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The Implementation and Adoption of a Corporate Performance Management Information System in the City of Cape Town Municipality – A Case Study using Actor-Network Theory

by

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TDRMAR001

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Abstract

This study examines the adoption of a Corporate Performance Management (CPM) Information System in the context of a local Municipality with South Africa. The role of ICT in supporting and facilitating CPM is also examined within this context. The historic progression of CPM Systems is reviewed from their origins rooted in early executive information systems to the rich functional business intelligence aligned platforms of today.

The business processes of CPM are described in detail highlighting the cyclical and self-reinforcing nature of these processes as well as the key CPM frameworks in general use. Existing literature on the adoption of these types of systems is reviewed in detail to understand the frameworks that exist. The review highlights the dominance of positivist research in this body of knowledge. It is argued that this has led to a failure within existing work to adequately describe the complexities associated with organisational adoption of these types of systems. This research case study therefore uses a framework composed of interpretivism, hermeneutics and Actor-Network theory with the objective of providing a rich description of a single example of the enterprise adoption of CPM. The key findings and implications of this study are: 1) ICT does play a role in supporting and facilitating CPM; 2) The adoption of the Business Processes associated with CPM is closely linked if not an antecedent of the adoption of the ICT; 3) The performance culture of an organisation can block the adoption of both; 4) ICT does not always deliver on its promise when poorly implemented; 5) The research framework adopted does provide a vehicle for successfully conducting this type of research.

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Acknowledgments

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Abbreviations

ABC	Activity Based Costing
ANT	Actor-Network Theory
BI	Business Intelligence
BPM	Business Performance Management
BPS	SAP Business Planning and Simulation (Planning Toolset)
BSC	Balanced Scorecard
BW	SAP Business Warehouse (Data Warehouse and BI Toolset)
CPM	Corporate Performance Management
CoCT	City of Cape Town Municipality
DSS	Decision Support Systems
DW	Data Warehouse
EDW	Enterprise Data Warehouse
EIS	Executive Information System
ERP	Enterprise Resource Planning
ETL	Extraction, Transformation and Load
GT	Grounded Theory
ICT	Information and Communication Technology
IDP	Integrated Development Plan
IS	Information Systems
KPI	Key Performance Indicator
MIS	Management Information System
OLAP	Online Analytical Processing
OLTP	Online Transactional Processor
OPP	Obligatory Passage Point used in Actor-Network Theory
PM	Performance Management
SAP	Systems Applications Products software and services provider
SDBIP	Service Delivery and Budget Implementation Plan
SEM	SAP Strategic Enterprise Management (Broad term for complete CPM Toolset)
TAM	Technology Acceptance Model
TOE	Technology-Organisation-Environment
TRA	Theory of Reasoned Action
UAT	User Acceptance Testing

1. Introduction

1.1. Context

This study investigates Corporate Performance Management (CPM) and the complexity associated with the implementation and adoption of these systems within an organisation. Additionally the role of IT in facilitating and supporting these business processes is investigated. The implementation of a CPM Information System at the Cape Town Municipality is explored using a Case Study in order to gain a richer understanding of these topics. The research uses an interpretivist paradigm as its theoretical framework and Actor-Network theory to assist in describing the uncovered phenomena. This chapter outlines the topic, the approach and objectives of the research further.

1.2. Topic

Corporate Performance Management (CPM) is a relatively new business term, which although widely used in the popular press and business literature, has failed to find widespread acceptance within academia. This fact made conducting initial research on the subject complex, as parallels with other MIS reporting terms were required in order to extend the body of knowledge in these areas to cover CPM. At times these parallels appeared tenuous, but the lack of direct academic research within the context of CPM made this necessary.

The definition of CPM has been well articulated and documented in popular press and business literature. Gartner researchers have historically been credited with the first use of the term and their articles form the basis for much of the CPM definition within this paper. This definition and the preceding tools that gave rise to CPM are important to understand and identify, especially when relying on commonality in these areas to extend the scope of the associated research. It is argued in this study that MIS, EIS, DSS, ERP, DW and BI all share varying degrees of commonality with CPM. This commonality is also used when identifying research on adoption, facilitation and support.

1.3. Brief Theoretical Background

Adoption is a widely researched area dominated by positivist models aligned more to the explanation of personal adoption in an optional setting. The organisational context of CPM

adoption makes this work of lesser importance as researchers continue to identify weaknesses within these models in this context. Positivist research is reviewed that endeavors to apply the earlier personal adoption models to an organisational context. It is suggested however that none of these delivers a comprehensive and workable framework for organisational adoption of IT.

It is suggested that this could be interpreted as a weakness in the underlying positivist research paradigm and that in order to understand the phenomena more completely it is necessary to look to interpretivism for a richer understanding of organisational adoption. Seminal works in this area put forward ideas and concepts that when applied to an organisational adoption context provides a richer understanding of the phenomena present. Although a significant body of research in this area was not found it is anticipated that this approach would prove more useful in growing the body of knowledge relating to organisational adoption of IT, especially in the context of CPM adoption.

1.4. Value of Research

The value of the research is that it provides greater insights into the specific challenges encountered in the implementation of CPM within the organisation explored in the case study. The context of the City of Cape Town Municipality implementation of CPM provides rich real world examples of the challenges and successes organisations face when implementing these types of tools. While it is accepted these will not be immediately applicable to all implementations of CPM, it describes richly the phenomena found in one implementation.

