lead to strong path dependency and a suboptimal balance (March, 1991).

Some scholars have also argued that although exploitation and exploration are diametrically opposed (Tinco, 2014), exploration over time generates opportunities that the organization can exploit later on, and exploitation can yield financial benefits that can be invested in future exploratory projects (Gualandris et al., 2018; Lavie et al., 2010). They maintain that without a balance of both activities, organizations cannot achieve their desired performance (Lavie et al., 2010) and therefore advocate that ambidexterity should be a strategic aim developed by the right capabilities (Tamayo-Torres et al., 2016) that incorporates paradoxical thinking in strategies and practice (Chandrasekaran et al., 2012; Dutta, 2013). Although finding the right balance can be extremely difficult (March, 1991), firms must structure and manage their activities to exploit and explore (Zimmermann et al., 2015; Patel et al., 2013) because a balance in these opposing activities could also help overcome the adverse impact of lethargy and core rigidities in the organization's structure. This necessitates flexibility in both activities which tend to be proactively embedded in multiple yet conflicting processes that drive incremental and radical innovation (Tinco, 2014). Combining exploitation and exploration does not only prevent organizations from inertia due to primary focus on exploitation but also stops the organization from accelerating in exploration without benefiting (Jansen et al., 2009; Lavie et al., 2010;

Raisch and Birkinshaw, 2008). Its joint pursuit allows organizations to be innovative, flexible, and effective without losing the merits of stability and efficiency (Simsek et al., 2009).

### **2.2.1 Different Conceptualisation of OA**

OA has been conceptualised and measured in different ways by different authors resulting in outcomes that are hard to synthesize (Brix, 2019; Lavie et al., 2010; Birkinshaw and Gupta, 2013). Some have generalised findings on the antecedents and outcomes of exploitation and exploration in varying contexts using different interpretations which has led to contradictory empirical results (Lavie et al., 2010). Clarifying the scope of ambidexterity is essential and could help researchers identify new insights that distinguishes the concept from other related concepts and at the same time preserve its unique contribution (Birkinshaw and Gupta, 2013). Its meaning, originally from the notion of “an individual’s ability to skilfully use both hands equally” has been adapted by scholars as an organization’s ability to do two different things with equal ease (Birkinshaw and Gupta 2013; Blome et al., 2013; Coa et al., 2010). For instance, an organization’s ability to be efficient and flexible, exploit and explore, align, and adapt.

Scholars have progressively used the concept of ambidexterity in the analyses of organizational design, organizational learning, technological innovation, and other domains (Gupta et al., 2006; O’Reilly and Tushman, 2013; Lavie et al., 2010; Simsek et al., 2009). Some have also studied ambidexterity in many ways including “purchasing ambidexterity” (Gualandris et al., 2018) and “ambidexterity governance” (Blome et al., 2013), and how these forms of OA benefit organizations. Although OA is an important and versatile concept, its varied use and application can make it difficult to study, because it runs the risk of losing its explicit meaning and its measurement being distorted (Birkinshaw and Gupta, 2013). Too much use of the concept could result in it being overworked and abused, and thus necessitates that literature in ambidexterity has a better sense of perspective so that the concept can profit from greater focus (Birkinshaw and Gupta, 2013). Table 2.1 shows how OA has been defined and conceptualised by different authors, whilst table 2.2 shows how authors employing qualitative studies have described the characteristic of an ambidextrous organization.

***Table 2.1: OA Definitions and Conceptualisation by Different Authors***

<b>Author</b>	<b>Method</b>	<b>Definition</b>	<b>Conceptualisation Areas</b>
<b>Birkinshaw and Gibson, 2004</b>	Mixed method	The ability for organizations to master adaptability and alignment.	Organizational structure
<b>Gupta et al., 2006</b>	Review of articles.	An organization's ability to learn through local search and experiential refinement and also learn through processes of concerted variation and experimentation.	Learning.
<b>Jansen et al., 2008</b>	Survey	The ability for organizations to pursue as well as synchronize exploitative and explorative innovation simultaneously.	Individual attributes and leadership styles.
<b>Andriopoulos and Lewis, 2009</b>	Comparative case study.	The ability of an organization to exploit its existing products to enable incremental innovation and explore new opportunities to foster radical innovation.	Product innovation

<b>Raisch et al., 2009</b>	Review of literature and articles	Ambidextrous organizations can simultaneously exploit their existing competencies and explore new opportunities.	Organizational structure.
<b>Simsek et al., 2009</b>	Review of literature	A firm's ability to both exploit and explore.	Knowledge management.
<b>Lavie et al., 2010</b>	Review of literature	A firm's ability to engage in search, variation and experimentation, as well as be sufficiently effective and productive through choice and variation reduction.	Learning.
<b>Chandrasekaran et al., 2011</b>	Survey	An organization's ability to confront and manage the dual demands of exploring new products or processes and exploiting existing products or processes.	Organizational structure.
<b>Durisin and Todorova, 2012</b>	Mixed Method	Firms that are successful in engaging in exploitation and exploration	Organizational structure
<b>Dutta, 2013</b>	Survey	An organization's ability to do two contrasting activities at the same time.	Organizational structure.
<b>Lin et al., 2013</b>	Survey	An organization's ability to explore in order to be able to radically innovative and at the same time exploit to ensure incremental innovation.	Product innovation.

<b>Lisboa et al., 2013</b>	Online Survey	OA is when firms develop and deploy knowledge about their already existing markets, products and abilities and also develop and deploy new knowledge about new markets, products and abilities.	Knowledge management
<b>Laplume and Dass, 2014</b>	Case Study	An organization's ability to exploit and explore at the same time.	Organizational structure.
<b>Tinco, 2014</b>	Survey	An organization's ability to pursue exploration and exploitation simultaneously.	Product innovation.
<b>Bravo et al., 2018</b>	Survey	OA is the simultaneous performance of exploitative and exploratory learning styles.	Knowledge management.
<b>Chuen et al., 2018</b>	Survey	An organization's ability to explore new opportunities whilst simultaneously exploiting existing competencies.	Behaviour
<b>Severgnini et al., 2018</b>	Survey	OA is organization's ability to be aligned and efficient in managing today's business demands and at the same time adapt to changes in the environment.	Organizational structure
<b>Brix, 2019</b>	Conceptual study	OA is a process made of two components, namely exploitation and exploration.	Organizational learning.

### 2.2.2 Organizations Characterised as Ambidextrous

Examining the samples (see Table 2.2) further confirmed that authors had diverse views of the characteristics of an ambidextrous organization, for example Andriopoulous and Lewis, 2010 qualified a product design company as ambidextrous because the organization was known to be creative and highly profitable, whereas the second company- a new product development consultancy was qualified as ambidextrous because of its ability to drive incremental and radical innovation. Birkinshaw and Gibson (2004), on the other hand, viewed an ambidextrous organization, as one that could make small adaptations to their existing strategies without losing alignment – the Renault Company used in their study or a firm that could foster rapid growth and at the same time ensure organizational objectives, goal setting and incentive programs were circumspectly aligned - the Oracle Corp, the second company used in their study.

**Table 2.2: Organizations Identified as Ambidextrous by Key Authors Deploying Qualitative Approaches**

<b>Author</b>	<b>Characteristics of Ambidextrous Organization</b>	<b>Company</b>
<b>Birkinshaw and Gibson, 2004</b>	Organizations that can foster rapid growth and at the same time ensure that organizational objectives, goal setting and incentive programs are circumspectly aligned.	Oracle Corp
<b>Birkinshaw and Gibson, 2004</b>	Organizations that can increase profit margins through an operational strategy that is well aligned and at the same time drive new store concept and product line development to high levels.	Tesco Plc
<b>Jansen et al., 2008</b>	Organizations worth billions of pounds in assets, ranked in the Fortune 500 in terms of total revenue, with a wide range of products and	Financial services firm

	services and able to operate well within varying levels of environmental dynamism.	
<b>Andriopoulous and Lewis, 2009</b>	Organizations that do extremely well at exploiting their existing products to drive incremental innovation and explore new avenues to drive radical innovation.	New Product Development Consultancies
<b>Andriopoulous and Lewis, 2010</b>	Organizations with creative competency, design awards and highly ranked in the Business week design rankings and at the same time highly profitable.	Product Design Companies
<b>Durisin and Todorova, 2012</b>	Organizations that are leaders amongst their competitors, able to adapt to changes in dynamic market environments and at the same time manage incremental and discontinuous innovation.	High tech company
<b>Laplume, O. A and P, Dass 2015</b>	Organizations that are highly entrepreneurial and have survived long term	Commercial construction company
<b>Zimmermann et al., 2015</b>	Organizations that excel in uncertain environments and that have equally balanced alliance portfolio made of the same number of exploitation and exploration alliances.	Automotive companies

### Researcher's conceptualisation

Based on the review of literature on definitional issues, a careful examination of definitions of OA generated by different authors (see Table 2.1) and a thorough investigation of examples of ambidextrous organizations used by authors adopting the qualitative approaches (see Table 2.2), the researcher adopts Andriopoulos and Lewis' (2009) definition, which states that **“OA is the ability of an organization to exploit its existing products to enable incremental innovation and explore new opportunities to foster radical product innovation”**. This conceptualisation was

stimulated by the researcher's desire to understand the interplay between OA and PMS mainly from a product innovation perspective and therefore an examination of the author's study helped channel attention on the right literature that could inform this study. Furthermore, the researcher views exploitation and exploration as a capability that can manifest in dual structures or simultaneously, and views both activities as mutually enabling and not necessarily in opposition and therefore of the same opinion as the authors.

### **2.2.3 Managing tensions in OA**

Various studies have shown varying results of the relationship between exploitation and exploration (Andriopoulos and Lewis, 2009; Gupta et al., 2006; Jansen et al., 2009; March 1991; Tinco, 2014). Earlier research claimed that the simultaneous pursuit of exploitation and exploration was impossible to achieve (Hannan and Freeman, 1977). More recent studies have shown exploitation and exploration as independent activities and orthogonal to each other, meaning that firms can pursue high levels of exploitation and exploration concurrently (Coa et al., 2009; Lisboa et al., 2013; Marino et al., 2015). Whereas others show that exploitation and exploration may not be necessarily in fundamental opposition but could be mutually enhancing (Andriopoulos and Lewis, 2009; Chuen et al., 2018; Fournè et al., 2016; Gupta et al., 2006; Herzallah et al., 2017). Theories of the ease or difficulty with which an organization can pursue both exploitation and exploration depends on whether both activities are viewed as competing or complementary (Gupta et al., 2006). Scholars, however, agree that paradoxical thinking and actions are significant to attain and sustain ambidexterity although extremely challenging (Andriopoulos and Lewis, 2009). They explain that tensions, also referred to as paradoxes between both activities can be resolved by considering the structural, temporal, or contextual nature of the phenomena (Sohani and Singh, 2017; Duncan, 1976).

#### ***Structural Ambidexterity***

This form of ambidexterity shows exploitation and exploration as incompatible and therefore dual structures are employed to enable specific business units to focus on exploitative activities whilst others focus on exploratory activities (Adler et al., 2019; Andriopoulos and Lewis, 2009; Chandrasekaran et al., 2012; Jansen et al., 2009). This approach is noted as the standard approach to OA, where units are configured to the

specific requirements of its task environment (i.e., configured to enable exploitation or exploration). Each structure has a distinctive strategic intent, competencies, roles, learning context, cultures, managerial teams and are rewarded accordingly (Adler et al., 2019; Birkinshaw and Gibson, 2004; Lavie et al., 2010; Sohani and Singh, 2017).

With this type of ambidexterity, exploitative units are usually centralised with a close net culture that focuses on maximising efficiency and control using process management strategies (Lavie et al., 2010; Raisch and Birkinshaw, 2008). Such units tend to benchmark their primary business activities and adopt highly formalised and standardized operating systems to ensure efficiency and to improve their profit margins. High formalisation in this context refers to the extent to which rules and procedures govern the work roles and the way employees execute their daily tasks (Adler et al., 2019). Due to significant emphasis on cost control and profit attainment, such business units tend to have tight and mechanistic controls that encourages a culture of low risk taking. Targets are set based on achieving short term financial margins and emphasis placed on performance metrics (Adler et al., 2019). Typically, an organization's production department is usually associated with exploitation (Lavie et al., 2010; Simsek et al., 2009). Employees working in such departments tend to serve existing customers without pressure to explore or innovate (Asif, 2017).

Exploratory units on the other hand, are usually fashioned to facilitate innovation through experimentation. These units tend to be typically smaller and decentralised with a culture that promotes autonomy and flexibility in work processes (Lavie et al., 2010; Jansen et al., 2009). Core operations primarily involve search for new market prospects, tracking and the development of emerging technologies (Birkinshaw and Gibson, 2004). Exploratory units mandate high adaptability and innovation (Adler et al., 2019) and are characterised by low formality, with looser control and less restriction. Such units tend to anticipate technological transformations and shifts in customer preferences that ultimately affects changes in products and markets. Planning in exploratory units takes significantly long and targets are usually future oriented (Adler et al., 2019). Typically, an organization's R&D department is usually associated with exploration (Lavie et al., 2010). Employees in such departments engage in innovative activities without being influenced by demands to be efficient (Asif, 2017).

A top down approach is usually employed for structural ambidexterity as senior management is responsible for delegating activities to their employees and dictate how best they should use their time at work (Lavie et al., 2010). Junior managers in such units are usually not ambidextrous as they tend to focus on one activity or the other (Mom et al., 2009). Employees also have specialists' roles and usually do not get the opportunity to broaden their knowledge as they are restricted to a single business unit or activity (Birkinshaw and Gupta, 2013). The structural approach could be deployed to manage tensions in OA by preventing operations in exploitative units from interfering and obstructing emerging competencies developed in exploratory units. It creates boundaries that safeguard experiential activities from dominant managerial strategies and inertia present in mainstream activities (Jansen et al., 2009). Although both exploitative and exploratory activities are dramatically different, they are integrated or held together by a common strategic intent, an overarching set of values and linking mechanisms that leverages the shared assets (Adler et al., 2019; Simsek et al., 2009). A crucial aspect of structural ambidexterity is not the separation of both activities but the process by which they can be integrated to create greater value (Wang and Rafiq, 2014). Although the pursuit of exploitation and exploration in different units mandates distinct operational capabilities and competences at dispersed locations, these differentiated competences can only be useful if they are strategically integrated into new combinations of exploitative and exploratory innovation (Jansen et al., 2009), therefore when differentiating both activities, organizations subsequently need to establish an integration mechanism to coordinate and bring together the capabilities developed at the spatially dispersed location (Jansen et al., 2009).

Adopting such differentiation and integration strategy presents a powerful and complementary tactic for stimulating OA. The differentiation strategy is vital as it ensures clearly focused actions whilst the integration approach accentuates the importance of managing tensions in OA and encourages a paradoxical mindset. The integration strategy requires high managerial creativity to manage tensions across various units and levels. For example, strategic intent tensions tend to predominately occur at firm level, whereas customer preference affects efforts within projects and personal drivers seem most impactful on knowledge workers themselves. Controlling these paradoxes across organizational levels can help mitigate problems such as

mixed messages being disseminated across the organization. However, in some cases, efforts to manage a single tension may contradict efforts aimed at another as they tend to be interconnected (Andriopoulos and Lewis, 2009).

Although the structural approach produces a plausible solution to managing tensions in OA, integrating both activities is not a trivial task (Lavie et al., 2010; Raisch and Birkinshaw, 2008) and it is only at this point that senior management is expected to exhibit ambidextrous thinking and action (Adler et al., 2019; Lavie et al., 2010). By loosely integrating exploitative and exploratory units, senior management teams can facilitate OA. They can attain OA by orchestrating the harmony between the differentiated business units, enabling robust resource allocation, and providing strategic direction (Adler et al., 2019). They must also sense and seize novel opportunities (Chuen et al., 2018) and need strong analytical and creative thinking skills to do so (Adler et al., 2019). These managers must be able to resolve the attributes of rigorous costs mitigation and flexibility, whilst maintaining the objectivity needed to make difficult trade-offs (Adler et al., 2019).

A setback with this approach, however, is that separating exploitative and exploratory units could lead to isolation and may stimulate tense relations between both business units (Birkinshaw and Gibson, 2004; Andriopoulos and Lewis, 2009; Lavikka et al., 2015; Li, 2013). The lack of shared language, shared ways of working and different working backgrounds could create knowledge management tensions. For example, many R&D groups tend to be unsuccessful in getting their ideas accepted due to lack of clear links to core business operations. The distinct nature of each unit creates knowledge boundaries that hinders effective collaboration (Chandrasekaran et al., 2012; Lavikka et al., 2015). This can stymie organizational learning and reduce employee's commitment to explore. Radical innovation may be viewed as unrealistic and active resistance could stem from exploitative units (Adler et al., 2019; Choi et al., 2016). The embedded and tacit nature of background knowledge in such units could create obstacles (Lavikka et al., 2015) and senior management teams may face role conflicts that could mitigate acceptance of decisions, especially when they are responsible for the "opposing" unit. Structural ambidexterity could also enhance self-interested behaviours amongst managers who may be competing for scarce resources (Jansen et al., 2009; Li, 2013). It could burden senior management with the difficult task of identifying and translating different, ambiguous, and contradicting expectation

across the differentiated units into workable strategies (Jansen et al., 2009). Managing tensions between exploitative and exploratory units could also lead to inefficient information sharing and interpersonal conflicts which could lead to less desirable results (Li, 2013). Attaining ambidexterity through structural separation can also be too costly or impractical when organizations have constrained resources which is usually the case with smaller businesses (Salvador et al, 2014).

Some of these challenges, however, can be mitigated through common values and aspirations that allows senior team members to prioritize, interpret problems and mitigate tensions collaboratively. Dialogue between such members could stimulate critical debates leading to the evaluation and redesign of potential combinations of knowledge sources at the differentiated units (Jansen et al., 2009). Furthermore, using managers from cross functional teams could facilitate the use of their distinct expertise to help overcome differences in interpreting knowledge. Increased interaction amongst such managers could help foster collaborative conflict resolution, mitigate the accumulation of grievances and grudges, and help develop information bridges across exploitative and exploratory units (Li, 2013).

### ***Temporal Ambidexterity***

Temporal ambidexterity is also known as punctuated equilibrium (Brix, 2019; Jansen et al., 2009). This is whereby inherent trade-offs between exploitation and exploration reinforce their occurrence as opposing activities, that take place as a continuum. OA manifests in cycles of exploitation and exploration by focusing on one activity and then shifting to the next after a period of time. Organizations that use this approach can utilise the same unit but at different times for either exploitation or exploration (Gibson and Birkinshaw, 2004). The business unit, however, must realign its structures and processes to reflect the change. Mechanisms put in place to suit the existing business environment should be adjusted to support changes that occur over time (Lavikka et al., 2015). With temporal ambidexterity, the development of new knowledge depends on the organization's existing knowledge base (Santoro and Usai, 2018). For example, as the organization experiments, it enacts exploration but as the organization repeats the experiments, the new knowledge is exploited and becomes the dominate knowledge overtime, consequently exploration evolves into exploitation. Both activities serve as successive stages whereby exploitation trails exploration and vice versa. During specific periods, exploitation is kept at a minimal

yet adequate level whilst resources are channelled towards exploration. Alternatively, exploration is carried out to meet a minimal threshold whilst the organization invests mainly in exploitation (Lavie et al., 2010). This approach is usually characterised by long periods of stability and incremental change, followed by short phases of radical changes (Caniëls et al., 2017; Jansen et al., 2009; Lavie et al., 2010).

During such transitions, managers are challenged with coordinating contradictory activities, managing the process and dislodging path dependence (Lavie et al., 2010). Both frontline managers and employees tend to initiate the shift. Frontline managers take it upon themselves to balance exploitative and exploratory activities as opposed to waiting for senior management or executives to make such judgements on their behalf. For example, being closest to technical and market requirements, they may proactively initiate changes informally and then explain previous challenges to senior management and the benefits of the change before taking a formal approach to enforce the adjustment. The transition, however, can also be externally driven by market changes and thus fostered by senior management (Zimmermann et al., 2015). Temporal ambidexterity is more useful in stable, slow moving environments and for smaller firms with limited resources (O'Reilly and Tushman, 2013). It allows organizations to achieve both alignment and adaptation but requires managers to decide how best to divide up work groups and time to meet the varying needs across both activities (Gupta et al., 2006).

A challenge with this approach, is that the activity the organization focuses on at a given point in time only reinforces the path dependency of either exploitation or exploration and could delay subsequent transitions (Lavie et al., 2010). Managing tensions, maintaining effective interpersonal relations, and developing a mechanism that facilitates the switch between exploitation and exploration is also a difficult task (Wang and Rafiq, 2014). This approach to managing tensions is also ineffective in a highly dynamic environment (O'Reilly and Tushman, 2013) and mandates the development of efficient procedures (i.e. crafting a supportive culture, negotiating and collaborating) for controlling the transition from one mode to the other (Lavie et al., 2010). It necessitates a good level of agility to excel at both activities. The shift from one activity to the other is usually slow and gradual rather than sudden and immediate. This type of ambidexterity is mainly useful in single units where exploitation and

exploration can occur in the same domain, but in the absence of a robust exploration function, exploitation tends to dominate (Asif, 2017).

### *Contextual Ambidexterity*

Contextual ambidexterity considers exploitation and exploration as complementary organizational activities that permeates all functions and levels in a unit as opposed to dual structures in which the two demands are kept separate (Wang and Rafig, 2014). It is viewed as a multidimensional construct, with exploitation and exploration, alignment, and adaptability, efficiency and creativity, each involving a separate but interrelated element (Gibson and Birkinshaw, 2004; Lavie et al., 2010) rooted in the organization's culture (Wang and Rafig, 2014). Cultural values that stimulate innovation, coexist with values of quality and efficiency. Integrating these, mitigates the trade-off approach, as organizations can align themselves around adaptability (Lavie et al., 2010). According to Zimmermann et al., (2015) this method of ambidexterity is viewed as more sustainable than the other types because it facilitates adaptation of the entire business as opposed to relying on a unit to stimulate adaption and new business developments. It also mitigates coordination challenges (Salvador et al, 2014) and concurrently facilitates alignment and adaptability across various business units. Alignment enables coherence among activities and fosters working together towards achieving a single goal, whereas adaptability fosters the reconfiguration of activities to be able to quickly respond to changes in the environment (Gibson and Birkinshaw, 2004; O'Reilly and Tushman, 2013). With contextual ambidexterity, the entire unit is responsible for exploitation and exploration but through largely stable formal and informal rules of behaviour. Exploitation and exploration are viewed as interrelated and mutually enabling in nature (Zimmermann et al., 2015).

Although OA is a characteristic of a business unit, it manifests itself in the actions of organizational members. Individuals in their daily work are faced with choices on how to spend their time, for instance whether they should focus on the needs of existing customers or nurture the needs of new customers with new requirements (Brix, 2019; Gibson and Birkinshaw, 2004; O'Reilly and Tushman, 2013). This type of ambidexterity uses behavioural and social means to bring together exploitation and exploration (Andriopoulos and Lewis, 2009; Li, 2013; O'Reilly and Tushman, 2008). Individuals must maintain a good balance between creativity and attention to detail,

so that exploratory efforts and innovation does not necessarily undermine quality and efficiency. This enables the organization to exploit and explore simultaneously as employees at all levels engage in both activities (Lavie et al., 2010; Lavikka et al., 2015). For example, in the case of Ciba Vision, a unit of the Swiss pharmaceutical giant Ciba-Geigy that sells eye-care products to optometrists and consumers, in the 90s created autonomous units for new projects in a bid to stimulate ambidexterity. The CEO furnished each unit with its own R&D, marketing and finance functions and chose project leaders for their willingness to question the status quo and ability to operate independently. Managers and employees were given freedom to shape their own units and rewarded for the overall performance of the company. This paid off, as over the next five years Ciba Vision successfully launched a series of new products and pioneered a new lens-manufacturing process that significantly reduced production costs. Ten years later the organization tripled in sales and have become a billion-dollar business (O'Reilly and Tushman, 2004).

Ciba Vision's testimony resonates studies that show that emotional behaviours, managerial and organizational conditions, and strategies were vital to initiating OA (Zimmermann et al., 2015). The manifestation of ambidexterity can be exhibited in employees and not just senior managers (Adler et al., 2019). Change in the organization does not only occur through top-down processes for example, frontline managers who are directly confronted with unexpected problems, technological changes and new customer demands could also propose new solutions to their superiors leading to changes in activities undertaken in particular units. In some cases, changes in the environment also created emotional stress when frontline managers and employees continued to follow previous established ways of doing things which in turn triggered the initiation of novel transformations (Zimmermann et al., 2015). In such instances, junior members of staff are empowered to balance the competing requirements of exploitation and exploration in their daily tasks. They are given autonomy to use their own initiatives, search for new opportunities, adapt to cooperative working styles, and are sufficiently motivated and informed to act spontaneously without necessarily requiring permission or support to carry out their jobs. (Adler et al., 2019; Caniëls et al., 2017; Chuen et al., 2018; O'Reilly and Tushman, 2013). Such employees carry out actions that involve adaptation to new opportunities that are clearly aligned with the overall strategy of the organization to

deliver value to existing customers and at the same time look out for new customers (O'Reilly and Tushman, 2013). Such behaviour traits foster both incremental and radical innovation (Chuen et al., 2018).

To stimulate contextual ambidexterity, senior management are responsible for setting the appropriate organizational context and enabling an environment in which ambidextrous individuals can thrive (Adler et al., 2019). Organizational systems, processes, incentives, controls, and beliefs are used to shape and influence the daily actions of employees to ensure that set goals are achieved. Routines can also be used to systematise creative processes and job enrichment schemes used to motivate workers to be more innovative (Gibson and Birkinshaw, 2004). According to Birkinshaw and Gibson (2004) attributes such as stretch, discipline, support and trust could also encourage individuals to deliver high quality results, make them accountable for their actions, provide them with security and the latitude they need to perform. These attributes, however, if imbalanced or lacking entirely, could lead to a less optimal organization. For example, stimulating stretch and discipline without support and trust could lead to employees being burnt out and an authoritarian driven work environment which may lead to high employee turnover, making OA difficult to achieve. Whereas focus on support, and trust without stretch and discipline could result in employees benefitting from a collegial working environment but not maximising their potential to achieve superior results. Organizations that fall in such category tend to have low ambidexterity and may produce satisfactory but uninspiring results. A lack of such attributes could result in employees who are unlikely to either exploit/align or explore/adapt, let alone be ambidextrous (Birkinshaw and Gibson, 2004). Chuen et al., (2018), on the other hand, explain that the ability to control, create and collaborate could facilitate contextual ambidexterity. Control in terms of ensuring stability, routinization and maintaining hierarchical control. Create, by facilitating adaptation and growth, and collaborate in terms of participative decision making, idea sharing and fostering empathic relationships. They argue that individuals with ambidextrous traits should be flexible and strict, creative, and routine, formal and informal (Chuen et al., 2018). To foster contextual ambidexterity, besides helping to establish a supportive context, organizational leaders can play a vital role by encouraging and nurturing adaptability. This is usually achieved by

simply serving as a good role model and exhibiting adaptable behaviours and then enforcing it with rewards and recognition (Gibson and Birkinshaw, 2004).

Although contextual ambidexterity could lead to superior performance (Patel et al., 2013), it does not occur without challenges. It is viewed as a capability that is developed gradually over time through the integration of various attributes (i.e., stretch, discipline, support, and trust). The development of such capability could take years and therefore it would be inaccurate to infer that incorporating these attributes into an organization's culture would deliver immediate performance. The attributes can also create challenges if they are not deployed simultaneously, for example, if managers pay attention to discipline, they could be viewed as less supportive of risk taking and less trusting which could hinder learning. Furthermore, inconsistencies between core capabilities and innovation demands could result in teams repeatedly missing opportunities for creative breakthroughs (Gibson and Birkinshaw, 2004). Lower level organizational members with different backgrounds could also become emotionally stressed when faced with the challenge of having to make choices between exploitative or alignment-oriented activities and exploratory or adaptation-oriented activities (Birkinshaw and Gibson, 2004). For example, in Chandrasekaran et al.'s, (2012) study employees in an R&D department complained that *“one minute senior management is telling us to innovate and the next minute they are giving us marching orders to deploy Six Sigma and become efficient. It is crazy to tell people they should be focused on becoming more efficient while at the same time you want them to explore untapped growth potential. This is making me nuts”*. In such cases frontline managers may use relational initiatives to help overcome this and teams could agree on the need to engage in complementary knowledge processes that facilitates the adoption of ambidexterity (Zimmermann et al., 2015). Another setback with this approach is that, although it is conceptually easy to imagine how it might manifest within a given setting, it is difficult to see how it would practically allow a company adjust to disruptive changes, for example, in cases where significant restructuring is needed. Key decisions cannot be left to low level employees and at some point, would require senior management to provide resources and legitimacy for new technology or business models. Furthermore, given the kind of new skills required, it would be unlikely that operational employees would possess the technical capabilities necessary (O'Reilly and Tushman, 2013).

In conclusion through structural ambidexterity, exploitation and exploration can be achieved by task partitioning, whereby one group carries out exploitative related activities and the other, exploratory (Gibson and Birkinshaw, 2004). This approach helps buffer exploitative activities from exploratory activities but requires a reintegration mechanism orchestrated by senior management (Lavikka et al., 2015). Some believe that it is the best way to foster OA with each unit (exploitation or exploratory) focusing on a single mandate (Adler et al., 2019). Temporal ambidexterity, on the other hand, manifests when organizational structures developed and solidified by exploitative initiatives are interrupted by periodic bursts of exploration. This mandates channelling resources for each activity. Organizational structures adapt over time to make room for both exploitation and exploration (Brix, 2019; Caniëls et al., 2017). Usually exploitation is strengthened due to the immediate and short-term benefits which if not managed carefully could lead to success traps (Asif, 2017; Snehrat et al., 2018). Whereas contextual ambidexterity adopts an integration perspective that depicts that exploitation and exploration can co-exist and are complementary (Brix, 2019). It is when organizations simultaneously manifest alignment and at the same time adaptability across an entire unit and enables coherence among all business activities to achieve the same goal and at the same time reconfigure business activities quickly to meet the changing demands of the environment (Gibson and Birkinshaw, 2004). Table 2.3 summarises how structural, temporal, and contextual ambidexterity can be achieved, the main challenge faced with each approach and how tensions can be managed.

**Table 2.3: Summary of how OA can be achieved**

<b>Type of ambidexterity</b>	<b>Structural Ambidexterity</b>	<b>Temporal Ambidexterity</b>	<b>Contextual Ambidexterity</b>
<b>How is ambidexterity achieved?</b>	Separation of units for exploitative and exploratory activities	Exploitation and exploration occur as a continuum with each activity at the opposite end.	Simultaneous pursuit of exploitative and exploratory activities.

<b>Main Challenge</b>	Coordinating across different units, integrating, and managing contradictions at management level	Managing transitions between exploitative and exploratory activities	Managing dynamic tensions nested across different organizational units.
<b>How to manage tensions</b>	Spatial separation	Temporal separation	Simultaneously

#### **2.2.4 Factors that can affect an organization’s ability to be ambidextrous.**

OA can be immensely complex to achieve, however factors such as the environment, organizational culture, managerial inclination, and availability of resources can affect an organization’s ability to be ambidextrous.

##### ***Environmental factors***

The need to exploit and explore can be triggered by environmental dynamism (Raisch and Birkinshaw, 2008; Zimmermann et al., 2015). Organizations in stable environments are naturally efficient when it comes to incremental improvements (Lavikka et al., 2015; Lavie et al., 2010; Tamayo-Torres et al., 2016). Such environments lead firms to pursue low exploration because their fundamental competencies are known (Marino et al., 2015; Fournè et al., 2016). Whereas those in dynamic environments tend to exhibit efficiency in new product development (Raisch and Birkinshaw, 2008; Tinco, 2014; Tamayo-Torres et al., 2016). Such firms do not only have to pursue some form of uniqueness to differentiate themselves from their competitors but must also exploit their existing resources to ensure increased customer satisfaction (Herzallah et al., 2017). Turbulent environments tend to favour organizations that can capitalise on emerging opportunities and neglect expiring certainties. Extant products and services become obsolete quickly, and therefore necessitates exploration. The extent of unpredictable change in an organization’s environment usually comes from changes in customer preferences, market demand or technologies leading to extensive search for novelty. Organizations in turbulent

environments tend to allocate more resources to exploration as it is crucial for competitive advantage (Lavie et al., 2010; Wang and Rafiq, 2014). Although exploratory efforts under dynamic environments can allow firms to adjust to the new environment it also increases costs, risks and challenges that could outweigh the benefits it brings (Kovach et al., 2015). Furthermore, it is vital to note that environmental changes do not automatically mandate strategies for greater exploration (Marino et al., 2015).

Unexpected changes in the environment beyond the organization's control such as deregulation or technological breakthroughs, deviations in demand due to crisis could also necessitate exploitation or exploration. This is prevalent in various industry such as hospitals where changes call for immediate organizational response. In such instances some organizations may drive exploitation in a bid to salvage their past investments whilst others may enhance their exploratory efforts in a bid to prosper in the future (Lavie et al., 2010; Kovach et al., 2015).

### ***Organizational culture***

Organizational culture pertains to the beliefs, attitudes, experiences, and values that guide the behaviours of the organizational members (Lavie et al., 2010). There is a systematic tendency for an organization to gravitate toward either exploitation or exploration that is usually associated with the history and identity in which the organization is founded (Lavie et al., 2010; Li, 2013). Some organizations exhibit very strong culture, whereby organizational members share a set of strong views, norms, and values. Such culture can impose social controls on appropriate behaviour but could also be a barrier to exploration as such organizations tend to stay within the realm that they are familiar with, furthermore consensus on corporate goals and values provides a strong foundation for the organization's exploitation capabilities. However, if the organization's mission is to foster continuous innovation, then that would stimulate a broader search for new information that facilitates exploration (Lavie et al., 2010). Such cultures and social climate tend to motivate employees to take actions in the best interests of the organization rather than in themselves (Santoro and Usai, 2018). The organization's identity also presents its members with a perspective of the organization's goals, mission, and dominant logic that directs its

exploitative and exploratory activities. Identity affects exploitation and exploration by shaping the evolution of organization's culture.

### ***Managerial inclination***

The cognitive and behaviour inclination of senior management teams could also influence an organization's tendency to exploit or explore. A manager's learning ability and attitude towards risk taking can reinforce exploitation or exploration (Lavie et al., 2010). Risk aversion stimulates exploitation because exploitation fosters certainty and therefore risk adverse managers may be motivated by short term performance aspirations. In some instances, as senior management teams mature, they tend to be more internally focused and exhibit a self-reinforcing nature of learning from experience and thus use this to guide the allocation of resources and in so doing fortify the tendency to trade off exploration for exploitation (Lavie et al., 2010). They find it easier to engage in the activity which they have gained experience from. This could lead to path dependency as efforts are focused on the dominant activity. Senior management may also rely on performance feedback in making decisions about whether to engage in exploitation or exploration. When performance drops after exploitative efforts, managers may be prompted to engage in exploration and vice versa (Lavie et al., 2010). According to Raisch and Birkinshaw (2008) top-down knowledge inflows tend to be positively correlated to exploitation whereas bottom-up knowledge in flows are associated with exploration. This implies that a frontline manager who acquires top down and bottom-up knowledge in flows is more likely to engage in a higher level of OA.

### ***Availability of resources***

Resource availability plays a critical role in determining whether there is a binding trade off that requires finding an appropriate balance between exploitation and exploration (Coa et al., 2009; Fournè et al., 2016). OA is more evident under uncertain conditions and when there are sufficient resources available, which is usually the case with larger firms as opposed to smaller ones (O'Reilly and Tushman, 2013). Firms that have scarce resource tend to benefit most from achieving a close balance between exploitation and exploration (Coa et al., 2009; Fournè et al., 2016; Li, 2013). The trade-off view may be relevant and suitable (Coa et al., 2009).

## **2.2.5 Conclusion**

To be ambidextrous organizations must exploit and explore. Exploitation and exploration decisions are intentional and therefore organizations must plan and carry out plans for balancing these tendencies. Balance, however, does not necessarily mean equal number of exploitative and exploratory activities to be carried out but the ability to excel in both (Brix, 2019; Li, 2013). OA can be difficult to achieve and the ability to deal with its paradoxical requirements is viewed as a key prerequisite for OA to transpire (Zimmermann et al., 2015). Studies have shown that tensions in OA can be managed through structural, temporal, and contextual means, and its manifestation is also dependent on factors such as the environment, culture, managerial mindset, and resource an organization has.

## **2.3 Performance Measurement Systems**

### **2.3.1 Performance Measurement**

Performance Measurement (PM) is the ability to obtain, analyse and express information about an aspect of a process, activity, or person (Micheli and Mari, 2014; Pěsalj et al., 2018). In management research, PM has been studied from three main points of view. The first is management accounting, which regards PM systems as a type of management control system and therefore tightly linked to planning and budgeting (Elg et al., 2012). The second is operations management, which views PM “as a set of metrics used to quantify the efficiency and effectiveness of actions” (Neely et al., 2005; Neely et al., 1995) and the third is strategic management, whereby the deployment of organizational goals and their related measures connect strategic initiatives with operational performance (Elg et al., 2012). The dominant perspective, however, is the management accounting and operations management view. Both views mainly focus on the technical aspect of measurement processes such as the design and implementation of measurement tools; whilst strategic management view, brings together researchers from several areas who have examined an array of social, cultural and the behavioural effects of measurement (Beer and Micheli, 2018; Smith and Bititci, 2017).

Indeed, PM is not just a technical process but also a social practice that enables organizations to monitor progress, evaluate performance, focus attention, and influence behaviours (Koufteros et al., 2014; Watts and McNair-Connolly, 2012). PM is inextricably linked to behaviors, as an individuals' interpretations of performance measures can influence their actions which ultimately affects the organization's performance (Beer and Micheli, 2017). Its social implications, if not considered, tend to be dominated by technical concerns which, over time, can make PMS less personal and more focused on results and thus potentially alienate an organization's stakeholders (Beer and Micheli, 2018; Bourne et al., 2013; Smith and Bititci, 2017).

### **2.3.2 Performance Measures**

Performance measures can be used to highlight critical success factors, help show what success looks like and communicate this throughout the organization (Micheli and Mura, 2017; Bourne et al., 2013). Financial measures such as revenue, costs, and sales are vital and play a central role in assessing the financial performance of an organization. Such measures provide information to managers, financial analysts, investors, auditors and government bodies through annual reports (Bourne et al., 2018; Barnes and Hinton, 2012; MacBryde et al., 2012; Upadhaya et al., 2014) but are highly aggregated and only able to provide a retrospective view with heavy reliance on historical accounting data. These measures must be balanced with non-financial measures to present a holistic approach to PM (Barnes and Hinton, 2012; Jääkeläinen and Laihonen, 2014; Moxham, 2014). Non-financial measures can be used to detect areas that require improvements (Letmathe et al., 2012), foster double-loop learning (Micheli et al., 2011) and stimulate creativity and innovation (Baird and Su, 2018); for example, learning and growth measures could foster the development of employees, leading to enhanced customer service, increased customer satisfaction, and sales revenue through repeated sales (Upadhaya et al., 2014).

### **2.3.3 Performance Measurement System-The Balanced Scorecard**

Initially, financial performance measures were primarily used and viewed as a vital tool that played a central role in assessing the performance of an organization. Such measures provided information to government bodies through annual reports. It also represented a common language for various organizational activities. These measures provided limited direction for future actions that could ensure potential growth

(Bourne et al., 2018; Barnes and Hinton, 2012; MacBryde et al., 2012; Upadhaya et al., 2014). Indeed, the sole use of financial measures attracted significant criticism by both researchers and practitioners for its inability to consider transformation processes and the “feedback effect”. It rewarded short term behaviours by focusing on short term results, with no guidance for enhancements, and in some instances obstructed organizational improvements. It also highlighted consequences instead of revealing causes (Liu et al., 2014; Tung et al., 2011). By using financial measures only, managers gained immediate profit at the expense of long-term productivity. This was even worse in cases where wages or incentives were linked to profits, with numerous cases documented of managers increasing their own wages and incentives sometimes at the cost of the organization’s profitability (Barnes and Hinton, 2012; Liu et al., 2014; MacBryde et al., 2012; Upadhaya et al., 2014). By the late 1980s to the early 1990s, many scholars and practitioners began to identify these challenges (Bititci et al., 2006; Gopal and Thakkar, 2012; Hansen and Schaltegger, 2018; Liu et al., 2014). This created a widespread dissatisfaction with the financial measures and led to the proposal of multi-dimensional PM frameworks generated from practice (Bourne et al., 2018; Liu et al., 2014). Management practices, initiatives and tools began to be understood from a more strategic perspective. PM extended to cover other aspects such as customers, innovation, and intellectual capital, thus leading to the introduction of the BSC.

Today, the BSC is noted as one of the most typical PMS (Lucianetti et al., 2019). It presents a more holistic approach to PM by integrating non-financial, forward looking and external measures with financial measures to form a multi-dimensional PM framework based on four main perspectives: financial, customer, internal business processes and learning and growth (Kaplan and Norton, 1992; Barnes and Hinton, 2012; Jääkeläinen and Laihonen; 2014; Liu et al., 2014; Moxham, 2014; Taticchi, 2012). The non-financial measures are strongly linked to the financial performance of the business; for example, customer-based measures could be used to stimulate customer satisfaction which could in turn lead to increased sales; robust internal business processes measures could be used to drive innovation with differentiated products and services leading to competitive advantage, and the learning and growth measures could be used to encourage the attainment of new training initiatives for employees which could lead to better customer services, satisfied customers and

increased profitability (Bouwens and Kroos, 2017; Baird and Su, 2018; Liu et al., 2014; Tung et al., 2011; Marchand and Raymond, 2008). Non-financial performance measures are used to complement financial measures (Letmathe et al., 2012) and to mitigate gaming stimulated by financial measures (Baird and Su, 2018).

The initial components of the BSC, however, could not keep up with the volatile nature of the dynamic business environment (Liu et al., 2014) and has evolved overtime. This has led to a much stronger link between measurement and management (Bai and Sarkis, 2014; Srimai et al., 2011). Introduced as a set of performance measures, the BSC has then become a framework for strategy implementation and a strategic management system (Smith and Bititci, 2017; Srimai et al., 2011). The BSC integrates measurements into the planning and budgeting cycles and helps link an organization's long-term strategic goals with its short-term operational actions (MacBryde et al., 2012). It has become an extensive and comprehensive performance evaluation tool used to enable adequate planning and control. The four perspectives highlight the organization's value creation activities and could help managers understand the interplay and trade-offs between alternative performance dimensions which could lead to improved problem solving, decision making (Zangoueinezhad and Moshabaki, 2011), information sharing and learning (Lucianetti et al., 2019). The BSC however has some limitations, for example it takes long to implement, and measures must be constantly reviewed to be relevant (Kolehmainen, 2010). It also does not support radical changes or transformations and may be unable to bridge exploitative and exploratory units in ambidextrous organizations (Hansen and Schaltegger, 2018). It is also usually unsuitable for small companies because it is heavily reliant on a well-developed corporate strategy for successful implementation of which most small firms do not have (Watts and McNair-Connolly, 2012).

#### **2.3.4 Functions of a PMS**

A PMS such as the BSC is a sophisticated mechanism that can be used to serve various purposes and applied in different ways. It helps measure performance from varied perspectives as there is not a single best way to measure performance and an organization cannot be assessed based on a single indicator (Baird and Su, 2018; Moxham, 2014). It is a management control system that incorporates a structured framework of key financial and non-financial performance metrics (Amir, 2014;

Baird and Su, 2018; Koufteros et al., 2014; Maestrini et al., 2018). PMS has become an integral part of performance management (an integrated set of methodologies, processes, metrics, and applications) and is deployed by numerous organizations to enable top down or bottom-up business management (Camp and Braet, 2016). It is fundamentally and predominately known to enable or facilitate the following activities:

### ***Strategy implementation***

A PMS is an essential part of performance management that can be used both top down and bottom up to enforce corporate strategy. It facilitates the development of an organization's strategy and the translation of strategy into operational terms (Camp and Braet, 2016; Kaplan, 2001; Maestrini et al., 2018; Micheli and Mura, 2017) by linking it with critical success factors (Baird and Su, 2018; Franco-Santos et al., 2012). It is used as a vehicle to articulate an organization's strategy to employees to help align their individual tasks and behaviours, with the initiatives implemented by the organization to realise their goals (Bourne et al., 2018; Tung et al., 2011; Lucianetti et al., 2019). For example, it can be used to inform frontline employees of factors that are essential to attain the organization's strategic goals and how their work impacts on these goals. Strategy maps, embedded in PMS, could also show cause and effect relationships, and used to support decision making by showing the impact of different plans and checking their coherence with the organization's strategy and objectives (Sidorova et al., 2016). A PMS could also act as a catalyst that links long term strategic objectives with short term actions and facilitates top down and bottom-up communication of the objectives (Bourne et al., 2018; Tung et al., 2011; Lucianetti et al., 2019). To maximise its benefits, performance targets and indicators should be accurately linked to strategy and examined in strategic reviews (Micheli and Mazoni, 2010; Franco-Santos et al., 2012). Indicators must not be considered as exact pictures of reality but used as a means to gather information about the organization's performance as adequately as possible (Micheli and Mari, 2014). It should accommodate multiple stakeholders' interest by continuously interrogating and reinventing the organization's strategic vision and imperatives (Micheli and Mura, 2017). Although PMS enables strategic planning, a drawback with doing so is that it helps institute objectivity and goal setting processes that facilitates alignment and predictability and tend to buttress outdated processes over a period of time (Selcer

and Decker, 2010). PMS therefore necessitates that refinement of performance measures to enable changes in strategy and should be a continuous activity as opposed to a one-off exercise (Gopal and Thakkar, 2012; Srimai et al., 2011; Micheli and Mura, 2017).

***Evaluate performance, monitor progress, and drive motivation.***

PMS allows organizations to trace and relate performance outcomes to planning, decisions and actions (Micheli and Mari, 2014; Liu et al., 2014; Marchand and Raymond, 2008). It helps compare forecasts against actual results, monitor, and examine variances, with the aim to learn and do better (Pedersen and Sudzina, 2012). Financial performance indicators can reveal how an organization is performing in terms of costs, sales and revenue, whilst non-financial indicators such as, customer satisfaction, customer loyalty and social media responses can unveil how well a particular product or service is performing. For example, the number of the advertisements of a product being shared on a social media platform could correlate to the sales of that product (Sidorova et al., 2016).

PMS also acts as a monitoring function and helps signal changes in the internal and external environment where significant information can be attained for making decisions (Baird and Su, 2018; Srimai et al., 2011). Monitoring simple performance indicators on organization's social media platform such as "followers" or "likes" can reveal stakeholder behaviours and show where attention could be focused. This could lead to quicker revision of actions when indicators show, for example, the dissatisfaction of multiple stakeholders. Such indicators could instigate immediate change and influence key decisions such as planning. It could also help trace problems through comments, advise and opinions, and highlight the issues to personnel responsible for addressing the situation. These indicators could provide additional information to conventional sources of PMS and help mitigate some of the drawbacks of traditional indicators and enhance performance due to timeliness. Information derived from such indicators, however, require careful examination and analysis to validate their reliability (Sidorova et al., 2016).

PMS can also influence behaviours and drive motivation (Amir, 2014; Watts and McNair-Connolly, 2012; Oates, 2015; Ukko et al., 2007). Its role in facilitating rewards and punishment has been noted as a powerful way to achieve this (Camp and

Braet, 2016). Measures can provide clarity on areas that are critical to success and focus attention on the achievement of results. It can be used to stimulate employee motivation at various organizational levels by driving a performance improvement culture and organizational learning. Performance information can enable intrinsic motivation and empowerment by helping managers understand how their work fits in the broader scope of the organization (Micheli and Mari, 2014; Micheli and Mazoni, 2010). By evaluating performance, monitoring, controlling, driving motivation, and enabling effective communication, it maximises the efficacy of business operations and drives improvement to optimize profitability (Anderson and Kimball, 2019; Bourne et al., 2018).

### ***Ensure organizational alignment***

Numerous studies have also shown PMS to have positive impact on aligning organizational activities, employee capabilities and performance with the organization's strategic goals (Anderson and Kimball, 2019; Bourne et al., 2013; Bjorklund et al, 2012; Watts and McNair-Connolly, 2012; Kloviene, 2013; Lucianetti et al., 2019; Micheli and Mazoni, 2010). It fosters organizational alignment by highlighting where and how value can be created and coordinates the right activities to deliver value. It also enables the formalization and holistic configuration of an organization's objectives and strategies by translating them into a set of measures that can be cascaded throughout the organization. Through the deployment of action oriented strategic targets, derived from the organization's strategic action plans, PMS can foster alignment. For example, if an organization wants to deploy a particular type of strategy, then the right performance measures and targets would be specified to obtain adequate information to steer the organization in that direction (Lucianetti et al., 2019). This however could present challenges as the role of PMS in enabling alignment between the organization's strategy and actions could cause rigidities and may slow the organization's ability to respond to changes (Kolehmainen, 2010). As shown in Patel et al. (2013), too much attention on alignment could limit the flexibility required for innovation. This is true, especially in larger organizations, where for instance attention is paid on developing core capabilities to gain competitive advantage, but this may also inhibit organizations' capacity to change, leading to competency traps (Birkinshaw and Gibson, 2004). In some instances, such organizations may have innovation processes and procedures that are routine and

explicit. These routines over time could become old, outdated, and ineffective in supporting radical innovation (Tinco, 2014) and enabling alignment to such processes could be detrimental to the business. Alignment can also be enabled through discipline instilled through performance standards, feedback systems and consistency on how employees are managed. Employees can be encouraged to achieve ambitious goals if these are aligned with the right incentives (Patel et al., 2013).

### ***Facilitate learning and feedback***

PMS can be used to facilitate the development of an organization's capability through sensing and learning (Marchand and Raymond, 2018). It can urge organizations to pursue strategic learning initiatives and could facilitate a collaborative learning environment and therefore create a rich platform for employees to understand how they can contribute to the attainment of the organization's vision and direction (Lucianetti et al., 2019; Moxham, 2014). By facilitating such platforms, it encourages face to face dialogue between employees across different levels of hierarchy (Pavlov and Bourne, 2011; Pěsalj et al., 2018) and encourages shared learning and inter-organizational knowledge transfer (Pekkola and Ukko, 2016; Micheli and Manzoni, 2010). Information generated from feedback on reported performance could stimulate learning and improvements (Amir, 2014; Kloviene, 2013; Letmathe et al., 2012). For example, non-financial measures could be used to obtain feedback from a variety of sources such as managers, supervisors, subordinates, customers or even complaints or criticism of products. Such feedback helps in identifying opportunities for development and employing corrective actions. It can be used by managers to motivate and evaluate employees and help track an employee's progress towards achieving the organization's strategic goals (Micheli et al., 2011; Upadhaya et al., 2014). It can also stimulate a feedforward function and lead to the development of novel processes in vital areas. This feedforward strategy can be preventive in nature and used to anticipate threats or instigate change (Pavlov and Bourne, 2011).

### ***Facilitate reward and sanctions***

A PMS can be used also to reward and sanction (Anderson and Kimball, 2019; Bourne et al., 2018). It does this by linking actions with goals and proffers regular performance updates whilst incentivising employees to steer the right resources and actions required to achieve set goals. Performance measures can also be used to guide

the distribution of incentives (Kaplan and Henderson, 2005). These incentives, whether rewards or punishments, tend to be connected or linked to the organization's strategic objectives and plans (Smith and Bititci, 2017) and are used by managers to selectively influence the performance of those under their control (Hanson et al, 2010). The use of PMS to facilitate rewards and sanctions, however, has led to controversial debates on the effects such use could have on organizational members. Some scholars argue that facilitating rewards and standards to communicate new priorities could drive performance in the right direction (Camp and Braet, 2016; Melnyk et al., 2014). They argue that rewards and monetary incentives are antecedents of managers' creativity and that the presence of reinforcements or reward systems for certain initiatives and actions could best drive performance when risk controls are used (Goodale et al., 2011). They also claim that creating new incentives to match innovative initiatives is crucial because it prevents competency traps but creates a system that is crucial to facilitating organizational responses to change (Kaplan and Henderson, 2005). Others, on the other hand, have criticised this and argued that performance measures linked with pay could intensify command and control practices that could mitigate employee engagement (Smith and Bititci, 2017), trigger gaming and poor performance, and could hinder entrepreneurial behaviours (Micheli and Mari, 2014; Selcer and Decker, 2010).

### **2.3.5 Issues with PM and PMS**

Literature has shown the impact of PMS to range from positive to negative and in some cases to be insignificant (Micheli and Mura, 2017; Gray et al., 2014; Taticchi, 2010; Bento et al., 2014; Koufteros et al, 2014; Pavlov et al., 2017; Choong, 2014). Although the famous sayings; "if you cannot measure it, you cannot manage it" and "what gets measured gets done" denotes the significance of PM in organizations, these flattering statements have two major repercussions; the first, is that it suggests that behaviours and action follow measurement although this is not necessarily the situation in organizations. Secondly, it assumes that all the key properties of measurement are without problems and therefore is taken for granted (Micheli and Mari, 2014).

Studies have shown that there is no conclusive evidence regarding the benefits and problems with PMS both in the private and public sector (Micheli and Mari, 2014),

however, its inappropriate use could be detrimental as it may facilitate incorrect decisions and the allocation of an organization's limited resources to initiatives that may fail to deliver (Camp and Braet, 2016). In worse case scenarios, it could be harmful or destructive (Micheli and Mari, 2014). A major challenge for organizations who engage in measurement practices is their inability to limit the number of performance measures they implement (Gopal and Thakkar, 2012). Some have questioned whether PM reinforces or reverses the establishment of economic reason and accounting into newer fields (Pedersen and Sudzina, 2012). However, PM is broadly viewed as an indispensable pre-requisite for management; although considerable progress has been made, performance management and the interplay between measurement and management has been notoriously challenging to explain and remains one of the pressing problems in the field of management (Bourne et al., 2018; Pavlov and Bourne, 2011; Pavlov et al., 2017). Some authors have maintained that businesses perform better if they are managed using balanced, formalised, and integrated performance measures. Such studies show that high and diverse sets of measures tend to lead to higher performance (Bento et al., 2014; Smith and Bititci, 2017), whilst others have produced empirical evidence showing that solely focusing on some performance measures could contribute to a firm's shortened life span (Neely, 2005). Others have also shown PMS to be detrimental to creativity, growth and a threat to an organization's life span and have noted the following issues with PMS.

***It creates rigidity and may not be suitable for innovation or in dynamic environments***

Studies have shown that a PMS could stifle innovation if it is poorly implemented (Micheli and Mazoni, 2010) and PMSs have been criticised for their lack of dynamism and limited use in innovation programs (MacBryde et al., 2012). PM efforts and activities are immensely engrained in exploitative activities. Such activities tend to enable stability, strong alignment to set processes, standardisation, and help mitigate uncertainty (Goodale et al., 2011). The use of PMS to enable these activities, however, could introduce rigidity and slow down an organization's ability to adapt to changes (Adler, 2009; Kolehmainen, 2010; Micheli and Mazoni, 2010), especially if the changes mandate radical innovation, known to be competence destroying, as firms are forced to rethink their scientific, engineering, skills and design principles. Whilst

PMS aims to reinforce the dominance of established technologies and processes (Marino et al., 2015), innovation, on the other hand, aims to lead and move firms into new ventures and strategic direction. The presence of control systems such as PMS, its related structures and policies seems to channel and restrict actions and could deter the liberty needed to drive innovation (Goodale et al., 2011). Whilst PMS aims to drive standardisation, compliance and strategic alignment (Bourne, 2008; Oates, 2015), innovation - and in particular radical innovation - usually necessitates flexibility, new knowledge, deviation from set routines, intense collaboration and high information processing which could present severe challenges to organizational structures, and could be significantly disruptive, causing misalignment across functional boundaries and mandating changes to organizational settings (Bititci et al., 2012; Patel et al., 2013; Tinco, 2014).

Other reports have also shown PMS to enable a form of planning and control that makes it challenging to integrate in an organization that competes on flexibility and innovation. Although non-financial measures are viewed as significant in uncertain markets, this insight is not enough to change existing management and measurement rules, routines and norms organizations deploy (Pedersen and Sudzina, 2012). This makes it difficult for PMS to cope with the transition processes of change because it is designed to maintain short term performance and at the same time required to bring about long-term changes in strategic goals. This also means that management must rely on existing procedures and practices - the very procedures and practices they aim to change (Goodale et al., 2011; Hanson et al., 2010). Furthermore, previous processes and practices that make firms successful tend to hinder their ability to implement radical innovation strategies successfully. Extrapolating improvement strategies based on such experiences could create core rigidities (Hanson et al., 2010) and this therefore raises questions on whether the establishment of a pervasive “golden thread” should be desirable, if at all feasible (Bourne et al., 2018; Micheli and Neely, 2010). Responding to dynamic changes in the market could lead to issues in alignment. Firms in such dynamic environments are usually unable to change or align their strategy or operational practices in a timely way, leading to a disconnect or lack of internal alignment. This could lead to loss of competitiveness, excessively long cycle times, lack of agility in key markets (McAdam et al., 2014), and adverse effects such as disruptions and failures (Pryor et al., 2014).

In addition to this, studies have also shown that there is usually resistance to change in every transition process which may stem from valid concerns regarding the suitability or appropriateness of the shift in strategic objectives. In such changing conditions, metrics cannot provide enough guidance and may not be very helpful in communicating the strategy (Hanson et al., 2010). Emphasizing on financial metrics that are reflective rather than formative could be detrimental and therefore the use of specific metrics may have to be mitigated under conditions of radical innovation as they could constrain innovation processes (Micheli and Mazoni, 2010). PMS may be at odds with innovation and entrepreneurial initiatives (Goodale et al., 2011) and although popularly used, may not always be accurate, but deployed in the hope that the destiny of the organization can be determined by management's ability to establish a clear strategic plan attained by changing and controlling employees' values to fit the organization's goals which may in turn mitigate employee's willingness to be innovative or entrepreneurial (Selcer and Decker, 2010).

***PMS require time to implement and may produce outdated information.***

PM is a continuous activity that requires time and effort (Franco-Santos et al., 2007; Elg et al., 2012; Teeratansirikool et al., 2012; Lucianetti et al., 2019; Tung et al., 2011) and can be complex and costly (Neely, 2005). Kaplan and Norton (2001) explain that although the BSC could lead to improved performance, this may only take place after two to three years of its implementation due to its lag effect. This poses a significant challenge on how PMS can be designed and developed in a manner that is sufficiently flexible to cope with dynamic changes that occur in organizations (Neely, 2005; Tuomela, 2005; Bourne et al., 2000). This has also led to arguments that measurement systems do not only produce inadvertent outcomes but are also inadequate because they provide managers with outdated information based on assumptions derived from historic data and in some instances could obstruct improvement, because they are unable to provide sufficient direction for future actions (Neely, 2005; Bjorklund et al., 2012; Upadhaya et al., 2014). This issue is even worse in highly dynamic environments where increased uncertainty requires greater divergence over time and reduces the ability of a firm to assess its performance immediately (Patel, 2011) and whereby the dynamism of the market environment mandates the use of real time information to explore multiple alternatives simultaneously and relies on fast new knowledge creation. PMS can also be challenging to use as it requires the collection

of data from multiple sources (Maestrini et al., 2018) and necessitates a robust information system for successful implementation and operation (Srimai et al., 2011).

*PMS could stimulate dysfunctional behaviours especially if mainly financial measures are used.*

As noted in the previous sections, literature has progressively shifted from the design and implementation of PMS to their uses and impact (Bititci et al., 2012; Melynk et al., 2014; Pavlov and Bourne, 2011). Behavioural factors are essential to the successful implementation and use of PMS (Smith and Bititci, 2017). Although there are practical challenges with measuring non-financial and behavioural aspects, a PMS can be used to encourage discussions but could also stimulate dysfunctional behaviours if the parties are not satisfied with the outcomes of the discussion (Pedersen and Sudzina, 2012). Its inappropriate use could reduce trust and employee engagement (Smith and Bititci, 2017). In circumstances where employees are disengaged and demotivated, performance measures could create a perception of improved performance, but this may not actually translate into actual results (Bourne et al., 2013). Performance metrics that are ambiguous in their definitions and deterministic in their results could also trigger problems because employees may fail to understand a newly implemented strategy or may not view it as appropriate for the circumstance or better than existing alternatives (Hanson et al., 2010) and thus could engage in gaming. The use of PMS such as the BSC to facilitate rewards could also lead to complaints regarding favouritism in the distribution of bonuses and rewards. Its incentivisation role could create tensions amongst organizational members instead of cooperation to attain a single goal. It could also cause managers to focus on activities they are measured against in order to obtain a bonus at the expense of other areas of equal importance that are not rewarded (Lucianetti et al., 2019).

### **2.3.6 Conclusion**

PMS such as BSC is a noteworthy mechanism that can be used to enable various organizational activities such as strategy implementation, evaluate performance, monitor progress, drive motivation, ensure organizational alignment, facilitate learning and feedback and as well as rewards and sanctions. PMS, however, can be difficult to implement and requires time. Its improper use can lead to dysfunctional

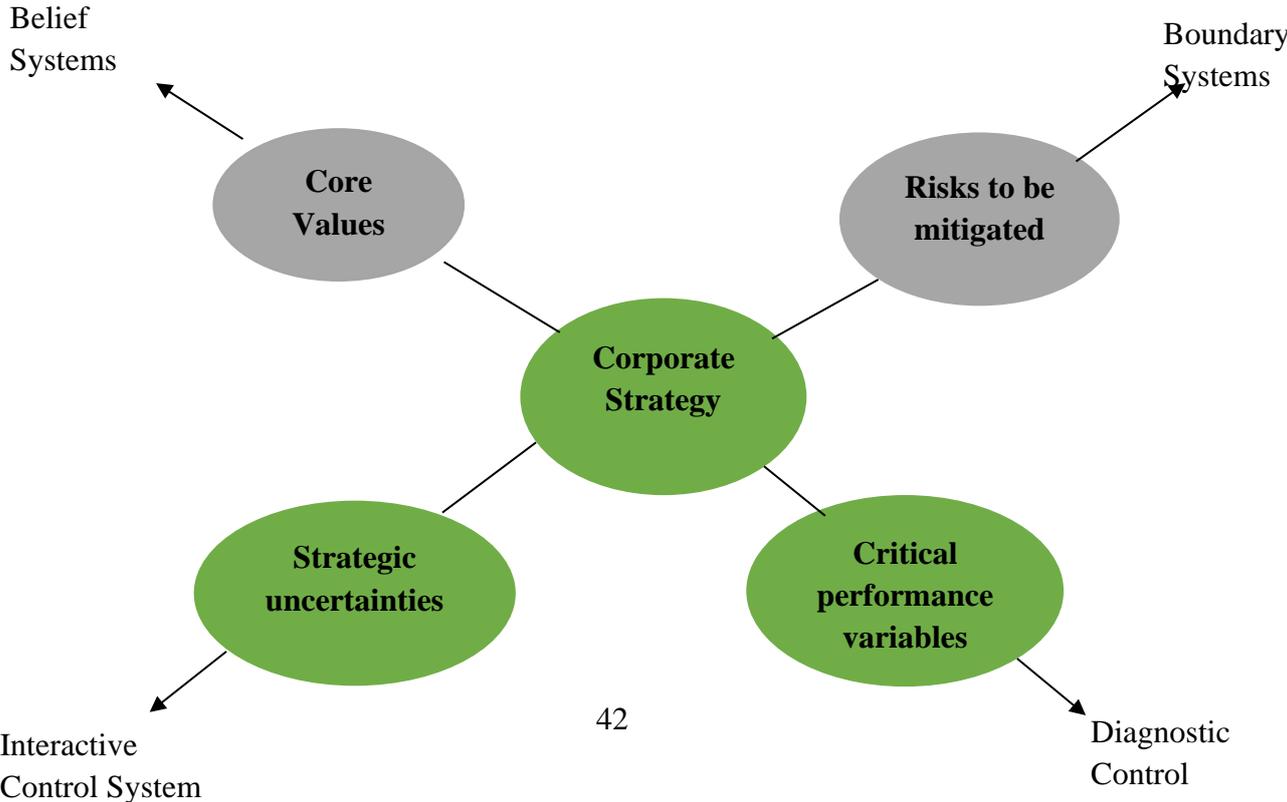
behaviours and in some instances have been noted to constrain innovation and exploration.

## **2.4 Organizational Ambidexterity and Performance Measurement Systems**

To become ambidextrous, organizations require systems and practices that enable them to exploit their existing resources by monitoring and understanding their performance, maintaining coordination and alignment, and correcting deviations from set standards of performance (Koufteros et al., 2014). At the same time, they require systems and practices that enable them to drive exploration and adaptability by identifying specific business areas that require new solutions and therefore search for new opportunities (Koufteros et al., 2014).

A seminal study conducted by Simons (1994) identified that PMS were not just mechanistic systems but dynamic in nature. Simons developed a framework called the Levers of Control (LOC) (see figure 2.1) to illustrate that control systems have four main uses – the most notable of which are the diagnostic and interactive (this study will focus on these, as previously done by other authors (for example, Henri, 2006), and will not include the remaining two: boundary and belief systems).

***Figure 2.1: Levers of Control***



Underlying the LOC framework is the notion of opposing forces that manages tensions between constraints and freedom, accountability and empowerment, top-down direction and bottom up creativity and between efficiency and experimentation (Koufteros et al., 2014; Tessier and Otley, 2012). Simons' study shows that PMS could be used to exert control over the attainment of organizational goals and at the same time enable adaptability (Simons, 1994; Tessier and Otley, 2012). If utilised in different ways, PMS could increase an organization's ability to exploit and explore (Henri, 2006). As a dynamic system (Elg et al., 2012; Marchand and Raymond, 2008) the diagnostic and interactive uses coexist to stimulate tensions necessary for competitive advantage (Baird and Su, 2018; Tessier and Otley, 2012). For example, whilst the diagnostic use evokes a concentration of financial based measures, the interactive use warrants the use of broader based non-financial measures (Baird and Su, 2018). A balanced set of these measures could enable exploitation and exploration.

The diagnostic use is a formalised set of procedures that uses information to maintain or alter patterns in organizational activities. For example, it can be deployed as a reporting system or used for monitoring. Such procedures facilitate operational excellence or evaluate critical to success factors and monitors specific targets and performance. For example, through monitoring, attention can be channelled to critical success factors (Koufteros et al., 2014). The diagnostic use also communicates critical performance variables and are formal information systems that managers can use to check organizational outcomes (Tessier and Otley, 2012). It is also known as a mechanistic control and noted to enable two fundamental features. First, it enables tight control of operations and strategies, and secondly, it enables and facilitates highly structured channels of communication and restricts flows of information. Its primary use, however, has been associated with dysfunctional behaviours such as biasing, and illegal acts (Koufteros et al., 2014).

The interactive use, on the other hand, stimulates innovation around strategic uncertainties (Simons, 1994; Davila et al., 2009) and equips organizations with two fundamental attributes. First, it facilitates an interactive information exchange process based on a wider scope of information, required to find novel opportunities (Amir, 2014). Secondly, it allows top management to use PMS to analyse the root cause of

problems and supports the allocation of appropriate resources to achieve set targets (Koufteros et al., 2014).

The LOC framework shows that the uses of PMS could be employed to enable exploitation and exploration. The diagnostic use could enable exploitative activities by monitoring performance, correcting deviations from set standards and if it is used as a prototypical feedback mechanism, could trace variances from pre-set goals. Such use fosters goal clarity, employee compliance with pre-set organizational regulations, helps reduce lead times as well as enable organizational alignment. The diagnostic use clearly shows the set of activities employees are expected to carry out to ensure that organization's strategic goals are met (Arjaliès and Mundy, 2013; Anderson and Kimball, 2019; Oates, 2015; Smith and Bititci, 2017; Lucianetti et al., 2019). Its information providing or feedback function (Pavlov and Bourne, 2011) can also be continuously applied to form a continuous cycle of learning and adaptation (Barnes and Hinton, 2012) and could allow employees to evaluate actual performance output against set standards, help establish the appropriate diagnosis for variation and facilitate a reward mechanism (Oates, 2015). The diagnostic use, however, could stifle creativity, constrain innovation necessary for exploration, and mitigate the ability of an organization to transform itself (Archilage and Smith, 2013; Micheli and Manzoni, 2010).

On the other hand, the interactive use could compensate the effects of the diagnostic use and enable exploration by encouraging dialogue and debates that create avenues for new ideas and options. According to Bedford (2015), using formal systems interactively promotes the sharing of tacit knowledge significant for guiding opportunity searching. It presents a forum for debate, questions the status quo, and raises queries regarding the soundness of current practices (Bedford, 2015; Arachchilage and Smith, 2013; Arjaliès and Mundy, 2013; Simons, 1994). It also facilitates organizational innovation and drives performance (Koufteros et al, 2014; Schermann et al, 2012) by producing information that helps identify specific areas that need management attention, encourage selective intervention, and cultivates priority setting that initiates search for new approaches (Smith and Bititci, 2017). The interactive use can also empower employees to make decisions and take actions that serve the best interest of the job they carry out and enable those closest to particular tasks make crucial decisions without having to depend on support from other

members of the organization who may have their own agendas (Haas, 2010). It facilitates a bi-directional role, that enables communication of strategy, discussion of results, fosters collaboration and continuous improvement (Elg et al., 2012). Managers use targets and KPIs interactively by involving themselves in the decision-making activities of their employees and help channel attention on critical areas through discussions (Pavlov and Bourne, 2011; Pěsalj et al., 2018; Ukko et al., 2007). They also encourage a bottom-up approach to organizational change and creativity by allowing frontline staff who directly deal with unexpected problems to identify and bring forward opportunities to senior management at high levels who may not see or be aware of, due to their work context. Such bottom-up inflows of knowledge help provide senior management with increased understanding of changes in products, technology and markets which may trigger novel solutions (Zimmermann et al., 2015; Haas, 2010; Elg et al., 2012). By using non-financial measures, managers can better implement and manage new initiatives (Srimai et al., 2011; Tung et al., 2011). Managers at all levels of the organization can also be instrumental in fostering entrepreneurial activity leading to productive innovation results (Goodale et al., 2011). The interactive use can also foster double-loop learning by presenting a rich platform for asking questions, requesting information, seeking feedback, and experimenting. This can help build and renew strategy instead of just simply supporting an existing one (Pěsalj et al., 2018). Although such interactive control has motivational effects and can direct management attention to specific strategic priorities it can also lead to tension and dissatisfaction if employees do not understand or agree with the priorities (Jordan and Messner, 2012). The interactive use also normally requires organizations to loosen their performance targets and give room to discussions (Speklé and Verbeeten, 2014; Koufteros et al., 2014), which could potentially drive an organization's ability to explore.

Both uses facilitate a balance between taking actions congruent with the organization's goals and at the same time giving employees enough autonomy to make decisions (Koufteros et al., 2014; Tung et al., 2011). The combination of the uses generates dynamic tensions, that produces organizational capabilities that are vital for competitive advantage and organizational ambidexterity (Archilage and Smith, 2013; Tuomela, 2005; Micheli et al., 2019; Bedford, 2015). In fact, an organization's inability to balance the different uses could lead to wasted resources,

poor decision making and low performance (Koufteros et al., 2014). Although the combined use is vital, there are, however, questions raised regarding the level of importance of each use (diagnostic and interactive). Some scholars have argued that the diagnostic use is of greater importance as the overall impact of the diagnostic use on strategy performance is more important than the effects created by the interactive use (Archilage and Smith, 2013), whereas others argue that organizations that primarily deploy the diagnostic use exhibit an authoritarian leadership (Koufteros et al., 2014). Simons, on the other hand, explained that the most significant factor is not the identification of controls but rather how they are used to maintain or alter organizational patterns (Simons, 1994). Others, on the other hand, have criticised the LOC framework of having concepts with definitions that are too vague and at times ambiguous (Tessier and Otley, 2012). Table 2.4 below gives a brief overview of the diagnostic and interactive uses of PMS.

**Table 2.4: Brief Overview of Diagnostic Use and Interactive Use of PMS**

<b>PMS use</b>	<b>Diagnostic use</b>	<b>Interactive use</b>
<b>Type of System</b>	Feedback system for monitoring performance, correcting deviations from pre-set standards, and for organizational alignment.	Control system for decision activities.
<b>Purpose</b>	For motivation and to ensure organizational goals are achieved. For Business planning, Budget review and performance management.	To focus attention on strategic uncertainties and therefore prompt the need for new strategies and initiatives. For Business review, crisis management, environmental scanning.
<b>Source</b>	From formal reporting procedures.	From debates and discussions

<b>Design Variables</b>	Critical performance variables	Strategic uncertainties
<b>Key performance Indicators</b>	Uses many diverse KPI	Uses fewer KPI
<b>Communicates</b>	Plans and goals	Strategic uncertainties
<b>Association with OA</b>	Enables exploitation	Enables exploration

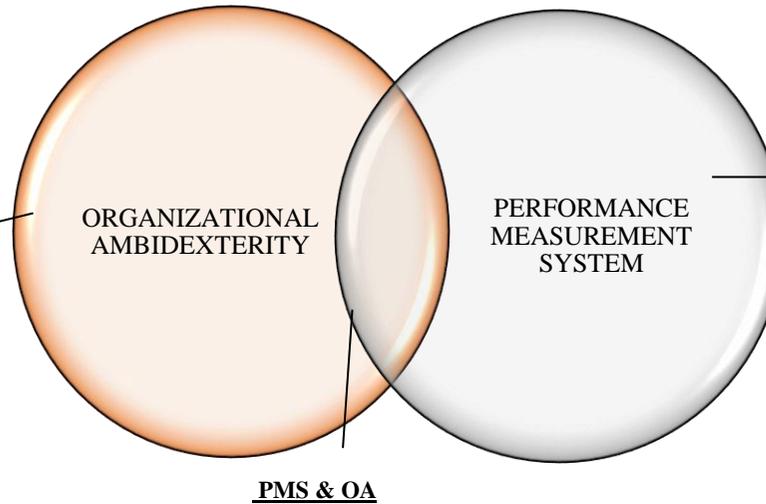
As shown in the literature, PMS could provide managers with information on all areas of an organization and is effective in generating exploitable information that could provide a solid basis for communication between managers and employees (Lucianetti et al., 2019; Ukko et al., 2007) as performance data is continuously interrogated (Pavlov and Bourne, 2011). Through the joint use of the diagnostic and interactive controls, managers can institute fairly rigid goals and objectives to exert control and at the same time coach employees to creatively meet the evolving needs of customers and market demands (Selcer and Decker, 2010). Balancing the diagnostic and interactive use of PMS could play a vital role in managing dynamic tensions embedded in OA (Tessier and Otley, 2012; Schermann et al., 2012; Pěsalj et al., 2018) and therefore enhance organizational performance (Archilage and Smith, 2013).

## **2.5 Research Position**

This research examines how the uses of PMS can constrain or enable OA and probes claims that the diagnostic use constrains exploration and can only enable exploitative activities. The diagram below in figure 2.2 shows an illustration of where the research lies amongst other key literature that informs the project and the main building blocks in which this study stems from. The overview shows how this study expands the research on OA.

***Figure 2.2: Overview of Research Position***

Andriopoulos and Lewis, 2009; Andriopoulos and Lewis, 2010; Caniëls et al., 2017; Asif, 2017; Chandrasekaran et al., 2012; Chuen et al., 2018; Blome et al., 2013; Dutta, 2013; Durisin and Todorova, 2012; O'Reilly and Tushman, 2004; O'Reilly III and Tushman, 2011; O'Reilly and Tushman, 2013; Birkinshaw and Gibson, 2004; Brix, 2019; Chuen et al., 2018; Duncan, 1976; Li, 2013; Lisboa et al., 2013; Fournè et al., 2016; Choi et al., 2016; Raisch and Birkinshaw, 2008; Raisch et al., 2009; Birkinshaw and Gupta, 2013; Kang and Snell, 2009; Snehvrat et al., 2018; Marino et al., 2015; Simsek et al., 2009; Gibson and Birkinshaw, 2004; Patel, 2013; Lin et al., 2013; Lavie et al., 2010; Wang and Rafig, 2014; Sohani and Singh, 2017; Pellegrinelli et al., 2015; Salvador et al., 2014; Cao et al., 2009; Tamayo-Torres et al., 2016; Laplume and Dass, 2015; Jansen et al., 2009; Jansen et al., 2008; Gupta et al., 2006; March 1991; Herzallah et al., 2017; Gualandris et al., 2018; Santoro and Usai, 2018; Lavikka et al., 2015; Matthews et al., 2015; Bravo et al., 2018; Severgnini et al., 2018; Hannan and Freeman, 1977



Adler, 2009; Arjaliès and Mundy, 2013; Archilage and Smith, 2013; Amir, 2014; Anderson and Kimball, 2019; Elg et al., 2012; Barnes and Hinton, 2012; Jordan and Messner, 2012; Davila et al., 2009; Oates, 2015; Mom et al., 2009; Tinco, 2014; Lucianetti et al., 2019; Marchad and Raymond, 2008; Micheli et al., 2019; Koufteros et al., 2014; Baird and Su, 2018; Schermann et al., 2012; Goodale et al., 2011; Patel et al., 2013; Simons, 1994; Mom et al., 2009; Micheli and Manzoni, 2010; Tessier and Otley, 2012; Smith and Bititci, 2017; Srimai et al., 2011; Bedford, 2015; Haas, 2010; Tuomela, 2005; Henri, 2006; Pėsalj et al., 2018; Speklè and Verbeeten, 2014; Selcer and Decker, 2010; Simons, 1994; Hansen and Schaltegger, 2018; Marino et al., 2015; Ukko et al., 2007; Zimmermann et al., 2015

Micheli and Neely, 2010; Bento et al., 2014; Choong, 2014; Bititci et al., 2012; Pedersen and Bouwens and Kroos, 2017; Sudzina, 2012; Bourne 2008; Franco-Santos et al., 2007; Francos-Santos et al., 2012; Gopal and Thakkar, 2012; Bourne et al., 2013; Kaplan and Norton, 2001; Bjorklund et al., 2012; Liu et al., 2014; Taticchi, 2010; Taticchi, et al., 2012; Taticchi et al., 2015; Micheli and Mari, 2014; Beer and Micheli, 2018; Bourne et al., 2000; Bourne et al., 2013; MacBryde et al., 2012; Upadhaya et al., 2014; Micheli and Mura, 2017; Neely 2005; Gray et al., 2014; Patel, 2011; Norreklit, 2000; ; Tung et al., 2011; Micheli et al., 2011; Letmathe et al., 2012; Moxham, 2014; Jääkeläinen and Laihonen, 2014; Maestrini et al., 2018; Bjorklund et al., 2012; Kloviene, 2013; Kolehmainen, 2010; Marchand and Raymond, 2008; Marchand and Raymond, 2018; Pavlov and Bourne, 2011; Pekkola and Ukko, 2016; Miller et al., 2015; Bititci et al., 2006; Kaplan and Henderson, 2005; Melnyk et al., 2014; Zangoueinezhad and Moshabaki, 2011; Neely et al., 1995; Saunila, 2013; Maestrini et al., 2017; McAdam et al., 2014; Teeratansirikool et al., 2012; Hanson and Schaltegger, 2018).

As shown in the literature reviewed, PMS is a noteworthy mechanism that can enable exploitative activities, such as alignment and strategy implementation (Hanson et al, 2010; Marchand and Raymond, 2008; Micheli and Mari, 2014; Miller et al., 2015) and at the same time may enable exploratory activities by instigating dialogues or through the use of performance information (Birkinshaw and Gibson, 2004; Kim et al., 2012; Arachchilage and Smith, 2013; Bedford, 2015; Koufteros et al., 2014; Saunila et al., 2013)( and may be vital in managing nested tensions embedded in enabling OA). Some studies, however, have presented contradictory findings that shows PMS, with its related structures and policies, to be detrimental to innovation and exploration, because it creates rigidity that diminishes employee creativity and could slow down an organization's ability to adapt to changes (Adler, 2009; Kolehmainen, 2010; Micheli and Mazoni, 2010). They maintain that, usually after investing substantial resources to the development and implementation of PMS, organizations often do not modify it, as they are perceived as the perfect representation of performance (Micheli and Mari, 2014) which could constrain innovation. Recent studies, on the other hand, show that PMS may not to foster, constrain, or are simply unrelated to radical innovation (Hansen and Schaltegger, 2018).

The use of PMS to enable both exploitation and exploration is paradoxical as both activities require different, incoherent and contradictory strategies to take place (Cao et al., 2010; Jansen et al., 2009; O'Reilly III and Tushman, 2011; Raisch et al., 2009). Whilst exploitation enables firms to use their capabilities, competences and resources efficiently, at a reduced cost and within set boundaries, exploration enables innovation by pushing the boundaries of existing practices to achieve long term improvements (Salvador et al., 2014; Tinco, 2014). These contradictions have led to some of the inconsistent findings regarding the interplay between OA and the uses of PMS.

### **2.5.1 Research Question**

Following the extensive review of literature, this study aims to explore three main areas in order to address the research question “How can the uses of PMS constrain or enable OA?” By addressing this research question, it responds to calls to investigate the impact of the uses of PMS on OA. This study will firstly explore how PMS could constrain OA, it will then examine the interdependency between the diagnostic and interactive use of PMS and identify specific practices in which both uses could be deployed to foster OA, and finally it will probe the notion that the diagnostic use can only play an exploitative role and could be detrimental to exploration.

## **CHAPTER 3: RESEARCH METHODOLOGY**

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### **3.1 Introduction**

This chapter presents an overview of the research design of this study by presenting the philosophical stance, methodological approach, methods, and analytical procedures deployed. It also reviews the steps undertaken to confirm rigor and authenticity, presents the main ethical considerations made, and concludes with a personal reflection.

### **3.2 Philosophical Stance**

Contributions to the field of PM have traditionally focused on the development of tools and techniques that organizations can employ to ensure effectiveness and efficiency. Over the last decade, several scholars have examined the uses and effects of PMS. Scholarly evidence, as shown in the previous chapter, has shown PMS not to be just a technical process but also a social practice (Beer and Micheli, 2018; Miller et al, 2015; Bjorklund et al, 2012; Watts and McNair-Connolly, 2012) that could have implications on an organization's ability to be ambidextrous. Although several authors have advocated deeper reflections to move away from the viewpoint that "what gets measured gets done", PMS are still seen by many as objective assessments of reality (Arjaliés and Mundy, 2013; Oates, 2015).

Theorists argue that the way we think about the world (ontology) has impact on what we think can be known about the world (epistemology) and the way it can be researched (methodology) (Fleetwood, 2005). Debates regarding the appropriate research method to use for social science research is invariably linked to assumptions about ontology, epistemology, and human nature (Morgan and Smircich, 1980). These philosophical aspects provide solid grounding for research work, by revealing truths about ourselves and the world in which we live (Benton and Craib, 2001). Research methods, techniques, strategies, and concepts cannot be secluded or isolated from these parameters as individuals adopt certain suppositions of the nature of the social world and how we interact with it (Shaw, 2013).