The use of an interpretivist paradigm and Actor-Network Theory (ANT) seeks to avoid and improve on the existing bias towards positivist research in the area of IT adoption. The socio-technical context of the implementation as well as the social complexity of an organisation makes this research framework well suited to this kind of exploratory research.

1.5. The Research Proposition

The aim of this research is to describe fully the issues encountered by an organisation when implementing and adopting a CPM system. Existing published knowledge in this area is limited with no uncovered literature covering this topic specifically. ANT provides an exploratory framework to research this subject matter so it is in this context that the objectives are identified below:

1. To explore the reported journey of an organisation implementing CPM and correlate this with that reported in literature.
2. To explore the organisational adoption of CPM within a specific context using Actor-Network Theory.
3. To explore the role of ICT in supporting and facilitating CPM.

1.6. Overview of Rest of Dissertation

Chapter 2 provides an overview of the published literature on this topic. It begins by defining the origin of CPM with its roots in performance management and Management Information Systems. It then defines in detail what is meant by CPM and the business processes and existing methodologies that deal with this area. Following on from this the existing toolsets and key benefits from implementing CPM are also defined. Concluding the literature review the existing literature on adoption of these types of tools is reviewed along with the role of ICT in supporting and facilitating these business processes.

Chapter 3 then covers the process of defining an appropriate research approach. This includes the clear identification of the research philosophy and methodology. In addition the key principles found in literature covering the execution of these types of studies are also evaluated. The research theory of ANT is then described in detail. Concluding this chapter are the details associated with the research method employed, including the research objectives.

The Analysis in Chapter 4 provides a contextual background to the implementation of CPM at the City of Cape Town Municipality. It then progresses to describe the emergent actors identified in the study, essentially explaining the distinct components of the identified Actor-Network.

The Discussion in Chapter 5 then attempts to describe holistically the Actor-Networks encountered, making sense of these individual components in the wider whole. In addition the chapter highlights key themes emerging from the study in the context of this wider whole.

Finally Chapter 6 concludes the study by reflecting on the study as a whole through the evaluation of the existing theory, research approach and findings. In closing, the implications for future research are discussed.

2. Literature Survey

2.1. Introduction

Corporate Performance Management (CPM) is a relatively new term, however it can be argued that the business processes it includes have been around for some time. Pratt (1991) suggests that organisations have been formulating strategies and measuring their performance against these plans for centuries with some evidence of this going back as far as the 3rd Century AD. Awareness of the concepts associated with CPM has become more widespread since they were initially published and highlighted in the early 90s with many businesses actively engaged in the implementation of systems to support these concepts. (Chandler et al., 2010). Demand for these Information Systems in this area continues to grow in these tough economic times as many play a part in managing cost optimisation efforts (Chandler et al., 2010). The global market for CPM is growing at a rate of 19% per annum (Chandler et al., 2010).

Wade and Recardo (2001, pg. 12.), who published one of the first books on the topic of CPM, believe there are four basic concepts involved. These are that:

- *"Top Managers adopt a well-defined and communicated strategy*
- *Top Managers close gaps between organisation, technology, and process architectures. Closely align each element, within each architecture, greatly enhances company performance.*
- *Top managers align all the activities from the top to bottom within the organisation. If an activity doesn't add value, managers outsource or eliminate it.*
- *Top Managers adopt a specific set (more than 10, less than 30) of key performance measures covering a diverse set of performance categories (e.g., employee satisfaction, customer satisfaction, productivity, growth and innovation, financial results)."*

These four seemingly basic concepts in many respects belie the complexity associated with their execution; however they provide a clear insight into the target state of an enterprise embarking on a CPM initiative. To find a clear definition of the term however it is necessary to look elsewhere.

Gartner researchers have claimed first to have used the term in one of their research papers in 2001 (Buytendijk, 2001). It is therefore useful to review their published definition.

Rayner et al. (2005b, pg. 1) define it as follows:

> *"Corporate Performance Management (CPM) includes not only the processes used to manage corporate performance (such as strategy formulation, budgeting and forecasting), but also the methodologies that may drive some of the processes (such as balanced scorecard or value based management), and the metrics used to measure performance against strategic and operational performance goals."*

This core definition has not change over the 10 years since publication with popular press and software vendors still referencing the initial definition from Gartner (Cognos, 2008). One key element of the published Gartner (Buytendijk, 2001; Rayner et al., 2005b) definitions is the fact that CPM as a collective business process is technology autonomous. All organisations engage in some CPM related activities, and in many cases Information Technology supports these efforts, but fundamentally CPM exists separate from the technology. This notion is important to recognise, as it is then possible to look separately at the impact of IT on the collective CPM business process.

The specific elements of CPM have all existed in isolation in most organisations. CPM, based on the Garter ideal (Buytendijk et al., 2004), attempts to integrate these isolated business processes into a single meta-process. This paper argues this integration is supported and facilitated by ICT suites of applications targeted at delivering to this ideal.