Scholars have diverging views of the world and varying assumptions that underpin approaches to social inquiry. Ontological assumptions are what we believe constitutes reality. Every individual has ontological assumptions that affects their view of what reality is. This can either be objective, which posits that reality really exist, or subjective, which posits that reality is only real in the mind. For this study, the researcher adopts an objective ontology and posits that reality exists independent of human knowledge and cognition.

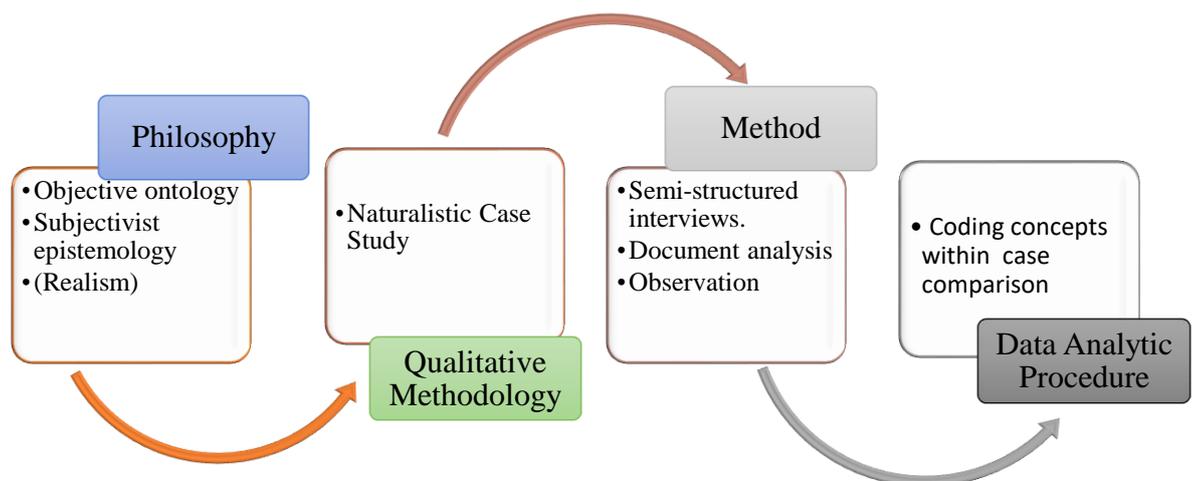
In social science research the epistemic role of humans should also be considered. Epistemology relates to how knowledge is attained and the relationship between the researcher and participants of the study (Fleetwood, 2005; Ponterotto, 2005). An objective epistemology implies that it is feasible to have a theory-neutral observational language and that knowledge can be acquired objectively. On the contrary, a subjective epistemology implies that human agents could impose meanings on the world and construe it in a way that makes sense to them (Johnson and Duberley, 2000). The researcher adopts the latter and posits that reality is construed by an individual's reflections and interpretations of it.

In light of this, the researcher adopts a realist's view stemmed from an objective ontology and subjective epistemology. The realist's approach can provide philosophical foundations for causal explanations of social phenomena and has been used to guide applied work in various areas of social research including management and information systems. It presents a systematic way of thinking and expressing facets of the world that are not directly observable (Jackson et al., 2016).

Different philosophical standpoints could lead to the adoption of varying methodological approaches which could result in contrasting outcomes. This has implications on social research inquiry. For example, experiences or viewpoints constructed from a survey response in quantitative studies is diametrically opposed to experience that is constructed as a "lived" temporal experience in qualitative studies. It is therefore vital that when formulating a theoretical framework, researchers recognise and appreciate that beliefs about the world are subject to various philosophical interpretations.

For this study, the researcher argues that the interaction between OA and the uses of PMS can be known by exploring the thoughts of individuals who engage in performance measurement and/or exploitative and explorative activities. This thesis, therefore, sets out with a realist view, to explore the varying interpretations and thoughts of individual employees, to gain an in depth understanding of how the inherent attributes of a PMS can constrain or enable OA. PMS are often concerned with technical as well as social objects that can be immensely difficult to define and measure (Beer and Micheli, 2017), and the PM process – and individuals’ experience of it - may be harder to understand using a quantitative approach, therefore this study employs a qualitative methodology. Figure, 3.1 shows the philosophical, methodological, methods and analytical dimensions of the study.

***Figure 3.1: Philosophical and methodological aspects***



### **3.3 Qualitative Methodology: Naturalistic Case Study**

A naturalistic case study with an abductive approach was used for this study. A case study is an empirical research method that uses contextually rich data derived from a bounded setting of reality to examine a specific phenomenon (Barratt et al., 2011; Halaweh, 2012). It allows researchers to gain in-depth understanding of the dynamics at play within a single setting by using multiple sources of evidence, with each case reinforcing or disputing findings obtained from others (Stake, 2013). Case research is

one of most powerful methods of new theory development in organization studies (Voss et al., 2002). It is also appropriate for theory extension, and for addressing "how" and "why" questions (Baxter and Jack, 2008; Barratt et al., 2011), and suitably addresses the proposed research inquiry.

The interplay between OA and the uses of PMS is immensely challenging to explicitly categorise and scrutinise through quantitative research due to the social aspect of a PMS. Using a case study, however, presents a rich platform to gain in depth understanding of the phenomenon through close interaction and exploration of the thoughts of practitioners and professional who daily engage in PM practices and use PMS (Adam et al, 2018; Stake, 1995; Stake, 2013). Case research facilitates the generation of analytical richness due to its prevailing explanatory capability, which is a strength of the methodology. It however, does not pledge a straightforward tactic to address the research problem by giving a set of guidelines to be followed that produces a sense of security and luxury in the pursuit of knowledge, but relies on the "power of words and metaphors" to conscientiously search for meaning and in-depth comprehension of the phenomena (Kapoulas and Mitic, 2012). This methodological approach helps uncover the interplay between OA and the uses of PMS by interpreting, discovering concepts and relationships in raw data and produces a theoretical framework in which similar future work can be built on (Gioia et al., 2012; Silverman, 2013; Stiles, 2003).

## **3.4 Methods**

### **3.4.1 Theoretical Sampling Approach**

A theory-based sampling criterion was used to guide the selection process for organizations deemed suitable for the study and examined the phenomenon in the context of a single firm (Stake, 2013; Voss et al., 2002; Yin, 2009; Caniato et al., 2017). Firstly, the organization had to engage in a satisfactory level of exploitative and exploratory activities or innovate to a sufficient degree. Organizations such as automotive manufacturing companies, IT firms and software businesses have been identified in various literature to engage in both activities (Birkinshaw and Gibson, 2004; Zimmermann et al., 2015). Secondly, the organization had to be suitably large to use various PM practices and deploy a robust PMS across all its hierarchical levels and stakeholder groups. Automotive manufacturing companies tend to be large and

usually use control systems and mechanism to support the running of their business operations (Tinco, 2014; Schermann et al., 2012). Thirdly, the organization had to actively use PM practices and PMS tools such as the BSC, KPIs, performance targets etc. to coordinate both internal and external business activities and establish how using these elements affected OA.

The organization used for this study satisfied these criteria. It was a well-established automotive company, that was highly and consistently profitable, known to innovate quite frequently. The company launched cars with new features every year and was very large, renowned, and had approximately 40 000 employees and therefore actively engaged in PM practices and used a PMS. Four of the organization’s departments - Marketing, R&D, Engineering and Manufacturing - were the units of analysis. Each department had its own BSC with objectives that aimed to align with the overall corporate objectives. The company adopted different approaches to PM and used PMS in diverse ways. Managers and employees from different disciplines and at different organizational levels, responsible for PM activities and PMS were used for the study. These professionals had a proven track record for engaging in such activities for over 24 months. A snowball technique was also deployed to help gain access and ensure that the sample included individuals that were most knowledgeable and could significantly contribute to the study (Patton, 2002). A descriptive information of the selected case is shown in table 3.1 below. To ensure anonymity pseudonym names are used.

***Table 3.1: Descriptive Information of Case***

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<b><u>DB AUTOMOTIVES</u></b>
<b>Car manufacturing company</b>
<b>Founded over 10 years ago</b>
<b>Has over 200 markets and 20 national sales companies globally</b>
<b>Has over 1500 retailers</b>
<b>Has approximately 40 000 employees</b>
<b>Annual turnover of £1.1 billion</b>

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### **3.4.2 Data Collection Methods**

A set of procedures and techniques were used for collecting and analysing data (Strauss and Corbin, 1990; Voss et al., 2002). Three primary data elicitation methods were used: semi-structured interviews, an observation, and organizational documents on performance. Data collected from multiple sources presented evidence that strengthened the validity of the research and provided a strong substantiation of constructs (Stake, 2013; Eisenhardt, 1989; Voss et al., 2002). It also enhanced the researcher's understanding of the organizational dynamics at play. A research diary and case database were also used to capture the researcher's immediate thoughts after every interview session. The data collection methods will now be discussed extensively.

#### ***Semi-Structured Interviews***

Conducting semi-structured interviews presented the opportunity to understand the participant's lived experiences, how they interpreted the social phenomena under investigation and their versions of reality (Silverman, 2010). The interviews were held between December 2016 and June 2017 and were guided by a case study protocol to ensure reliability (Patton, 2002; Yin, 2013). Each interview lasted 40 minutes to 1 hour. 36 interviews were conducted at three different business sites and the remaining four conducted by telephone due to the participants' schedule. All the interview participants had worked for the organization for over 2 years, with the longest service employee having worked with the organization for over 30 years. All the participants were professionals from the four departments mentioned and they engaged in PM practices and used the BSC.

Patton's (2002) approach for conducting semi-structured interviews was adopted for this study. Literature on OA and PMS were used to inform the development of the interview protocol. The protocol presented a set of questions that helped address the research question and at the same time standardise the scope and type of data to be collected. The way the questions were worded was critical for extracting the desired information and thus theoretically framed questions were converted into suitable ones, to ensure the questions were articulated in language that the respondents were familiar with. A draft interview protocol was first designed by the researcher and reviewed by the researcher's supervisor. A few iterations were made to the draft

protocol. The protocol was then presented to other scholars who further commented on it. The questions were open-ended formulated to drive the discussion. They were also clear and free from academic jargon. Every participant was asked the same question using the same wording but not necessarily in the same order. The flow of questions was dependent on the responses received from the participants. The questions could switch as the interview progressed but remained within the scope of the research. Each interview was distinct as each participant could express their views freely and offer explanations specific to their business roles and individual experience. This sometimes led to the instigation of new questions that had not been anticipated earlier (Gray, 2004).

The protocol was divided into four main sections. Questions in the first section aimed to confirm the research participant's area of expertise and their suitability for the study. The second section asked ambidexterity related questions aimed at establishing the level (individual or organizational) and type of ambidexterity (i.e., structural, contextual, or temporal) being manifested. The third section asked PM and PMS related questions and aimed to investigate the organization's performance objectives, the types of measures used, and its effects. The final section focused on the interrelation between OA and PMS. Examples of theoretically derived interview questions are shown in appendix C. The use of an interview protocol helped mitigate the trap of paying too much attention on particular information and helped avoid conflicting information to confirm one's own preconception and the tendency of untimely closure of data collection which could result in drawing conclusions based on incomplete data (Gugiu and Rodriguez-Campos, 2007). To avoid the pitfall of potential informant bias and increase construct validity, data from other sources were analysed and compared to data collected during the interview.

Below is the job title and number of interview participants from each department.

**Table 3.2: Job title and number of participants in each department**

<b>Department</b>	<b>Job title and number of participants</b>
<b>R&amp;D</b>	<ul style="list-style-type: none"> <li>• Head of Research Strategy (1)</li> <li>• Research Manager (1)</li> <li>• Research Technology Delivery Manager (1).</li> <li>• Senior Research Engineer (3)</li> <li>• Design and Innovation Research Manager (2)</li> <li>• RIT Funding Senior Manager (1)</li> <li>• Lead Research Engineer (2)</li> <li>• Research Engineer (4)</li> <li>• Strategy and Innovation Coordinator (1)</li> <li>• Project Manager (1)</li> <li>• Project Leader (1)</li> <li>• External Affairs Technical Coordinator (1)</li> <li>• Business Quality and PR Manager (1)</li> </ul>
<b>Marketing</b>	<ul style="list-style-type: none"> <li>• Global Marketing Communications Director (1)</li> <li>• Product Marketing Director (1)</li> <li>• Chief Marketing Officer (1)</li> <li>• Business Planning Senior Manager (1)</li> <li>• Experiential Marketing Manager (1)</li> <li>• Business Excellence Manager (1)</li> <li>• Coordinator of External Communications (1)</li> </ul>
<b>Manufacturing</b>	<ul style="list-style-type: none"> <li>• Paint Manufacturing and Engineering Senior Manager (1)</li> <li>• Project Governance Manager for Global Manufacturing Innovation (1)</li> <li>• Manager of Advanced Final Assembly Facilities (2)</li> <li>• Business Excellence Manager (1)</li> <li>• Advanced Manufacturing Senior Manager (1)</li> </ul>

<b>Engineering</b>	<ul style="list-style-type: none"> <li>• Principle Engineer (1)</li> <li>• Calibration Lead Engineer (2)</li> <li>• Calibration Engineer (1)</li> <li>• Lead Project Engineer (1)</li> <li>• Engineering Strategy Engineer (1)</li> <li>• In- Control Aps and Connected Technologies Manager (1)</li> </ul>
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***Document Analysis***

All documents collected were thoroughly analysed. This enabled further understanding of the dynamics beyond the insights gained from the informants (Patton, 2002; Bryman and Bell, 2003). It helped throw light on what the organization’s performance priority and key deliverables were and the impact it had on OA. The documents collected and reviewed included the BSC, annual reports, TBEM Application and other organizational and performance documents shown in Table 3.3. In total, 31 documents were reviewed for the study. The table shows documents collected directly from DB and those collected from other sources such as websites.

**Table 3.3: Sources of Document Collection**

<b>Documents from DB</b>	<p>DB Corporate Policy Commitment Doc (2014)</p> <p>Global Marketing Objectives (2017/2018).</p> <p>DB TBEM Application (2016).</p> <p>M&amp;S Scorecard (undated)</p> <p>M&amp;S Scorecard (2016/2017)</p> <p>M &amp; S Scorecard (2017/2018)</p> <p>Assessment Report (2017/2018)</p> <p>Assessment Report (2016/2017)</p>
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	<p>MS &amp;S Feedback Document (2017).</p> <p>TRT T500 Lean Doc (2016)</p> <p>TRT T500 Lean Doc (undated)</p> <p>JENGA Model (undated).</p> <p>Organizational Study Report (2016)</p> <p>RCA Improvement Selection Doc (undated)</p> <p>MR Team Structure (2017)</p> <p>DB Experience Scorecard (2016/2017)</p> <p>Product and Process Enabling Technology Doc (2016)</p> <p>Lead Project Engineer CFI Team Objectives (2016/2017)</p> <p>CFI Graduate Objectives (2016/2017)</p> <p>Management Performance Review Template (2016/2017)</p> <p>Analysis of DB PM and Management Practices Report (2016).</p> <p>Research Vision and Strategy (2016)</p>
<p><b>Documents from other sources (Websites)</b></p>	<p>End of Year Performance (2015/2016).</p> <p>End of Year Performance Review (2016/2017)</p> <p>End of Year Performance Review (2017/2018)</p> <p>End of Year Performance Review (2018/2019)</p> <p>DB Annual Report (2014/2015)</p> <p>DB Annual Report (2015/2016)</p> <p>DB Annual Report (2016/2017)</p> <p>DB Annual Report (2017/2018)</p>

***Research Diary***

A research diary was used from the initial stage of the study to capture comments, ideas, questions, and thoughts throughout the process. Notes were made during interviews to capture new and emerging insights as participants shared their views. A part of the diary was also used to note interview schedule dates and times.

***E-Folder***

An electronic folder, where all information such as interview transcripts, e-documents, notes etc. were securely stored was created. This acted as a valuable organising instrument.

***Observation***

The researcher had the opportunity to observe one of the senior managers give a presentation on how the DMAIC model in Six Sigma could drive improvements. Questions that other people asked at the presentation provided further insight on the interplay between OA and PMS. The meeting took place on the 30<sup>th</sup> of March 2017 at one of the organization's UK based office.

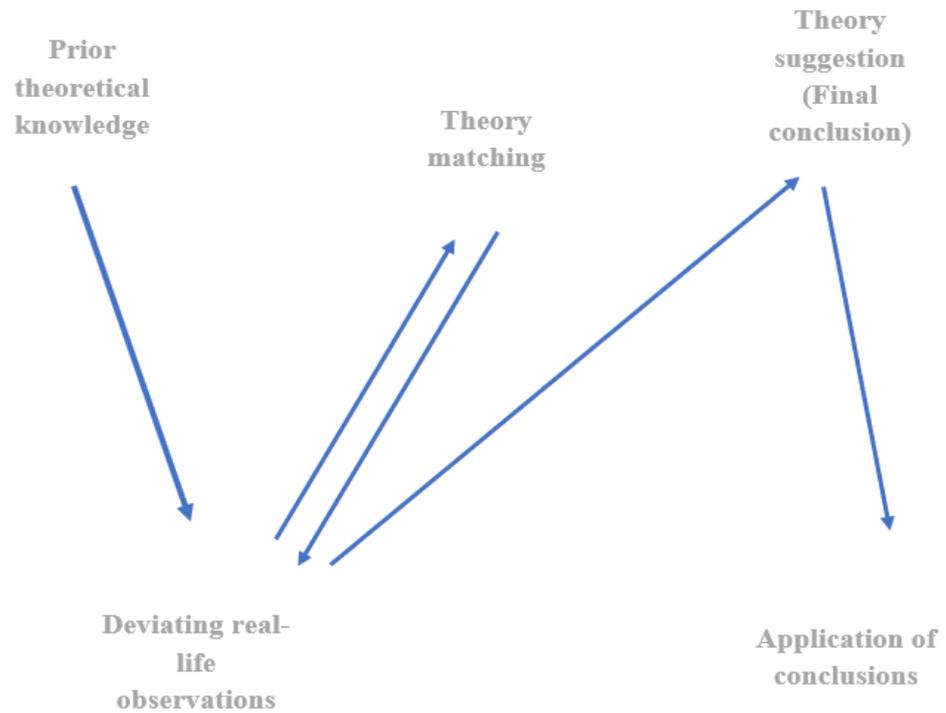
**3.5 Abductive Analytical Approach**

For this study, an abductive reasoning was used due to its ability to mitigate the limitations of the deductive and inductive approach. The abductive analytical approach enabled the interpretation and re-contextualization of the phenomena within a contextual framework (Kovacs and Spens, 2005). The process involved systematically moving from deduction to induction and vice versa (Dubois and Gadde, 2002; Patton, 2002; Saunders and Lewis, 2012). The deductive approach involved the collection of data and using it to evaluate a hypothesis or propositions relating to an existing theory whereas the induction approach involved the collection of data and exploring it to identify themes and patterns in order to produce a conceptual framework (Dubois and Gadde, 2002; Saunders and Lewis, 2012). The abductive approach helped the researcher understand the existing phenomenon in a

new way and from the perspective of a new conceptual framework (Kovacs and Spens, 2005). As already indicated in the previous chapter, PMS is shown in various literature to have some impact on OA, some studies have shown the diagnostic use to enable exploitation and in so doing could constrain exploration, others, on the other hand, also argue that the interactive use could foster exploration. Data collected using the abductive approach helped investigate and examine some of the dynamics mentioned in existing theory but at the same time also allowed new observations by exploring themes that emerged from the data and therefore used to propose a new conceptual framework.

The analytic process started by departing from a theoretical pre-understanding that was empirically elaborated. A creative iterative process of theory matching was then used to find a new matching framework and therefore extended theory (Kovacs and Spens, 2005). The empirical data collected, and the theory building phases overlapped in a learning loop (Dubois and Gadde, 2002). Although the research departed from an existing theoretical framework, it was not constrained by having to stick to the existing theory (Dubois and Gadde, 2002; Strauss and Corbin, 1990) because too much initial theory has potential to impede the research process by relying on previous theories to provide explanations of the new phenomenon. Rather, empirical data and existing literature were simultaneously examined and matched to choose the best explanation (Adam et al., 2018). The theory matching framework used for the study is shown below in Figure 3.2.

**Figure 3.2 Theory Matching**



(Adopted from Kovacs and Spens, 2005)

**The abductive analytic process followed the sequence outlined below:**

1. Firstly, a thorough examination of raw data was undertaken. This involved an informal scrutiny of data before proper data analysis began. It involved screening data for quality, checking for accuracy of data entries, finding, and dealing with missing and outlying data, and investigating raw data for their fit to the assumptions of the data analytic method to be deployed. A framework that showed attributes that consolidated characteristics that were unique to organizations that were ambidextrous and attributes of what PM and PMS comprised of was used. Empirical data on DB's activities that qualified the organization as ambidextrous and data on their PM practices, how PMS was used in each department and its impact was collected and analysed following an abductive logic. Information collected through interviews, observation and review of company documents were coded using the NVivo software. The coding process commenced at the initial stage of data collection and continued throughout the data collection stage. Coding is an analytic process of

fracturing, conceptualising, and integrating data to form theory (Strauss and Corbin, 1990).

2. Data collected from each department was broken down and put under different labels derived from emergent themes. Data from each individual department was independently analysed, allowing a standalone examination. This was then followed by a cross examination of data between departments. This stage involved a "categorizing process" for coding and categorising raw data into groups based on similarities. It commenced with the categorisation of empirical themes, (i.e. "the use of performance information", "the collaborative development of performance objectives and targets", "employee performance and project review") which were then grouped into conceptual categories. For example, empirical themes such as those in brackets were noted as a means in which the diagnostic use could enable exploitative activities such as strategy implementation, alignment and resource allocation, whereas the interactive use on the other hand, could instigate discussions leading to exploration. The conceptual themes were further categorised to show factors that enabled incremental innovation and those that could stimulate radical innovation. The conceptual themes were then grouped into aggregated dimensions that determined whether the uses of PMS instigated, or constrained exploitation or exploration. The different categories were compared with each other and the objectives of the research to ensure that no category was repeated and that they were all within the scope of the research (Gray, 2004).
3. The final phase involved an iterative process of theory matching. The process involved discovering patterns and themes in relation to the interplay between OA and PMS and then these themes were analysed according to the existing theoretical framework (Patton, 2002). Findings from the literature were compared to findings from empirical data. The process revealed existing theory on the various ways the uses of PMS could impact OA which matched some of aspects of the empirical findings, however information on how PMS if used in specific ways could constrain or enable OA, the context in which the combined use of the diagnostic and interactive use could foster OA and how the diagnostic use of PMS was not only necessary but critical to

exploration was significantly insufficient. The inductive codes were connected to established constructs and new categories were developed to extend theory (Gray, 2004) on the interplay between OA and PMS.

### *NVIVO Data Coding Software*

Raw data collected was analysed using Nvivo software. The software and method helped the researcher (Bazeley and Jackson, 2013):

- manage the data collected: it helped organise and keep track of unstructured records that is common with case research.
- manage ideas: it allowed the researcher to organise and gain quick access to conceptual and theoretical knowledge created during fieldwork.
- query data: it helped retrieve specific type of data quickly when a query was made.
- visualise data: it showed the content and structure of different concepts, ideas, and embedded cases.
- report data: it enabled good reporting of data using contents from the database, including information regarding original data sources, knowledge developed from them and the process by which the outcomes were reached.

The researcher also used a pen and paper to draw visual connections between concepts at various points of the study. This enabled greater creativity and flexibility in expression, something beyond the software's capability. Table 3.4 shows the summary of the research approach employed.

**Table 3.4: Summary of Research Approach**

Conception	Have in-depth understanding of the process by which individuals interpret the world.
Philosophical Position	Realist Ontology and Subjectivist Epistemology
Methodological Approach	Qualitative (Naturalistic case study)
Data Analytic Procedures	Abductive approach
Data collection methods	Semi-structured interviews, analysis of documentation, single observation

### **3.6 Limitations of The Methodological Approach and Proposed Solutions**

Although this methodological approach allowed the researcher to gain in depth understanding of the phenomena under investigation, it also had limitations. The researcher was aware that involvement in the process could influence the way information was dissected and interpreted, and thus could result in the conclusion of the study being based on the researcher's individual perception and interpretation of events (Meredith, 1998, Flyvberg, 2006). This, however, was mitigated by deploying a reflexive stance. The researcher critically reflected on the data gathered, and on the role and influence she had on the research process and drew conclusions that went beyond her personal experience and opinion but reflected the thoughts and experiences of the participants within the social setting. Furthermore, a diary with details of case developments, events and occurrences was used as a reference point for judgments and interpretations and was compared to the information received from participants. Without appropriate reflexivity, the researcher could unintentionally

adopt the informants' views and thus lose the high-level perspective required for developing an informed theory (Gioia et al., 2012). To mitigate this problem the researcher allowed another scholar doing a similar research with an outside perspective to critique any interpretations that seemed biased.

Challenges associated with this methodological approach such as having good interview skills were also addressed by attending training and after conducting a pilot study, the researcher reflected on how the interview went and areas that required improvements. Other issues such as data protection were also thought of and ethical considerations were made to protect the identity of informants. Diplomacy and discretion were exercised, and all information obtained were anonymised (Gioia et al., 2012).

There was also the danger of misjudging the representativeness of a single event and amplifying easily available data and generalising conclusions derived from limited set of cases (Voss et al., 2002). Critics have argued that this methodological approach is characterised by reduced precision, credibility and rigour when compared to other approaches and therefore could be prone to distortion imposed by the beliefs, values and purpose of the researcher (Stiles, 2003). However, the researcher in alignment with her philosophical standpoint and the purpose of research decided to adopt a qualitative approach to contribute to theory development and ensured quality, validity, and reliability in the following ways.

### ***Quality***

In qualitative research, quality criteria are not as clearly set as in quantitative research (for example, statistical significance levels). The ultimate goal for qualitative research is to ensure that the intended phenomena is fully captured. Quality was attained by following set guidelines for doing and assessing research work but more importantly from the validity and reliability of data produced (Farmer et al., 2006).

### ***Validity***

For this study, data collected from numerous sources helped confirm or disconfirm findings during the empirical stages of the research with the underlying assumption that validity of empirical results is increased if the different methodological approach present convergent outcomes about the same empirical domain (Farmer et al., 2006).

By establishing the complementarities of various sources of evidence, several dimensions of the same research issue were exposed and therefore increased the researcher's understanding of the interplay between OA and PMS and the likelihood that the interpretations and findings are credible and dependable. The use of multiple sources of evidence also extended the depth and breadth of the inquiry and therefore increased confidence in the results produced, whilst mitigating research bias (Farmer et al., 2006) and increasing validity (Voss et al., 2002). The case research was also not constrained by the rigid limitations of questionnaires and models and therefore led to high validity with practitioners – the ultimate users of this research.

To enhance validity in this study, Kumar's (1999) procedure for enhancing validity in quality research was used:

- Face and Content Validity - the interview questions were tightly linked to the objectives of the research.
- Member-checking: Reports produced were sent back to the participants to check for accuracy.
- Bias Clarification: The research was analysed with an open mind and checked by other academics.

### ***Reliability***

The use of triangulation also enhanced the reliability of the research and mitigated some of the challenges faced using qualitative methods such as personal bias. The use of audio recordings also enhanced the reliability of the research as it enabled detailed and accurate capturing of data (Gray, 2004).

### **Establishing Rigour of Study**

Also, to ensure rigour and trustworthiness of the findings, factors such as credibility, transferability, dependability, and confirmability proposed by Lincoln and Guba (1985) were checked. These factors already explored extensively in this chapter are summarised in Table 3.5 below.

**Table 3.5: Checks to ensure rigour and trustworthiness**

<b>Rigor criterion</b>	<b>Action taken</b>
<p><b>Credibility</b></p> <p><b>Sureness in the “truth” of the findings</b></p>	<p>Triangulation of data from semi-structured interviews, documents, and observation</p> <p>Peer debriefing</p>
<p><b>Transferability</b></p> <p><b>Applicability of findings in other context</b></p>	<p>Relevant in context with various organizations and stakeholders</p>
<p><b>Dependability</b></p> <p><b>Consistency and repeatability of findings</b></p>	<p>Research diary</p> <p>Reflexivity</p>
<p><b>Confirmability</b></p> <p><b>Degree of neutrality/the extent to which findings are shaped by respondents</b></p>	<p>Multiple perspectives of the various participants obtained.</p> <p>Emerging findings discussed and iterated several times with supervisor.</p> <p>Emerging findings presented to and discussed with several academics</p> <p>Emerging findings discussed with participants.</p>

(Adopted from Lincoln and Guba, 1985)

### **3.7 Ethical Considerations**

This type of research project is classified by the Economic and Social Research Council's Framework for Research Ethics as one that has minimal risk or potential to cause harm to participants involved in the study (ESRC, 2010). The framework, however, advises that organizational documents should be handled and managed with due diligence, as failure to do so could instigate issues with the identification of participants. The framework states that all documents can only be used if approved by the organization. To mitigate the risk of not gaining access to the relevant documents required for the successful completion of the study, the researcher informed the organization about the requirements of the study at the initial stage and gained consent by signing an official document.

Several standard ethical considerations had to be made when designing and undertaking the study which is vital for all social scientists. Conducting a research that includes human participants mandated that the following ethical obligations to participants were duly considered and upheld (ESRC, 2010):

- Informed consent
- Free from harm
- Voluntary participation
- Anonymity
- Confidentiality
- Data protection
- Feedback

Informed consent was obtained from participants after explaining the full scope of the study to them. The proposed questions to be asked during interview sessions and how the data would be collected and stored, and then destroyed after the successful completion of the study was fully explained to the participants. To ensure adherence to the above ethical guidelines, the organization was briefed on the purpose and intended method of the research during the initial contact and a consent form was

signed by both parties. Individual participants were also briefed on the purpose and intended method of the study, and how information provided by the participant would be used.

Risks associated with anonymity were mitigated by excluding names of participants in the project write up. Furthermore, documentation received was locked away in a safe place with the researcher being the only person with access to the documents and any electronic documents stored on a computer system could only be accessed using the researcher security log in details. Environmental considerations were also made by the researcher by transcribing all the interviews on a computer to minimise paper usage.

### **3.8 Personal Reflection**

Embarking on this journey was an interesting one but I would like to highlight some of the challenges faced with gaining access and how I eventually prevailed. Gaining access to the right organization started on a slow note. I searched for several automotive, IT and mobile companies that had potential to meet the theoretical sampling criterion, from various websites and emailed various departments in a bid to gain access. After weeks with no response, I changed my strategy and asked for guidance from various academics. I was then directed to an external liaison office at my university to check if they could help but unfortunately, they could not due to various reasons beyond their control.

After a few months of further persistence, an associate professor at the university helped me gain access to an IT firm. The organization produced Hi-Tech and Hi-Touch technology and delivered services for online learning. They created data systems and platforms that informed, instructed, and inspired learners as well as technologies that stored, sorted, and shared data. They also created social learning platforms for educational institutions and organizations. The firm was a highly ambidextrous, engaged in various exploratory activities and filed a good number of patents yearly. However, after a meeting with the CEO, it was established that they had a very small employee base, with 11 members of staff and therefore did not have a clear PM processes or PMS. This made the organization unsuitable for the study but appropriate to use as a pilot study because, although they did not have a robust PMS, they had an informal way of measuring performance and generated performance

information which enabled me to better understand the effects of PM in practice, but this information did not inform the study to the required capacity.

After further persistence, the researcher was introduced to an expert informant, who worked for a publishing company, in London as Head of Business Development. The researcher contacted the informant by telephone to schedule an interview. During the telephone conversation, the informant revealed that she had practical experience and rich information on the uses of PMS and the impact it could have on OA. A formal interview was then arranged and conducted at a later date. The interview lasted for approximately one hour and the findings were very valuable but not included in the study. After more weeks of persistence, with no opportunities, my supervisor advised that I join, his executive postgraduate class so that I could meet various professionals from varying industries and indirectly request access to their organization to carry out my studies. This plan was successful and a couple of years later, here I am, with the mission accomplished!

### **3.9 Conclusion**

For this study, an objective ontology and subjective epistemology (realist view) was adopted to explore the interplay between OA and PMS. A naturalistic case study was conducted to discover how PMS could constrain or enable OA. The research met the three outstanding strengths in case research proposed by Voss et al., (2002), because it investigated the phenomenon in its natural settings, it addressed the “how” question, and it lent itself to early exploratory examinations of variables that were not clearly understood, for example whether PMS only played an exploitative role. This approach of study led to rich theoretical insights, as the researcher queried the various thoughts of employees at different levels of the organization with varied opinions of the case context (Voss et al., 2002). Data was collected through semi-structured interviews, analysis of organizational documents and an observation. Various steps were also undertaken to ensure rigor and authenticity and ethical considerations made.

## **CHAPTER 4: CASE CONTEXTUALIZATION**

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### **4.1 Introduction**

This chapter presents the case contextualization of this study. It presents DB's vision, mission, corporate governance framework and structure, and briefly introduces the four departments used for the study. These contextualizing aspects underpin the consequent findings section which shows the interplay between OA and PMS, and how PMS can constrain or enable OA.

### **4.2 DB Automotive Organizational Context**

#### **4.2.1 Mission, Vision and Core Competencies**

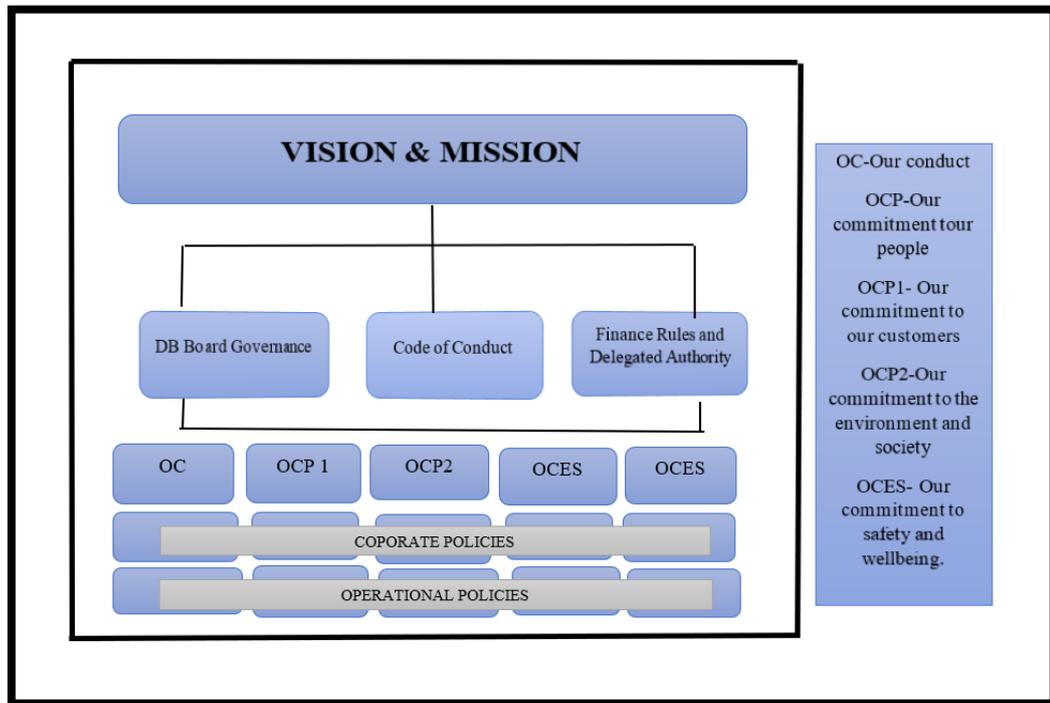
DB is an automotive manufacturing company based in Europe. The organization has market shares globally and over 1500 retailers that sell a range of first-class products and offer financial and customer services to its clients (DB Research Vision and Strategy, 2016). The organization also has manufacturing centres all over the world including countries such as China and Brazil and has a workforce of approximately 40, 000 people (DB TBEM Application, 2016). DB's vision is a world of sustainable and smart mobility. The organization aims to drive a future of zero emissions, zero accidents and zero congestion. They purpose to realize their vision through their mission to deliver quality products and to be leaders in the field of environmental innovation (DB Annual Report, 2018/2019). Their core competencies reside in their design capability, lightweight aluminium intensive architecture, on-road and off-road vehicle dynamics and brand management. Innovation is at the core of DB's business operations and therefore the organization invests heavily in R&D. DB has key strategic partnerships with major innovators such as Panasonic, Intel and world leading universities such as Oxford University, Warwick University and the Massachusetts Institute of Technology (DB Research Vision and Strategy, 2016).

#### **4.2.2 DB's Corporate Governance Framework and Structure**

DB's corporate governance framework is supported by its plc board, governance structure, code of conduct, finance rules and delegated authorities. The framework delineates the organization's five corporate policy commitments (which are commitment to their conduct, people, customers, environment and society, and safety

and wellbeing) that form top headings for cascading both corporate and operational policies, supported at functional and departmental levels (see figure 4.1) (DB, TBEM Application, 2016; DB Annual Report 2018/2019).

***Figure 4.1: DB’s Corporate Governance Framework***



(DB, TBEM Application 2016)

***DB’s Governance and management structure***

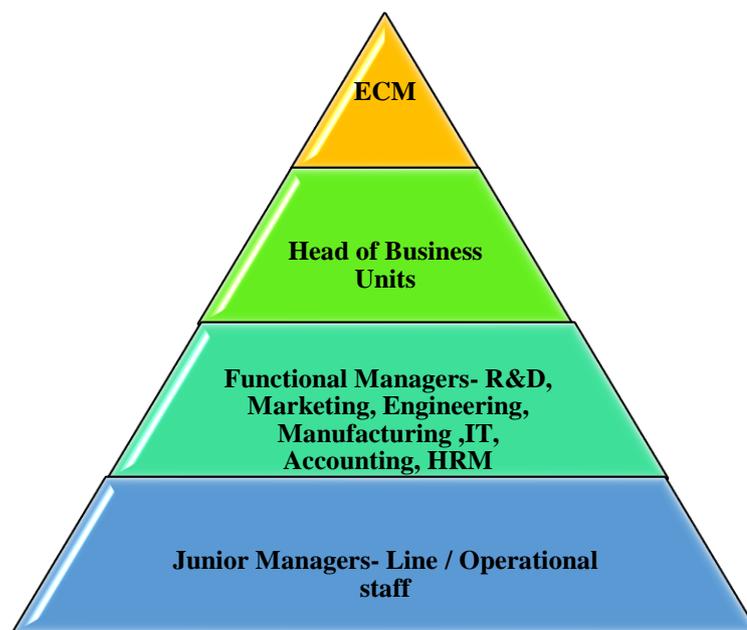
DB’s Executive Committee Members (ECM) are a core element of the organization’s operational governance system. The ECM is responsible for the executive management of the business and the strategic direction of the Group. They are also responsible for risk management across the Group, communicating the organization’s policy requirements and to review and approve the risk management policy and framework. The ECM employs a strategic business planning process to monitor and examine market trends and competitor acumen, and then defines DB’s strategic priorities for sustained competitive advantage (DB Annual Report, 2018/2019).

Beneath the ECM is the organization’s Head of Business Units as shown in figure 4.2 below. The Head of Business Units is responsible for planning and organizing daily operations. They determine which group or individual is accountable for specific problem solving and cost reduction tasks, both on a permanent and ad-hoc basis

depending on the organization's need. DB's Functional Managers report directly to the Head of Business Units.

The Functional Managers manage specific departments such as the R&D, Engineering, Manufacturing etc. and are responsible for the general direction of the technical work of their subordinates. They assign specific individuals to teams, allocate resources, plan work packages, develop schedules and manage activities within their function. The Functions are individually responsible for delivering specific operational requirements, but they collectively review progress against their corporate scorecard targets during Business Plan Review (BPR) meetings every quarter. The Functional Managers have junior managers who are responsible for operational and line staff. Below is DBs organizational structure at Management Level (DB, TBEM Application, 2016).

**Figure 4.2: DB Organizational Structure; Management Level**



(DB, TBEM Application, 2016).

The ECM meets once a week to review operational and key strategic aspects of the business and take proprietorship of targets to deliver the vision and mission of the organization. They develop targets and corresponding initiatives and actions to achieve the targets. All senior leaders align their personal objectives to the corporate objectives to achieve the set targets. The ECM on a regular basis discuss how the

organization should progress towards achieving its strategic goals. This provides a rich platform for feedback, and to identify and learn where approaches to the organization's mission could be enhanced (DB, TBEM Application, 2016). At BPR meetings, the ECM recognized opportunities for changes which usually led to the introduction of major programs. The organization implemented numerous initiatives that facilitated and enabled it to be agile and quickly respond to the dynamism of the market. The initiatives were then employed by all members of staff to help accelerate DB's growth ambition. Each key focus area of the Business Plan (BP) was employed as a strategic objective on the corporate scorecard. Every major project to deliver the BP was either owned by a senior leader or a member of the ECM. The BP was then deployed to the workforce (DB, TBEM Application 2016).

The performance of each individual ECM was examined against pre-agreed objectives that aligned to the corporate scorecard and was evaluated twice a year using standard performance management techniques such as performance appraisals. This process led to performance ratings that could result in increased salary or the attainment of incentive payments (DB Annual Report, 2017/2018; DB Annual Report 2018/2019). All members of staff were also assessed against a performance metric which provided a foundation for personal development and improvement. For products, DB had processes that helped categorize performance priorities and their delivery, which was rigorously tracked over the course of the product development program (DB, TBEM Application 2016).

The ECM established the vision of success for the organization which was then cascaded to managers down the hierarchy and their teams to come up with their own detailed plans on how to achieve the vision of success. The detailed plan behind the high-level objectives were developed, discussed, and agreed by managers and members of staff down the hierarchy which to some extent fostered a bottom up approach.