From the identified definitions it can be seen that CPM itself is not critical to the operational business processes of an organisation, however when the long-term continuity and success of the organisation is taken into account it becomes a critical strategic business process. Central to CPM is the formulation of strategic objectives. Wade and Recardo (2001, pg. 3) write:

> "Business experts, business economists, and organisational psychologists all agree management must choose a specific business strategy for a corporation to excel".

As important from a business perspective is the creation of targets based on the defined strategy as well as the measuring of performance to these targets (Kaplan & Norton, 1992). This provides the necessary feedback cycle for the strategy to be amended to take into account reported performance and adjust to market forces. Many methodologies exist for managing the process of defining, communicating and measuring performance to strategy.

This dissertation does not include a detailed analysis of the various published methodologies in this area and has no intention of identifying a preferred one. They have all demonstrated their strengths in specific contexts. It does however provide a brief description of those encountered in the literature review and a more detailed description of the one that Wade and Recardo (2001, pg. 5) describe as the most popular – The Balanced Scorecard developed by Kaplan and Norton (1992). This has been done to provide some understanding of the commonality in the methodologies themselves. It is accepted that in a specific context one methodology could perform better than another. The research that this literature survey supports attempts only to understand the adoption of ICT and its role in the support and facilitation of CPM. It did not become apparent during the execution of the study that the choice of methodology played a significant role in the organisational adoption with the balanced scorecard methodology being the predominant methodology in use by local governments within South Africa.

Software vendors providing IT solutions in this market have generally incorporated one or more of the existing methodologies into their offerings thus enabling the automation and integration of many of the CPM business processes. These CPM specific applications have been available from reputable vendors for many years and most provide a stable platform for addressing many of the CPM specific requirements (Tiedrich & Rayner, 2002). The organisational acceptance and implementation of these tools however seems difficult to predict or explain and little research has been published in the area.

It is important from an organisational perspective to understand the successful adoption of this technology as well as the effectiveness of these tools themselves in supporting and facilitating CPM. Software vendors of the CPM suites additionally have a vested interest in understanding this implementation and adoption process. The lack of published research dealing with the adoption of ICT in this context is a strong motivating factor for extending existing knowledge in this area through additional empirical study.

CPM specifically is not a widely identified and researched area in Information Systems. In order to conduct a suitable review of the published work it has been necessary to widen the considered literature by exploring and understanding the origins of the term. Following this approach has meant the inclusion of related research that although not directly targeting CPM, could be argued to report on closely related phenomena.

This literature survey begins by defining what is meant by CPM. It then goes on to review the two main themes identified in the research topic. The primary theme is the adoption of

technology in a CPM context and the secondary theme is the support and facilitation ICT provides for the CPM business processes. To this end the paper firstly examines the literature covering adoption from both an organisational and end-user perspective. The literature review aims to provide a complete understanding of the existing body of knowledge relating to adoption in this context. This is followed by a review of the minimal amount of literature covering the concepts of support and facilitation.

2.2. The Origins of CPM

2.2.1. The Origins of CPM from a Performance Management Perspective

Kaplan and Norton's (1992) initial explanation of the importance of performance management was summed up in the first sentence of their key paper motivating and explaining their own performance methodology:

"What you measure is what you get." (Kaplan and Norton, 1992, pg. 75)

There is little debate around the importance of measuring the success or failure of a business enterprise or specific employee using performance measures. The key discussion has always been around what to measure and how to present the results. Performance Management is a broad subject and it is necessary to specify that this paper and research deals specifically with organisational performance as opposed to employee performance management although at time these are closely related.

In organisational performance management there are other terms in use that in many cases should be seen synonymously with CPM. Enterprise Performance Management (EPM) (Callaghan, 2003) and Business Performance Management (BPM) (Ferguson, 2005; Eckerson, 2006) have both been used in the reviewed literature. The origin of these terms seems likely to be from the software vendors for Business Objects and Hyperion respectively as these terms align to their named offerings. SAP uses CPM to describe its offering.

The confusion in terminology in this area is recognised by Eckerson (2006, pg. 27), with him motivating for the use of BPM ahead of all others. He does however note the use of CPM by

Gartner and sees these terms as being synonymous as previously suggested (Eckerson, 2006, pg. 28) (To add additional confusion Gartner uses the acronym BPM for Business Process Management – an unrelated field.) In his definition however he defines BPM as a business strategy that brings together "a number of related management disciplines, processes, and tools into a coherent whole" (Eckerson, 2006, pg. 27). The interesting and differing aspect of this definition is the inclusion of the tools themselves. This clearly differs from Gartner's view of CPM being technology autonomous in many respects.

The implication of this is that in grouping together terms like BPM, EPM and CPM it is still necessary to be aware of the subtle differences in their definitions. Having said that it remains valuable to acknowledge the existing commonality across the various terms in Performance Management and pull together the work in these closely related areas.

When reviewing the beginnings of CPM from a performance management perspective the key theme to understand is that CPM should not be seen as a new discipline, but rather a concerted effort to bring together various existing disciplines "in a cohesive and concerted way – using a common strategic and technical framework to drive all parts of the organisation toward a common set of goals and objectives" (Eckerson, 2006, pg. 27). The inclusion of the technical framework in this quotation is explained by Eckerson's definition of BPM.