### ***DB's Code of Conduct***

The Corporate Governance Framework showed that DB prioritised and committed to conducting business with integrity. DB's code of conduct and supporting corporate policies set out 14 core principles for ethical conduct for its stakeholders summarized below (DB, TBEM Application 2016; DB Annual Report, 2017/2018);

1. Commitment to avoid bribery or corruption of any form.
2. Commitment to treat social development activities as vital.
3. Commitment to improve environmental performance by reducing emissions and using sustainable energy and materials.
4. Commitment to seek the economic development of local communities.
5. Commitment not to compromise safety in pursuit of commercial gains.
6. Commitment to respect the human rights and dignity of stakeholders.
7. Commitment to avoid discrimination of any kind.
8. Commitment not to engage in any restrictive or unfair trade practices.
9. Commitment to provide avenues for stakeholders to raise concerns or queries.
10. Commitment to create an environment free from fear of raising concerns.
11. Commitment for leadership to demonstrate the ethical codes set out.
12. Commitment to comply to the laws of the countries they operate in.
13. Commitment to act with professionalism, integrity, and high ethical standards.
14. Commitment to be truthful to stakeholders.

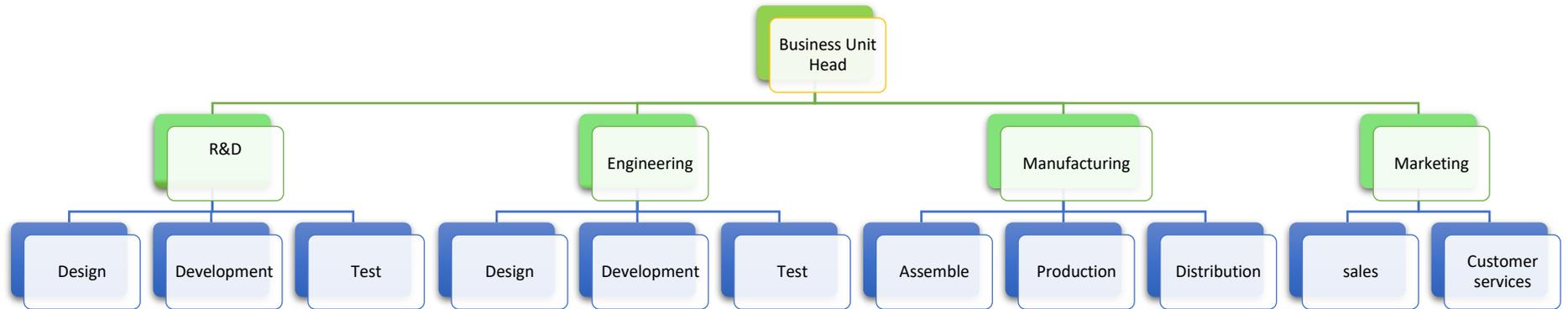
#### ***Finance Rules and Delegated Authority***

DB also adopted finance rules to monitor and track its cash flow, create budgets, and mitigate liabilities. The organization had an audit committee responsible for monitoring the integrity of their financial statements. The committee also managed relationships with their external auditors, the audit process, scope and nature of the external audit. They also monitored and reviewed the effectiveness of the corporate audit and reviewed the effectiveness of the Group's system for financial reporting, internal financial control, and risk management (DB, TBEM Application 2016; DB Annual Report, 2017/2018).

#### **4.2.3 Departments under investigation**

The R&D, Engineering, Manufacturing and Marketing departments were used for this study. Below in figure 4.3 is the structure of the departments.

***Figure 4.3: Organizational Structure of the four departments***



The R&D function conducts thorough research to find new product specifications in order to design new car features. The department had a yearly target of providing at least 3 USPs. The new specifications were translated into designs, developed, and assessed to ensure that it met specific guidelines and regulatory specifications before it was passed to the Engineering department for further development. The Engineering department carried out a similar function but at an advanced level. They engaged in further research and carried out innovation projects to enhance the designs. The improved features were then tested to ensure its functionality and performance before it was passed to the Manufacturing department. The Manufacturing function adhered to the design specifications outlined by the Engineering department. They assembled the various car parts and produced cars with the new features ready for distribution. The Marketing department ensured that customer's requirements were captured and used to inform the design of new USPs. They tracked and monitored their competitors, promoted the organization's brand and helped facilitate sales processes (DB, TBEM Application, 2016; DB Annual Report 2018/2019).

### **4.3 Conclusion**

DB's vision is a world of sustainable and smart mobility. The organization aims to ensure continuous growth by producing quality products and engaging in innovation. DB has a governance framework that is supported by its plc board, governance structure, code of conduct, finance rules and delegated authorities. The framework provides a basis for DB to achieve its commitment to its conduct, people, customers, environment and society, and safety and wellbeing. To explore the research question data was collected from the R&D, Engineering, Manufacturing and Marketing department briefly introduced in this section.

## CHAPTER 5: FINDINGS

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### 5.1 Introduction

The purpose of this qualitative, single case study was to explore how PMS could constrain or enable OA. This chapter shows the level and type of ambidexterity DB engaged in. It also shows how performance was measured in the four departments, how PMS was used, its effects and issues related to its deployment.

This chapter reveals how the uses of PMS could constrain OA if used in particular ways. It also uncovers how the combined use of the diagnostic and interactive use of PMS could enable OA and surprisingly, reveals that the diagnostic use is required and critical to exploration.

### 5.2 DB's Engagement in Exploitative and Exploratory Activities

Evidence from the data collected reveals that DB engaged in exploitative and exploratory activities, although the level of engagement varied in the different departments. DB enhanced its existing products to foster incremental innovation, for example: *“there are improvements we're making in the digital area such as the xxx which is a really cool app on your phone which uses VR technology and also augmented reality, so basically you can use your phone, point at a switch and it will detect which switch you're looking at and show you how to use that functionality on the car screen, with the app... it gives you a little video explaining what you need to do”* (Global Marketing Communications Director). This was an improvement from and was *“far better than the handbook that was initially used. They were big documents that are about 300 pages, very comprehensive and legally robust, but they're not always very user friendly. The handbooks were printed in black and white which is the first problem and you've got this funny symbol and you're thinking, what does that mean? Is it a problem? Do I need to worry about it?”* (Global Marketing Communications Director).

The organization also exploited its existing resources to ensure efficiency and deployed strategies that helped them operate at a reduced cost. They *“ensured*

*efficiency by moving some of the work from outside to in-house, without adding additional resources to that area, we've made a saving of well over £1.5 million over a five-year duration and we haven't added any more people. So, it's the same people, we've just redeployed them to get more efficient, get them doing more value-added work than just mundane admin tasks” (Project Manager).*

DB on other hand, engaged in exploration and launched new cars with game changing features, for example of the introduction of the “xxx” car, was the first of its kind in the automotive sector. *“The xxx car is a great example. No one else had a product like the xxx. We’ve brought it to the market, and we’ve made more xxx’s than any other car in our history” (Business Excellence Manager 2).* The Product Marketing Director explained that: *“Ten, eleven years ago, to think that a xxx car might exist would seem like a big leap but now it’s obvious.”* The car had distinct features and functions. For example, one could *“walk up to the boot, with your hands full of shopping, you don't have to scrabble about trying to find your keys. You can literally just wave and the boot opens. You can set the temperature of the car. So say... oh I'm going to go to work at seven o'clock this morning, and so I want to make sure the car is warm and ready for me...And you can set that on your phone, and it will just do it automatically. So, you don't have to scrape the window, you don't have to sit and wait while the windscreen defrosts” (Coordinator of External Communications).*

The organization engaged in collaborative projects with various organizations to progress their innovation agenda. The Chief Marketing Officer explained that: *“we're looking at now working with other brands in other sectors that are complementary to our cars, like hotels, banks, airlines, to see how we can work together.”* DB encouraged stakeholder engagement in the development of their vehicles and viewed the voice of the customer as vital to remain competitive: *“when a car is brought to market, you’ve got to keep that car as competitive as possible and you do that by listening to customers with all the research that you have internally, external sources, press reports and so on. So, in various ways to make sure that we are constantly listening” (Product Marketing Director).* The organization did not only have plans to stay relevant to its existing customers but also aimed for future customers as: *“we are targeting more towards 2025 or perhaps as far out as 2030 in terms of concepts... I think every team is encouraged to innovate to that level ... you’re going to bring to*

me at least two things that are justifiable, that are real, that we should be doing that I don't know about today” (Research Manager).

Documentary evidence also reveals that to ensure consistent growth, DB invested and engaged in exploitative and exploratory oriented initiatives such as LEAP (Leadership in Efficiency, Agility and Performance) and other development programmes as shown in figure 5.1 (DB TBEM Application, 2016; DB Research Vision and Strategy, 2016). LEAP was a transformation programme aimed to drive changes in performance across six major work streams: (1) Market Equation, (2) Product Design Cost, (3) Material Costs, (4) Manufacturing Costs, (5) Quality/Warranty Costs and (6) Fixed Cost Containment & IT, with each work stream having several initiatives. The initiative was introduced to help the organization become agile and to be able to quickly respond to changes in the market. It was a collaborative, participative approach in which all members of staff were expected to engage in. The organization’s idea generation and change management hopper were also managed through LEAP (DB TBEM Application, 2016).

***Figure 5.1: Exploitative and Exploratory Oriented Initiatives***

Key Themes	Key Actions and Initiatives since 2013 Assessment (illustrative)
Customer first and foremost	<ul style="list-style-type: none"> <li>✓ <b>'Customer First' as one of the strategic priorities for the business</b></li> <li>✓ Deployment of Customer First priorities roadmap including customer centric culture</li> <li>✓ Roll out of single view CRM</li> <li>✓ Quality / Warranty breakthrough work streams</li> <li>✓ Order to delivery (Bedrock), Delivery to promise process reviewed</li> <li>✓ Evaluation and improvement of customer satisfaction studies</li> <li>✓ Complaint management process improved including CRC global aggregation</li> <li>✓ Customer First Five Principles being rolled out</li> </ul>
The big cost challenge	<ul style="list-style-type: none"> <li>✓ <b>'Cost (fixed &amp; material)' as one of the strategic priorities for the business</b></li> <li>✓ <b>LEAP</b> transformation driving step change performance across six work streams</li> <li>(1) Market Equation (2) Product Design Cost (3) Material Cost (4) Manufacturing Cost (5) Quality / Warranty Cost (6) Fixed Cost Containment &amp; IT</li> <li>✓ Improving Operational Excellence for consistent delivery of Product to Cost, Time &amp; Quality</li> </ul>
Transformation of the business and brand	<ul style="list-style-type: none"> <li>✓ [Redacted]</li> <li>✓ Brand@Retail (ARCH CI) to achieve globally consistent premium representation</li> <li>✓ Retail network growth and standardisation of global retailer sites</li> </ul>
Fixing our supply chain	<ul style="list-style-type: none"> <li>✓ Purchasing transformation (Drive)</li> <li>✓ Best cost country sourcing (global sourcing)</li> <li>✓ New Internationalisation and Trading Division formed</li> <li>✓ New logistics operations to support global expansion</li> <li>✓ Global retailer standards, audits and satisfaction measurement coverage</li> </ul>
Technology for the future	<ul style="list-style-type: none"> <li>✓ <b>'CO2' as one of the strategic priorities for the business</b></li> <li>✓ Levers to achieve global CO2 emission compliance with product &amp; technology options (e.g. BEVs, PHEVs, etc) to achieve fleet average targets</li> <li>✓ Technology workshops</li> <li>✓ Strategic research themes – Smart, Connected, Clean, Capable, Desirable</li> <li>✓ Future product portfolio (~2025/30) study currently underway</li> <li>✓ Supporting architecture and system strategy study in progress</li> </ul>
Global growth	<ul style="list-style-type: none"> <li>✓ <b>'US and China' as one of the strategic priorities for the business</b></li> <li>✓ Increase in global manufacturing footprint (CJLR, Brazil, Slovakia, India)</li> <li>✓ Solihull capacity expansion</li> <li>✓ Engine Manufacturing Centre established and plans for further expansion</li> <li>✓ Long term strategies for US and China being developed and deployed</li> </ul>

(DB TBEM Application, 2016)

### 5.2.1 DB Unit Level Ambidexterity (Contextual Ambidexterity)

The four departments examined exhibited contextual ambidexterity. All four units engaged in exploitative and exploratory activities simultaneously, although the level of engagement varied. For example, in the Engineering department, Calibration Lead Engineer 1 explained that his team primarily engaged in incremental innovation: *“So it’s making sure that there is continuity from what we’ve done before but at the same time it’s an opportunity to check if there’s ways of improving... If there’s the opportunity to improve, then we’ll go head and we’ll improve it.”* This was confirmed by Calibration Lead Engineer 2: *“It’s still incremental because it’s what we’ve finished working on, we are trying to see if we can improve it for next year, so we have a whole year or 2 years to bring that change”* (Calibration Lead Engineer 2). Whereas, Lead Project Engineer, stated that her team engaged in radical or explorative activities: *“We also set ourselves an objective of how many innovation projects we wanted to run this year... So, we put ourselves in a different space and innovate and use customer insights to develop new features and come up with new ideas”* (Project Lead Engineer). The Lead Project Engineer CFI team objectives (2016-2017) (see figure 5.2), showed that, their team primarily engaged in exploration and had more potential to drive radical innovation. The Lead Project Engineer’s team engaged in various exploratory activities and were expected to:

- (1) Deliver at least 2 USPs annually,
- (2) Run 1 GEN Y focused Innovation Event,
- (3) File for 4 customer feature patents,
- (4) Deliver 4 predevelopment projects robustly to IR gateway,
- (5) Hold 2 “FED EX” days which involved, coming up with an innovative idea overnight, delivering project business cases, collaborating with internal and external working groups and engaging in “Project Blue” in delivering a new feature (Lead Project Engineer CFI team objectives, 2016-2017).

**Figure 5.2: Project Lead Engineer Team Objectives**

<b>Develop CFI into an established team</b>	Team skills matrix and training plan for upskilling team
	Support CFI graduates & Manage CFI graduate placements (setting objectives & regular 1:1s)
	process creation for CFI team to help new starters. Build links with relevant teams to improve efficiencies.
	Keep sharepoint up to date.
	Team have correct tools to do their job - access to workshop, funding and vehicles.
<b>Deliver new customer features</b>	Demonstrate collaboration with internal and external groups (working level)
	Deliver 2 USP
	Run 1 GEN Y focused Innovation Event
	File 4 customer feature patents
	Deliver 4 predevelopment projects robustly to IR gateway
	Enable 6 Graduate/Undergraduate development placements
	Hold 2 "FED EX" days - must deliver something overnight.
	Deliver project business cases delivering > £10M annual revenue
	Demonstrate collaboration with internal and external groups (working level)
	Mentor Project Blue team in delivering a new feature (developing design & engineering skills)
<b>Personal development plan</b>	Upskill myself inline with skills matrix & team vision (CAD training, Photoshop/illustrator)
<b>Active participation in continual improvement</b>	Active member of ESG - Employee Development Project in line with New Era of Engineering
	Active member of PQ&EE PULSE working group to deliver team offsite and improved team satisfaction.

(Lead Project Engineer CFI team objectives, 2016-2017).

The same strategy was deployed in the R&D department where *“there’s the innovation acceleration team so everybody’s being forced to innovate all the time...whereas with efficiency, we’ve got a project police team that generates an awful lot of the metrics around where each of the projects are at and get it right first time”* (Research Manager). The Manufacturing department also had teams that focused on daily manufacturing operations and improvements, and others, who focused on innovation and exploration. The Paint Manufacturing and Engineering Senior Manager explained that Kaizen was used to ensure incremental innovation. He explained that: *“you encourage, what we call Kaizen, which is continuous improvement, they are small innovation ideas, for instance, which you may not think of being innovative in the first place, but they are generally small improvements.”* Whereas, on the other hand, the Manager of Advanced Final Assembly Facilities 2,

mentioned that: *“Manufacturing, innovation itself, it’s very innovation focussed and that’s because they’re trying to bring in innovation to a delivery focus area, which is quite hard.”* She further explained that there had been a paradigm shift as the R&D department had become more delivery focused and the Manufacturing department, an area that was once delivery oriented was embracing innovation and had started building teams that focused on innovation. She explained that: *“Research is becoming more delivery-focused, but I think they were very strongly innovative before that. Manufacturing, on the other hand, we’re trying to push innovation projects into different areas, and we’ve started to build innovation teams in those different areas. So instead of having a research team as a separate group, each of the areas will have their own innovation team to do those projects.”* The Manager of Advanced Final Assemble Facilities 1 gave an example of the type of innovation that took place in his department: *“So as we start to think about our cars moving to more electrification, hybrids, we need to start thinking about how we do that. We can’t start a programme without knowing how we’re going to assemble these cars, so there’s a lot of the innovation that we’re now undertaking to understand how to get weight out of the car. So, we’ve got to think of new innovative approaches to cope with that... we’re currently looking at adapting the way we apply the ceiling to the car... So, we’re working with the development teams now in parallel to all of the vehicle programmes to find a better way of doing it. And some of the things that we’re coming up with have a weight saving and they have the manufacturing efficiency saving as well”* (Manager of Advanced Final Assemble Facilities 1). DB’s pursuit of growth resulted in an increase in their manufacturing capabilities and refurbishment of facilities such as their prototype vehicle operations and powertrain test cells. The organization has established a technical centre that creates bespoke commissions and extreme performance models (DB Annual Report, 2014/2015). Significant financial investment has been made in the Manufacturing department to drive innovation and exploration (Product & Process Enabling Technologies Document, 2016).

In addition to this, DB used management improvement tools with PM practices embedded in it to drive exploitation and exploration (TRT T500 Lean Doc2, 2016). Some of the tools and initiatives DB deployed were the JENGA model which shows 9 key steps to establish operations control and deliver operations improvements (JENGA model, undated; DB, Organizational study report, 2016 ); the RCA

improvement selection methodology which shows the best methodology to deploy when selecting different improvement tools when solving different problems (RCA Improvement selection doc, undated; DB, Organizational study report, 2016); LEAN, which reveals where waste could be eliminated and areas where value could be added and Six Sigma, which is used to drive quality improvements (TRT T500 Lean Doc, undated). These initiatives were facilitated by PMS and PM practices, for example, employing the concept DMAIC (see table 5.1) embedded in Six Sigma. During an observation session, the Business Excellence Manager 1 used the DMAIC model to encourage employees to engage in improvement activities by having clear improvement goals, using reliable metrics to monitor the goals and if gaps were identified, use PM practices to ensure corrective measures were taken. Employees were also encouraged to explore data obtained from monitoring, creatively and interactively to inspire novelty. Below is an overview of the DMAIC model the Business Excellence Manager used to encourage employees to engage in continuous improvement and change.

**Table 5.1: DMAIC deployed in DB to facilitate continuous improvement and change**

<b>D</b>	Define goals that facilitate improvements and incorporate them into a Project Charter.
<b>M</b>	Measure the existing process/system. Use valid and reliable metrics to monitor progress towards the improvement goals. Determine the current process baseline performance using metrics.
<b>A</b>	Analyse the process/system to identify ways to mitigate any deviations between the current performance and desired performance. Use descriptive and exploratory data analysis strategies and statistical tools to guide the analysis.
<b>I</b>	Improve the process/system. Be creative in finding novel ways to do things cheaper, better, and faster.
<b>C</b>	Control the new process/system. Institutionalize it through policies, procedures, and incentives. Monitor it.

(DB, Organizational study report, 2016).

When problems were sensed, the DMAIC model was deployed to first, define the exact nature of the problem. Then, the source and scale of product non-conformance was confirmed in the measure phase. The analyse phase then revealed causal factors. Usually clues about organizational behaviours that had adverse impact on process effectiveness were revealed at this stage. PM practices were then employed to focus attention on improvements that had to be made. During the improve phase, there was evidence documented that, resistance to changes was usually imminent, however the control phase was used to establish measures that enforced changes and ensured that the new initiatives were successfully deployed (DB, Organizational study report, 2016).

### **5.2.2 Individual Level Ambidexterity (Contextual Ambidexterity)**

The study reveals that DB encouraged a culture of contextual ambidexterity in most departments. Although there was evidence that some teams were encouraged to focus on exploitation, there were opportunities to engage in exploration. The organization encouraged attributes such as stretch and autonomy. For example, Lead Project Engineer explained that: *“we set ourselves really ambitious targets... we said to ourselves we were going to do two innovation projects this year. We committed to that,”* which exhibits stretch. DB also had programmes implemented to provide employees with personal training required to support its transformation process (DB Annual Report, 2014/2015; DB TBEM Application). The organization promoted autonomy through flexible working procedures. This was *“basically a framework, so people have a lot of leeway to do their own thing... we're not saying to them, you must do this, this and this. We're saying, in order for you to be at this level, this is the level of robustness that you need, and these are the tools that you can use to get there. But if they come up with own tools, or their own way of doing it, as long as they can satisfy that robustness level we're quite happy”* (Business Quality and PR Manager) which exhibits autonomy.

DB deployed strategies and techniques to deliberately stimulate contextual ambidexterity in its employees. For example, employees were encouraged to use 5% of their time at work to engage in blue sky projects and to come up with new or radical ideas: *“you can go and find something interesting to do. So, I went off to conferences for a variety of different things. I found something interesting, I tried to initiate that,*

*because that's a conversation we had"* (Research Engineer 1) and the remaining 95% of their time to engage in more narrowed exploratory and exploitative projects: *" we have to do both continuous improvement and we also need to look for the step change which are going to be game changers for us. So, every year we hope to develop a feature or a technology which is going to put us ahead of the competition"* (Business Quality and PR Manager).

Employees were also encouraged to engage in different activities outside the confines of their jobs: *"none of us have just one single role in this team. We all work on a couple of different things and have an input in a number of different things, so not just one area. Which I also think helps with the whole innovation stuff around the team because we all have experience in different areas"* (The InControl Apps and Connected Technologies). The External Affairs Technical Coordinator in agreement stated that: *"I feel like as I'm employed, I'm a tool, I'm an instrument to be deployed as you see fit."* The Business Quality and PR Manager, in agreement also mentioned that: *"I think there is a level of flexibility. One of the things is, we don't want too many specialists, especially in the operational side, because we need to be agile and do other things."* Whereas the Project Governance Manager explained that: *"When I started here, I was doing materials and process research. I then moved to design research, did some design stuff, then I did concept car building, and now I'm in manufacturing. So, I mean, you get to see a lot of different things, and you could go and do whatever you want... So, you do find that people are keen to do that and find out about new stuff."*

Employees in the various departments tried to balance exploitative and exploratory activities simultaneously as pointed out by the Manager of Advanced Final Assemble Facilities 1: *"We're all project managers but we're all engineers as well."* Although they had their areas of expertise, their work structure was designed in a manner in which *"you could end up doing a few different things for every project, because if you're a project leader, you'll need to be dealing with the IP team, the legal team, with standards, with safety, with HMI, with everything. So you'll end up doing a bit of everything. But primarily, you still have a specialty. So, a body research member would be doing body projects. If they want to go and work somewhere else, it could be negotiated between management... Like, I'll lend you somebody for three months, you give me somebody for three months"* (Research Engineer 1).

Employees perceived the value in being flexible and agile. For example, the Project Governance Manager explained that the opportunity to explore different areas of the business gave him competitive advantage and enabled him to contribute substantially to the business *“because you see lots of different areas. I can bring a different perspective to manufacturing because I’ve seen a lot of the PD stuff. I know how hard it is to work for design. I know the sort of issues they have. So, I can bring those to manufacturing... which is really useful for my role, because I interact with research heavily. I interact with PD heavily to bring that stuff into the manufacturing area. But I’m also then trying to learn about manufacturing and stuff that I’m not necessarily an expert in.”* Whereas the Project Manager explained that flexibility and agility was necessary because *“we don’t want too many specialists, especially in the operational side, because of the fact that we need to be agile and do other things. The way the resources are, it’s always difficult to try and do every single thing at once, so you need people who can cover and help replace other people, because there’ll be times when you have a peak so you can’t cover for everything. So, we have to have the flexibility of the team from an operational viewpoint. So, there is a level of specialism but there is also a level of flexibility as well. So obviously we’d have a lead in a particular area, but we’d have other people who could do that work as well.”* Such culture and opportunities stimulated OA as: *“we all work on a couple of different things, which is actually quite nice because it means that you have an input in a number of different things, so not just one area. Which I also think helps with the whole innovation stuff”* (In Control Aps and Connected Technologies Manager).

### **5.3 Measurement of performance in the 4 departments**

All four departments had very similar PM practices and PMS, although each department was measured according to the distinct activity it carried out. For example, in the R&D department, employees produced technology designs that were applied to a vehicle programme through a Technology Creation Delivery System (TCDS) (DB TBEM Application, 2016). Performance, in that department was mainly measured by the number of research projects investigating potential features completed, also known as concept ready projects, as explained by Senior Research Engineer 2: *“we are measured on concept ready projects... it’s basically how many projects you complete within your group... so the number of research projects investigating potential features completed on time.”* The Design and Innovation Manager 1, in

agreement stated that: *“Well, we track projects in terms of how they are delivering against the timeline. So, the projects are planned. Within the projects we have milestones, and they are specified at the start of the project, and we try and ensure that the projects stay within those time frames.”*

In the Engineering department performance was primarily measured according to the number of design projects completed and delivered to Manufacturing, for example: *“how many projects you've delivered, and the way that you've delivered them...They might be big projects that we're already working on”* (In Control Apps and Connected Technologies Manager). The main KPI was the number of projects delivered: *“we're measuring performance on delivery of the projects”* (Lead Project Engineer). The In-Control Apps and Connected Technologies Manager explained that: *“you are measured against your objectives. So, did you deliver what you said that you were going to deliver? And did you deliver anything on top of what we agreed that you would deliver? It could be anything from delivering a premium new feature for our customers, which is one of our biggest, given that we're working with apps.”*

Measurement of performance in the Manufacturing department, on the other hand, involved factors such as *“businesses hours per unit. So how many hours does it take to manufacture a vehicle? How long does processing take? rework hours, etcetera”* (Business Excellence Manager 2). The Paint Manufacturing and Engineering Senior Manager, stated that: *“some of the KPIs will include things like accuracy, the budget, so, you know, no overspend on the budget or potentially under-spending the capital investment project. But there are time elements, so it will be cost and timing.”* The Advanced Final Assembly Facilities Manager in agreement explained that: *“The key KPIs are cost and timing and quality, so cost for me, overall vehicle affordability against budget.”*

Performance in the Marketing department was however measured in terms of output and sales: *“So in terms of Marketing, Sales and Service, our primary drivers are sales volumes. There are 16 KPIs in the Marketing, Sales and Service scorecard. And they are all output measures on delivery results related to volume of sales, value of sales, profit from sales, customer satisfaction, retailer satisfaction. Most of our KPIs are predominantly output focused”* (Business Excellence Manager 1). To confirm this the Experiential Marketing Manager stated that: *“The biggest driver for my performance*

*measurement is overall return on investment, so very simply, pretty much everything we do in the experiential space, we are looking for at least a 4:1 return on investment.”* The Business Planning Senior Manager in agreement explained that: *“the number one measure that we're on is how many cars have we sold”* (Business Planning Senior Manager).

A joint “Top down” and “Bottom up” approach was deployed when setting performance objectives, KPIs and targets. The Lead Project Engineer explained that: *“it comes from above, in the sense that the Engineering Director, writes the scorecard for the year. Then I sit down with my senior manager and write the objectives for my whole team. So although it filtered down... we sort of sit down and detail them specifically to my team. We picked out the ones we felt were relevant, added to it and wrote ourselves the actual objectives that we wanted to reach”* (Lead Project Engineer).

Senior management had their personal objectives aligned to the corporate objectives (DB TBEM Applications, 2016). Each employee then developed their individual objectives with the approval or input of their managers to ensure they were in alignment with the corporate objectives as explained by Research Technology Manager: *“I have quite a big say as a manager what I do sign up to but it is coming from the process of the review with our senior managers of what is it, that they will expect us to do. As a manager we definitely have a say on what we are signing up to, so we sort of setting our own targets.”* Research Engineer 1 in agreement stated that: *“Mine is quite happy for me to draft them, review it with him, that's personal and project objectives.”* The InControl Apps and Connected Technologies Manager also confirmed that this was done in a collaborative manner: *“So what will happen in our team is that we'll sit down with our manager, and we'll write down what we think our objectives for the following year should be, then, you are measured against those objectives.”*

Each department had a PM and standardized reporting mechanism (End of Year Performance Review, 2015/2016; End of Year Performance Review, 2018/2019). The department individually, periodically showed accountability to its stakeholders by reporting its performance in a transparent and open way (DB Corporate Policy Commitment, 2014). Short- and long-term performance measures were critically

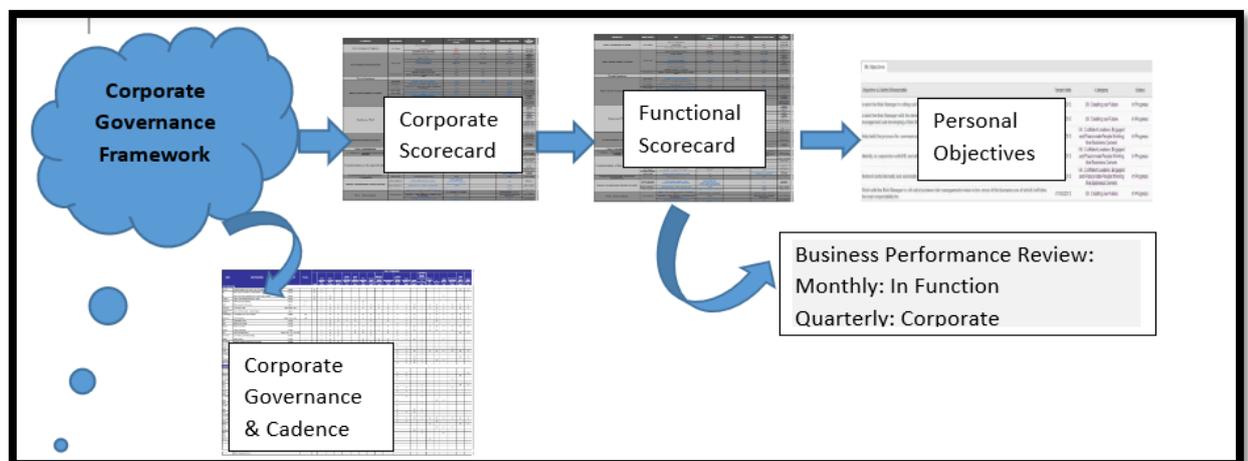
monitored and reviewed. This enabled the business to identify both challenges and opportunities and ensure that vital action plans were carried out to meet the organization's strategic growth objectives. In most cases, performance measures were reviewed on a quarterly basis: *"We just review our measures on a quarter-by-quarter basis. So now is our period to say, well, what do we want to carry over from this year into next year's scorecard, in terms of which measures do we want?"* (Business Planning Senior Manager). By reviewing performance measures on a quarterly basis, old and irrelevant measures that were no longer required were identified. Some of such measures were taken off the scorecard and others kept: *"So some of them just get taken off the score card if they're no longer relevant. Some of them might still be relevant but not something big enough we'd need to report on company-wide, but actually for my team it's still worth keeping an eye on as a personal objective"* (Strategy and Innovation Coordinator). Sales volumes, on the other hand were reviewed daily. *"In the sales department, sales numbers are reviewed at the end of every single day"* (Business Excellence Manager 1). Unaligned measures and metrics were questioned, and a root cause analysis was conducted to identify the reasons for the misalignment and recovery actions taken. This fostered organizational improvement and search for new options (DB, TBEM Application 2016).

Some departments (i.e. the R&D department) had performance measures that were much more flexible compared to other departments, for example, Lead Research Engineer 1 explained that agility was immanent in the R&D department. *"At the beginning of the year, you can plan things, but things always change."* (Lead Research Engineer 1). Whereas in the Marketing department once performance measures were set, they were rarely or not changed at all before the new financial year: *"...very rarely, but we have done them before, we try and say get these right at the start of the year. There might be new things that come up that we didn't know about, but mostly it will be to inform the following year's objectives"* (Chief Marketing Officer). All the departments also had a scorecard with KPIs that showed the performance status of projects: *"we have a number of measures, or indicators to gauge whether the performance is balanced, was better or worse"* (Head of Research Strategy).

## DB's BP and Scorecard Structure

DB's business plan and scorecards contained key deliverables. After the KPI content on the corporate scorecard was agreed, its proposed targets were reviewed and challenged until a common consensus was reached, (Analysis of DB performance measurement and management practices report, 2016; MS&S scorecard, undated) before it was cascaded and deployed throughout the business as shown in figure 5.3 below.

***Figure 5.3: Structure of Scorecard***



(DB, TBEM Application, 2016)

### **5.3.1 How PMS was used and its effects**

PMS was used for monitoring and financial tracking which enabled the business to identify gaps, assess it and establish a revised plan. For example, through monitoring activities, the purchasing team quickly responded to problems faced when suppliers could not run their facilities due to flooding in China (DB TBEM Application, 2016). Through monitoring performance outcomes, PMS was used to focus attention on activities that had to be carried out. *“At the end of each month there's a report which is issued to say, are the projects on track? is it on budget? And that element of control is useful because it keeps the team focused on the right activities”* (Design and Innovation Research Manager 2). The Project Manager explained that: *“for me I think it certainly helps me focus because I'm a project manager so for me we need to have PMS to be able to be focused and aim for the same goal.”* In agreement Lead Research Engineer 2, mentioned that: *“it helps the team to focus and helps the individual to*

*align with... the general direction or bigger direction of where the business is going... which I think is very effective*” (lead research engineer 2). Regular meetings were held to ensure the team’s performance objectives were aligned to the overall objectives (DB TBEM Application, 2016). During such sessions, managers used a Management Performance Review document to establish whether key deliverables were aligned to the corporate business objectives. Graduates who were on placement at DB also had one to one meetings with their managers to identify how well they had performed, areas where they had deviated from pre-set standards, which led to refocusing their attention on the right areas and on continuous improvement (CFI Graduate Objectives, 2016/2017; Management Performance Review Template, 2016/2017). The ECM also facilitated performance leadership by monitoring key business metrics on a weekly basis, off-track metrics were interrogated for recovery actions.

PMS was used to produce performance data that was readily available and accessible to organizational members. Such data helped inform decisions on areas that required improvements. Business Excellence Manager 2 stated that: *“it’s having that data available, in real-time, in a presentable format with teams to work with immediately, so they can see the performance of the plant, then we can get right on the problems and focus on the real right areas of the business to drive improvement.”* The data produced also highlighted the status of projects. For example, projects that were delayed were colour coded red and quickly brought to the attention of management: *“ we have a number of things highlighted every single week and if there's anything that's red, we discuss it with management”* (Calibration Engineer). The Manager of Advanced Final Assemble Facilities 2 explained the need for measuring performance and stated that: *“ you can see how you performed; otherwise, you haven’t got anything to measure against, so how do you know that you’ve done anything over the last year or made any benefit for the company.”* By evaluating performance, better future decisions were made (DB Annual Report, 2015/2016).

PMS was used as a behavioural control mechanism that motivated employees to achieve their objectives (DB TBEM Application, 2016). Some viewed it as necessary to drive progress and organizational goals: *“I think it’s a necessary evil to motivate people and motivate myself I guess”* (Research Manager). Some, viewed it as good pressure that forced them to engage in various projects: *“PMS adds that necessary pressure to get something out, it forces us to work towards a specific goal and time,*

*because we know that the vehicle program team needs this idea for November, for example, so we have got to have all our ducks in line, ready to go*” (Senior research engineer 1). The Strategy and Innovation Coordinator gave an example of how PMS was purposely deployed as a motivation mechanism which led to better results: *“We noticed before we put a particular metric in place around the number of CRs, it was fairly low per year, and then once we had an ambitious target and had a metric in place, people were more incentivized to meet the target. So, I think it does motivate people to deliver more”* (Strategy and Innovation Coordinator). The Marketing department also used target setting as a vehicle to enhance performance. They shifted the official deadline dates to an early date so that if they did not meet the early date, they were almost certain that they would make the official date to launch. Business Excellence Manager 1 explained that: *“So one of the things that we’ve learned within Marketing, Sales and Service is we have to shift the milestones left. We have to do things sooner. You can’t move a launch date back. So what you have to do is bring your milestone targets forward to ensure that if you fail to meet or if you make a late change it doesn’t impact on your go to market dates.”* Bringing targets forward motivated employees to get the job done quicker and meet the demands of their customers within the specified time. This approach resulted in high organizational performance and was evident as “The launch gateways passed on time “ in 2016/2017 and 2017/2018 was highlighted green, indicating that DB met its launch dates (see figure 5.6) (MS & S scorecard, 2016/2017; MS & S, 2017/2018).

Measuring performance continuously motivated and enabled teams to progress in producing new designs: *“You need to push yourselves to give us new designs that’s more radical, but they only got there by continually measuring their performance and measuring their progress”* (Senior Research Engineer 3). The Design and Innovation Research Manager 1 stated that: *“I am motivated by my performance measurement to improve on innovation.”* PMS was used to motivate employees to achieve their goals through target setting: *“You’ve got to have targets, because if there are no targets then, potentially nothing could get done”* (Paint Manufacturing and Engineering Senior Manager). The Manager of Advanced Final Assemble Facilities 2, explained that: *“it just pressures you to do a project, rather than not and just roll around.”*

PMS was also used to motivate employees to achieve their personal goals and go beyond set targets. Calibration Lead Engineer 1, stated that: *“I think they [PMS] are*

*there to be something to aspire for as an individual, and as an engineer, I would want to push myself harder, because the more you push yourself the better you become.”*

The InControl Apps and Connected Technologies Manager also mentioned that having targets could drive motivation: *“I prefer having it that way because it motivates me to do more and go and do more than I'm expected to do.”* The Engineering Strategy Engineer also mentioned that PMS motivated and gave him focus: *“Personally, I wouldn't say that I'm constrained by PMS. But it's more motivational, actually, to say, okay, we need to deliver this and this in these COCs.”*

PMS was used to help employees align their tasks with the business objectives: *“It aligns the individual's objectives with the bigger picture, which is the company's objectives, so in this way it's very helpful, and to me personally I like it”* (Lead Research Engineer 2). In agreement, Lead Research Engineer 1 stated that: *“It aligns everyone's interests and from an organization point of view, it's works quite well, it's effective.”* The diagnostic use of PMS was used to facilitate alignment, clarity, compliance and prevented organizational disorder *“because any big company needs processes, management control systems such as performance measurement, and needs discipline, otherwise, chaos ensues”* (Product Marketing Director). During monthly meetings, senior leadership teams reviewed priority items, and used the opportunity, to drive quality matters and establish clear guidelines for employees (DB, TBEM Application, 2016). Without PMS, *“you find projects that don't have the measures defined in a clear scope and a clear set of objectives, generally you will get mission fatigue and the project won't deliver what it was originally planned to do, or it all just fails and falters, and we won't get the output that we desire”* (Design and Innovation Research Manager 1). DB used PMS to allocate resources by showing areas of need. For example, in areas where there were constraints such as bottlenecks, PMS was used to ensure that adequate resources were aligned to support the requirements of the constrains (TRT T500 Lean Doc, undated). The documentary evidence below in figure 5.4, presents some indication of how DB used PMS to identify gaps and make informed decisions.

***Figure 5.4: PMS used for evaluations and to identify gaps***

Evaluate Business Needs and Directions	Evaluate whether PMS is current with Business Needs	Identify Gaps	Actions to fill the gaps
What we must continue to do and why - Our learning from the past: about need, about ourselves, our performance External environment analysis (drivers, other player activity) Internal environment analysis (fitness to face future) Core Competencies	High level aims with objectives for each Measures defining what the organisation wants to deliver Using industry benchmarks for comparison Strategies to deliver financial, customer, quality assurance, safety, and carbon mitigation	Visibility - collect, store, disseminate and display information Motivation - incentives and authority people are given to make decisions L&D - building skills and competence Speed - Time to transform Strength - Ability to change Co-ordination - Ability to control operations in balance/harmony Focus - strategic priorities	Leadership LL1 - LL4 making the right changes to compete effectively Management LL5 - LL6 - sensing and responding quickly to opportunities for new products or services, that for a while, have terrific profit margins Non-management - making a hundred small adjustments every day to reduce operating costs and increase revenues

(DB TBEM Application, 2016)

### **5.3.2 Issues with DB’s PMS and Management Practices**

Although various participants expressed the need and value of having a PMS, a PM and management practices report revealed flaws in how DB engaged in PM practices and used its PMS. The report showed that DB had 66 KPIs and targets on the business corporate scorecard, 422 KPIs and targets across 14 functional scorecards which was significantly high as shown in table 5.2 below (DB Scorecard, 2016/2017; DB performance measurement and management practices report, 2016). Although KPIs were useful in delivering critical information that helped achieve the organization’s mission, its excessive use became problematic because some, were not clearly linked to the organization’s corporate strategy and some of the departments measured things that were not relevant. Some of the KPIs also produced information that was outdated and did not paint an accurate picture of the activities that were carried out in some of the departments (MS&S Feedback Document, 2017).

**Table 5.2: Analysis of DB scorecard**

<b>Scorecard</b>	<b>Link to vision, mission, KPIs</b>	<b>Financial</b>	<b>Customer</b>	<b>Internal</b>	<b>Learning and growth</b>	
<b>CORPORATE SCORECARD</b>	Y	66	15	25	15	11
<b>Functional scorecards</b>						
<b>Corporate &amp; Strategy</b>	Y	45	16	7	9	13
<b>Design</b>	Y	69	7	6	36	20
<b>Engineering</b>	Y	39	4	3	17	15
<b>Finance</b>	Y	16	6	0	6	4
<b>Human Resource</b>	Y	22	4	2	2	14
<b>Information Technology</b>	Y	9	1	2	4	2
<b>Manufacturing</b>	Y	45	4	4	31	6
<b>Marketing, Sales &amp; Services</b>	N	28	3	22	2	1
<b>Product Creation &amp; Delivery</b>	Y	21	4	3	7	7
<b>Public Relations</b>	Y	46	13	17	9	7

<b>Purchasing</b>	N	30	12	1	12	5
<b>Quality</b>	N	28	1	13	14	0
<b>research</b>	N	14	1	4	5	4
<b>Special Operations</b>	N	10	10	0	0	0
<b>Functional scorecard linked to mission, vision and values</b>	64%	422	86	84	154	98

(Analysis of DB performance measurement and management practices report, 2016).

DB's scorecard reflected the four perspectives of a BSC: financial, customer, internal, and learning and growth. However, a detailed analysis of the functional scorecard showed significant misalignment between the functional objectives and the corporate objectives (also shown in figure 5.5 below). Some functions also omitted or ignored one or more of the BSC perspectives, some showed bias towards a single perspective and there was a general bias across the different functions towards internal process KPIs (Analysis of DB performance measurement and management practices report, 2016).

The misalignment according to the report was partly due to the specialist nature of activities carried out in particular functions and also part of the company's history. The report revealed that failure to collect the company's "rule book" with set organizational procedures and processes when it was sold by the original company and the loss of experienced personnel during the time of recession contributed to the misalignment (Analysis of DB performance measurement and management practices report, 2016). According to the report, there were also several unintended dysfunctional behaviours noted, motivated by lack of clear and specific deliverable objectives of the organization's strategy and as a result of having numerous KPIs and

targets over the separate scorecards. Some of the dysfunctional behaviours noted were:

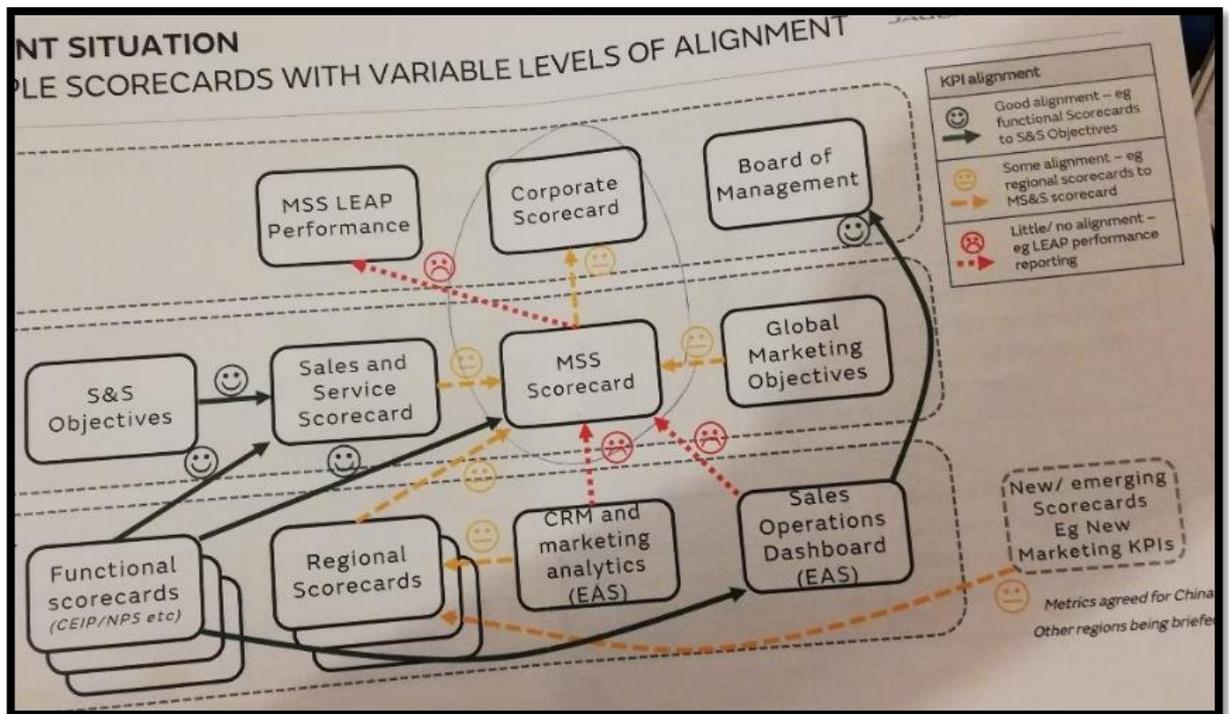
Myopia- Some of the organization's objectives that were considered SMART (Specific, measurable, attainable, realistic and timely) were typically short term, for instance retail sales volumes, monitored on a daily basis by senior leadership, stimulated short term behaviours like incentivizing sales through increasing variable marketing cost leading to decreased profit margins.

Tunnel vision- the report showed that the most profound example of tunnel vision was evident in manufacturing operations, where everyday production output was the focus of all decisions and related actions. This had adverse consequences on other KPIs on the manufacturing scorecard, for example opting to build vehicles with missing parts to avoid late deliveries resulted in expenses generated from re-work or rectifying the vehicles.

Misunderstanding – unclear strategic objectives also led to debates about what activities were necessary to achieve the organization's strategic goals. Some Function leads struggled to show activities in progress that aligned with the organization's strategic targets. The Corporate Strategy Office also struggled to provide a clear definition of the company's strategic targets. (Analysis of DB performance measurement and management practices report, 2016).

An "Assessment Report", (2017/2018) shown below in figure 5.4 also revealed some misalignment between the scorecard deliverables and individual objectives in the Marketing department and showed that there was no integrated performance management or reporting process for MS &S. Functional processes were also fragmented and non-standardized (Assessment Report, 2017/2018), but there were proposed steps documented on how this was to be corrected. The "Assessment Report", (2017/2018) also showed that the organization needed fewer KPIs and a new monthly reporting cadence to the Board of Managers was proposed. Members who took part in reviewing the assessment acknowledged that some teams did not use best practice processes or KPIs and proposed better functioning initiatives (Assessment Report, 2017/2018). These poor practices had significant impact on OA and is explained in the next section.

**Figure 5.5: Assessment Report- DB Scorecard Alignment**



(Assessment Report, 2017/2018)

## The interplay between OA and PMS

### 5.4 How PMS Can Constrain OA

The findings highlights that although PMS enabled exploitative activities such as strategy implementation, goal clarity, alignment and formalization (Bourne, 2008; Micheli and Mari, 2014; Miller et al., 2015), it could constrain exploration if it was used to focus attention primarily on output and financial measures, if it reinforced old practices and processes and if it was linked to individual incentives or sanctions, as explained below:

#### 5.4.1 If used to focus attention primarily on output and financial measures

The study shows that departments with scorecards that primarily focused on output and financial measures engaged in minimal exploration (MS&S Scorecard, undated). Such focus stimulated exploitation and mitigated exploration because *“if you decide to measure performance and then you use a scorecard that just shows outputs only then you are in danger of driving efficiency alone without innovation”* (Calibration Lead Engineer 1). Senior Research Engineer 2 explained that: *“there’s a risk that when you are driven by financial and output measures, you’re more committed to*

*delivering stuff that you know is possible, because if you are worried about failing, then there's a risk you won't innovate, ... you almost going to say, you know this is not going to work, lets follow the steps that are guaranteed.*" Some departments also relied on other departments to progress, for instance, the Engineering department had to wait for the R&D department for completed projects and therefore any added delays caused by exploration could have impact on the delivery deadline date. For example, *"If we've got engineering saying, we want this, we need this now, it needs to meet this deadline so that it can go on this vehicle, and we feel that pressure, so we have to deliver as best as we can"* (Strategy and Innovation Coordinator). This constrained exploration because *"if you don't deliver in time, everything gets pushed behind and yours and other team's performance as well, because they are just sitting down, waiting for you to deliver"* (Calibration Engineer).

Using PMS to primarily implement output and financial measures led to the establishment of tight deadlines that was not conducive for exploration. The InControl Apps and Connected Technologies Manager stated that: *"I think the main concerns are getting things out at the right cost and time. A lot of people are constrained a lot by deadlines, and gateways and things that we have to deliver, and on budgets, as well"* (InControl Apps and Connected Technologies Manager). There were concerns that *"within research there's always a bit of a risk, if you become too performance focussed, you get pulled closer to production, and production sees immediate and short-term issues, so they can say, I need this functionality on the car next year and that's great and needs resolving, but it's not, however, far enough, so to an extent there's a necessity within research to look for the horizon, look at five-years ahead future projects"* (External Affairs Technical Coordinator).

Driving exploration or creativity is very time consuming and complicated and therefore focus on delivery meant that most creative ideas could not be implemented: *"So we do have some like creative discussions but implementing that on the actual system; it's more complicated because of the time constraint"* (Calibration Engineer). Trying to meet launch dates instilled a level of pressure on employees to the extent that *"we barely have the time to fully test some components before we pass through the development milestones to bring it to market"* (Business Excellence Manager 1). The Paint Manufacturing and Engineering Senior Manager emphasized that: *"starting something from scratch as an innovative idea generally has a long gestation period,*

*so it's a long period of time before you can actually use it to do something useful."*

This view had the potential to hinder employees from engaging in exploration.

Innovation in some instances was noted to adversely affect performance, in terms of output: *"it can have significant effects on the performance of the factory in terms of meeting volume demands and therefore customer orders and therefore customer satisfaction. And that will affect the retention of the customer because he might not be getting his car on time"* (Manager of Advanced Final Assemble Facilities 1). The Manager of Advanced Final Assemble Facilities 1 viewed the use of innovation centred KPI as a distraction to delivering outputs. He stated that: *"if I'm trying to deliver a vehicle and I'm worrying about KPIs for innovation that will distract me from the real task."* The Advanced Manufacturing Senior Manager with a similar view explained that: *"I don't have a problem with innovation, I actually have a problem with trying to control the innovation because we have a group of engineers that want to do everything faster, quicker so trying to control that in a sustainable way is actually more difficult"* he further explained that as: *"an operator, you know your first metric is of doing the job as it was described."* Whereas the Global Marketing Communications Director felt that PMS was most beneficial if it had a concentration of efficiency measures: *"if we were going to use performance management to our advantage, we would need to put more focus in our performance KPIs on the efficiency of the organization."* The External Affairs Technical Coordinator held the view that delivery had to be prioritized over exploration and explained that: *"the ratio of what we have to deliver versus what we can take as risks is very, very dangerous. There's a lot of reputation at stake and DB especially is a very high-pressure environment. We don't do things half-measure. We've grown so violently, and therefore it is necessary that everything hits target."*

Exploratory and innovative activities were viewed, by some employees, to have significant levels of risks which could have adverse impact on the organization's financial outcomes as *"not all innovation works and to do something that is a very significant change, carries the risk that you will stop the process, you know, you will disrupt it so much that you will stop the process, and we can't afford to do that, that could costs millions of pounds a minute. So, the small innovative changes are safer to do, but also, when there are lots of them, tend to be more beneficial"* (Paint Manufacturing and Engineering Senior Manager). The Paint Manufacturing and

Engineering Senior Manager further explained that: *“unfortunately in the real world of business, this type of activity costs money and if you don’t have a defined timescale, then the cost of the innovation will run away beyond its usefulness as a project. So, when you’re doing that type of thing you’ve got to know that you’re going to get some business benefit out of it. So if you don’t measure the time and the cost of it as you’re going through it and review it, whether you’re going to get the business benefits that you originally expected, then you could end up just wasting money, literally wasting money.”* This showed that careful consideration was required to engage in exploratory activities as opposed to activities that were exploitative in nature because exploratory activities posed as a risk to the business attaining its financial target and, in some instances, could lead to financial loss.

Focusing primarily on output measures encouraged the establishment of: *“tight deadlines, which makes you more focused on delivering, not creativity... The deadlines are very tight... although we do have some like creative discussion but implementing that on the actual system; it’s more complicated because of the time constraint”* (Calibration Engineer). The Principle Engineer stated that: *“I think they are given the opportunity to try new things, but it’s forced against a time-scale... It kind of limits innovation because it’s targeted and focussed on a certain time frame, it kind of restricts the amount of technology development or creativity you can create, because the timing is fixed.”* He further stressed the need for flexibility to enable exploration and innovation by stating that: *“when you want to engage in exploratory or innovative projects, I don’t think that you want any rules, you want any constraints apart from, go do, go see what you can do with the technologies around you... I think you’ve got to support, encourage innovation without any time constraints or metrics that is focused on efficiency measures. I think that will actually defeat what you’re trying to do.”* The Paint Manufacturing and Engineering Senior Manager highlighted that focus on output and financial measures which led to stringent deadline dates was usually detested by engineers. He mentioned that: *“the people that are working on those sort of things don’t like to be constrained by a timescale, you know, they’re often scientists, they don’t like to be constrained by timescales”* (Paint Manufacturing and Engineering Senior Manager).

In some departments: *“the key KPIs are cost and timing and quality”* (Manager of Advanced Final Assemble Facilities 1). Producing cars at reduced costs, launching

within the specified date and quality were indicators of good performance. Furthermore: *“we have to work with the product development teams to ensure that the cars are designed within a deliverable scope. So it’s not too difficult to implement the new equipment or also timing, so whatever plans we do come up with, they’ve got to be deliverable... once the car comes through to that programme, you’re running into a delivery phase so the opportunity to innovate is reduced because you don’t have time to spend innovating something new.”* The Research Manager, on the other hand, viewed using PMS to direct attention primarily on outputs and financial measures as “noise.” He explained that: *“what we don’t do particularly well as a management group is to protect our innovators from noise... there’s some churning noise in emphasizing too much on output measures. The research team tends to sometimes get too focused on delivering to the gateway for the next vehicle programme or even delivering to vehicle programmes... We get pulled back because there’s not enough game changer innovative features, not enough USPs. We like to think we’re innovative, but I think we get drawn towards trying to be efficient.”* The Project Manager in agreement stated that: *“we focus on the most cost-benefit projects. So, we’ll try and minimise the effect that it has on the business by prioritising projects. Last year we had a budget of £59 million, this year we’ve got a lower budget but we hope to deliver a similar amount to the programme, just by focussing on the ones that have a better return”* (Project Manager).

The departments that were noted to engage in very little exploration did not have a clearly defined KPI that focused on innovation, for example, in the Marketing department: *“there are 16 KPIs on the Marketing, Sales and Service scorecard and they are all output measures on deliverable results related to volume of sales, value of sales, profit from sales, customer satisfaction, retailer satisfaction... but innovation, or innovative activities, per say, are not targeted amongst our KPIs* (Business Excellence Manager 1). This was evident on the yearly MS & S scorecards from 2016/2017 and 2017/2018 as financial measures dominated the scorecard but with no obvious KPIs centred on innovation as shown in figure 5.6.

**Figure 5.6: DB's KPIs in the Marketing Department**

KPI level	#	Corp	KPI	UK	NA	Europe	US	China	EMEA	APAC	LatAm	Other	Global	
Corp / Corporate Targets	1	X	Gross Revenue (£ Billion)	6.31	0.81	1.41	1.30	1.14	1.63	6.11	0.83	1.70	1.25	1.3
	2	X	Market Equation (£ Billion)	1.48	0.23	0.25	0.34	0.25	0.58	1.79	0.22	0.37	0.23	0.81
	3	X	P&A Profit (EM)	132.8	40.2	37.2	46	49	42.9	159.0	38.8	46.8	58.8	66.5
	4	X	HLR Retail Sales (Including China JV)	168,228	25,640	36,121	35,341	27,106	44,025	110,706	24,227	33,630	34,060	20,711
	5	X	Fleet and Business ('000s)	94,682	6,901	3,575	12,129	7,062	5,025	27,742	8,242	20,742	11,553	20,742
	6	X	Approved Pre-owned Volumes ('000s)	32,813	15,080	6,289	6,392	4,452	600	36,308	13,914	11,333	6,657	20,742
	7	X	Arch Roll Out	133	8	3	73	39	10	133	8	3	73	39
	8	X	Employee Engagement Index (EEI)	78%	84%	80%	85%	80%	70%	77.0%	84.0%	69.0%	79.0%	75.0%
	9	X	Performance Excellence Index (PEI)	70%	80%	80%	80%	76%	79%	71.0%	71.0%	62.0%	72.0%	68.0%
	10	X	Loyalty%	Apr-17	n/a	n/a	n/a	n/a	n/a	57.0%	n/a	n/a	n/a	n/a
Brand specific targets	11	X	Retail Sales (£/m)	55,258	9,557	14,087	10,681	8,099	13,334	45,414	9,117	14,087	9,720	10,681
	12	X	Market Share (%)	4.0%	14.9%	3.9%	3.9%	3.7%	2.9%	4.3%	14.9%	3.9%	3.6%	3.9%
	13	X	Sales Advocacy (pts)	+85	+84	+93	+76	+70	+92	+82	+75	+88	+75	+68
	14	X	Service Advocacy (pts)	+75	+68	+86	+72	+53	+82	+69	+60	+83	+67	+55
	15	X	Digital Effectiveness (1-5)	Jan-17	2	2	3	2	2	25-Jan	1	1	3	1
	16	X	Retail Sales (£/m)	112,470	16,083	22,034	24,660	19,007	30,686	109,924	15,860	21,745	24,340	19,007
	17	X	Market Share (%)	8.0%	32.3%	4.8%	11.4%	7.4%	7.1%	7.4%	31.8%	4.7%	11.2%	7.4%
	18	X	Sales Advocacy (pts)	+84	+79	+93	+77	+73	+91	+84	+79	+91	+78	+76
Model specific targets	19	X	Service Advocacy (pts)	+71	+62	+83	+70	+57	+84	+68	+53	+81	+67	+60
	20	X	Digital Effectiveness (1-5)	Jan-17	2	2	5	5	2	25-Jan	2	2	6	2
	21	X	Conquest% (16/17)	80%	80%	80%	80%	80%	80%	Apr-17	72.0%	81.0%	68.0%	n/a
	22	X	Conquest% (17/17)	80%	80%	80%	80%	80%	80%	Apr-17	n/a	n/a	n/a	n/a
	23	X	Order Bank - UK (2 mths China & US)	3 mth	3 mth	2 mth	3 mth	3 mth	2 mth	2.6	4.5	2.4	3.6	2.6
	24	X	Order Bank - Europe (2 mths China & US)	3 mth	3 mth	2 mth	3 mth	3 mth	2 mth	3.2	6.0	2.0	3.1	3.2
	25	X	Order Bank - APAC (2 mths China & US)	3 mth	3 mth	2 mth	3 mth	3 mth	2 mth	Mar-17	Mar-17	Mar-17	Mar-17	Mar-17
	26	X	Launch gateways passed on time	70%	n/a	n/a	n/a	n/a	n/a	73%	n/a	n/a	n/a	n/a
27	X	AMS	100%	n/a	n/a	n/a	n/a	n/a	100%	n/a	n/a	n/a	n/a	
28	X	Customer Needs Assessed	100%	n/a	n/a	n/a	n/a	n/a	100%	n/a	n/a	n/a	n/a	

The findings also show that in some departments over stretched targets were used to compel employees to work harder to meet the actual corporate sales targets, for example in the Marketing department, “sales targets are very, very, very aggressive. So, you will hear every month that DB sales have exceeded the previous years' sales. What you won't hear is that those sales are way below the target sales that the organization has set for itself... almost everybody will tell you, we won't achieve this. But there's almost this philosophy that if you aim for the stars you might reach the moon” (Business Excellence Manager1). This philosophy worked in terms of meeting output demands and reflected on the department’s scorecard, as their actual retail sales performance was a lot less than the target set (MS & S Scorecard, 2016/2017), yet the company’s gross revenue, profit and overall performance was reported as good (DB, Annual Report 2016/2017). This however, had detrimental effects and triggered dysfunctional behaviours that could mitigate exploration, for example: “The problem is, whilst externally you are able to celebrate and give good PR to having out achieved your previous years' performance. Internally, everybody's beating themselves up

*mercilessly, and being beaten up mercilessly because they're not achieving those targets. Even though this may seem to work, with DB making significant growth year on year, it will make employees burn out eventually because they will work hard but never meet the target and get penalised for it” (Business Excellence Manager 1). “The launch gateways passed on time” shown on the 2016/2017 scorecard was highlighted green (MS & S scorecard 2016/2017) which was an indication that the business always ensured the dates for launching new cars were reached on time and therefore showed the possibility that, no extra time was given for exploration. In some cases, it also led to compromises during the production stage: “We did a project at the end of last year and the business put a deadline on us. We had six weeks to go from IDF to concept resolution. And we engaged a supplier to help us because we knew we would need it. And, don't get me wrong, we achieved it, but there were compromises, and we're going to fix those compromises in the next phase of work, that's fine, but if we'd have had eight weeks we probably would have got a better solution” (lead Project Engineer). The Business Excellence Manager 1 confirmed that pressure on employees to deliver products quickly sometimes led to such behaviours. He explained that: “a watermelon green is a description that's been used to describe our performance measurement. From the outside, it looks green. But if you scratch it and look inside, really, it's red. So people are declaring themselves to be green against a milestone. But with the expectation of, okay, I know I'm not really. But I'll catch up before we get to the next stage. But then, they don't because they're not used to working in the pace that we are today” (Business Excellence Manager 1).*

DB also awarded rewards and promotion, which in some instances had potential to direct attention on financial and output measures: *“there's a performance measurement attitude within some management teams, unless you're achieving delivery within TCDS, and the measured gateway. Then you haven't delivered, therefore you're not ready to move up a grade... you're certainly not ready to move into management which some of the ambitious individuals, kind of, are very focused on that side of things and miss the bigger picture about the importance of innovation” (Research Manager). Focus on output measures stimulated incremental innovation rather than radical innovation: “I mean deadlines, focus on outputs, that sometimes it's a good thing because they drive you to do something, but there's always the risk of making the steps too small” (Senior Research Engineer 2). In some cases: “a piece*

*of innovation, if it's not matured enough and if it's not implementation ready by the appropriate gateway then you've got to say, it can't go in"* (Product Marketing Director). In agreement the Research Engineer 2 stated that: *"you could set targets in such a way that improves your capacity to incrementally or massively innovate and be creative. I think the targets set in this department do not assist with that. A focus on quantity and speed doesn't help with finding the right solutions."* Due to focus on delivery, some employees did not make innovation or exploration a priority: *"Our responsibility, our immediate responsibility is to make money for DB. That's very simple, so I think in this we are working in a way, which we're not relying on ourselves to come up with genius ideas"* (Lead Research Engineer 1).

Furthermore, *"over the past recent times we're becoming more process driven at the expense of being more creative. Because obviously research takes a lot of time to do and we're in the business of making cars and making money, so you have to be quick and deliver things. So, if you want to come up with new ideas they don't happen overnight"* (Research Engineer 4). In the Marketing department focus on output measures led to the daily review of sales: *"so every single day there is a review of the numbers. if the numbers don't look good today, the following morning there's a whole lot of behaviour to try and encourage and promote sales the next day"* (Business Excellence Manager 1). This only facilitated short term improvements and mitigated collaboration required to stimulate exploration, as employees were more concerned about their output deliverables as opposed to supporting each other: *"So, if you have five objectives and somebody came to you with a request to support something other than those activities. It's not uncommon to get a response that sounds like, yes, but really means no... they don't want to deviate from the things that they're being measured against"* (Business Excellence Manager 1).

Due to focus on output and financial measures, Business Excellence Manager 2 felt that: *"The reality is we're not as innovative as a company as we should be. And you know people are trying to chase the sort of annual set targets almost blinkered."* The Coordinator of External Communications in agreement stated that in his view: *"the overall culture in DB, is about hitting targets, and delivering.... yes, I think sometimes we are running so fast, we're not taking the time to check, and make adjustments. I mean if you think about your typical project management of plan, do, check, act. I think sometimes the checking bit is missing."* This was because in some departments

and teams, senior management prioritised the need to meet financial targets: *“the main problem is this... I think we've got a lot of work to do to convince our Board of Directors that scorecards have a place, you know, but these guys are salesmen and the mentality of a salesman is can I deliver my sales for next year? .... So I tend to find that they have shorter term focus and have a more tactical rather than strategic view”* (Business Planning Senior Manager). The Calibration Lead Engineer 1 stated that: *“the way the industry is now, you have to work fast, you don't have the luxury of time, if it's something that needs to be done now, then it needs to be done now, otherwise your competitors would push you out of the way.”*

In summary, the study shows that focusing primarily on financial and output measures, tight deadlines, and incentives for delivering outputs channelled attention towards exploitative activities. This stimulated short term performance, constrained exploration and in some instances, led to dysfunctional behaviours.

#### **5.4.2 If it reinforced old practices and processes.**

The findings show that a PMS that was outdated, ambiguous and had measures irrelevant to existing operations reinforced old practices and processes which constrained exploration. This was because it made employees focus on areas that were less important: *“if the process is outdated... it makes it difficult to do work based on the old process because, you know, times have changed... you would be like, but why don't you just do it this way instead? And those people might say because that's the way it's always done”* (InControl Apps and Connected Technologies Manager). Outdated PMS endorsed old practices and a resistance to change attitude, *“certainly with the old DB people, they don't necessarily react well to being performance managed. They think they know best and they tend to lean back on experience and stuff like that. It can be very difficult with those guys to have a conversation around performance and this is even worse when the measures are outdated as it just reinforces what they are doing”* (External Affairs Technical Coordinator).

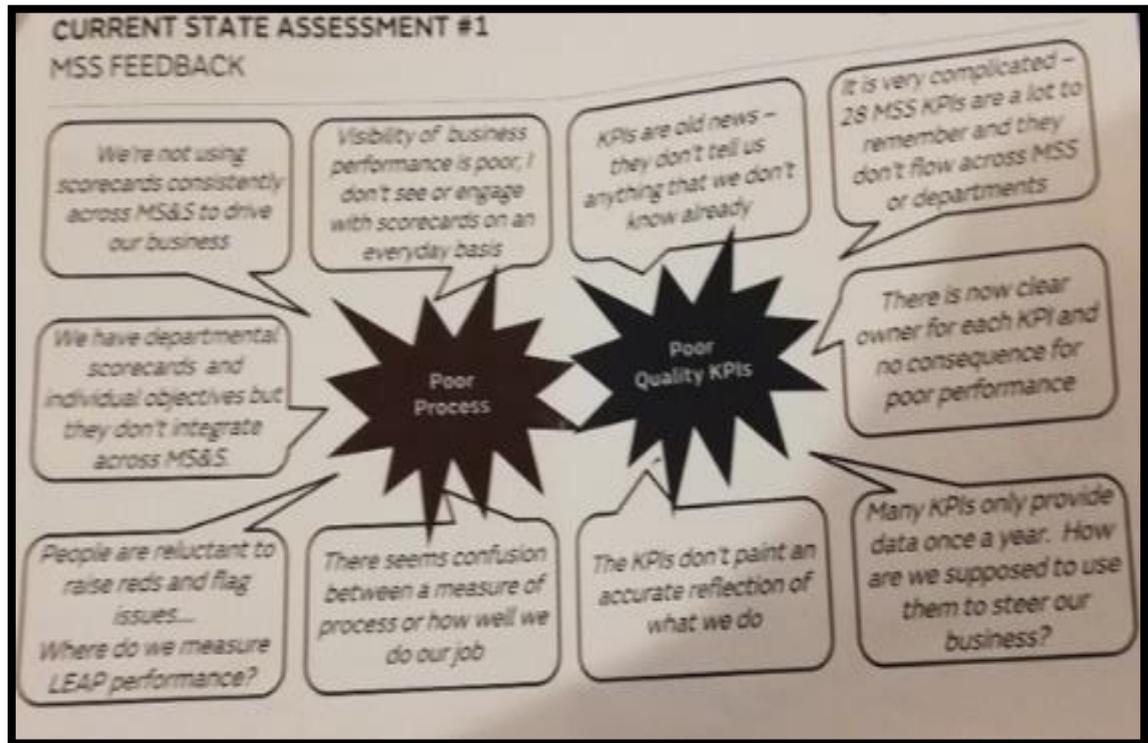
The Business Planning Senior Manager criticised some of the KPIs his department used and explained that predictive ones that were more relevant for future progress were necessary. He stated that: *“I bring it down to two things, one of them is we've got a pretty crappy process, and the reason we've got a pretty crappy process is partly fuelled by our KPIs, they are pretty poor and when you look at our KPIs most of them*

*are lagging indicators. So, what I'm trying to push, is trying to use smarter KPIs, more predictive ones” (Business Planning Senior Manager). The Advanced Manufacturing Senior Manager also explained that: “I think the word, the phrase KPI, key performance indicator you know sometimes we forget the word **key**...we need them, more importantly we need the right ones.”*

Some of the KPIs in that department were outdated and did not correctly highlight areas where exploratory efforts could be channelled but reinforced old practices and processes. There was also no clear owner for each KPI or consequence for poor performance, and data was produced once a year, which was not enough to steer the business appropriately or highlight possible areas that required exploratory efforts. An assessment of a feedback document revealed that some of the business KPIs did not paint an accurate picture of what the organization did and showed the measurement process to be unclear, leading to confusion regarding the reliability of the employee performance assessment process. The report showed misunderstanding between some managers and employees due to the vagueness of the process. This led to confusion and mitigated employee’s desire to be creative (see figure 5.7) (MS & S Feedback, 2016/2017). The document also showed that the KPIs only presented old data and did not tell them anything they did not know already. *“So, when we're serving up a scorecard with, you know, how many cars did we sell, it's already old news. I know how many, I'm paid a lot of money to go and manage a business, I know how many. So, it prompts, well, what's the point of this scorecard if it tells me things I already know”* (Business Planning Senior Manager). Such KPIs were unable to guide the department on areas that required exploration. The Business Planning Senior Manager also explained that: *“We've got departmental scorecards and individual objectives, but they don't integrate, so everyone's measuring different things and it doesn't all tie in... I think the only way to improve it is to start off by using better KPIs, we can use some KPIs which people might find useful, rather than telling them something that they already know ... If we can get a bit smarter with the KPIs.”* PMS was deployed to enable organizational alignment but, in some departments, it was noted that *“there's a misalignment between what the company is driving and what the functions are driving. And when you look at the functional scorecards, a third of them cannot demonstrate alignment to the corporate scorecard... So I think there is a huge piece of work for DB to do to really try and understand those things that are important*

at the corporate level... and then, those that are important to the functions, that will enable both performance delivery, but also innovative development. And at the moment, I don't think we have that balance” (Business Excellence Manager 1).

**Figure 5.7: MS & S Feedback Document**



Research Engineer 2 in agreement stated that: “A correctly set performance measurement will encourage people to work collaboratively and will encourage finding the best possible approach to a problem... which will require you to be creative and smart about what you're doing. A badly set performance measure, a badly set performance metric, will discourage you from looking at a problem in any way other than the one you know“ (Research Engineer 2), whereas the Project Governance Manager explained that “They can drive innovation if you word them right and you allow some flexibility in what you're giving them to do.” This shows that a good PMS could drive creativity, whilst a poor one could restrain interest in opportunity search. The Calibration Lead Engineer 1, in agreement also raised concerns about the limitations and bias aspect of a PMS and explained that: “it can cause restrictions especially if the measurements are done without taking individualism into account and then you are measuring everybody by the same yard stick, then you start running into problems because then you're asking people

*irrespective of their personality and background to do the same thing, meanwhile innovation can be inspired in different ways. Depending on how you measure, the type of measure, what you are measuring will affect whether you get the desired result.*” Whereas the Research Manager explained that: *“I probably consider that as, certainly product engineering, to the larger group we’ve got a bit of a one sort of product suits all the rest solution at the moment which probably needs to be looked at especially in a context of delivery and innovation and encouraging innovation”* (Research Manager).

This was evident in some of the departments investigated because although different teams had different functions, the performance metrics were almost the same. This approach affected some employees as they felt some of the measurements were irrelevant: *“You know, manufacturing should be driven by quality at the minute, right first time and out of the door. Should Research be driven by quality, right first time and out of the door, no? I don’t think our current system is as effective”* (Research Manager).

Business Excellence Manager 2, on the other hand, expressed that from an overall business perspective, standardization and a reduction in performance metrics could lead to improved performance. He stated that: *“it’s important to get standardised metrics so that you’re all focussing on one thing, one direction. One of the things that we used to do is have too many of them...that were generic and we break them into six different categories... in those categories we used to have 50 metrics, which was too many to chase. I think this year we standardised around about 18 or so of those categories in total which is much better. Because it gives the organization, and the groups the opportunity to focus on what is important... It also helps leadership teams to say, well, what really matters in this business when you limit the amount of metrics that you chase. Too many and you are distracted by everything”* (Business Excellence Manager 2).

At DB there were also questions raised about the reliability of the performance assessment process. There was the notion that the outcome of a performance appraisal was dependent on the nature of the manager in charge of the team as opposed to the actual performance of employees: *“some managers will rate their teams strongly simply because that’s the type of managers that they are or they will not take much*

*notice and they will give them a very generic review... it really does depend on the manager themselves because it varies. There is a discord between managers across the business. And it is not just me. It's happened to quite a few people that I know"* (In-Control Aps and Connected Technologies Manager). This poor performance appraisal system implied that employees with managers who were supportive were likely to inspire creative behaviours whereas those with a stricter and less supportive character could have adverse influence on their employees.

#### **5.4.3 If it was linked to individual incentives and sanctions.**

DB has numerous innovation award programmes such as the “Innovista”, Technical Excellence Award etc and employees received an award or pay raise for performance outcomes, however, *“the problem with the reward is that, it penalises those people that, I'm not saying it's through their own fault, haven't been able to meet the target or objective, maybe because it wasn't possible”* (Principle Engineer). The Strategy and Innovation Coordinator explained that: *“if you haven't met that target, and for quite valid reasons, it can be a little bit demotivating when you've got a stretched target, you can't meet it and then people get a little bit defensive because it's not that you're not trying hard to deliver, you're doing your best, but other factors influence it.”* This could mitigate an employee's desire to explore and, in some cases, stimulate fear and anxiety if they genuinely felt the set targets were unreachable, for example, *“a lot of engineer's pay and reward, is based on the performance of their objectives. And if their objectives are geared to a 12-month cycle, but the project is not possible in 12 months, then that creates anxiety, it creates tension, it creates fear in the engineers”* (Principle Engineer). Research Engineer 3, stated that: *“ I might deliver some coaching support guidance, which contributes value to the research engineers, but it doesn't necessarily get measured effectively, and if in so doing I fail to deliver to a framework where I am measured and get penalised for it... this means I cannot make time for innovation as it requires additional time.”* This also shows that targets or performance measures that are linked to individual incentives or sanctions could hinder creativity or exploratory endeavours that may be valuable to the business but cannot be quantified or measured effectively.

The findings reveals that individual reward systems enabled by PMS also mitigated collaboration, idea sharing and discouraged employees from helping their colleagues

if they felt their efforts were not valued, for example, *“if you only measure the output and say, oh he was the one that came up with the solution, you overlook the other people that participated, and they may have sown the seed, that brought about the solution so it’s not just, oh he came up with the solution so we praise him for that... because the next time that happens people tend to say well, the last time I was involved but I didn’t get recognised so what’s the point”* (Calibration Lead Engineer 1).

The Principle Engineer stated that: *“at the moment, people are working in isolation because they’re looking for their own financial reward... from the individual perspective, they can achieve the performance goal. But actually, the company’s losing on the fact that it’s not fully realised the potential of the whole team’s contribution that they could make.”* Although employees could achieve their performance goals, it usually came at the expense of achieving greater performance for the business through team collaboration. Business Excellence Manager 2 also explained that individual incentives and sanctions could stimulate unproductive discussions that could negatively affect the moral of employees. He stated that: *“But with money it’s almost a de-motivating factor because you get lots of discussions about who’s got more than the other person. Why didn’t they get more?”* This also instigated an innovation stifling culture because *“often, you’ll find with a lot of the engineers, they’re not prepared to share their knowledge. Because, if I share the knowledge with somebody else, I’m going to give them an advantage. So they may achieve more performance than me. So, it disables sharing”* (Principle Engineer) and stimulates a working in silos culture, yet *“working individually is really difficult for exploration and innovation. So, if you are on a project on your own it’s quite difficult”* (Lead Project Engineer).

In some of the departments, PMS was used to enable poor appraisal processes that were used to make judgements regarding employee rewards and sanctions. This had detrimental effects on employees if they felt they were disadvantaged by an unfair system. For example, the In-Control Aps and Connected Technologies Manager explained that: *“I was doing a million extra things on top of my daily role and delivering them all. And being reviewed in a very generic way? just because of the level I was, at that time? it was really demotivating...and I do feel like it’s a very disconnected process and can be disheartening. But yes, I think that the biggest issue with that is that there is so much disparity between the business, in terms of how a*

*person gets rewarded.*” Getting a reward was also dependent on a manager’s character or their personal view on the reasons for the reward or sanction, for example, “*some managers recognise innovation, and some don't. So, if someone's done something really innovative, and has gone really out of their way, but they didn't get any recognition for it, then they probably might not, obviously, do it again*” (In Control Aps and Connected Technologies Manager). In agreement, Research Engineer 1 stated that: “*getting a good score, or a high ranking is obviously good for you because generally, that equates directly to pay raise, which is nice. But if you’ve got a low score for whatever reason, if it’s something as stupid as your manager doesn’t like you or your senior manager doesn’t like you then you get stuck with a low score, so you have a very small pay raise ...and I’ve seen this happen here and in other parts of the business. You think well, that’s going to piss people off and they’ll want to leave. And losing intelligent people is probably worse than giving them a higher score.*” Such poor appraisal processes or management practices could have adverse effect on an employee’s self-esteem, motivation, and willingness to be creative if they felt they were not liked, valued or appreciated and were deliberately denied a reward. This, however, was uncommon or could be easily avoided in cases where rewards or sanctions are given to teams as opposed to individuals.

Performance metrics linked to rewards and sanctions, in some instances also encouraged individual employees to focus on core projects that were less challenging to attain: “*you set a metric and you achieve it and, I don’t want to say you cheat, but you tend to structure things towards success against that metric and it’s counterproductive because a lot of the time you don’t sign up to projects that you know will fail or you don’t set very ambitious targets ...you get some people who swing more towards working on what I would term advanced engineering projects because it aligns with delivery, it aligns with the performance metrics and they get recognised for it. You get some managers taking that approach as well*” (Research Manager).

Furthermore, as pointed out in the previous section, PMS are implemented and used to drive behaviours without considering an individual’s abilities or natural traits. This could present challenges associated with facilitating individual rewards and sanctions. For example, “*there is a disparity between the engineers. You might have 50% of ten engineers who can achieve their performance goals because their skills are matched to the simpler tasks. The ones that are more difficult will never, ever, complete them.*”

*So, from a reward or remuneration point of view, they're going to suffer” (Principle Engineer). This could lead to discouragement and search for exploitative projects that are less complex as opposed to taking on exploratory ones that are more complex and time consuming. The Principle Engineer further explained that individual rewards and sanction enabled by PMS could also stifle learning because: “where there’s technology risk... you’ve got someone who’s prepared to go and learn and will make mistakes. But I don’t call it mistakes. I call it learning... So, if you penalise that individual for learning through that process because he’s unable to deliver at that point in time, but he’s learned how to apply the next step then you’re going to discourage them, the ability to take courage, to take commitments, to learn. So, in the end, I think it’s self-defeating” (Principle Engineer).*

The findings, however, shows that incentivising team contribution instead, mitigated problems faced with facilitating individual rewards and sanctions. Business Excellence Manager 2 advocated for this by stating that: *“I think if recognition, where you got team recognition as well, they spend money as a team, you know, they’ve got to do something as a team together,”* this could facilitate collaboration and instigate productive debates and idea sharing. The Coordinator of External Communications in agreement said that: *“a banging the table sort of a culture could result in an environment where people might be more afraid to come up with ideas, and to explain why something hasn’t been done. Whereas the culture our director sets is more about collaboration, about teamwork, about everybody coming together to meet the objectives. You know, he says outright, if one person fails, the whole team is failing. So, we all need to work together to make sure that everybody succeeds. And that’s the culture that he sets, which personally, I think, does allow for more creative working.”* Such approach could: *“also start breeding a bit more innovation culture around the business, where people start collaborating a bit more, and start discussing ideas instead of just thinking, well, I’m sure it will be fine. So, they discuss problems with other people. And then, maybe the other people have some more ideas to tag onto it”* (In-Control Aps and Connected Technologies Manager). It could also stimulate support for each other if they: *“recognise, if they succeed in doing that, they all get some reward. So, I’d say, for me, it would be those common objectives, means the team now is encouraged to work together. Rather than thinking about their own objectives, for their own reward. So, this mentality of rewarding individuals, there is*

*something in it. But you need to reward the collective group... Encouraging people to work together, rather than against each other, or working in isolation... It's up to the team to work out how they're going to succeed and achieve that goal"* (Principle Engineer). Team participation and engagement as shown in the Lead Project Engineer CFI team objectives, (2016/2017) was essential to DB in stimulating and driving exploration.

## **5.5 How the diagnostic and interactive use can enable OA**

The findings uncover that a combined use of the diagnostic and interactive uses of PMS could however enable OA. It reveals that the diagnostic use could focus attention on continuous improvement and incremental innovation, whilst the interactive use could instigate discussions leading to the exploration of new ideas, options and opportunities. The combined uses of PMS could drive OA in four main ways.