2.2.2. The Origins of CPM from a MIS Perspective

The broad research area of reporting information systems is a complicated web of terms. As mentioned CPM as a term came to prominence in popular press and business publications in 2001 with the publication by Gartner (Buytendijk, 2001; Geishecker & Rayner, 2001) of many papers seeking to define its meaning and context amongst the existing reporting terminology. These early papers defined CPM as a natural progression from Business Intelligence and in some cases used the term synonymously with Strategic Business Intelligence (Buytendijk, 2001). They essentially defined it as a strategic deployment of strategic information in contrast to Business Intelligence that they define as being more tactical in deployment and content (Buytendijk, 2001). In research literature the situation is less clear.

Much published research uses the term Executive Information System (EIS) to describe CPM tools (Singh et al., 2002; Salmeron and Herrero, 2005). It is therefore useful to understand the origins of EIS. Early research introduced and differentiated between

Management Information Systems (MIS) and Decision Support Systems (DSS) (Sprague, 1980). MIS was defined as delivering information focussed and aligned to managing the business, while DSS was targeting specifically the delivery of decision support relevant data (Sprague, 1980) facilitating the process of critical decision making. MIS would intrinsically be more static in nature with DSS being more dynamic. Adhoc capabilities would also be essential to support the decision making process (Sprague, 1980). EIS emerged in the mid 80s (Singh et al., 2002) as a subset of DSS primarily focussed at enabling it to be used at an executive level within an organisation through the use of more executive friendly toolsets and presentation methods.

At this time computing power was not what it is today. The lack of processing performance accounted for many of the problems encountered in the initial implementation of these systems (Cooper et al., 2000). The wide implementation of ERP or transactional processing systems gave rise to large volumes of data, but no timely method of analysing this. This gave birth to the field of Data Warehousing and Online Analytical Processing (OLAP). These technologies aimed to deliver powerful analytical capabilities in an online environment. Some prominent academics in the area still view Data Warehousing and DSS as closely inter-related topics with Data Warehousing delivering to the initial promise of DSS (Inmon in Kimball, 1996, p.xvii).

The maturation of Data Warehousing led to new terms being used to describe the use and manipulation of this data. The term Business Intelligence was used to define the knowledge gained through the analysis of data contained within the data warehouse (March & Hevner, 2006).

CPM can therefore be seen to have elements of MIS, DSS, EIS, ERP, OLAP and BI. It consequently makes any research covering the adoption of these tools relevant in some respects for the purposes of this review.

Buytendijk (2001) uses two key constructs to delineate CPM from other reporting applications in business - these being the “Focus of Information” and the “Nature of the Deployment”. Where both of these are perceived as strategic this would imply a CPM solution. This model is useful for understanding the differentiating factors of CPM.

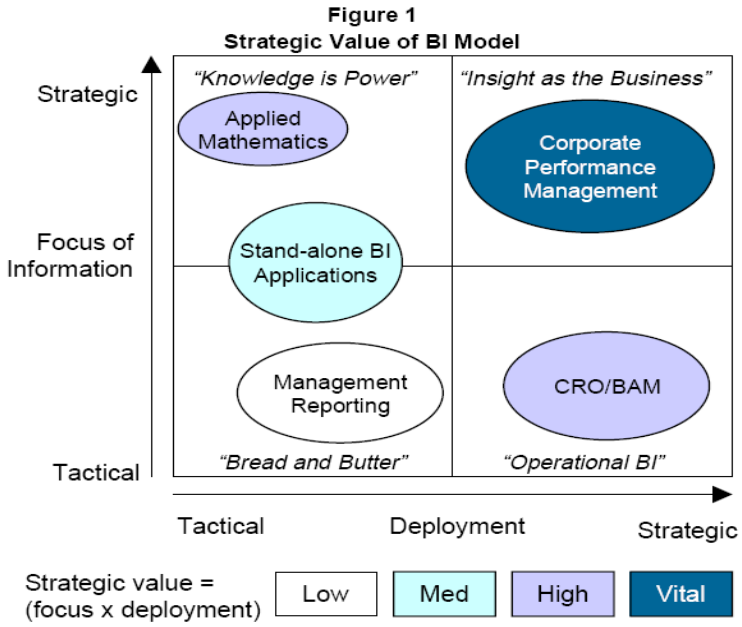

Figure 1 – Definition and Strategic Value of CPM (Source: Buytendijk, 2001)

In attempting to further understand CPM it is necessary to appreciate the business processes and methodologies and benefits associated with the topic. This in turn provides the context to understand the technology available that attempts to automate these processes.

2.3. The Definition and Benefits of CPM

2.3.1. The Business Processes in CPM

There are many models in existence that attempt to provide a holistic view of the CPM business processes (Wade & Recardo, 2001; Rayner et al., 2002b; Salmeron & Herrero, 2005; Eckerson, 2005) however the model put forward by Rayner et al. (2002b) appears the most comprehensive in many respects. This model in reviewed in detail and then compared with some of the other existing models.

Rayner et al. (2002b) describe the business processes involved in CPM as the "glue" for the overall solution. Central to these processes they see are three feedback loops entrenched in the overall solution. These loops they contend provide timely performance feedback at different organisational levels to enable appropriate behavioral modification.

They define these three feedback loops as follows:

1. **Strategic** – The strategic feedback loop they see as focused on strategy formulation. The emphasis at this level would be on the constant review of strategic objectives to make sure they remain aligned with the forecasted market conditions and performance feedback from the reporting business process. The emphasis should be on the ongoing nature of this cycle.