### **5.5.1 Uses of performance information**

DB made better informed decisions by monitoring and using performance information (TBEM Application, 2016). For example, performance information was used to determine customer needs and show areas that required exploitative or exploratory intervention. The Experiential Marketing Director explained that: *"we measure from an effective performance perspective: is what we are doing over here more valuable than what we are doing over there? Are more people engaging here than here? How much are we spending here, and does it give us value for money? And we use that information to make key decisions."* The In-Control Aps and Connected Technologies Manager, on the other hand explained that: *"What we do in the team is, every week we submit details in terms of the performance of the projects we're working on, and their status, in terms of red, amber and green, and if there's anything that's red, we discuss it and try and find new solutions to improve."*

By using PMS diagnostically and interactively, *"the right performance data can help you identify a problem or identify an opportunity... and the act of discussing and evaluating this, even if you do it once a year, that sort of conversation, that sort of thinking can naturally lead you to some innovative ideas"* (Research Engineer 3). The ability and act of *"looking at old data and being able to apply it to help you innovate"* (Design and Innovation Research Manager 1) fostered exploration. Such platforms

for discussion created a rich environment whereby engineers “*could bounce ideas off each other, they're more excited, they're more innovative, they're more focussed, they drive themselves and each other forward*” (Lead Project Engineer).

Performance information was also used diagnostically to reveal areas where set standards were not met, or where teams had deviated from set objectives. The Chief Marketing Officer stated that: “*my measure of business excellence is whether my team are doing their job versus the objectives we've set, and the important thing is to then review that regularly... If we are not hitting our objectives in some areas, then some remedial action or added focus is required and that is communicated.*” Taking remedial action involved search for internal knowledge that fostered improvements and incremental innovation. To help teams get back on track, performance information was critical because “*If you have the right performance data and you get the right data to the teams quickly, and it's accurate, and it's well-presented... what it allows them to do then, is to understand very quickly the current state. And then they're working on the right things that can drive improvement straight away*” (Business Excellence Manager 2). The Advanced Manufacturing Senior Manager, in agreement, explained that: “*we need the right people to be able to see the right data and react quickly...Right down to engineering level we need information to understand how we react, control and ensure alignment.*”

When deviations from pre-set standards were identified, the diagnostic use was deployed to ensure alignment. In some instances, the misalignment was due to changes in the market as explained by the Global Marketing Communications Director: “*we're checking obviously for alignment, is it aligned to the global plan? If it's not aligned, is it right for it not to be aligned? Either it's because there's a gap in the global plan that's particularly needed for that market, or is it actually changes in the market? In which case we will challenge and have those discussions.*” This triggered the interactive use of PMS and led to conversations regarding search for new opportunities to be exploited and those to be explored.

Performance information was used to give an indication of what type of intervention was required. For example: “*If the return on investment I'm getting at the Paris Motor Show is three times higher than the return on investment I'm getting at Los Angeles then that raises some questions...but the virtual reality, that was so successful that*

*we've now added that to all of our other major motor shows... So, I would review this quarterly, look up where there are any reds and work out an action plan to sort of get it back into the green by the end of the year”* (Chief Marketing Officer). Examining such performance information could lead to decision making that could foster continuous improvement. Furthermore, *“If we're looking at new product launches for example, we'll run big car clinics to understand how people feel about the car, and how we could potentially improve it”* (Coordinator of External Communications). Through such clinics, DB gathered performance information that could support the development of exploratory projects. One of the departments under investigation had a Customer Analytics Team (MR Team Structure, 2017) dedicated to collecting and analysing customer data. Scrutinising such data highlighted specific car features customers liked, disliked, or that required novelty. Such information was used during *“ideation sessions to generate solutions, where we may say: ok, we would like to improve the way our customers find their human-machine interface”* (Research Technology Delivery Manager). Other performance information was also used to understand and detect technology and systems failures and their possible impact: *“You have to go through a level of failure mode analysis to understand the relationships and dependencies of the system... So more recently that's driven us to embrace better technologies”* (Advance Manufacturing Senior Manager).

In some departments, forums were used to discuss performance related challenges. The RIT Funding Senior Manager explained that: *“one of the big things they put in place is a portal with an online collaboration tool that is designed to foster both sort of company-led challenges, but also employee generated challenges...which is opened up for people to contribute ideas.”* Through the online discussion forum, a new type of widget was created through idea sharing on a performance related topic, whereby financial performance information revealed inefficiencies and waste in the production of widgets. The RIT Funding Senior Manager stated that: *“In the process of making this widget, we've had all of these inefficiencies or waste. Through the forum ... we found a way of producing these widgets more efficiently and have come up with a completely radical approach... after a couple of months we've produced a totally new widget at a cheaper price.”*

Documentary evidence and an observation also revealed that DB adopted quality improvement tools such as LEAN, the RAC methodology and Six Sigma, which had

practices enabled by PMS. Through such tools, performance information was used to identify wastes and new value streams (TRT T500 Lean Doc, undated; Product & Process Enabling Technologies Document, 2016) and the root cause of problems (RCA Improvement selection doc, undated; DB, Organizational study report, 2016). For example, departments that deployed LEAN, used performance information to identify performance gaps which then led to deliberations that fostered continuous improvement and exploitation. Deploying *“what we call Kaizen, which is continuous improvement, are small improvements, innovation ideas, which you may not think of as being innovative in the first place, but they are generally small improvements in the system or process, which can be quickly introduced and quickly has an impact when performance information reveals gaps in performance”*(Paint Manufacturing and Engineering Senior Manager). In some instances, it led to search for new capabilities or skills as *“it is about improving and learning and developing new skill sets as you carry out these tasks”* (Paint Manufacturing and Engineering Senior Manager). Such tools required performance information to drive change and inform decisions that influenced exploitative and exploratory projects. The DMAIC model in Six Sigma, deployed by some teams used performance metrics to monitor the progress of improvement goals. Performance information was regularly analysed to identify performance gaps and new and better ways were explored to ensure improvements (DB, Organizational study report, 2016).

### **5.5.2 Collaborative development of performance objectives and targets.**

DB merged a “top down” and “bottom up” approach when developing performance objectives, KPIs and targets (DB performance measurement and management practices report, 2016). Performance objectives and targets were usually developed collaboratively at various hierarchical levels. For example, *“the overall objectives set at marketing level are set between Mark, who's our Chief Marketing Officer, and his first line, so it's the five different pillars of marketing. So we've got product marketing, marketing communications, experiential marketing, customer insight, and marketing strategy... So, they get together, they set the high-level objectives for marketing, and then those are cascaded to the directors in the team. And what we have to do is to sit down and think about which of those objectives are we going to be leading the achievement of, and which ones are we going to be supporting”* (Coordinator of External Communications). This was replicated at different hierarchical levels.

Employees dialogued with their managers when setting performance objectives and targets as opposed to having set objectives imposed on them. This created a rich platform to identify and discuss initiatives that could foster exploitation and exploration. The Business Quality and PR Manager stated that: *“my manager and I sit down to talk about our targets and objectives, it’s something we do only twice a year, it’s a different mode of thinking to day to day business, we take a step back and we think about things on a different scale, on areas that require improvements and I think naturally this creates new ideas.”* He further explained that selecting performance objectives and targets collaboratively inspired exploration: *“just thinking about targets and objectives makes you think about not just what you do but how you do it, and I think the act of discussing those and evaluating those things. That sort of conversation, that sort of thinking can naturally lead you to some innovative ideas.”*

Setting objectives collaboratively also ensured that employees’ values were more aligned with the business’ vision: *“You set objectives between yourself and your manager and ensure that your values are aligned and your working ethics are aligned to the company’s set performance objectives”* (Calibration Lead Engineer 1). The diagnostic use of PMS helped reveal parameters in which the objectives should fall and ensured employees remained in alignment with what was agreed, whereas the interactive use or discussing the objectives collaboratively presented opportunities for idea sharing. For example, *“I’ll sit with my boss, he will be clear about the strategic priorities for the next year, for example, it could be key themes around digitisation, it might be around customer first principles, it might be around the vehicles we’ve got to launch. I then have to set my objectives within those success factors...as we discuss these objectives, we are able to share ideas, I can pick on his ideas and build on it and be creative with it”* (Chief Marketing Officer). The Research Technology Manager, who collaboratively developed his objectives with his senior manager explained that: *“should there be a scenario where somebody possibly over promises, and say yeah am going to do this much, the manager can say look, you probably not going to be able to do this many projects, or on the other hand, if you say this year I’ll do two projects and there’s expectation that based on this kind of resource, you should at least get four or five projects done, then the senior manage can explain this*

*to you... but the good thing about these discussions is that you can get ideas for your projects, which for me, is centred on innovation.”*

Developing performance objectives and targets collaboratively in some instances led to the introduction of new projects: *“we have a rigorous target setting process with our boss and for example, he had an objective to optimise our customer touch point in every area. So that's basically, looking at trying to improve either the efficiency or effectiveness or both, of every touch point. So by discussing this objective, we came up with ideas, we put a pitch at the Business Planning Conference where basically all of the sales and marketing communities come together and this has led to new projects which the business is now working on”* (Chief Marketing Officer). In some cases, developing performance objectives collaboratively also, triggered discussions on new skills and training that were required: *“We'll sit down with managers, and we'll write down what we think our objectives for the following year should be. They might be new big projects...or new personal development skills etc. and we'll agree them with the manager and the manager will add any that they also see fit”* (Strategy and Innovation Coordinator). The CFI, Graduate Objectives (2016-2017) document showed that, in such sessions, managers used the opportunity to motivate employees, *“because you always want enough of your objectives to be the forward-thinking ones”*(Marketing Communications Director), and this could lead to opportunity search.

In some teams the collective development of performance objectives and targets led to the establishment of earlier deadlines. This was particularly evident in departments where high prioritisation was placed on deliverables. Bringing targets forward motivated employees to get the job done more quickly and meet the demands of their existing customers within the specified time and therefore stimulated exploitation.

Business Excellence Manager 1, however, said that managers who did not involve employees in the development of performance objectives discouraged and prevented the active and creative participation of employees in achieving those objectives. He explained that: *“I had a set of objectives at the start of 2016 that were developed by my previous manager. And I would suggest that his view was very narrowly focused on the things that made him look good, right? And under his leadership it was very, very difficult for me to provide any kind of input back to say, well, I think we should*

*do something better, different, or just something innovative.*” Not involving employees in the development of performance objectives and targets had contrary effects. It resulted in disengagement and lack of zeal to be creative and constrained opportunities to share ideas which could lead to exploration.

### **5.5.3 Employee performance and project review sessions.**

All members of staff at certain times of the year or at the end of a project, went through a performance review session supported by DB’s corporate performance management assessment process (DB, TBEM Application, 2016). As part of the process employees *“write a report on ourselves, and we then analyse each other, and we do 360s of sort of performance. So, you’ll say: can you give me some feedback on what I’ve done over the last year? Do you agree with the performance that I believe that I’ve done? And then you have reviews with your senior manager to discuss it”* (Project Governance Manager). This created a rich platform for *“managers to know what you’re doing. It creates an opportunity to come and talk to them about your metrics... to discuss, and say: what help can we give you to help you get better? What is your biggest problem? What is really important to the work group?”* (Business Excellence Manager 2). In addition to this, during such review sessions: *“we look at the projects, what worked, what didn’t work last year, and then it gives me things to build on. You know, you get some advice, I think that helped me improve because someone else has given it a fresh pair of eyes and given me their view on it and then I can go away and, in the future, improve on it”* (Research Engineer 4). DB used this medium to identify areas that required improvement and deployed the diagnostic use to ensure changes were made through action logs and follow ups (DB TBEM Application, 2016). During such sessions, conversations stemming from employee and project performance also stimulated ideas which led to the improvement of existing designs, for example: *“a couple of months ago, we had finished one platform, and we came together, and our manager said let’s have a session where we look at how we’ve done in the various projects and how we can improve it for the better... then we say for the next release, how can we make this better to increase the customer’s experience based on what we found”* (Calibration Lead Engineer 1).

Such sessions triggered the interactive use of PMS and fostered exploration by examining project performance objectives and targets that were or were not achieved.

The Lead Project Engineer stated that, *“in the weekly team meeting everybody gives an update to the team based on targets set... it is like a sprint, and it's used in tech companies as a way of driving innovation and driving projects forward.”* During one of the usual review sessions, *“very late in the development of a new car, a senior person said they were disappointed with the feature in one area of the car, and that something was missing, and that they wanted to add a feature in... we had three days to collect information, locked ourselves in a room and brainstormed until we had something completely new to deliver.”* The review session fostered a brainstorm activity where the engineers explored each other's ideas and came up with a completely new feature. This also led to the birth of another new idea and car feature: *“we not only came up with a feature for that car... but we also came up with a feature for another program that's now going to go on a different car. And the only reason that that, couldn't go on the one we wanted was because it was too big a change to the car, and too big amount of development, considering the time that was left on that program... so it made sense to wait and apply it to a different program”* (Lead Project Engineer). Employee performance and project review sessions enabled the interactive use of PMS and fostered exploration as: *“a lot of technology developments, where people are contributing to in an open framework, leads to better developments. Because you're putting together lots of people's ideas that actually makes a better product* (Principal Engineer). In agreement, Calibration Engineer 2 discussed that such idea sharing sessions led to innovation: *“getting feedback from that can even make you think innovatively.”* DB also facilitated innovation through: *“something called Innovation Lab, so a key part of the metrics is to deliver innovative content, technology led content, on the stand and show a minimum return on investment for every show. And then we go through a review at the end of every show, we examine how we did, what are the learnings, are the objectives met, do we need to do something different?”* (Chief Marketing Officer).

Through performance and project review sessions, managers could highlight areas that required personal development and enhancements because: *“some managers will give you really good feedback and ideas of how you can improve yourself and other stuff... and it makes you reflect on what you've done over the year, otherwise, you just keep going”* (Project Governance Manager). The sessions created a rich platform for managers to set up a personal development plan for employees (DB TBEM

Application, 2016). A management performance review document (see figure 5.8) was used to gather information about employees’ performance. Information on the document highlighted individual performance against agreed objectives and the kind of traits an employee exhibited. The document had three main sections that aimed to determine (1) employees who performed well against their objectives; (2) employees who demonstrated good behaviours coupled with personal objective progression; and (3) employees who exhibited innovative traits, with evidence of engaging in transformation activities and leading “game changing” projects. The document aimed to identify employees’ key strengths such as their agility and flexibility (Management Performance Review Template, 2016/2017; TBEM Application 2016). By examining these documents together, managers could pick out employees with behaviours likely to trigger innovation and facilitate the development of such talent by engaging them in exploratory projects. The document also formed a basis for personal improvement and development.

***Figure 5.8: Management Performance Review Template***

Management Performance Review Summary Template 2016/17			Leadership Level: xx
Employee Name: xxx		Reviewing Manager: yyyy	
A. Delivery of Business Objectives	B. Business Behaviours	C. Business Transformation Delivery	
<p><i>Focus on overall delivery of key business objectives for the year with supportive KPI evidence. Five to Seven clear deliverables – cross referenced to Catalyst statements</i></p> <ul style="list-style-type: none"> <li>Objective 1</li> <li>Objective 2</li> <li>Objective3</li> <li>Objective4</li> </ul>	<p><i>Development and display of key business behaviours. Focus on 4 Key strength areas and at least 2 opportunities for development (to be used in feedback)</i></p> <p><b>Key Strengths</b></p> <p>e.g.</p> <ul style="list-style-type: none"> <li>Agility &amp; Flexibility.</li> <li>Clear communication</li> <li>Strong Teams.</li> </ul> <p><b>Opportunities for Development</b></p> <p>E.G</p> <ul style="list-style-type: none"> <li>Efficient Delivery</li> <li>High Performance</li> <li>Hold right people to account etc</li> </ul>	<p><i>Driving the business forwards – very effective personal management that has found/made opportunity to engage in key/corporate objectives in a leadership capacity.</i></p> <ul style="list-style-type: none"> <li>Process leadership</li> <li>Deliver lessons learned</li> <li>DB wide activity</li> </ul>	
Prepared by: yyyy.yyyyyy	Date: xx/xx/xxxx	PC file name:	
<p><b>Notes for guidance:</b></p> <p>This document is in effect the evidence gathering sheet that allows managers and our team members to assess performance and achievement, and differentiate between delivering the business, the way individuals deliver the business and transforming the business.</p> <p>The principles that this tries to drive in our assessment are:-</p> <p>Working from the LH side of the sheet - good performance against agreed objectives gets the individual to an 'expected standard' rating. This is transactional management and is the base line for expected standard.</p> <p>Moving to the middle column - demonstration of good behaviours together with personal objective progression could move the individual to 'strong' or 'outstanding' - if not they stay at 'expected' level.</p> <p>Finally the end column - evidence of an individual taking on transformation activities, such as SIPPE projects or leadership of 'game changing' activities could move them on again to 'outstanding' or 'exceptional'. Doing the expected objectives of 'getting the day job done' does not count against this.</p> <p>If they are not undertaking this additional action, then the best they can be is 'strong' - assuming they performed well against the middle column.</p>			

(Management Performance Review Template, 2016/2017)

DB also used “experience centres and events” to capture customers’ experiences using their automobiles and deliberated on necessary modifications or changes that was vital during review sessions (DB TBEM Application, 2016). The Experiential Marketing Director explained, “*we do some exit survey interviews, where we have a qualitative survey to see what people’s perception of what they experienced was. So you are always trying to refine what you have on offer and if you’ve got some data to show you which level of interactivity, you can start informing what you are doing*” (Experiential Marketing Director). Through such experiential assessment, DB captured information which was discussed during project review sessions which led to opportunity search: “*we innovate the experience to make sure that we’re always focusing on something that’s going to add value to the customer*” (Chief Marketing Officer). In agreement the Marketing Communications Director gave an example that: “*the future customer experience is an interesting one; it’s a big project that’s looking at how we can be more digitally enabled for the customer of tomorrow. So, we’re doing a next generation car configuration online which is the thing that you do to spec your car, a new version of that is coming. We’re developing more assets now using CGI rather than traditional photography. And that’s a big project just looking at all the touch points.*” Such projects were only possible through idea sharing during project review meetings where information captured through the experiential assessment process triggered the interactive use of PMS. The Product Marketing Officer agreed, “*invariably if you watch the dynamic of a meeting, any meeting that you’re in, ideas build on other people’s ideas. So, you go, that’s a really good point, that prompted something and made me think of, boom, boom, boom.*” Creativity could stem from such sessions and meetings as ideas were shared and discussed. The “Current Process Assessment document” also revealed that during such review sessions, examination of the current process led to discussions that could drive exploration, for example deliberations on reducing the number of KPIs and opting for those that could drive future innovations (MS& S scorecard, 2017/2018).

#### **5.5.4 The use of lessons learnt**

DB had an established governance and reporting mechanisms for audits. These audits provided a valuable source of learning (End of Year Performance Review, 2015/2016). Lessons from previous performance stimulated continuous improvement and future changes: “*let’s look back, let’s use the past to inform the future, so what*

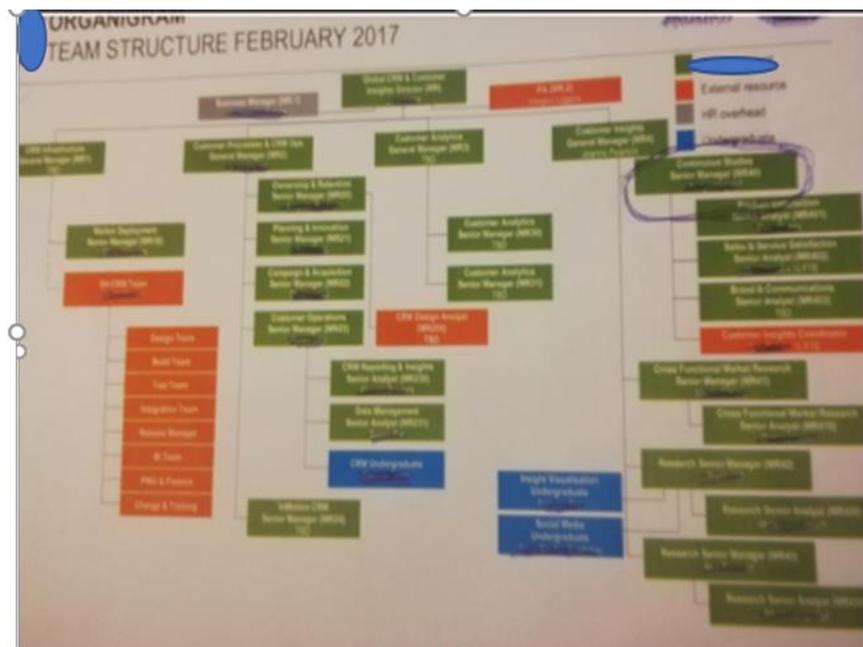
*changes do we want to make going forward?” (Business Planning Senior Manager). It stimulated questions and discussions on “how can we improve? As a team, how can we help each other out more and also make sure that mistakes that have happened in the past are not repeated” (Calibration Engineer). Previous experiences presented a good opportunity to search for new knowledge: “lessons learned, some real internal reflection about how we did it last time, we run a quite rigorous lessons learned review for everything we do. And we have some key checkpoints in our schedule to make sure that we’re addressing those lessons and having a real reflective view throughout the whole process” (Manager of Advanced Final Assembly Facilities 1). In addition to this, it “is relevant to pick up the flaws. Because people looking at the past are going to pick up what went well and go, let’s try that again. But it’s also useful to look at the flaws and go, what didn’t go well and how can we fix that?”*

Investigating areas of failure led to exploring novel solutions and options and triggered opportunity search. As a matter of fact, making mistakes and learning from them could facilitate growth because *“if we're not failing, we're not pushing ourselves hard enough. This is because you can't guarantee success with something new, and... sometimes the original project fails and no you didn't deliver it, but you've identified a different technology or way of doing things” (Lead Project Engineer). According to the Project Manager, the rate of failure was an indication that innovation took place. He mentioned that: “well one of the things that we're setting ourselves is, we want to set a certain failure rate. So we should be failing at a certain level. In order for us to do the innovation we should be saying... “Dare to Try”, well done, you had the balls to try this. It hasn't worked but well done for doing it anyway. Because unless we do risky things, we're not going to get innovation. We've got to work on the basis that there is a certain level of failure that we're prepared to tolerate” (Project Manager).*

DB enabled lessons learnt by documenting information on past projects where: *“you can go into the master projects list of closed projects and open projects, see who started them, see who closed them, how successful they are and what happened to them. And you can bring metrics out of that, for what milestone projects you are doing... And the same for TCDS projects, what gateways have they gone through, how many gateways have they tried to go through” (Research Engineer 1) to inform exploitative and exploratory projects they engaged in. The departments developed*

comprehensive sources of competitive and comparative data which addressed their needs (DB TBEM Application, 2016). This created an opportunity to learn by scrutinising data on areas where the business as well as their competitors went wrong or excelled. By deliberating on this, organizational members saw opportunities for improvements and in some cases were inspired to try new approaches. There were departments and teams dedicated to continuous studies who used past data and learnings as a guide to establish areas where exploitation and exploration were required. Information from the Product and Sales & Services satisfaction analyst and the Customer Insight Coordinator was reported to the Continuous Studies Manager (MR Team Structure, 2017) (see figure 5.9) who ensured enhancements and improvements were made after reviewing performance data and lessons learnt from customers' experiences. The Lead Project Engineer stated that past lessons: *“drives us to find alternative ways of working and alternative solutions to the problem that we've got.”* It also highlighted the best steps to take in some instances, for example: *“If you're designing an engine management control system to control the engine, as a company we've done it several times... you know the steps you have to take and therefore develop a plan. And you roughly have the idea of the timing, based on previous work”* (Principle Engineer).

**Figure 5.9: MR Team Structure**



(MR Team Structure, 2017)

DB used PM tools diagnostically as a feedback mechanism that highlighted areas where changes were required and where lessons could be learnt to inform future projects: *“we would use the feedback from KPIs to change a procedure or a process or to re-educate ourselves or feed some design attribute back to the vehicle engineering teams”* (Manager of Advanced Final Assembly Facilities 2). PM tools were used interactively to foster discussions and debates which led to exploration and the development of future car features: *“So what we are looking for next year is: how do we make it fresh? So, what do we learn from that? So, say we did this in Brussels and then we did it in New York, why was the results in New York better?”* (Experiential Marketing Director). The Business Planning Senior Manager also gave an example of how lessons learnt from past failures led to the development of a new car feature: *“when we went to Germany, there was an outright reason for rejecting the car totally. Which was that, in Germany, they're very keen on recycling bottles, and that sort of thing. And they have these standard crates that they put their bottles in for recycling. And they put them in the boot of the car, and off they go. You couldn't fit these crates in the boot of the car. But, as a result of the clinic feedback, we went back and changed the design of the boot, so it would fit a standard recycling crate into it.”*

With regards to past lessons: *“you see it's really just reflecting, its main purpose is to look back on our Q3 results, so there's the looking back bit and then it's saying, well, what do we want to do going forward, really? And it's purposefully written to be quite provocative”* (Business Planning Senior Manager). Past lessons were also used in problem solving models: *“we can use how we have solved stuff in the past to help us define how we solve stuff in the future”* (Design and Innovation Research Manager 1). These problem-solving models had PM practices embedded in it and deploying them to conduct root cause analysis triggered conversations that led to search for new options: *“Well, you need to understand why you haven't achieved it, look at past performances and say, okay, these are the reasons why we didn't do it, then you do your root cause analysis and discuss it with the team, then find newer and better options”* (Business Quality and PR Manager).

Although failures in projects highlighted by the PMS did not always inform or lead to the production of intended features, several lessons were learnt from it, for example: *“we might not deliver a physical piece to go on a car, but we might have*

*lots of learnings and findings that will impact the future vehicle*” (Strategy and innovation coordinator). This meant that lessons learnt could drive exploration. In some cases, even if lessons from ongoing projects were not applied to that particular vehicle programme, it had the potential to trigger something new in other projects and therefore *“it's not always right to say this project didn't actually make it onto the vehicle, because quite often it's the case that this project triggered some other research which did make it onto the vehicle”* (Design and Innovation Research Manager 2).

## **5.6 The diagnostic use can enable exploration by focusing attention on creativity, innovation, and exploration**

Although previous studies have mainly associated the diagnostic use of PMS with exploitative activities (Marchand and Raymond, 2008; Micheli and Mari, 2014; Miller et al., 2015), and in some cases shown PMS to constrain exploratory activities such as radical innovation (Adler, 2009; Kolehmainen, 2010), this study reveals that the diagnostic use could also enable exploration and was not solely detrimental to exploration but was required to focus attention on creativity, innovation, and exploration in various ways.

### **5.6.1 Using innovation centred measures, targets, and objectives**

*“In an innovation context, I think that the correct performance measures can very much promote innovation and an innovation attitude”* (Research Manager)

In some departments, the request for at least three USPs per year fostered the need to engage in exploration. Innovation centred measures, targets and objectives were vital to ensure employees did not get caught up in their usual day to day activities without innovating: *“Unless there's a point, a line item in that performance review that includes innovation, then it's hard to get people to acknowledge that as an actual indicator of performance. It becomes difficult to see it being pushed”* (InControl Apps and Connected Technologies Manager). The Advanced Manufacturing Senior Manager stated that: *“I think without staring at them as a performance objective you are not going to do anything because there's no driver.”* He gave an example that: *“Mike's team will have an objective to carry out X number of innovation activities through the course of the year”* (Advanced Manufacturing Senior Manager) which

gave his team the drive to carry out exploratory activities: *“Some projects will have performance targets that are related to innovation and, you know, new techniques, new processes, and that type of thing, they’re basically inventing things”* (Paint Manufacturing and Engineering Senior Manager). It was noted that in some departments, to drive innovation, setting ambitious innovation-centred targets was crucial: *“we’re constantly trying to make sure the idea hopper’s full and that we’ve got new projects that are always ready.... we set ourselves really ambitious targets... we set ourselves a target of how much money we’re going to make for the business this year. Like, it’s quite a lot of money, we know we would never reach it, but we said to ourselves: if we had a couple of big win projects, we’d get there. So, the team is constantly doing innovation projects and developing something new”* (Lead Project Engineer).

The document “Lead Project Engineer CFI team objectives (2016/2017)” clearly showed innovation being pushed in the team through the establishment of a target of delivering at least two USPs annually, running one Gen Y focused innovation event, filing at least four customer feature patents and championing “project Blue” in delivering a new feature. Having innovation centred targets acted as a reminder and stimulated commitment to innovate: *“the target helps. It kind of is a reminder and it’s a sort of... you know, we said to ourselves we were going to do two innovation projects this year. We committed to that so we’ve got to find a week where we can all get out of the office and we’ve got to go and do that innovation event. And so, I think it encourages you to find that time, whereas maybe you would be busy with other things”* (Lead Project Engineer). For instance: *“the request to have USPs drives us to innovate. I suppose the whole measurement, all the research projects that we are asked to put through are driving us to generate projects and generate ideas.”* (Design and Innovation Research Manager 1). Furthermore, *“DB measures patents. And numbers of patents and set targets for patent generation”* (RIT Funding Senior Manager), which promotes investments in innovation.

DB emphasized the need to continually anticipate new market trends and explore novel mobility business models. The organization aimed to remain competitive by focusing on innovation, creativity and designs for future customers (DB TBEM Application, 2016): *“If you look at the bigger picture, we’re always trying to get to 2021. Then much better metrics describes what the bigger challenges are, and the*

*more aggressive will be. And then you have to think innovatively because you can't get there with tactical solutions"* (Business Excellence Manager 2). Such focus did not only lead to creative thinking but also stimulated actions required to achieve those objectives: The Project Governance Manager stated that: *"the way you would bring in innovation is to give them an objective in innovation or an objective to do some innovative thinking. So, I've created my objectives based on what innovation we want to do over the next year, it just pushes you to do the project."* He explained that, without innovation centred objectives and measures, employees could neglect exploration in favour of exploitation. He gave an example that in the R&D department: *"they're supposed to use 5% of their time to do innovative projects, and I don't think anybody actually uses it. And it's not because they wouldn't love to do it, but they've got other objectives to meet, and there is not an objective to have 5% of your time doing innovation stuff. So, if they want to push innovation, I think that you'd push it into an objective."* In agreement the Business Excellence Manager 1 explained *"performance management and performance measurement systems need to be sensitized to the organization to make it relevant to them. So, if innovation is important for your product, you need innovation KPIs in amongst the product development team."*

Having the right objectives was necessary to make room for exploration, otherwise the business could become susceptible to falling into competency traps: *"you always want enough of your objectives to be the forward-thinking ones. Because the reality is the business is hugely complex, everybody is always very busy. You can very easily just spend all day dealing with all the stuff of today. But of course, you've got to give yourself enough bandwidth to make sure you're heading in the right direction longer term"* (Global Marketing Communications Director). The Project Governance Manager explained that the right performance objectives could also foster innovation: *"you have to do stretch objectives, stuff that you wouldn't normally have to do. So, if you are really pushy and you really want to do well, then a lot of people do extra things such as using that 5% of their innovation time to do extra projects or to run different initiatives."* Using PMS as: *"part of the performance monitoring is to be able to recognise appropriate stretch. So, we're encouraged through our objectives and setting objectives to use the phrase smart in a specific measurable sort of stretch"* (Advanced Manufacturing Senior Manager). The Business Excellence Manager 1,

who's department had no clear KPI centred on innovation explained that although employees at DB were encouraged to use 5% of their working time to engage in exploration: *"If we had a target to take, you know, even 1% of those ideas and take them through to evaluation, I think you might be able to force a rate of innovation greater than what we're currently achieving. So innovative thinking is encouraged. And there are ways that employees can share their innovative ideas internally. But there are no KPI driven targets to actually, drive that."* This meant the lack of KPIs centred on innovation could have detrimental effects on the organization's capacity to innovate.

Although there was consensus that having innovation centred targets, measures and KPIs could drive exploration, the scorecards in some departments did not have clearly defined innovation centred targets and KPIs (MS&S scorecard, 2016/2017; MS&S, 2017/2018). The Paint Manufacturing and Engineering Senior Manager explained that: *"if you direct the people to do something that's innovative, then it will force them down a certain route of inventing something new."* However: *"sometimes without the appropriate tensions and pressures there's a tendency for us to just do the same thing again and again and again"* (Advanced Manufacturing Senior Manager). The departments without innovation centred targets or KPIs, engaged in limited exploration. In agreement, the Business Planning Senior Manager stated that: *"what I'm trying to push, is trying to use smarter KPIs, I say, well, let's look at more predictive ones, let's have a look at how many website hits we've had, let's see what the journalists are saying."*

### **5.6.2 Using flexible measures and performance targets**

Due to the uncertain nature of innovative projects: *"At the start of the year there's usually a bit of unsettling on exact dates. You kind of make your first guess at the start of the year in alignment with the vision of success document. Then everything gets reviewed quarterly by the teams. We look at what's the latest timing and what's fallen off the table because there is an expectation that we're never going to achieve everything"* (Research Manager). To drive exploration, employees used an agile approach (Product & Process Enabling Technologies Document, 2016) by employing loose or flexible measures for milestone projects: *"we'd forecast that the project might take 18 months, but when we've done two months or something like that, we might*

*say, well, we need more than 18 months. This is going to take a lot longer... we plan in short phases, we do agile, and that gives us the flexibility. We are very flexible, and the processes are designed for flexibility” (Business Quality and PR Manager).*

Departments and teams that engaged in high exploration had a higher level of flexibility, for example in the R&D department: *“we've set new targets and we're setting new metrics as we're going along, and it's because research is a changing environment, we have to realign our metrics to what the business needs. And we're actually assessing our projects a lot better as we go along... one of the things that we have to be as a business is to be agile and be prepared to change. So, we change as and when required, depending on the circumstances” (Project Manager).* Innovative projects were done in phases and timelines were revised as the projects progressed through the development stages: *“we only do the detailed planning for the next phase. We know what the phases are, but we don't do any detailed planning, we don't do the conventional waterfall. We do agile, and that actually gives us the flexibility to move around. If projects need to take longer or can be done quickly, we get a better idea, and every gateway that we go through we reset the baseline” (Project Manager).*

Teams and departments that had greater level of flexibility engaged in various exploratory activities because: *“the targets offer the flexibility to do both. The way we do the targets is quite loosely defined, so that allows for if something more important comes along. But most of my targets are a bare minimum. So, I see it as quite a flexible thing.” (Coordinator of External Communications).* Employees who were empowered and given autonomy to define projects with flexible or loose measures engaged in exploratory activities. The Principal Engineer stated: *“Be a bit more flexible, otherwise you're never going to explore or innovate... You're never going to develop the skills that the people need. In my view, less performance metrics would help. More freedom for the team so, instead of saying, I want feature A by this timeline, and feature B by that timeline, if we said, well okay, we're working on autonomous driving guys. We've got a pot of money here, we'll need some sizable technology, and some ideas and concepts of how we can do it. So, a looser framework, giving the project teams a responsibility to not only develop the technology, but come up with what they think they can deliver. It gives them the empowerment.”*

Giving employees autonomy through flexible measures meant that: *“you have the authority to modify the system as you find things change through time, this would certainly be a benefit, whereas if you have to stick rigidly to the measurement system, then it could constrain what you want to do, be it innovation”* (Paint Manufacturing and Engineering Senior Manager). In agreement, the Project Governance Manager explained that without flexibility, exploration could be constrained, however, the presence of measures was necessary to encourage employees to engage in innovation projects in the first place and explained that: *“I’ve had the opportunity to choose what projects we’re going to be doing... I’ve created my objectives based on what innovation we want to do over the next year. But where you are told, oh, you’ve got to finish a project this year, you’ve got to do this and that... that sort of thing, it might stifle it but, in some ways, it just pushes you to do a project.”* Business Excellence Manager 2 expressed the need for managers to give employees: *“some time to breathe and put some of these suggestions into practice as well. To create some windows of opportunity where they can put those ideas into practice.”*

Flexible targets were vital due to the dynamic nature of projects: *“At the beginning of the year, you can plan things, but things always change. Yes, so it’s not like unchangeable targets. It’s a flexible system. So, I think it works quite well”* (Lead Research Engineer 1). The level in which a department or team engaged in exploration: *“depends on how strictly your manager makes you stick to your objectives, where I’ve worked previously, it’s been very flexible. Go and do... As long as you do your objectives, you go and you do whatever you think you need to do to do your job. So, I’ve had lots of space to do extra bits and innovate around and stuff... If you’re very stringent on the measures, then it would deplete innovation”* (Project Governance Manager). The Project Governance Manager further explained that he liked having performance measures and targets: *“because it pushes you to do certain things that you’ve got to do for the business, but you do have to have some flexibility on allowing people to make up their own minds and do things their own way.”* Various teams adopting an agile approach engaged in exploration: *“when we set ourselves performance objectives for the year, they are quite open, so changing between projects and that fluidity is possible, and we know that’s how our team functions”* (Lead Project Engineer). Innovation was viewed as a process that mandates changes and thus, as processes changed, it was essential that measurements were tailored to

accommodate the changes: *“an important part is being able to keep the measurement systems flexible as the projects develop”* (Paint Manufacturing and Engineering Senior Manager). Measures were noted to: *“drive innovation if you word them right and you allow some flexibility in what you're giving them to do”* (Project Governance Manager) and if employees: *“have a bit more flexibility on timing, because you're actually doing innovative work. It is very difficult to time”* (Principle Engineer).

In was also essential to: *“trust the people. Enable them. Support them. Encourage them. Don't worry about mistakes, because that's learning. Because it actually makes a better solution... By giving an open framework, let's give it a go. Encourages people to take the extra stride... trust the engineers with their managers to come up with technological proposals for innovation...”* (Principle Engineer).

In other departments target deadlines were brought forward not only to drive exploitation but also exploration as room was made to resolve new challenges that emerged: *“we had a look at the compressed launch cycle, shifted the milestones left. And then, from doing that, giving ourselves the ability to manage innovation more effectively. And by bringing all your milestones left, you give yourself more time to recover when those problems arrive”* (Business Excellence Manager 1). Evidence from company documents showed that flexibility of targets and measures encouraged managers and their team members to engage in a range of innovative activities (Lead Project Engineer CFI team objectives, 2016-2017; CFI Graduate Objectives 2016-2017).

## **5.7 Why the diagnostic use is critical to support and enable exploration**

This study's findings also counter claims that the diagnostic use is unrelated or detrimental to exploration. On the contrary, the diagnostic use of PMS appeared to be critical for exploration.

### **5.7.1 The diagnostic use ensures that exploration-related activities are aligned with the organizations mission, vision, and values**

DB used PMS to align employees' objectives to the organization's mission and vision. PMS enabled processes that provided a framework and set parameters for innovation. Calibration Lead Engineer 1 mentioned that: *“I imagine how people call them [PMS]*

*constraints, but I try not to think of them as constraints but rather, I look at them as parameters which I should work within... it's all well and good to sit down and try and be innovative, but you have to also take into account the business side of things."* In agreement, the Research Manager explained that: *"in the innovation environment, if we don't have some level of control, people will just run away like puppies in a park and play with all sorts. And you'll get to the end of the year and there'll just be this amazing mess that somebody else will have to come and pick their way through. So, yes, it's like I said at the start, it's a necessary evil"*.

The diagnostic use of PMS was used to ensure that all exploratory activities carried out were in alignment with the business goals: *"You're only given the ability to innovate within a threshold. You're not given a blank canvas and infinite money and told: do what you like. You need the metrics, otherwise you become that department that does what it likes"* (External Affairs Technical Coordinator). According to some interviewees, by setting the right metrics the right type of innovation could be attained: *"Because one thing that you will regularly hear back from anybody is, why should I be innovative, when my idea doesn't make it through to delivery?"* (Engineering Strategy Engineer). DB therefore deployed a well-planned strategy enabled by PMS to ensure control (Jenga Model, undated) and standardisation that facilitated the structuring of new ideas (TRT T500 Lean Doc, undated). Employees were given a high level of flexibility to engage in exploratory activities that were directed towards the achievement of set goals (Product & Process Enabling Technologies Document, 2016),

Although employees were given freedom to engage in exploration, they however had regular one to one meetings with managers to ensure that their projects were aligned with the mission and vision of the business (Lead Project Engineer CFI team objectives, 2016-2017; CFI Graduate Objectives 2016-2017). The Management Performance Review document was used to ensure this. The document was designed to assess whether employees' performance - including their participation in exploratory activities, innovation initiatives, projects, and ideation - were in alignment with the corporate business objectives (Management Performance Review Template, 2016/2017). The End of Year Performance Review (2015/2016) showed transformation and improvement activities were aligned to the strategic intent of the business. Some of the activities such as lean and Six Sigma had practices embedded

in them which were fostered by PMS and showed areas where novelty and value could be added to customers or processes, leading to exploration but these practices enabled by PMS also ensured ideas aligned with the organization's scope of operations (TRT T500 Lean Doc, undated).

The Engineering Strategy Engineer explained that using PMS was necessary to ensure innovative ideas, processes and projects met the necessary requirements: *“when you have a new component, then you need to be clear, of course. It needs to comply with the requirements of the car.”* He further explained that some of the innovation projects proposed did not necessarily align with the specific vehicle program and were rejected, and therefore highlighted the need for engineers to understand the scope before deciding what innovative projects to engage in: *“one thing that you will regularly hear back from everybody is: why should I be innovative when my idea doesn't make it through to delivery? My idea should be in a car.... the idea should be aligned to a specific car. So, when you set a clear measurement and target saying: for this and this car, we need a USP in this and this field in innovation. Come up with something... It needs to be aligned to that... Blue-sky stuff is nice, but the motivations of course often become lacking because they end up somewhere and never make it through”* (Engineering Strategy Engineer). Projects that were not progressed in most cases discourage employees whilst, on the other hand, *“the biggest win is if something you've done reaches production and is successful, but in order to be successful it needs to meet criteria”* (External Affairs Technical Coordinator). DB also deployed an Enterprise Risk Management framework that outlined what DB's tolerance for risk was and that risks taken when engaging in exploratory activities were within their predetermined levels of acceptability (DB TBEM Application, 2016).