2. **Operational (Functional and Cross-Functional)** – The Operational feedback loop should be focused on the management tasks associated with the operational execution of strategic objectives. These processes Rayner et al. (2002b) define as follows:
    - **Plan and Budget** – This process should involve the development of operational budgets that include the strategic targets established in the strategic objectives. It should consider both a "top-down" and "bottom-up" approach, and support both functional and cross-functional perspectives to ensure a cohesive and integrated final product.
    - **Communication** – This process should involve the communication of the agreed plan to operational managers and employees to make sure individual targets are aligned with the agreed operational targets, which in turn align with strategic objectives.
    - **Monitoring** – This process should involve the exception based monitoring of performance to operational targets as well as individual performance appraisal against operational targets.
    - **Forecast** – This process should provide the scenario modeling analytical capability. At present this is dominated by a fixed budget and planning cycle with no use made of the statistical inference and the other assumption based modeling techniques available.

    The key aspects of the operational feedback loop they see should be the reporting link to the strategic feedback loop. This is required to monitor and modify the strategic objectives based on performance.

3. **Activities and Processes** – This is the level of the day-to-day activities of the business and encompasses the daily actions of the employees. The model put forward by Rayner et al. (2002b) does not define this feedback loop in detail but identifies two main elements that make this up:

- **Transactional Reporting** – Users consume information for basic awareness and simple analysis of the transactional processes occurring in the business.
- **Business Activity Monitoring (BAM)** – this approach adopts an event driven architecture to provide key performance indicators to operational managers directly. This area is still in its infancy, but it is argued that to operate effectively will need input from the budget and plan process.

These processes are graphically depicted in the diagram below.

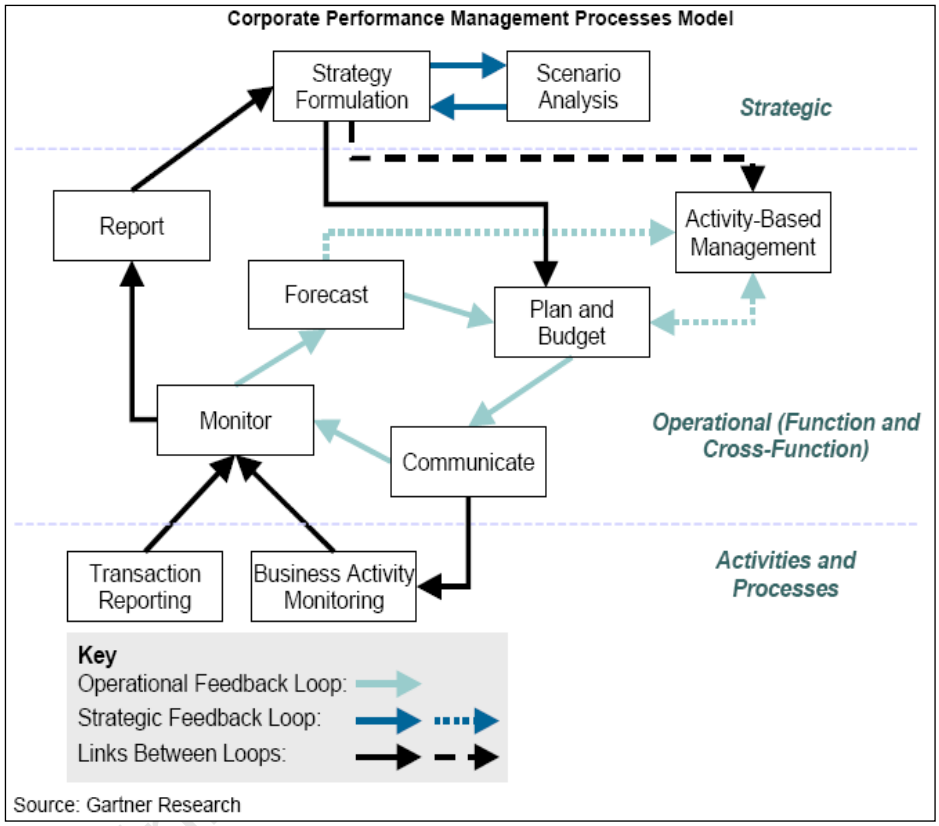

Figure 2 – The Business Processes of CPM (Source: Rayner, Buytendijk and Geishecker, 2002b)

It is relatively simple graphically to identify the feedback loops in the definition. Fundamentally though these loops indicate a close integration between the business processes and by extension, the tools used to support these processes. This integration should be seen as essential to the definition of the CPM business process as a whole (Eckerson, 2006, pg. 29).

Eckerson (2006, pg. 36) simplifies the overall business process considerably. At the highest level he draws a distinction between Strategy and Execution. Strategy then is broken down into strategize and plan, and Execution being broken down into Monitor & Analyze and Act & Adjust. This forms a cyclical process with Integrated Data at the core. Due to its simplicity

and cyclical nature this model is useful; however it does not reflect the complexity and hierarchical nature of modern organisations. The benefit of Rayner, Buytendijk and Geishecker's (2002b) model is the presence of differing cycles at different levels within an organisation. Salmeron and Herrero (2005) present a similar model to Eckerson but also crucially fail to acknowledge the differing feedback loops depending on the organisational level the business processes are operating at.

In one of the earlier articles on CPM by Geischecker and Rayner (2001) this process is graphically depicted in a simpler way that provides a better holistic view of the process by using the user types to differentiate the feedback loops. Ultimately though it provides an additional simpler view of the same processes but emphasizes the multiple feedback loops present rather than the single loop put forward by the other mentioned authors.

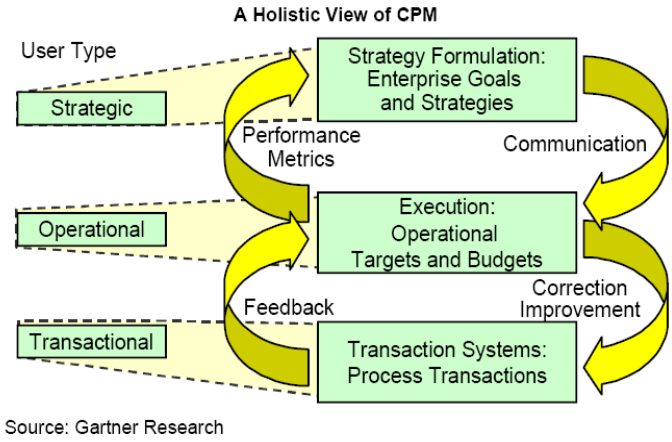

Figure 3 – The Business Processes of CPM (Source: Geishecker and Rayner, 2001)

The commonality between all the models of the overall business process remains potentially the most important concept, that being the overall cyclical nature of all connected processes. This places a clear emphasis on the continuous refinement and amendment of strategy based on sound performance and market feedback. These models have not changed in the 10 years since publication – the required business processes remain unchanged.

2.3.2. Performance Methodologies

There is no single CPM methodology. As has been explained the term covers a number of business processes and is used as somewhat of an umbrella term (Buytendijk & Rayner,

2002b). Many methodologies could potentially be employed in the various sub-processes within this cycle. Buytendijk and Rayner (2002b) believe the critical aspect in their deployment is the emphasis on their integration rather than their independent isolated deployments. They also suggest that drawing on the strengths of a few methodologies implemented based on contextual relevance rather than the adherence to a single above all others would be more advisable.

To define a complete list of performance methodologies as part of this literature survey would serve no meaningful purpose however it is beneficial to understand at a high level what these methodologies aim to achieve and how they are designed to deliver to these goals. It is interesting to note that most of the performance methodologies predate the initial published definitions of CPM by almost a decade. This would seem to suggest that CPM is the follow on business process definition associated with the initial work establishing the underpinning performance methodologies.

Kaplan and Norton (1992) in the introduction to their methodology provide a useful insight into the motivation for a non-financial approach to performance management. They contend that traditional financially focused methodologies like return-on-investment and earnings-per-share have the propensity to give misleading information when organisations are attempting to use this data to continuously improve and innovate. They go on to suggest that these more traditional measurement systems have grown out of the finance function and have a control bias and that "no single measure can provide a clear performance target or focus attention on the critical areas of the business" (Kaplan & Norton, 1992, pg. 76).

This principle of understanding the non-financial performance of an organisation underpins many of the methodologies developed since then. Fundamentally all of them aim to temper purely financial measures - which in many cases report historic performance or lag indicators (Wade & Recardo, 2001, pg. 5) - with non-financial data, that in some cases provides advanced warning of problems ahead or lead indicators (Melchert & Winter, 2004). "They aim to put strategy and vision, not control, at the center" (Kaplan & Norton, 1992, pg. 76).

What follows is a brief description of some of the more popular methodologies in use and a detailed summary of one of the most widely used – The Balanced Scorecard (Kaplan and Norton, 1992; Buytendijk, 2002a; Buytendijk & Rayner, 2002b; Eckerson, 2006). Coincidently the Balanced Scorecard was also the central methodology in use at the South African Municipality that was the subject of this research.

2.3.2.1. Prominent Methodologies

Some of the more prominent methodologies include:

- **European foundation for quality management (EFQM).** This is similar in many respects to the Balanced Scorecard, but is more practical in how the methodology is delivered and applied. Buytendijk and Rayner (2002b) suggest that this methodology has gained some recognition in Europe with other comparable methodologies like Six Sigma and Malcolm Baldrige retaining more prominence in the United States.
- **Economic Value-Added (EVA) \ Value-Based Management.** This methodology aims to create insight into shareholder value through purely financial indicators. Simplistically it is defined at the net-operating profit minus the opportunity cost of the capital invested (Buytendijk & Rayner, 2002b; Wade & Recardo, 2001, pg. 113). Buytendijk and Rayner (2002b) highlight the fact that this is essentially grounded on the primary assumption that the maximization of shareholder value is the primary objective of all enterprises. The process of managing assets and measuring the financial return on them rather than the traditional profit measures has become known as Value Based Management.
- **Activity Based Costing (ABC).** Activity based costing is a cost accounting methodology dating back to the 1980s. Buytendijk and Rayner (2002b) describe its primary aim as the efficient allocation of indirect costs using cost drivers to the activities within an organisation thereby providing a more accurate allocation of these overheads. This is supported by Wade and Recardo (2001, pg. 115). It is suggested that by understanding activity costs and the drivers associated with these – the activities – will provide a better perspective to make management decisions (Buytendijk & Rayner, 2002b).
- **Intangible Asset Management.** Buytendijk and Rayner (2002b) describe Intangible Asset Management as the focus on managing and measuring the growth in the increasingly more valuable intangible assets of an enterprise such as intellectual capital, intellectual assets and intellectual property.