### **5.7.2 The diagnostic use gives structure to exploratory ideas and supports new product development**

The diagnostic use of PMS was also critical for the progress of innovation projects, because, without it, employees could “get stuck in their own world” and may not know when an idea or innovative initiative should progress to the next stage: *“being a commercial business, it's great having blue sky thinking, but it's got to end at some point. As an engineer, who's working on a new piece of equipment or an invention, for them they still need constraints, or otherwise they could be working on that for*

*five years before you actually have anything measurable at the end of that”* (Project Engineer). Clear structure and guidelines were important to progress innovation, and creative thinking was only valuable if it became a product and thus the use of PMS to provide clear guidelines was vital: *“So, I think it’s good for innovation to have clear guidelines and deadlines. But, of course, you also, at some point, you need to principally stop and say, get it down to paper, and deliver what you anticipate. And try and work on not doing blue-sky research only. Also, align it then to delivery. At the end of the day, get a product out.”* (Engineering Strategy Engineer). In DB’s case, getting new ideas was not the problem, but rather translating the ideas into a finished product was where the challenge lied: *“We’ve got a lot of ideas. The problem is making these ideas reality. This is where it sucks... But making the ideas actually into something physical that could work, and then integrating them into a car”* (Engineering Strategy Engineer). Thus, the use of a structured framework enabled by PMS was essential to enable ideas to progress through various innovation development stages till it became a finished product. TCDS with its features and performance measurements helped translate ideas into products and revenue for the organization: *“The Company wants TCDS features, because they translate into money, because they get features on the car. So, that forces the timing. You need a little bit of that”* (Principle Engineer). The Business Quality and PR Manager stated that: *“in terms of creativity it's not a question of stifling creativity, it's just a question of putting some sort of framework around it which actually helps the engineers to deliver the technology. Because you can have a mad scientist who can do lots of things but never deliver anything.”*

The TCDS system DB employed filtered ideas and ensured that novel ideas went through the necessary stages (DB TBEM Application, 2016) and helped progress projects through the use of KPIs: *“TCDS is a process and this comes with KPIs, so the PMS applied unto TCDS... just gives you structure and then you can measure how many things are entering that structure, how many things are half way through the structure, and how many things have left the structure, so the KPI would be how many got into the TCDS”* (Research Technology Delivery Manager). This study also shows that: *“there is value in having an innovation process that has a gated series of KPIs through it. So, for instance, to deliver an innovation, you need hopper of ideas that gets filtered to enable you to understand, what's worth pursuing? What are the steps*

*in taking one of those ideas, evaluating them? And then, having evaluated them, turning them into a product, a service, or a behaviour”* (Business Excellence Manager 1). Furthermore, the Paint Manufacturing and Engineering Senior Manager explained that a framework enabled by PMS was vital: *“So if, for instance, something that is an innovation project, let’s say, goes away from the requirement of the business needs, then, yes, it may constrain the innovation aspects of it, but keeping it in line with the performance requirements of the business, yes, so an important part of that is being able to keep the measurement systems flexible as projects develop. If they’re cast in stone at the beginning of the year, then you won’t be able to keep them in line with the business needs”* (Paint Manufacturing and Engineering Senior Manager).

The KPIs helped evaluate how successful the department was at reaching its forecasted target and forced the progression of novel ideas into new products. Senior Research Engineer 2 stated that: *“it can force things to happen, so it gets technology onto a vehicle, or it gets technology out there in the business.”* It helped translate innovative ideas into deliverables: *“we don’t want to constrain innovation, but we also want to have deliverable projects, so it’s getting those ideas bubbling out, and then sort of filter them and start building on them”* (Design and innovation research manager 2).

Projects or ideas were evaluated against certain performance criteria and were pushed through numerous stages till they reached the manufacturing stage: *“There are times when you have projects which is key, but will never actually get to a vehicle because no one pushes it through, and the process does push it through, but in a way it can help innovation get from an idea to a car.”* (Senior Research Engineer 2). The Research Technology Delivery Manager explained that: *“TCDS, with its measurements, helps us to drive this innovation to something that really becomes a product, so I think what is good about a TCDS is that it makes sure that the ideas which we generated just doesn’t evaporate... and having the measurements there, we are actually giving the idea a much better chance to survive in the world of engineering and make it to production... where we can take it to the stage where we can put it into the customer hands”* (Research Technology Delivery Manager).

As ideas progressed through TCDS, performance data was collected and evaluated, and used to make key decisions on the next steps: *“because you start off with just an*

*idea, you actually do just a bit of work on it, try and ok, is it a product? ... You then go to a decision point whether we should invest in it further. So, creativity still needs a structure”* (Senior Research Engineer 2). The RIT Funding Senior Manager also explained that: *“I think that’s where things like the TCDS start to come into play. That then having got an idea developing and evaluating and testing and verifying that in a very controlled way I think is a good thing.”* It facilitated the new product development process by determining projects that had to be dropped at the right time to ensure resources were allocated to those that required it: *“making sure that people are working. And one of the key things that’s actually going to help us on the innovation front, and help on the delivery side, is being able to make decisions quickly. If a project is not worth doing, we should stop it sooner rather than later. And one of the problems that we have is the emotional attachment that people have with projects. They think that because they’ve started a project off, if they stop that project, it’s a failure on them. We need to break away from that and say, if you stop a project it’s not a failure, it’s a success, because you’ve actually helped save resources which can be deployed on doing something else”* (Project Manager). Performance checks such as safety checks were also made to ensure the suitability of the innovation: *“There are certain things that need to be in place for it to be part of a vehicle programme so, yeah, it does make sure we address failure modes, if we address the business case, it does make sure that we do a number of other activities, to make sure that it is fit for purpose when it gets to core”* (Project Manager).

A setback noted, however, was that once a novel idea progressed through the system, room for significant changes was narrowed: *“once you enter the process it’s harder and harder to come up with any radical ideas and, if there are, or if you do come up with radical ideas halfway through. I’ve got this situation, at the moment, you are actually locked into, at this point you’ve locked in to delivering this idea even if the one you have is better and you’ve got to complete this”* (Senior Research Engineer). As mentioned by the Design and Innovation Research Manager 2, *“it’s seen as a necessity to progress projects and get throughput of projects, is actually trying to pin an idea down, define it, scope it and deliver it”*. Only incremental changes could be made and thus the system did not support further radical changes. The Senior Research Engineer 2, on the other hand, stated that: *“If someone came up with a new idea, it will depend on how different it is, sometimes it can fit in, and that’s great and*

*sometimes that does happen, if it's small increments, the process is good and can handle it. If it's quite a major step, but you've thought about it, you're then locked in basically delivering this, in some ways it stops those radical changes and radical innovation."*

## **5.8 Conclusion**

The findings show DB as an ambidextrous organization that manifested contextual ambidexterity at unit and individual level. It shows that DB used PMS to facilitate a range of activities, including to monitor and evaluate performance, highlight areas that require improvements or changes, focus attention and drive motivation. However, there are also issues with how it was deployed. The study reveals that the organization had a PMS that was sometimes unclear, which had an excessive number of KPIs that did not facilitate alignment as expected. This study also reveals that the PMS could constrain exploration, if used in particular ways, but could also enable OA if both the diagnostic and interactive uses were deployed. It uncovers that the diagnostic use could highlight areas that required management intervention, clarity and improvements and could focus attention on exploitative activities. The interactive use, on the other hand, could also stimulate debates amongst managers and employees to find new and better ways of doing things which could in turn instigate exploration. Interestingly and contrary to previous claims that the diagnostic use could only facilitate exploitation, this study reveals that the diagnostic use is necessary and critical for exploration. The empirical themes derived from the data that address the research question are outlined in appendix E.

## CHAPTER 6 - DISCUSSION

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### 6.1 Introduction

This chapter brings together the empirical findings and conclusions drawn from literature and discusses the main implications of this research for theory and practice. Specifically, it explains how: (1) PMS can constrain OA if used in particular ways; (2) how the combination of the diagnostic and interactive uses of PMS can enable OA; (3) how the diagnostic use is not solely detrimental to exploration as argued in some studies, but can drive it by focusing attention on novelty, creativity and innovation; and (4) why the diagnostic use is critical to exploration because it aligns exploratory initiatives to an organization's vision, mission and values and supports new product development processes. This chapter also presents a new framework which articulates how PMS can be used effectively to support OA.

### 6.2 How PMS can constrain OA

OA is crucial for competitive advantage and survival. However, it is immensely difficult to achieve due to contradictory and profoundly irreconcilable demands of exploitation and exploration. Imbalance of these activities can lead to adverse outcomes and reduced performance and therefore careful considerations must be made when selecting management tools that affect an organization's capacity to be ambidextrous. Traditionally, PMS have been shown to enable exploitative activities such as strategy implementation, formalisation, performance improvement and organizational alignment (Hanson et al., 2010; Marchand and Raymond, 2008; Micheli and Mari, 2014; Miller et al., 2015) and to constrain exploratory activities such as those required to pursue radical innovation (Adler, 2009; Kolehmainen, 2010; Micheli and Mazoni, 2010). Some studies, on the contrary, show that a PMS such as the BSC cannot constrain or enable innovation and it is simply unrelated (Hansen and Schaltegger, 2018). This study, however, dismisses claims that PMS is unrelated to innovation and reveals a clear link between PMS (and, in particular, the BSC) and

exploration. It shows that PMS can be detrimental to exploration if: (1) they focus attention primarily on output and financial measures; (2) they reinforce old practices and processes; (3) if they are strongly linked to individual incentives or sanctions.

### ***Focusing attention primarily on output and financial measures***

This research reveals that if a PMS is primarily used to focus attention on output and financial measures, the organization may fail to adapt to market changes. Focus on such measures could produce adverse outcomes in the long run by channelling employees' attention on exploitation at the expense of exploration, and thus could make the organization susceptible to competency traps (Brix, 2019; Jansen et al., 2008; Raisch and Birkinshaw, 2008; Matthews et al., 2015). Focussing attention on such measures could also reinforce the limitations of financial measures and may divert attention from relevant transformation processes towards immediate and short-term profits (MacBryde et al., 2012; Upadhaya et al., 2014; Liu et al., 2014). It could also lead to non-financial objectives being ignored although useful and noted for enabling exploration.

In the case of DB Automotive, departments that prioritised producing cars quickly compelled employees to work hard to meet specific deadline dates and gateways using processes enabled by the PMS. In these cases, employees paid significant attention to production and did not deviate from the targets that they were being measured against. In so doing, they pursued exploitation by enhancing the quality and reliability of existing products (Tinco, 2014) and generally opted for projects that were easily attainable or incremental as opposed to engaging in exploration, as they perceived it as time consuming. Sole focus on financial measures led to a skewed view of innovation (Camp and Braet, 2016). In departments where emphasis was placed on quick production and meeting launch dates, innovation and exploratory activities were viewed as a hindrance to progress. Innovation-related KPIs and targets were usually omitted from the BSC as attention was directed towards working fast to deliver products. Performance in such department was defined in terms of meeting volumes and thus there was no regard for creativity and search for novelty. This was particularly harmful, as KPIs did not only serve to facilitate managerial action but were also instruments of control because they were used to impose a particular focus

on managers' and employees' actions (Jordan and Messner, 2012; Watts and McNair-Connolly, 2012).

This study also shows that a strong focus on delivery and output measures can lead to tight deadlines and this appears not suitable for exploration which typically involves venturing into new and unexplored territories, and projects with lengthy time horizons, seemingly "going nowhere" periods (Akroyd et al, 2009), and pushing existing boundaries (Pellegrinelli et al., 2015; Kwee et al, 2011; Tinco, 2014; Salvador et al, 2014). In the case of DB Automotive, incremental changes were predominantly pursued, in specific departments, to avoid disrupting the production process. Novel ideas that could be incorporated in formal projects were at risk of being prematurely rejected due to insufficient time allowed for them to mature and show market potential (Criscuolo et al., 2014). In cases where innovation was attained, after the initial phase of exploration, routine practices enabled by PMS impeded further changes (Heim and Ketzenberg, 2011) by forcing the ideas or the execution of projects in a pre-determined way (Tatikonda and Rosenthal, 2000).

Furthermore, primary focus on output and financial measures could lead to considerable attention placed on technical issues such as target setting, and thus ignoring the social aspect of measurement. This could stimulate the negative effects of PMS (Pešalj et al., 2018; Smith and Bititci, 2017). For example, in the case of DB, employees in departments where reaching targets was a priority found dubious ways of doing so in an attempt to meet them and avoid being penalised. Focus on output measures was shown to stimulate "tunnel vision". The most profound case of tunnel vision was when everyday production output became the focus of all decisions and related actions. This had adverse consequences also on other areas (and on performance information reported on the corporate scorecard) as some departments opted to build vehicles with missing parts to avoid late deliveries which resulted in expenses generated from re-work or rectifying faulty vehicles as well as misuse of time which could have been channelled towards exploratory activities. This shows that the deployment of control systems such as PMS to primarily monitor the attainment of predetermined targets relying on the conventional diagnostic style of control could foster gaming (Amir, 2014). Furthermore, focusing primarily on output and financial measures could lead to significant imbalance between exploitation and exploration and therefore could constrain OA.

*If it reinforces old practices and processes.*

Controls such as PMS have significant impact on organizational performance as they are powerful mechanisms aimed at directing actions and behaviours. It is therefore not only vital that the right ones are selected but also that appropriate measures should be applied because they have the potential to divert attention towards certain aspects of performance at the expense of others (Watts and McNair-Connolly, 2012). At DB Automotive, many lagging indicators in certain departments hindered opportunities for radical changes as they focused attention on exploitation and at times on areas that were irrelevant and did not show avenues for progression. PMS produced information that was biased towards exploitation and did not paint an accurate picture of the organization. This led to confusion and failure to engage in exploratory activities. This also meant that work was done the old way, instead of focusing on alternative practices. In such cases, repeated use of existing knowledge enabled exploitation (Tinco, 2014) but hindered the discovery of new knowledge which was critical for the future viability of the business (Chuen et al., 2018; Marino et al., 2015). The use of measures that focused attention on old practices and processes also discouraged new recruits from being innovative, as the presence of such measures were viewed by longstanding employees as the normal way of doing things and therefore restrained creativity and adaptive responses. Failure to displace behaviour that was no longer critical to success presented challenges (Melnik et al., 2010) and constrained exploration.

The case examined also shows that having unclear strategic objectives can lead to debates about what exploratory activities were necessary to achieve the organization's strategic goals. Indicators that were unclear could lead to poor visibility of business performance, making it challenging for employees to engage with the organization's scorecard daily. Unclear PMS could hinder opportunities to identify areas of strength, where newer options could be proposed to ensure continuous adaptation and evolution in response to the dynamic market, and areas of weakness where new solutions could be applied to ensure better outcomes. In such instances, performance measures could create a perception of improved performance but may not actually translate into actual results (Bourne et al., 2013). Furthermore, performance metrics that were ambiguous

in their definitions and deterministic in their results could trigger problems because employees may fail to understand a newly implemented strategy or may not view it as appropriate for the circumstance or better than existing alternatives (Hanson et al., 2011). This was evident in the case explored as KPIs that did not have a clear owner or consequences for poor performance led to confusion regarding the reliability of the employee performance assessment process, which was critical for exploration as it created an effective platform for dialogue between managers and employees. Indeed, a questionable performance assessment process could create a negative experience for both managers and employees. This sometimes led to bias, stress and anxiety, and therefore reduced creativity and exploration. It could also hinder a bottom-up approach to organizational change as frontline staff, who directly dealt with unexpected problems, may not suggest novel opportunities to senior managers if they viewed themselves as victims to an unfair system. Such bottom-up flows of knowledge are critical because they can help senior managers increase their understanding of changes in technology, products, and markets, which could trigger radical innovation (Zimmermann et al., 2015; Haas, 2010).

Various studies have also shown that most organizations tend to use too many indicators that are poorly designed and implemented (Pedersen and Sudzina, 2012). Authors have also maintained that PMS can be too complex (Aken et al, 2005) and need to be updated regularly to ensure that they are aligned to changing environments (MacBryde et al., 2012). This study's findings echo these points and shows that having too many indicators is detrimental and could result in ambiguity and failure to correctly highlight areas where exploratory efforts could be channelled. Having too many indicators could lead to significant misalignment between functional objectives and corporate objectives creating ambiguity and several unintended dysfunctional behaviours. At DB Automotive, it led to organizational "myopia" as some of the objectives that were considered SMART (specific, measurable, attainable, realistic and timely) were typically short term, for example, retail sales volumes, monitored daily by senior leadership and the CEO. This type of objectives stimulated short term behaviours such as enhancing sales by increasing variable marketing cost, eventually leading to decreased profit margins. This did not only direct employees' attention towards focusing on the attainment of high sales volumes, but also created mixed feelings, as employees were excited, motivated and enthusiastic when targets were

met, but on the next day they appeared frustrated, agitated and distressed when targets were not, leading to a frame of mind that was not conducive for exploration, but one that focused on exploitation.

*If it is linked to individual incentives or sanctions*

Several studies have shown that rewards can stimulate innovation and exploration (Goodale et al., 2011; Birkinshaw and Gibson, 2004) as they can incentivise employees to work better, encourage commitment and job satisfaction which can in turn facilitate creativity and the contribution required to build an innovation culture (Santoro and Usai, 2018). If properly aligned with other organizational practices, incentives can motivate employees to reach their predefined goals (Patel et al., 2013; Kusumastuti et al., 2015) and play a pivotal role in creating a context for stretch in OA (Patel et al., 2013). Although this may be true, findings from this study show that using PMS coupled with individual incentives or sanctions could be detrimental to OA, especially if it embodies intolerance of failure. Indeed, this study shows that numerous factors could contribute to poor performance and that penalising employees for their inability to meet targets for reasons sometimes out of their control could lead to frustration and may stimulate a defensive behaviour. For example, there were instances where employees had to leave the tasks, they were measured against to support projects of higher priority. This could discourage individuals if they were excluded from receiving a reward and increase their hesitance to engage in exploratory projects due to time constraints. On the contrary, managers who inspired their employees to be autonomous and encouraged them to take risks without any punishment if mistakes were made, could drive exploration (Birkinshaw and Gupta, 2004; Caniëls et al., 2017). Indeed, it could be argued that a prerequisite for the successful use of PMS is to ensure that people are not punished for errors but encouraged through discussions and analysis stemming from the review of performance information (Bititci et al., 2006).

This study also shows that using PMS to facilitate individual incentives could mitigate idea sharing and collaboration, as individuals may develop the tendency to keep information to themselves because they may not want their colleagues to be rewarded for their personal contribution. Indeed, in some instances, employees felt that their ideas were selected and developed, without them attaining any personal benefit or

acknowledgement. They felt focusing on one person discouraged them and other people who were part of the process but were neither recognised nor rewarded. Using PMS to facilitate such reward systems could lead to individual short-term relationships and negatively affect mutual trust, and knowledge sharing, which in the long run can affect the overall performance of the organization (Pavlov et al., 2017). It also meant that the business could run the risk of losing the contribution of a team and be penalised in the long run, as ideation leading to creativity and exploration by a bigger group was reduced. Individual monetary rewards also acted as a demotivating factor as discussions held around who received more money, in the long term led to all sorts of dysfunctional behaviours that constrained exploration. The study reveals that in some instances, issuing incentives was viewed as being narrowly focused as proposing to give a reward, had the potential to drive people to be fixed on a particular area in order to achieve their target in the quickest possible way, rather than opening up to new opportunities, new problem-solving approaches, creative thinking and exploration. Individual rewards did not promote interactive communication critical for collaborative teamwork (Selcer and Decker, 2010).

This study, on the other hand, shows that using PMS to incentivize team rather than individual contribution could foster collaboration and idea sharing. It could promote socialization and behavioural integration, which are essential attributes to stimulate OA (Andriopoulos and Lewis, 2009). Recognising and rewarding team contribution could promote creativity as employees work together and motivate each other to explore and look for ways to contribute, unlike individual recognition where individuals worked in silos and competed with one another (Pavlov et al., 2017). In the case of DB Automotive, teams and departments that incentivised team contribution reaped the full benefits of idea sharing and innovation outcomes developed by multiple stakeholders with varied expertise. Using PMS to incentivise teams stimulated team ideation sessions, team participation and inspired employees to push the boundaries and bond as a group (Maestrini et al., 2018). It also facilitated team learning which enables organizational change and renewal (Bresman and Zellmer-Bruhn, 2013) and had greater potential to enable exploration as everyone in the team was coerced to participate in specific exploratory tasks. This was different with individual rewards, as incentives could not always motivate employees to engage

in such initiatives especially if the individual was already well paid or not motivated by money and therefore could decide to opt out from such activities.

Using PMS to facilitate team reward and recognition could also encourage a sense of ownership. It mitigated problems associated with individual distribution of incentives, such as losing the young and talented who could not quickly achieve a reward due to their inexperience. Incentivising teams could also eliminate fear of isolation, not being able to finish an individual project, the notion of others being viewed as receiving preferential treatment and the temptation to solely engage in exploitation or opting for easier projects. According to Asif (2017) although rewards can encourage employees to engage in exploitative and exploratory activities, significant consideration had to be made on the unique characteristics of each activity, otherwise it can lead to employees shifting towards exploitation and neglecting exploration.

### **6.3 How the diagnostic and interactive use can enable OA**

PMS have been criticised for lacking dynamism and for being rarely used in an effective way in innovation programs (MacBryde et al., 2012). Some scholars argue that PMS enable formalisation which to some extent stabilises existing operational practices and could be a barrier to change. They argue that even the most robust PMS can fail to support radical innovation and it is unable to bridge the gap between exploitation and exploration (Hansen and Schaltegger, 2018). On the contrary, findings from this study show that a PMS is not just a mechanistic tool, and that the diagnostic use can facilitate exploitation and interactive use can drive exploration (for example Simons, 1994; Srimai et al, 2013; Tessier and Otley, 2012). Although there have been discussions around how the diagnostic and interactive use could enable exploitation and exploration, this study extends existing theory by illustrating how PMS could be deployed in a specific context to drive OA. Specifically, it shows that PMS can drive OA through:

#### ***The use of performance information***

This research shows that performance information does not only enhance efficiency but can also drive innovation and exploration. In DB Automotive, PMS produced sales information that was examined and used to determine customers' needs. Such

information highlighted areas where existing products could be improved: for example, it revealed that sales of a particular car launched in the German market underperformed due to the design of the car. This led to the development of a better design that suited the target group. This finding aligns with Asif's (2014) study which shows that performance information could be used to improve customer and after sales services and thus foster exploitation. Financial measures could highlight problems and their possible solutions (Baird and Su, 2018), whereas non-financial measures such as customer satisfaction could also provide forward-looking information (Bouwens and Kroos, 2017).

Using such information interactively could lead to the identification of new customer preferences and enable better forecasting by asking questions based on current performance and seeking different opinions. It could help reveal possible effects of future decisions and highlight gaps in performance compared to competitors which could then be addressed through action plans. It could lead to idea sharing with external parties such as external designers and inspire creative thinking and exploration. Information on the BSC could also show how well or badly the organization was performing and stimulate change from a bottom-up approach through a series of ground level change programs (MacBryde et al., 2012).

Operations performance information could also be used to understand and establish workload plans, capacity planning and resource allocation which could lead to alterations to processes and reformulation of strategy. It could help highlight waste in processes as well as identifying new value streams. In the case of DB Automotive, real time performance data showed specific and vital areas of the plant's performance. For example, it showed constraints and bottlenecks in the system, and the diagnostic use was employed to focus attention on such areas to ensure improvements. Such information was also used interactively and led to discussions between managers regarding the search for new options aimed at eradicating the root cause of problems, leading to a long-term solution. KPIs could show the progress of business initiatives leading to deliberations and discussions on how things could be done in a better way. It could show how projects were performing, whether budgets were met and reveal unexpected or escalating cost.

The study also shows that the interactive use could facilitate company-led or employee generated challenges to attract various ideas and new problem-solving approaches. It could encourage employees to take a step back from the usual ways of operating and look at things differently, triggering discussions regarding how work could be done effectively and efficiently, and thus inspire creative ideas. Using such information interactively could also prompt people to apply specific solutions to different scenarios to achieve novel outcomes. By revealing organizational problems, different experts could come together to discuss different ways forward. This shows that using performance information diagnostically and interactively could foster OA.

### ***Collaborative development of performance objectives and targets***

As shown in recent studies, the successful implementation and utilisation of PMS is intimately dependent on eliciting certain psychological and behavioural responses (Beer and Micheli, 2018). People are inherent parts of the measurement process as opposed to the distinct features and therefore, for employees to engage in performance improvement initiatives, they need to be involved in the development of measures related to the initiatives (Beer and Micheli, 2017). This study extends these theoretical findings by throwing light on how employee engagement - through the collaborative development of performance objects and targets - could drive OA. An individual's understanding and interpretation of performance measures could influence their actions which eventually affects the performance of the organization (Gopal and Thakkar, 2012). This study shows that setting performance objectives and targets collaboratively could foster OA because it mitigates the possibility of misunderstanding set objectives and stimulates encouragement and positive engagement in achieving them. When employees see alignment between their understanding of performance goals and the demands imposed by performance measures, they are more capable of acting towards the attainment of such goals. However, if PM practices do not reconcile or reinforce understandings of performance, it is doubtful that they will lead to achieving strategic results (Beer and Micheli, 2017).

Discussing the removal of irrelevant or unachievable objectives or targets, finding replacements for old ones, as well as predicting or forecasting future objectives or targets collaboratively, could lead to idea sharing and debates. Developing

performance objectives and targets interactively could facilitate the attainment of shared goals and values through a single language platform. Building such a common communication platform could enable the exchange of different perspectives, information sharing and incorporation of opposing opinions more effectively (Li, 2013), which could stimulate OA. In such instances, the diagnostic use of PMS could ensure that employee's values and work ethics are aligned to the overall corporate performance objectives, whereas the interactive use could encourage employees to engage in performance related activities and motivate them to put their own words or contributions into action and give their best towards the attainment of the predicted performance outcomes (Caniëls et al., 2017; Kusumastuti et al., 2015). Developing objectives collaboratively could also help employees view themselves as potential partners and important assets and thus could stimulate the likelihood of striving to achieve superior performance (Tung et al., 2011) and OA.

The research unveils that developing objectives collaboratively could also create a rich platform for managers to examine the employees' proposed objectives and scan them to find areas that require newness, identify potential development opportunities, or give suggestions that could inspire creative thinking (Herzallah et al., 2017; Chuen et al., 2018; Marino et al., 2015). Giving employees the opportunity to discuss and make suggestions regarding performance objectives and targets could help establish targets that are SMART. In the case of DB Automotive, top-down objectives were loosely defined, whilst bottom-up objectives were tightly defined. The CEO set very broad objectives whilst the relevant departments and their teams agreed on specific objectives and measures that were required to achieve the overall corporate objectives. They decided on what and how the broad objectives should be achieved. Keeping high-level objectives loosely defined created room for contribution from employees at various levels, with different backgrounds, knowledge, experience, and varied business views. This created a rich platform for OA as senior management could ensure exploitation by leveraging promising solutions and, at the same time, exploration by giving junior managers and operational staff who were more aware of emerging problems and engaged in novel experimentation (Raisch and Birkinshaw, 2008) the opportunity to contribute. The joint use of such top down and bottom up approach could help individuals set their own goals that did not only focus on today's capability but also on tomorrow's plans (Watts and McNair-Connolly, 2012). It could

empower employees, increase innovation, mutual decision making and organizational agility (Selcer and Decker, 2010).

### ***Employee performance and project review sessions***

A PMS is an effective mechanism that can be used to engage managers and employees in strategy review processes (Micheli and Mura, 2017). Continuous reviews and improvement procedures are essential for PM to be successful (Elg et al., 2012) and used to influence behaviours through planning procedures and meetings where employees can openly discuss their respective performance objectives and ask questions (Beer and Micheli, 2017). During such sessions, feedback generated from performance assessments and audits could highlight areas of weakness and strength in an employee's work performance. This could create a rich platform for conversations between managers and employees regarding the assessment outcomes leading to the exploration of new knowledge or options. This study shows that an effective way of doing this is to allow employees to write a self-report of their performance, assess and reflect on it before discussing it with their managers. Prior to the discussion, managers would also examine the report and think of ways to help the individual improve and be creative. Reporting on an employee's behaviour and action could allow them to elaborate on experiential data and learn from their experiences. It is a strategy that stimulates intrinsic motivation and learning and thus could increase performance (Letmathe et al., 2012). Indeed, psychologists maintain that feedback related to work performance is a significant factor of human behaviour in organizations, as it highlights and helps adjust behaviours to meet organizational goals. This practice could help employees understand not only the consequences but also the causes of their behaviour. It provides a basis for behavioural changes to meet performance goals and facilitates continuous improvement in current practices (Letmathe et al., 2012). For example, at DB Automotive, just before the launch of a new car, a senior manager was disappointed with a particular car feature and through such meetings expressed his dissatisfaction. This triggered a brainstorm activity between engineers and led to the production of a brand-new feature. The review session stimulated a creative attitude and caused the engineers to neglect the fixed mindset they had and, in doing so, fostered exploration. This shows that such review

sessions could act as a behavioural mechanism as it had the capability to influence the actions of organizational members.

At DB, managers used PM tools diagnostically to ensure that employees' individual objectives, values and working ethics aligned with the organization's. Any identified deviations were rectified by drawing on existing knowledge and models which stimulated exploitation (Caniëls et al., 2017). The revelation of deviations also stimulated fruitful deliberations leading to search for new knowledge, opportunities and novelty which could stimulate exploration (Herzallah et al., 2017). Future performance objectives based on current performance were discussed, knowledge gaps identified, and dialogue regarding mitigating or stretching set targets focused attention on exploitation or exploration. Such review sessions could create a platform for managers to address employee's concerns and therefore increase their commitment and emotional attachment to the organization (Tung et al., 2011). Managers could scan and search for behaviours that were likely to trigger innovation and to engage in routine meetings with such employees to nurture and develop their capabilities. At DB Automotive, managers used such opportunities to encourage employees to opt for forward looking objectives and engage in exploratory initiatives.

Frequent project reviews are significantly effective because they support learning and adaptation to problems as they emerge and help refocus resources and energy to manage uncertainties (Tatikonda and Montoya-Weiss, 2001). Using PMS interactively to facilitate discussions on factors that affected projects such as speed, quality and cost could lead to opportunity search. Project review sessions could provide an avenue for managers and their employees to creatively build on ideas stemming from project outcomes that have the potential to create value for the business. The interactive use could facilitate dialogue between managers and employees and give each party a fresh pair of eyes on how future improvements could be attained. It could signpost them to areas where new enquiries could lead to novel discoveries. A joint examination of what worked or did not work and problems encountered could lead to ideation, knowledge sharing and radical innovation. Regular interactions with employees through project review sessions could enable managers to improve the efficiency of existing processes and manage deliverable risks (Sohani and Singh, 2017). It could also promote a supportive culture which is crucial for OA (Gibson and Birkinshaw, 2004). Discussions during project review sessions

could lead to the identification of internal and external parties required to progress certain initiatives and collaboration leading to new idea generation, creativity, and innovation. Project review sessions could bring together various specialists who could evaluate projects and explore each other's ideas and therefore using PMS to enable this could facilitate OA.

### ***The use of lessons learnt***

Organizations are only viable if they operate on structures enabled by formal systems and, without guidelines informed by previous learning and experience, firms cannot function (Sydow and Schreyögg, 2010). A PMS is a vital tool that can facilitate learning from past performances to achieve better future results. When organizations resolve problems, they acquire knowledge that can be used to solve similar problems in the future. This knowledge regards what worked or did not, and helps the organization avoid dead ends or selecting unfruitful options (Adler, 2009). Past lessons are vital for future changes. Findings from this study reveal that the diagnostic use of PMS could help organizations capitalise on lessons learnt by facilitating audit processes and capturing information on past failures and successes necessary for future decision making and organizational transformation. In fact, failure to collect and analyse such data could impede an organization's ability to learn. It means that the organization may not be able to take advantage of knowledge that emanates from experience and therefore could impede organizational learning which is crucial for growth and survival. Organizational learning occurs when data about performance is acquired, interpreted, corrective actions taken and feedback about the actions is obtained. This process facilitates a continuous cycle of learning and adaptation (Barnes and Hinton, 2012). Feedback loops based on lessons from previous performance could help drive search for new knowledge, better or novel solutions, project transformation and reformulation of strategy (Micheli et al., 2011; Miller et al., 2015; Oke and Idiagbon- Oke, 2010; Saunila et al., 2013) It could activate a positive cognitive process and help employees understand the requirements of their tasks, and revise their actions and priorities (Letmathe et al., 2012). This study shows that using the interactive use of PMS to analyse the root cause of specific performance outcomes could help prevent future mistakes when exploring novel solutions by highlighting steps, processes or investments that should be avoided. It could form building blocks for future breakthrough initiatives as certain principles could be

applied to totally different scenarios to give radical outcomes. It could also throw light on possible effects of futuristic decisions and lead to changes in an entire process or re-education of employees. It could motivate employees to find alternative ways of working, new options, and solutions. By capitalising on past experiences, the best course of action for a specific problem could be identified and could inspire the organization to take a new direction leading to future changes. Better exploitative opportunities and cost reduction strategies could be deployed because before improvements are made, elements that may not be necessarily valuable, highlighted by previous work, could be omitted from existing developments. Past performance captured by the diagnostic use of PMS could result in using existing knowledge to drive exploitation, whilst the interactive use could encourage search for new knowledge and thus drive OA (Kang and Snell, 2009; Lisboa et al., 2013; Bravo et al, 2018). In the case of DB Automotive, cost and spending discrepancies shown in past projects led to the deployment of the diagnostic use of PMS to focus attention on areas where existing competencies and capabilities could be exploited. In some instances, it also helped the organization identify new strategic capabilities. Failures also led to the identification of new customer requirements and improvement of car features. The use of lessons learnt helped inform future projects as comparisons between what worked and what did not were made and used to guide opportunity search (Srimai et al., 2011).

The study shows that constant referral to lessons learnt could also stimulate a change of culture as employees are always looking for ways to do better. It could help mitigate possible mistakes and is a source of rich information where specific details could be retrieved and merged with others to drive change. In some instances, the use of lessons learnt could help highlight whether the right targets were used. Using lessons learnt from previous performances interactively could also inspire a different mode of thinking and it also showed how past solutions and problem-solving methods could be deployed for different problems.

#### **6.4 The diagnostic use can enable exploration by focusing attention on creativity, innovation, and exploration**

As noted in literature the diagnostic use of PMS enables high levels of formalisation, standardisation and specialisation which ensures strategic alignment and efficiency.

It enables a form of planning and control, which some scholars claim can be challenging to integrate in an organization that competes on flexibility and innovation (Rodney et al., 2013) and constrains the flexibility needed for radical innovation (Adler et al., 1999; Kolehmainen, 2010). Some have argued that successful new product developments do not only require adequate resources but avoidance of control procedures and practices that could restrict the freedom of specialists (Davila, 2000). They maintain that such formal systems tend to diminish employee autonomy and creativity and can cripple the agility organizations require to adapt to the dynamics of the external environment. These and other authors argue that restrictions embedded in formal systems at most may drive incremental innovation but not radical innovation (Patel et al., 2013; Mom et al., 2009) and that the management of processes using a variety of techniques and control systems tend to stabilise and rationalise existing organizational routines and thus fosters short term efficiency (Adler et al., 2009). The findings of this study, on the contrary shows that formal systems, such as PMS (and particularly its diagnostic use) could play an integral role in focusing attention on novelty, creativity, and innovation and in so doing drive exploration.

#### ***Using innovation centred measures, targets, and objectives***

Although Hansen and Schaltegger (2018) argue that PMS can support transformation processes, they however stated that the BSC is not a tool to trigger radical innovation. The findings of this study refute such claims and show that a BSC with clear innovation centred measures, targets or objectives can stimulate exploration. For example, at DB, the target of at least three USPs a year as part the organization's strategic objectives led to a good level of exploration. Without this, employees may not sufficiently engage in exploratory activities as they may be caught in their daily operational tasks or may have an idea but fail to bring it into fruition due to time constraints.

In most instances, exploration could be difficult to achieve if it is not acknowledged as an actual indicator of performance and if it is not clearly shown on the BSC and has clear targets. A scorecard with metrics that focused on innovation could show opportunities that may not be reached or challenges that could not be resolved (MacBryde et al., 2012) using the usual tactical solutions, but require a new way of thinking and doing things. Swapping lagging indicators for leading indicators could

also help predict future changes and show new trends worth exploring. Such indicators and targets also acted as a reminder and encouraged employees to commit to exploratory initiatives.

The study also unveils that a supportive culture and innovation centred measures, targets and objectives could drive motivation and give clear direction required to experiment in an autonomous but focused way. This could be attained by using efficiency measures and controls embedded in PMS to define the scope of exploration and enforce the limits in which exploratory initiatives must be carried out (Gualandris et al., 2018). In the case of DB Automotive, setting targets for a set number of patents and having objectives on innovation did not only inspire creative thinking but also stimulated actions required to achieve the objectives. The diagnostic use of PMS helped achieve this by providing clarity on areas where explorative efforts could be channelled and therefore mitigated the chances of talented employees deviating or resorting to doing the same thing repeatedly and in so doing impede exploration. Without such mechanisms, it could be difficult to encourage and support entrepreneurial behaviours or systematically identify and exploit entrepreneurial opportunities regardless of how zealous employees may be (Goodale et al., 2011). Furthermore, metrics focused on opportunity seeking rather than risk avoidance (Goodale et al., 2011) encouraged employees to adopt a broader or multiple perspective and empowered them to exhibit discretionary powers being closer to organizational problems. Such targets could stimulate creative thinking and risk taking required for exploration.

### ***Using flexible measures and performance targets***

Previous studies have shown the need to use flexible measures and targets to drive change. Without loose or flexible measures and targets, PMS would constrain innovation (Speklė and Verbeeten, 2014; Pedersen and Sudzina, 2012; Koufteros et al, 2014). Indeed, using control systems in a mechanistic way or a PMS that is not designed to deal with uncertainty could stifle innovation (Davila et al., 2009). This study extends theory by showing that to attain a balance in exploitation and exploration, using flexible measures was a prerequisite because it had direct impact on invigorating autonomous behaviours required for contextual ambidexterity. At DB Automotive, departments that gave employees autonomy to define the type of

innovative projects they wanted to explore, in alignment with the organization's strategic objectives, had flexible measures in place. The department understood that such employees required flexibility, space, and time to carry out their tasks without being constrained by rigid targets. Using PMS to promote a supportive culture that enables employees to take ownership of their tasks and make room for mistakes and failure was critical (Chuen et al., 2018; Gibson and Birkinshaw, 2004). Having flexible measures and targets could create a platform for better solutions and the opportunity to generate new ideas that came from mistakes previously made. It could make room for changes between projects and allow a level of fluidity when dealing with uncertainties. It could also facilitate adaptation, alterations, and amendments in new product development. Smart predictive KPIs and stretched targets could be used to help drive exploration especially if aligned with future trends. In the case of DB Automotive, some departments had a level of flexibility to reach set milestones and timelines to avoid constraining exploration.

Although this study reveals that flexible measures and performance targets are crucial to exploration, it also illustrates that careful consideration should be made to ensure that the measures and targets were not excessively loose, otherwise it could raise questions on their ability to serve as effective instruments of control. Indeed, managers must pay significant attention to selected measures and indicators by instituting forms of reporting or evaluation to ensure that they are appropriate and relevant (Jordan and Messner, 2012). Enabling a certain level of flexibility by using broad non-financial measures and efficiency through financial indicators could foster exploration as both are not mutually exclusive but rather complementary (Patel, 2011; Jordan and Messner, 2012). Flexibility ingrained in organizational culture could stimulate creativity whilst norms of efficiency and control could help with the execution of the required actions (O'Reilly and Tushman, 2013). Performance measures and targets that are loose could also exert necessary pressure on individuals to explore as it could motivate them to retreat from the tendency of focusing on exploitative projects that were easy to attain and engage in exploratory initiatives.

In cases where operational managers felt flexible indicators enabled them to manage their work better, they became more committed to engage in practices that could drive change. This encouraged them to explore new opportunities relevant to their assigned tasks without fear of failure (Pedersen and Sudzina, 2012; Koufteros et al., 2014). On

the contrary, in instances where rigid indicators or targets set by senior management were present, managers felt they were being coerced (Jordan and Messner, 2012). Although PMS could be used to build upon existing practices and allow managers to create continuity in their work processes, managers had to handle performance indicators in a flexible way, treating them as a means rather than an end when carrying out their tasks (Jordan and Messner, 2012).