2.3.2.2. The Balanced Scorecard

The Balanced Scorecard (Kaplan & Norton, 1992) was primarily developed to provide a holistic or balanced single view or scorecard of an organisation's performance. To do this Kaplan and Norton suggested that four key perspectives or areas are necessary to monitor in order to deliver to this aim.

The four key questions they suggest an organisation ask itself to identify these perspectives are:

- **How do customers see us?** (**Customer Perspective)** Customer satisfaction is near the top of many leading company's key performance measures (Wade & Recardo, 2001, pg. 6). This satisfaction would be measured differently based on the strategy being implemented and the industry in which the organisation operates.
- **What must we excel at? (Internal or Operations Perspective)** This perspective deals with the internal productivity and efficiency of the organisation. This may take the form of measuring input \ output ratios, total process costs, cycle times, setup times etc. In many cases speed is the key aspect of many of the indicators in this perspective (Wade & Recardo, 2001, pg. 7)
- **Can we continue to improve and create value? (Innovation and Learning or Organisational Perspective)** Wade and Recardo (2001, pg. 7) argue that in this perspective organisations have moved from concentrating on employee satisfaction to concentrating on measuring managerial and organisational effectiveness. Their reason for this they see is the impact on research showing employee motivation being linked to having more control over their work, greater contact with customers and having the resources to accomplish their work.
- **How do we look to shareholders? (Financial Perspective**) Financial performance will always be present in any methodology attempting to measure performance. There is however much debate over which financial indicators to use. There is some agreement (Wade & Recardo, 2001, pg. 6; Kaplan & Norton, 1992; Welch in Wade & Recardo, 2001, pg.6) that cash flow is one of the most important indicators in this regard. There are however some that would argue that the only value financial reports indicators give are historic and an organisation would be better served concentrating on other more successful lead indicators when taking strategic decisions (Wade & Recardo, 2001, pg. 6).

By answering these four questions and identifying measures or key performance indicators in each area Kaplan and Norton contend that their methodology will provide a balanced view of performance and go some way to reduce the information overload, which in their research they found present in many of the organisations they engaged with. Their model they contend forces management to concentrate on the measures that are most critical and enables a clearer understanding of the interrelationship between the perspectives.

Wade and Recardo (2001, pg. 5) explain succinctly the role of the balanced scorecard:

> *"The purpose of a balanced scorecard is to communicate strategic direction, establish performance categories, baseline and targets; identify which business processes directly impact cash flow; and provide the links between strategy, the business plan, and employees' activities. "*

It is important to understand though that the scorecard does not help in the definition of the strategy, it merely provides a mechanism for managing publication and performance reporting in the context of the chosen strategy. Strategy definition and the methodologies used in arriving at the central strategy and the associated performance measures fall outside of the scope of this literature review. It is important to note however that any seemingly successful CPM solution would be of little value if the underlying strategy were incorrect or misguided. This should not be confused with poor performance against a good strategy where the CPM solution would be invaluable.

The Balanced Scorecard methodology has been further developed over the years with the addition of strategy maps to better explain the strategy within the balanced scorecard (Kaplan & Norton, 2000a) and more recently another paper emphasizing the importance of organisational structure and the Office of Strategy Management when rigorously managing an organisation using a performance methodology (Kaplan & Norton, 2000b).

There is an ongoing effort in academia to devise broader and more encompassing frameworks; however Buytendijk and Rayner (2002b, pg. 4.) argue that this often leads to broader measures with higher degrees of abstraction. Their overall argument is clear in the conclusion to this paper in which they write: "Each methodology has its own focus and strength, but no single methodology covers all aspects of CPM. Enterprises need to understand how to blend multiple methodologies to support an overall CPM solution." It is this sentiment that is the most important when looking to compare one methodology with another or in taking practical decisions around which methodology to follow. Additionally this sentiment is extremely relevant when reviewing the toolsets available, as some are very prescriptive in the methodology followed.

2.3.3. Information Technology Toolsets

Eckerson (2006, pg. 43) sees the CPM toolset market as potentially the last big market for business software. He sees an integrated CPM toolset sitting at the top of a "business pyramid, serving as a command and control center for the entire organisation". With this

background it is easy to understand the existence of many toolsets purporting to offer this functionality. These toolsets either offer the automation of specific aspects of the CPM business process or attempt to deliver a complete CPM suite of applications. CPM applications are a top investment priority currently with a recent Gartner survey reporting that 56.4 percent of all respondent enterprises planning investments in these toolsets in 2010 (Van Decker, 2010b).

The market for CPM toolsets is in a process of continuous change as vendors consolidate and new products are released. Gartner Researchers (Chandler et al., 2010) see the market as dominated in 2010 by three key vendors with both vision in their product strategy and ability to execute in their technology with a pack of smaller vendors well behind their lead.