### **6.5 Why the diagnostic use is critical to support and enable exploration**

In addition to refuting claims that PMS could be detrimental to exploration, as shown in the previous section, this study shows that PMS is critical for exploration. Factors that drive exploration in established organizations - for instance high level of employee freedom in the performance of work activities and resource support for creative and innovative ideas - may not thrive or reach high performance at organizational level if control mechanisms such as PMS are not in place (Goodale et al., 2011; Menor and Roth, 2007). Also, increased uncertainty created by exploration necessitates higher levels of formalisation to increase accountability by driving more effective monitoring mechanisms for stakeholders (Patel, 2011). The diagnostic use is critical to manage the discovery/creation of a new idea, its development and adoption. It shows that although exploration mandates flexibility, it also requires structure and pace, i.e., innovation cannot take place without structures in place (Goodale et al., 2011; Menor and Roth, 2007). For instance, simple structures and rules such as setting well defined priorities, deadlines to track key operating variables or ownership of some major outcomes could help protect the firm from chaos (Sydow and Schreyögg, 2010). This study extends theory and shows that the diagnostic use is vital because it:

***It ensures exploration, creativity, and innovation are within the organization's scope and aligned with the organizations vision, mission***

This study shows that for organizations to be ambidextrous, they require exploratory initiatives that align with the organization's mission. Exploratory ideas must be directed and filtered to ensure that it aligns with the organization's mission and vision and is worth pursuing. By using appropriate performance metrics, the right type of

innovation is conceivable, and, through a guided process and structure, it is achievable. This study shows that the diagnostic use of PMS could help set the right parameters and ensure employees were not deviating from the organization's strategic goals and engaging in exploratory activities that were relevant to the business. It could also provide a framework for innovation and ensure that innovative initiatives were within the organization's scope as not all entrepreneurial behaviours may be good for the organization (Goodale et al., 2011). It could also mitigate the chances of engaging in initiatives that are beneficial but with no financial value to the business (Jansen et al., 2009). A major problem that DB Automotive faced that seriously constrained exploration was employee's dissatisfaction that their ideas were abandoned and never made it to production. This stimulated a perception that their efforts were not good enough or unappreciated and demotivated them from engaging in future exploratory projects in a bid to avoid another rejection. This conundrum was experienced not because their ideas were not good enough, but in most cases the ideas did not align with the organization's mission and vision. This study therefore highlights the need for a shift in theory that shows PMS as a mechanism used to enable organizational alignment that is solely linked to exploitation but discloses that PMS should be designed in a way in which it could enable organizational alignment that fosters exploration.

#### ***Gives structure to exploratory ideas and supports new product development***

The study also shows that PMS is critical in enabling structure for new product development. It could help mitigate engaging in continuous experimentation without knowing when to move onto the development phase by providing clear structure and guidelines for progressing exploratory activities and revealing novel areas where customer value could be added. It could also play a vital role in implementing aspects of transformation processes (Hansen and Schaltegger, 2018) and performance metrics used to guide change (Appelqvist et al., 2013). Without the diagnostic use, it may be difficult to accurately assess the progress of exploratory projects. It also facilitates effective time management, for instance if innovation initiatives were prolonged then the diagnostic use could highlight this and increase speed. The same applies to quality, cost and resource allocation. The diagnostic use could also facilitate appropriate stretch for exploratory activities and ensure that products meet the standard criteria otherwise all efforts could become futile.

PM tools were also found to ensure that innovation takes place and ideas are not lost. It helps pin down an idea, define it, give it scope, help it mature and progress through new product development processes. It creates a framework for innovation and ensures that an idea is aligned to a specific product and therefore encourages participation and exploration in the right direction. Furthermore, innovation and exploratory activities require resources and therefore the diagnostic use could enable robust resource allocation and manage the innovation process in a controlled way. Innovation management is at its best when tight and loose controls are used to provide support and direction for innovation (Davila et al., 2009) and therefore should be treated as a process that requires the application of structured and disciplined supervision. Managers must clearly understand how innovation could be generated and deliberately constructed. They must acknowledge that there are rules, strategies and general process knowledge that are resourceful in facilitating innovation efforts (Goodale et al., 2011). Furthermore, structure is required to determine how exploratory or innovative projects are managed, from the conception of an idea to the launch of the product, because, if care is not taken, exploratory projects can linger on and on at the expense of the business (Mom et al., 2009). Control systems such as PMS are therefore not antithetical but critical to enable and promote successful innovation (Goodale et al., 2011).

## **6.6 Conclusion**

This study reveals ways in which PMS could constrain or enable OA. It shows that using PMS to mainly facilitate exploitative activities could constrain exploration. However, a balanced deployment of the diagnostic and interactive uses of PMS could enable OA. The findings also show that the diagnostic use could drive exploration and is crucial for new product development. The conceptual framework derived from the study is outlined in appendix D.

## **CHAPTER 7: CONCLUSION**

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### **7.1 Introduction**

This section presents the concluding remarks and suggested avenues for further studies. It summarises how PMS can be used to foster OA and practices that should be avoided to ensure its effect use. It also highlights significant gaps in literature on which future studies could focus. It reveals vital practical implications and considerations that should be made in the development of a robust PMS.

### **7.2 Overview of contributions**

This thesis contributes to existing theories firstly by showing how the uses of PMS could constrain OA. It shows that if a PMS is used to focus attention primarily on output and financial measures it could lead to excessive exploitation and may constrain exploration. Primary use of such measures could encourage employees to concentrate on meeting production demands, set targets, tight launch and deadline dates and other activities that fostered exploitation. It could hinder employees' engagement in exploratory activities which were typically characterized as time consuming with various phases of "trial and error" and seemingly "going nowhere" periods (Akroyd et al., 2009). Primary use of financial measures could endorse its limitations by diverting attention from opportunities to innovate (MacBryde et al., 2012; Upadhaya et al., 2014; Liu et al., 2014) and could lead the organization into competency traps. The study also reveals that using the diagnostic use to reinforce old practices and processes could also produce detrimental effects towards exploration by channelling attention towards old processes and practices. It could reinforce such practices as the normal way of doing things and in so doing obscure opportunities for development, creativity, and adaptation. A PMS that was outdated or unclear could cause poor visibility of the organization's performance and stimulate confusion regarding areas that required exploratory efforts. Furthermore, performance assessment processes that were vague or perceived as biased could discourage employees from pointing out new opportunities to managers if they felt they were

victims of an unjust system. This had an adverse impact on innovation as such employees in most cases were quicker to note changes in the market through their interactions with customers. Finally, the thesis uncovers that a PMS could constrain exploration if it was strongly linked to individual incentives or sanctions because these could reduce idea sharing and collaboration as some employees in some instances could be hesitant in letting their colleagues benefit from their contributions. Discussions regarding who received the most money or rewards could also trigger dysfunctional behaviours that could constrain exploration. It could stimulate working in silos, isolation, and in some cases fear and anxiety, if employees felt they were going to be sanctioned for not achieving set targets.

Secondly, this thesis explains how the diagnostic and interactive uses of PMS can enable OA. It shows that the diagnostic use of PMS can generate performance information that could highlight areas where there are deviations from pre-set objectives, waste in processes or areas that require improvements and direct attention towards recovery action plans. Such performance information could also be used interactively, leading to collaboration, idea sharing and opportunity search and thus foster exploration. The study also reveals that developing performance objectives and targets collaboratively could foster OA. The diagnostic use could help employees align their understanding of set performance goals, with the demands imposed by performance measures. It could ensure that employees' values and work ethics are aligned to the overall corporate objectives and thus foster organizational alignment. Developing performance objectives and targets collaboratively also triggered the interactive use of PMS by creating a rich platform for managers to examine their employees' proposed objectives and suggest areas that require novelty, potential development, and enhancements. It could also create a rich platform to capture ideas from operational staff who were likely to be aware of emerging problems and engaged in novel experimentation (Raisch and Birkinshaw, 2008). Similarly, employee performance and project review sessions presented a rich platform for the diagnostic and interactive use to stimulate exploitation and exploration, respectively. Feedback obtained from performance assessments could highlight areas of weakness and strengths. The diagnostic use could reveal knowledge and performance gaps and facilitate the use of existing knowledge and models to close such gaps (Caniëls et al., 2017), whereas the interactive use could trigger conversations between managers and

their employees regarding the performance assessment outcomes. Managers could use such opportunities to scan for behaviours that were likely to stimulate innovation. Through such meetings they could inspire, and nurture identified talents. Furthermore, a combined examination of project outcomes, challenges faced, and areas of success could also lead to idea sharing and search for new options, opportunities and technologies and therefore stimulate exploration. The study also shows that the diagnostic use could help the organization capitalise on past experiences and use lessons learnt to influence future decision making. It reveals that lessons learnt could drive search for new knowledge, better solutions, or reformulation of strategy. It could also initiate conversations when conducting root cause analyses and inform future breakthrough projects. By examining lessons learnt interactively managers can influence employees to find better ways of working or to explore new projects or options. Continuous learning from past experiences could drive a change culture and increase the adaptive response of employees and thus foster OA. These findings question previous studies that show PMS to be detrimental to innovation (Adler, 2009; Kolehmainen, 2010; Micheli and Mazoni, 2010).

Thirdly, this thesis contributes to existing theories by showing that the diagnostic use is not only vital for exploitation but also necessary for exploration because it can focus attention and create room for creativity, innovation, and exploration. Innovation centred measures, targets and objectives that are also flexible or loosely defined can enable exploration. Innovation or exploration can be immensely difficult to attain if it is not reflected as an indicator of performance. Without innovation centred targets, it is likely that employees could get caught up in their daily operational activities or may only engage in incremental innovation or repeated experimentation without producing any tangible outcomes. Setting targets for innovation, may not only motivate employees to think creatively but also could stimulate the necessary actions required to achieve the objectives. Set measures and targets, however, had to be flexible and allow room for adaption to invigorate exploration (Speklé and Verbeeten, 2014; Koufteros et al., 2014). Flexible measures enabled autonomous employees to make the best decision regarding how they wanted to carry out their tasks without being restrained by rigid targets. It could facilitate a supportive and risk tolerant culture that fostered experimentation without fear of failure. It could also create a conducive environment for adaption and room to deal with uncertainties that emerged

from exploratory projects. Although these measures enabled flexibility their very presence on the other hand ensured progress. The diagnostic use of PMS could highlight areas where exploratory efforts were required and act as a roadmap that could help ideas progress through the various stages of new product development. Without the diagnostic use, innovation processes could be very slow and identifying novel opportunities to capitalise on could be taxing (Goodale et al., 2011).

Finally, another significant finding to emerge from this thesis is that the diagnostic use is not only necessary but critical to exploration because it aligns exploratory efforts and initiatives with the organization’s vision, mission and values and could be used to support new product development processes. These findings refute claims that the diagnostic use is solely detrimental to exploration and shows that it is crucial to exploration because it sets parameters that ensures that employees engage in exploratory activities within the scope of the organization. It also stimulates participation and facilitates robust resource allocation for innovation projects. The diagnostic use helps mitigate chances of investing time and resources into projects with no financial value and potential to discourage employees from engaging in future exploratory activities. It creates a framework for innovative ideas to progress through various developmental stages and metrics could guide the transformation process (Appelqvist et al., 2013; Hansen and Schaltegger, 2018). The diagnostic use could ensure clarity and delineate the rules and procedures for engaging in new product development (Goodale et al., 2011) and facilitate the right stretch for exploratory initiatives. Below in table 7.1 is a summary of the contributions.

**Table 7.1: Summary of contributions**

	<b>Previous findings</b>	<b>Theoretical extensions of this thesis</b>
<b>How can PMS constrain OA?</b>	Studies primarily show various ways PMS could be detrimental to innovation	This study shows that a PMS can be detrimental to exploration if used to focus attention primarily on output and financial measures, if it reinforces old practices and processes or if it is strongly linked

		to individual incentives or sanctions.
<b>How can PMS enable OA?</b>	There are inconclusive findings. Some studies show PMS to constrain exploration, others argue that using both the diagnostic and interactive uses can foster OA, and others argue that PMS and exploration are simply unrelated.	This thesis show that diagnostic and interactive use of PMS can stimulate OA by using performance information, through the collaborative development of performance objectives and targets, through employee performance and project review sessions and the use of lessons learnt.
<b>How can the diagnostic use enable OA?</b>	Studies show that the diagnostic use enables exploitative activities whilst the interactive use enables exploration	This thesis shows that the diagnostic use is not only necessary for exploitation but also for exploration as it can focus attention on creativity, innovation, and exploration by using innovation centred measures, targets and objectives that are flexible.
<b>Why is the diagnostic use critical to OA?</b>	Studies show that the diagnostic use can be detrimental or is simply unrelated to exploration	This thesis shows that the diagnostic use is critical to exploration because it ensures that exploration, creativity, and innovation are within the organization's scope and aligned with the organizations vision, mission, and values. It also provides structure and supports new product development

### 7.3 Limitations

Case research offers a means of investigating complex phenomena usually with multiple variables of potential significance, but such medium for research is usually limited by its inability to present generalised findings (Baxter and Jack, 2008; Barratt et al., 2011). The aim of this study is not to produce generalised findings on how PMS could constrain or enable OA, but to offer insight on the subject which can then be construed as a tentative hypothesis in which future studies can be built upon. Findings from this study plays a vital role in extending theory in the field of operations management by providing a knowledge base for the interplay between OA and PMS.

Case research is also anchored in real-life situations explored by the researcher, who is the primary instrument of data collection and analysis. This could instigate researcher bias as the reliability and validity of findings to some extent depends on the researcher's interpretations of the phenomena (Flyvberg, 2006). This limitation was however mitigated by deploying a reflexive stance and allowing another scholar doing similar studies to critique any interpretations that seemed bias.

Furthermore, this study explored a single case rather than multiple cases which had potential to produce much stronger and reliable outcomes (Baxter and Jack, 2008). However, a single case was preferred due to the researcher's desire to channel all efforts to intensely explore the phenomena in a single setting to create high quality theory, and question existing claims that the diagnostic use could only play an exploitative role. Using a single case study is usually better in such instances (Yin, 2003).

The study was conducted in a very large organization. Such large organizations tend to have formal control systems such as PMS whereas smaller firms tend to have informal controls (Amir, 2014), and therefore it cannot be confirmed if the findings will be the same for smaller organizations. Similarly, this study was carried out in the U.K, and other countries may deploy PMS in different ways and may have different outcomes. Further studies could also explore the phenomenon using different theoretical lens.

Furthermore, the study did not consider the LOC framework in its entirety but focused on the diagnostic and interactive use of PMS, and therefore it is not known whether

omitting the other elements has any impact on the outcomes of the study. Future authors can, however, investigate this.

## **7.4 Future Research**

One of the interesting findings that emerged from this study is that although the diagnostic use has been mainly associated with exploitation, it is critical to exploration. In light of this, future studies can investigate how particular exploitative activities facilitated by the diagnostic use of PMS i.e., alignment, formalization, and routinization can stimulate innovation or exploration. Such activities in some cases have been conventionally linked to creating rigidities that can mitigate an organization's ability to explore and adapt (Kolehmainen, 2010), but could actually be beneficial to exploration. For example, this thesis reveals that the diagnostic use can drive exploration by aligning exploratory activities to an organization's vision, mission, and values. This shows that alignment can lead to exploration, although the concept has been mainly linked with exploitation. Conversely, the interactive use of PMS has been solely linked to exploration, although this study did not uncover any link between the interactive use of PMS and exploitation, future studies can investigate this further.

Future studies can also investigate the role of innovation centred measures and targets in stimulating organizational performance. It can examine and identify particular measures and targets required to focus attention and inspire exploration. It can also explore whether innovation centred targets should be limited to specific numbers, i.e., the request for 2 USPs ?

As shown in the study, PMS is a social practice (Beer and Micheli, 2018; Bourne et al., 2013; Smith and Bititci, 2017) and has an emotive element, and therefore future studies can examine how the mediums identified in this study (i.e., collaborative development of performance objectives and targets, employee performance and project review sessions) in which the combined uses of PMS manifests, can facilitate and nurture contextual ambidexterity at individual level. The studies can also explore the impact of innovation centred measures and targets on employee behaviours, i.e., can it stimulate contextual ambidexterity at individual level?

Future studies can also explore how PMS should evolve over time to facilitate exploitation and exploration in dynamic environments. It could examine factors such as whether measures should be changed at the end of a project, particular lifecycle, or activity or when there is pressure from external sources such as competitors. Such studies can explore the environmental or social considerations that should be made when tailoring measures to respond to tensions embedded in OA.

This thesis explored the interplay between OA and PMS in organizational units that manifested contextual ambidexterity. Such units tend to view exploitation and exploration as complementary organizational activities (Wang and Rafig, 2014) as opposed to contradictory, as commonly viewed in the temporal and structural context (Adler et al., 2019; Andriopoulos and Lewis, 2009; Chandrasekaran et al., 2012). Taking this into account, authors can examine this phenomena in such settings and explore the effects of PMS in cases where units of exploitation and exploration are separated or where exploitation-exploration occurs as a continuum. Furthermore, future studies can conceptualise and examine OA from an organizational structure or knowledge management perspective to determine if the same outcomes will be reached.

Simons' (1994) LOC framework illustrates that control systems such as PMS has four main uses, however, this study solely focused on the diagnostic and interactive use of PMS in examining the interplay between OA and PMS. Future authors could examine the interplay between OA and the other two elements (belief and boundary) of the LOC framework.

Future studies can also investigate how non-financial measures or informal systems typically deployed by smaller firms that do not have a robust PMS or structures in place can facilitate OA. It can explore whether a balance between exploitative and exploratory activities is critical or whether an imbalance between both activities is required in such smaller firms. Such studies can investigate this through multiple case studies or other data collection methods. It may also consider investigating the phenomenon in different types of organizations such as IT firms, product design companies etc. and look into the extent to which these firms use PMS to manage conflicting strategic goals.

## 7.5 Practical Implications

This study also has implications for managers and policy makers. It shows managers new ways in which PMS can be utilized to achieve maximum benefits. For example, it reveals that the diagnostic use can foster creativity or innovation through the use of innovation centred measures and targets. It also reveals how managers can use the diagnostic use as a framework in which exploratory activities can be carried out.

The study reveals ambidextrous individuals to be those who can use their own creativity and initiative, and act autonomously in choosing their working methods (Caniëls et al., 2017; Chuen et al., 2018). Yet, PMS often enables certain practices, processes and facilitate reward systems that fail to consider individual characteristics. Usually, measures are set without considering an individual's abilities, skills, natural traits, learning styles, strengths, and weakness, although an individual's ability to be ambidextrous is inextricably linked to these attributes. For example, if a performance objective was tailored to a limited time cycle and an individual's ability to be creative was inspired by engaging in various external collaborations which is typically time consuming, PMS could present a challenge for the individual by associating their ability to perform within a set time to specific incentives (Goodale et al., 2011). This can put undue pressure on the employee and mitigate the drive to explore or be creative. In light of this, managers must develop measures considering the emotive aspect of PMS. A categorisation of individual traits (for example, Belbin categorisation) that aligns with particular measures could also be considered in the development of a PMS. For example, employees with strong interpersonal skills could be measured against their level of engagement in project activities, whereas those with less developed interpersonal skills, but stronger analytical skills, could be measured against the outcomes of specific tasks and not penalised for not being able to freely interact with others due to their behavioural traits.

The study also highlights that employees should not be penalised for failures but encouraged to learn from mistakes and that managers should opt more often for team incentives as opposed to individual incentives to encourage collaboration which can yield greater benefits for the business and mitigate competition amongst employees. Furthermore, practices such as developing performance objectives and targets collaboratively, examining performance information and lessons learnt together, and

reviewing employee and project performance should also be encouraged to stimulate OA.

This study also shows that excessive use of financial measures could lead to extreme focus on efficiency which could make the organization inflexible to adapt or effectively compete in today's dynamic market, whereas excessive use of non-financial measures, on the other hand, could result in disproportionate engagement in innovation activities. It therefore highlights the need for managers to use KPIs and targets that are SMART to ensure efficiency and at the same time innovation-centred and loosely defined measures and targets to create room for exploration.

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## APPENDICES

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### **Appendix A- Letter to request access to organization.**

Dear Sir/Madam,

I am a doctoral researcher at the Warwick Business School. The research I am undertaking investigates how Performance Measurement Systems can constrain or enable an organization's ability to be efficient and innovative.

The study intends to shed light on how control mechanisms, such as Performance Measurement Systems could enable creativity, innovation and exploration and examine performance measurement practices that could adversely affect such factors. The ultimate aim of the study is to give managers insight on how Performance Measurement Systems can be used efficiently and effectively to achieve increased performance.

I am contacting you to request permission to carry out this study in your company, as it has been selected as an appropriate site for such research. The research will involve interviewing members of staff and analysing company documents. I would like to assure you that the study will not disrupt the working environment, and that all data collected will be kept anonymous and confidential. I would also be happy to discuss the outcomes of the study with you and make recommendations that could enhance your current practices, also based on findings drawn at other companies.

If you are willing to participate in this research and feel the study may be relevant to your organization, please do not hesitate to contact me, or my research supervisor, Associate Professor Pietro Micheli, who can be reached at [pietro.micheli@wbs.ac.uk](mailto:pietro.micheli@wbs.ac.uk).

Yours Sincerely,

Daniella A Badu

*Doctoral Researcher*

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## **Appendix B -Participant Information**

*I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or would like more information. Take time to decide whether or not to take part.*

### **Research aim**

This study aims to investigate how Performance Measurement Systems (PMS) can constrain or enable Organizational Ambidexterity (OA). It aims to investigate this by examining how PMS is used in your organization and its effects. It also aims to examine how PMS can stimulate or mitigate innovation and/ efficiency (OA).

### **Background and significance of the research**

OA is the ability of an organization to exploit its existing products to enable incremental innovation and explore new opportunities to foster radical innovation. OA is critical for sustained competitive advantage, longevity and survival of organizations. Although extensive research has been conducted on the types, antecedents and different strategies organizations can adopt to foster ambidexterity, very few studies investigate the role of control systems specifically performance measurement systems (PMS) play in enabling or constraining OA. PMS have been traditionally associated with exploitation, and thus some studies have shown that it tends to constrain exploration by diminishing employee autonomy and creativity and stifles the agility organizations require to adapt to the dynamics of the external environment. Recent scholars have however argued that it can also foster exploration and could be beneficial to firm performance and OA and thus, this research aims to contribute to literature on OA, by providing insight on the interplay between OA and PMS.

**What would taking part involve?**

Potential participants who agree to take part in the research would be asked to answer a set of questions. There won't be any right or wrong answers – The researcher is just interested hearing the opinions of the participants. The interview will be in a form of discussion and should take about an hour at the longest. The questions will centre around the participant's experience in using PMS and involvement in performance measurement activities.

**Does the potential participant have to take part?**

No, taking part is **voluntary**. Participants who do not wish to take part can opt out without giving a reason. Participants can also withdraw from the study at any time.

**What are the possible benefits of taking part?**

The results of the study will be fed-back to participants if requested and could possibly shed light on how their organization can use PMS more effectively.

**What are the possible disadvantages and risks of taking part?**

There are no obvious disadvantages or risks to participants, apart from the fact that it may take time to interview.

**What if something goes wrong?**

If participants have a concern about any aspect of the research, they can speak to the researcher directly or contact the University of Warwick at; University of Warwick Research and Impact Services, University House, University of Warwick, Coventry, CV4 8UW, UK or call 02476575732.

**What will happen if a participant does not want to carry on with the study?**

Taking part is **voluntary**. Participants are free to withdraw from the study at any time without giving a reason.

**How will the participant's information be kept confidential?**

All information collected during the course of the research will be kept strictly confidential. Responses will be anonymised right from the outset of data collection

and when presenting the final report/findings. The data collected will be documented in a way that it becomes impossible to trace any remarks made or comments to an individual.

### **What should the participant do now?**

Think about the information on this sheet and ask the researcher (me) if unsure about anything. If the participant agrees to take part, he/she should sign the consent form. The consent form will not be used to identify the participant. It will be filed separately from all other information. If, after the discussion, the participant wants any more information about the study he/she can contact the researcher directly via email [phd14db@mail.wbs.ac.uk](mailto:phd14db@mail.wbs.ac.uk) or phone number 07415795603.

## **Appendix C- Sample of Interview Protocol**

### ***Questions related to the participants job role***

1. Could you kindly confirm your job role?
2. How long have you held this position?
3. Can you briefly describe what your job role entails?
4. How many people work within your department?

### ***Questions related to OA***

1. In your opinion, what is the organization's priority? To ensure efficiency in existing processes and to satisfy existing customer requirements or to develop new products and look for new customers?
2. Does your job role encourage you to exploit or improve in the way you carry out your day-to-day tasks or does it encourage you to find radically new ways of doing things?
3. Are employees encouraged and given enough autonomy to explore new products/ technologies or are they expected to improve already existing products/technologies?

4. Is there a team that solely commits to and engages in innovative projects and another that commits to ensuring the effective running of business operations or is everybody encouraged to do both?
5. Does the organization find it easy or difficult to engage in incremental and radical innovation simultaneously?
6. Do you experience any conflicts in trying to do both?
  - a. If yes, how do you manage such conflicts?
  - b. What resources are required to manage such conflicts?
  - c. Is it time consuming to manage such conflicts?
  - d. Are additional financial resources required to manage the conflicts?
7. Does your company invest enough financial and other resources into innovative projects?

***Questions related to PM and the uses of PMS***

1. What is performance to you and how is it measured?
2. What are your main performance objectives?
3. What is the rationale behind these objectives?
4. What type of PMS do you use?
5. How is it used?
6. What type of information is on your BSC and how is it used?
7. Are your department's performance measures predominately financial or non-financial? Or are they balanced?
8. How often are your measures reviewed?
9. Do your performance indicators and target reflect your objectives?
10. Can you give me examples of some of your department's KPIs and targets?
11. How many KPIs does your department have and what are the dominant ones?

### ***Questions related to PMS and OA***

1. How are your KPIs and targets developed? Collaboratively or individually?
  - a. What impact does this have in an innovation context?
2. What kind of performance information do you generate? does it drive efficiency or innovation?
3. Does the performance information generated help employees become more efficient or innovative?

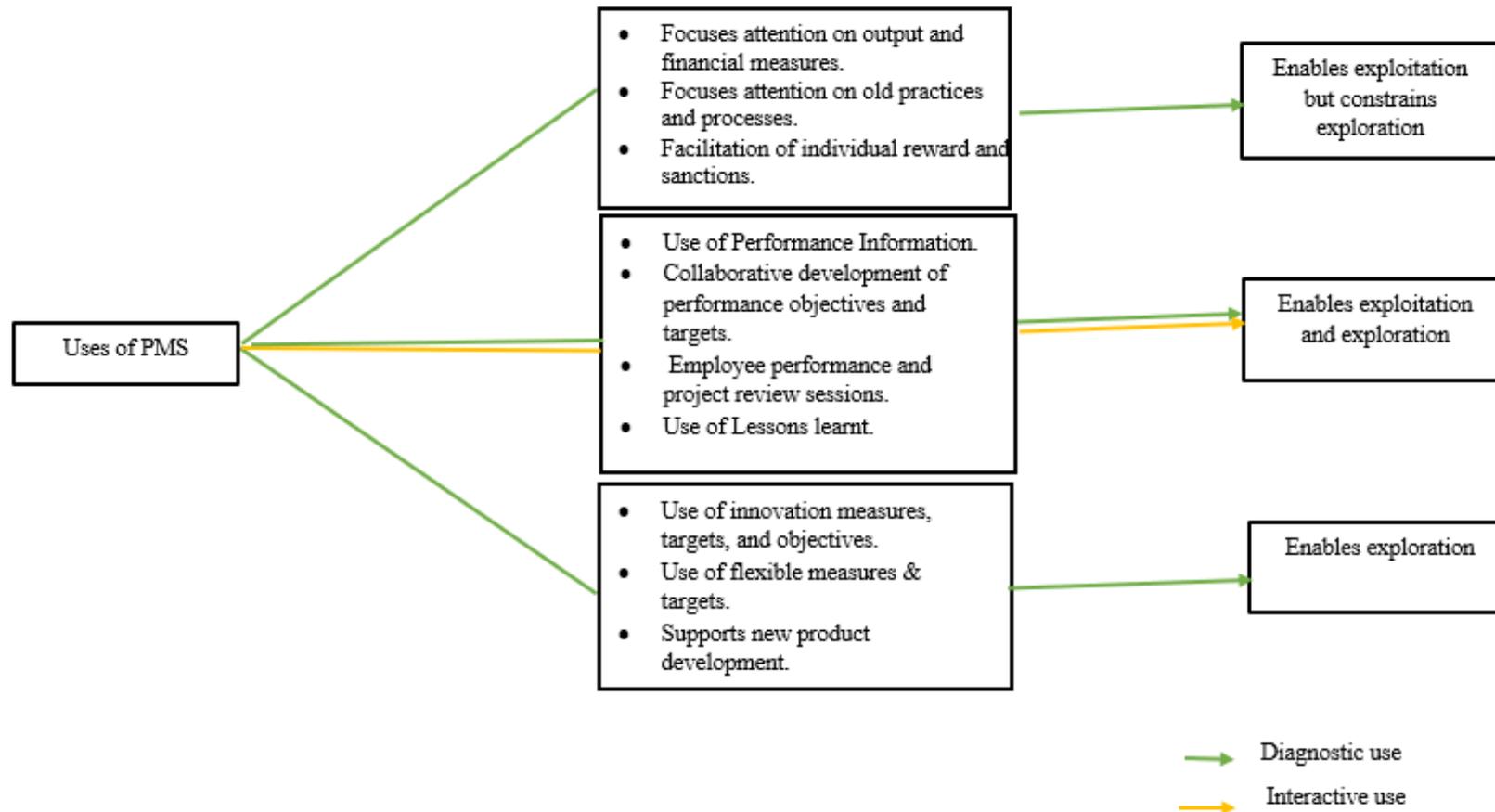
### ***Additional questions directed to senior management***

1. What PM practices does your department engage in and what impact does it have? Does it encourage employees to engage in continuous improvement or radical innovation?
2. How are your performance objectives cascaded down to different departments?
3. Do the KPIs drive incremental or radical innovation?
4. What communication mediums or platforms is PMS used to facilitate exploitation and exploration?

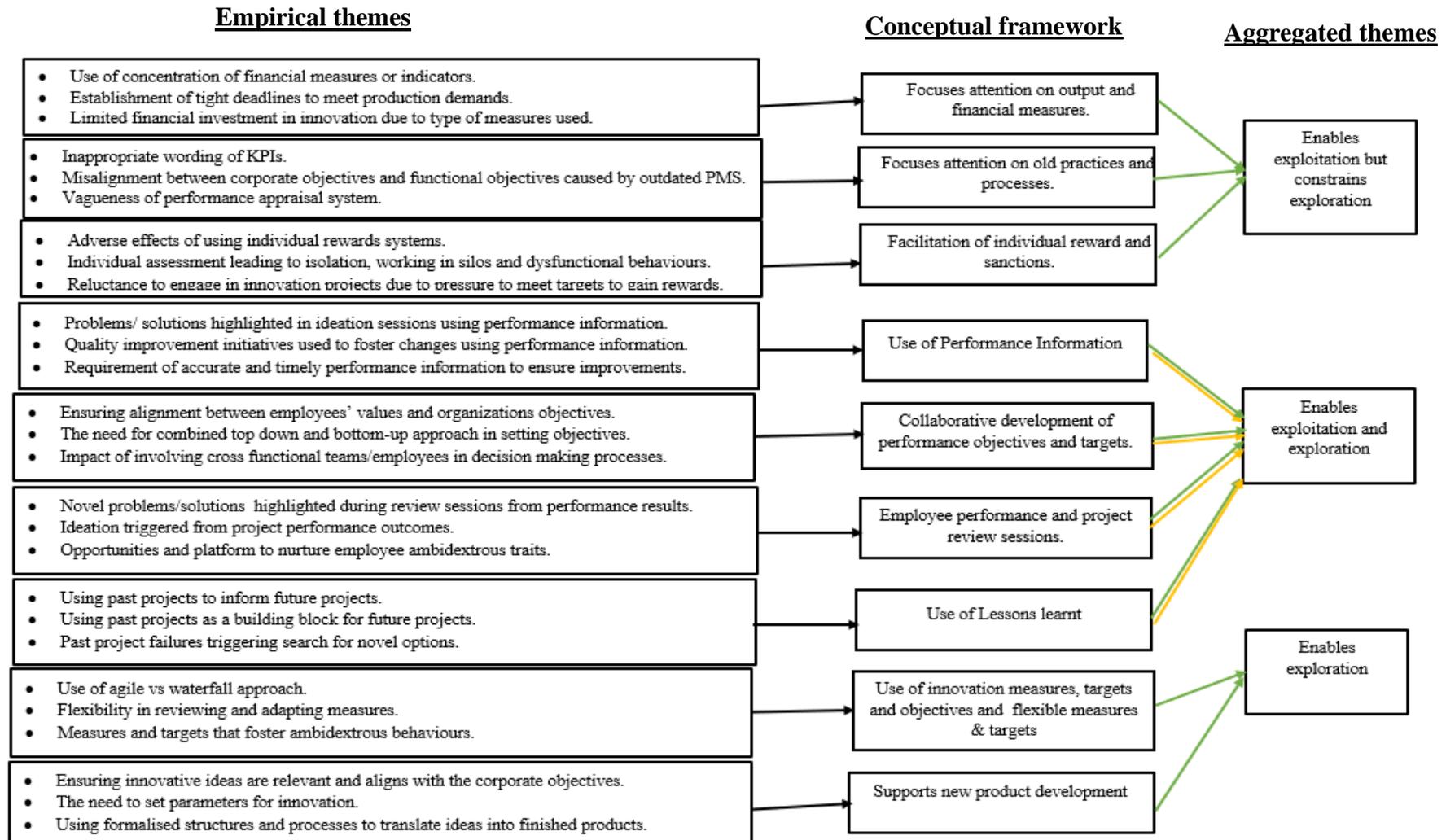
### ***Further questions derived from the interview***

1. Does the organization find it easy or difficult to innovate and at the same time efficiently manage its existing operations?
2. How are new measures introduced?
3. What happens to the old measures?
4. What PM practices are you actively engaged in?
5. How does past data help with future decisions?

## Appendix D- Conceptual Framework



## Appendix E- Data Structure



## Appendix F- Supplementary quotes for empirical themes

Empirical Themes	Evidence
<p><b>DB as an Ambidextrous organization</b></p>	<p>No one is really doing that and when you look at how we do it that's innovation as well, because we are developing technical solutions which no one else is doing at the moment. But the digital side of things is really important because going back to virtual reality there's a temptation that was a risk that with virtual reality you create experiences that answers a question that no-one's asked (Chief Marketing Officer).</p> <p><i>Example of new car features</i>- So randomly these lights will turn green and it will tell the driver you've got through those cones as quick as possible. Once you've gone through those cones another set of lights will go green, but what it's doing is it's measuring... because it's got military GPS system. it measures whether you have taken the quickest route, the shortest route, and how central you are when you go through the cones, and it gives you a score. So all of a sudden we're making a game out of a driving experience, you know, in only 100m2 without a racetrack and it's called smart. So this is a technology that we developed last year. No one else is doing this and because you can then get your own graphic of the route that you took and your score you can then share that digitally (Chief Marketing Officer).</p> <p>It's still incremental because it's what we've finished working on, we are trying to see if we can improve it for next year, so we have a whole year or 2 years to bring that change in so within that time, having highlighted where I think or how I think</p>

	<p>the improvement shall happen, I have some time to test out, that improvement if it meets the minimum criteria and it actually works as expected (Calibration Lead Engineer 1).</p> <p>the rest of the businesses are going to be working in step changes as well (Project Manager).</p>
<p><b>How can PMS constrain OA</b></p>	<p><i>If used to focus attention primarily on output and financial measures:</i></p> <p>In DB the performance measures are normally, on a 12 months calendarization. Now, I think, that's a problem in itself. Because if you try and bound successful completion of projects, or work, within a 12-month window, who's to say that that's possible?... And when you do something afresh, that you've not encountered before, it's very difficult to say whether or not you can complete it within a certain timescale... So, typically, there is a problem already, the objectives, the performance objectives for the engineers are bounded to a 12-month time period... We have to force you to deliver in 12 months otherwise the vehicle programme won't get the benefit. So that creates a lot of pressure (Principle Engineer).</p> <p>I've been building concept cars for Jaguar. You always had a time constraint, because you've got gateways for a vehicle programme, you've got to get it in before the project starts so that they can see your concept and decide what they're going to do... (Project Governance Manager).</p> <p>Roughly a rate of three per year every year for about six years, which is unprecedented in DB. And you know, the speed and the levels of innovation that are coming in, those two together make it very, very difficult. And because people are driven</p>

particularly through the product launch process. They've been driven to quite compressed milestones (Business Excellence Manager 1).

Commitments in the projects they're working on doesn't allow them any time to actually do that free thought, free thinking, free application (Principle Engineer).

A lot of people are constrained a lot by deadlines, and gateways and things that we have to deliver, and on budgets, as well... yes, we should be more innovative. But then, there's no real backing behind the words. So as a company, it's very difficult to be enabled to do some of the innovative things because you need time, space and resources to do those things In- (Control Aps and Connected Technologies Manager).

But certainly, in the last year of my previous role, you know, I was being targeted to deliver X number of projects by a new manager to the department who was pretty clueless on innovation. But if he saw it as the right way to go, to say right you've got to deliver 22 CDS projects and 10 milestone projects because you've got X number of people of this grade and X number of people of that grade. And, you know, I did have a very frank conversation with him saying this isn't going to work, you do realise this isn't going to work and he didn't get it. And kind of, mid-way through the year he's still hammering me to try and deliver that. I'm trying to align the team, so it looks like we're trying to deliver that but also trying to deliver what I know what other people really want. But you know rather than setting a number of projects total and the number of projects per person they've just said I want you to deliver two or three successful projects (Research Manager).

**How the diagnostic and interactive use can enable OA.**

***Through the use of performance information:***

So, for example, we, a recent one, we tracked the cost of the timing of that project, the costs started to increase, at a particular point where we could have introduced further innovation into the project as it developed, but then that would have affected, that would have affected the total cost to the business and when that happens we have to look at the business case as to whether it's worthwhile doing that or not (Paint Manufacturing and Engineering Senior Manager).

***Employee performance and project review session:***

At least having your performance review tells you if you're going in the right direction or not. Having a feedback every six months or every 12 months, at least you have feedback, and you have a way of also writing your thoughts to HR. I think it definitely helps because if your manager or department is expecting something from you and you are not actually delivering that and it shifts you to the right direction. I think it makes sure you are performing better or at least performing better by your manager and department's standards (Calibration Engineer).

***Collaborative development of objectives:***

And that then is used as the template for my team to build their individual objectives around. So obviously that if you like, those become then my personal objectives and measured on by my boss, and then my team basically take those and obviously build them up even further, so you kind of always get more and more detailed ( Global Marketing Communications Director).

	<p>So, if you can tell them that the high level performance requirement is this and you can effectively tell them what you're measuring, which business behaviours, are they performing at the right level in front of seniors? Are they putting in the right level of effort. If you can actually have the discussion with them, that can lead to some improvements (Research Manager).</p> <p>What will happen in our team is that we'll sit down with managers, and we'll write down what we think our objectives for the following year should be (In Control Aps and Connected Technologies Manager).</p> <p><b>Lessons learnt</b></p> <p>we do a lessons learned after every project, which I think some of the team, the research and quality team are now compiling all the lessons learned (External Affair Technical Coordinator)</p>
<p><b>Why the diagnostic use is necessary for exploration</b></p>	<p><i>Using innovation centred measures, targets, and objectives:</i></p> <p>We need to set a more realistic annual goal, with a stretch ambition. If you've got the stretch ambition above the goal, if you achieve the goal you can't celebrate because there's still more to do. You can say, yes, we did what we said (Business Excellence Manager 1).</p> <p><i>Using flexible measures and performance targets:</i></p>

I think every year I've changed something that I've then done in the next year, and I'm also creating personal objectives as well. We also have personal objectives, which are completely up to you what you put down (Project Governance Manager).

Sometimes the innovation can come out of being a bit more flexible with the customer and following the conversation that they want to have. I think there's a danger, if you're not open, and flexible, there's a danger of only asking questions that you want to know the answer to. Which won't necessarily tell you the full picture of what a customer actually wants, and needs, and values (Coordinator of External Communications).

For example: “We'll set a target of, we must achieve but because we know that halfway through the year somebody will want something different, we can't plan that far in advance. You know, we made a plan and then we got to the end of the week the plan changed and we've made a whole new plan...But the ones we set ourselves I don't see as a constraint. Like, as a team we see them as a challenge. It's a target, we want to meet it, we probably want to do better than it, and I guess it's a different way of looking at it, and if anything, it drives us forward and it just keeps us grounded to not getting sucked into the detail of this one project, remember the bigger picture of what we're wanting to achieve as a team, and make sure we find time to do the bits that, you know, you do have to consciously step away from your desk to do. Because it's easy to get wrapped up in the detail of a project, and it's also easy to forget certain things. So yes, I think we would see the objectives that we set for our team as a challenge to drive us to do the best that we can do, and not... Yes, not a constraint”. (Lead Project Engineer).

	<p>We have the flexibility within our own team. We aren't held back particularly by lots of things. So that one, in fact, for that example, we weren't constrained by our own capability (In Control Aps and Connected Technologies Manager).</p>
<p><b>Why the diagnostic use is critical to OA</b></p>	<p><i>Ensures that exploration, creativity, and innovation are within the organization's scope:</i></p> <p>You can invest speculatively, and a lot of innovation investment has to be speculative, because it may not work. But we do have to regularly do sanity checks to make sure that we're going to get some tangible benefit out of it, and that's done through a performance measurement type system, through something like schedule or general project control (Paint Manufacturing and Engineering Senior Manager).</p> <p>As an engineer, who's working on a new piece of equipment or a new invention, for them they still need constraints, so otherwise they could be working on that for five years before you actually have anything measurable at the end of that. What we've tried to do is create a like framework that you follow, as like the process for the team, and then what we've done is say that you must have achieved... These are the suggested activities within this phase of work, these are the must-dos, and this is what you must deliver to go onto the next phase... with the framework that will help them to stay focussed and have an objective and a deadline. And it's also good to help us get the buy-in for the people we're handing over to (Lead Project Engineer).</p> <p>But at some point you need to stop being fluffy and pick an idea and stick to it, and that's what the performance metric helps with as far as I understand (External Affairs Technical Coordinator).</p>

	<p>The milestone gives you flexibility to be more creative. The company wants TCDS features, because they translate into money, because they get features on the car. So, that forces the timing. You need a little bit of that (Project Engineer).</p>
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