Tiedrich and Rayner (2002) choose to group these available toolsets based on vendor types rather than functionality. They see the Enterprise Resource Planning (ERP) vendors as providing broad application suites focused at ERP heavy users, but warn against the propriety nature of the technology offering. Conversely they see the Business Intelligence vendors providing open architecture CPM applications to vendors not aligned with a single application vendor. The third market they see being focused CPM application vendors that lack the broad functional offering, but having significant expertise in a specific functional area. They argue the implementation decision around which application offering to follow is based largely on the incumbent organisational software architecture i.e. large ERP adopters look primarily at the ERP vendor offerings. However they go on to say the most important consideration is fundamentally how well the applications fit the business requirements.

It is important to understand in this section when identifying the components of CPM that individually they do not constitute CPM. The integration of these independent tools is the critical element within the definition of CPM (Eckerson, 2006, pg. 29). Any of these tools in isolation does not constitute CPM. Many recent implementations have failed due a fragmented toolset implementation approach to CPM as highlighted by Chandler (2009).

The following section breaks up the defined definition of CPM into its component toolsets to provide a clear description of what is meant by each:

Rayner et al. (2005b) group the tools associated with CPM into the proceeding categories:

2.3.3.1. Scorecards and Dashboards

CPM Dashboard tools either incorporate a specific performance methodology or are methodology agnostic. Agnostic tools in this context provide a flexible environment that can be configured to support most methodologies. CPM Dashboard tools aim to support the cyclical business processes associated with strategy formulation, publication, performance measurement and modification (Alenchery, 2005). Simplistically this entails either the implementation of a stand-alone application, or the integration of this application with the existing data infrastructure (usually data warehouse infrastructure) - the latter being more preferable from a strategic perspective (Hostmann & Strange, 2002).

McKeen et al. (2005, pg. 2) define Scorecards and Dashboards as: “electronic interfaces (typically portals) that provide employees with timely, personalised information to enable them to monitor and analyze the performance of an organisation”. The author would however replace the word “employees” with stakeholders to make the definition more inclusive.

They indicatively include graphical elements like traffic lights or tachometers, but may report tabular information in the form of exceptions. Toolsets that deliver this functionality may do so using a clear methodology like a Balanced Scorecard (e.g. SAP Strategic Enterprise Management) or may be methodology agnostic and provide only a technical infrastructure that can be utilised to deliver these reports in the client’s chosen format (e.g. SAP Web Application Designer). There is a trade-off here though, as when the methodology is entrenched in the toolset, the toolset itself becomes more of a transactional application with business processes associated with the evaluative processes around the reporting. For example a manager could be prompted to review and rate performance using workflow tools promoting the performance feedback loop. This is usually not the case in methodology agnostic toolsets that are normally focused on information delivery only.

Eckerson (2006, pg. 105) breaks down dashboards into 3 different types:

- **Operational Dashboards** that enable workers and junior management to track operational goals.
- **Tactical Dashboards** that allow middle managers and analysts to track and analyze organisational activities, processes and projects.
- **Strategic Dashboards** that allow executives and staff to chart the organisational progress toward achieving strategic objectives.

In defining what a dashboard is it is useful to understand that there are distinctions drawn organisationally based on whom the dashboard is targeted at and what it is aiming to achieve. Primarily though the dashboard delivers a capability for monitoring, analysis and management (Eckerson, 2006, pg. 105).

McKeen et al. (2005) argue the current interest in this area stems mainly from the confluence of four major developments:

- **Critical Success Factors** – the emphasis on monitoring a limited number of factors on a continuing basis that act as an early warning system and avoid the dangers of information overload.
- **Executive Information Systems** – the notion that to be useful information should be tailored for managers
- **Balanced Scorecards** – the understanding that corporate goals could be cascaded down the corporate hierarchy via sub-goals and/or roll back up into corporate goals
- **Technology** – the combination of browser-based technology and technology enabling integration of information and data.

The toolsets in this area are in many cases the most visible applications of CPM, however it should again be noted that a dashboard or scorecard tool in isolation does not provide CPM, the integration of this tool into the other business processes is a critical component of an effective CPM implementation.

2.3.3.2. Financial Consolidation, Statutory and Financial Reporting

Rayner (2005a) defines Financial Consolidation as enabling the organisation to reconcile, summarize and aggregate financial data based on the different accounting standards and federal regulations. Chandler (2009) also identifies these isolated toolsets as where a number of CPM implementations stall and do not continue past.

The complexities associated with meeting the generally accepted accounting practices of each legal entity of a multinational makes this a complex, difficult and specialised task (Rayner, 2005a). Financial Consolidation tools should enable the creation of audited, enterprise level views of the financial information (Rayner, 2005a). In recent publications the complexities associated with Financial Consolidation has meant this has been separated into its own functional sub group within CPM (Chandler et al., 2010).

Interestingly Wade and Recardo (2001) do not specifically make mention of this aspect of the toolset of CPM. They make reference to the various financial indicators that would be indicatively included in a CPM reporting system (Wade & Recardo, 2001, pg. 101) however they do not make specific mention of this as a key component of the wider CPM toolset. It could be argued that in many respects Gartner Researchers are linking the toolset categorisations they have defined with which process in the business they should ultimately feed into. As such these tools would ultimately form part of CPM. Equally however one could argue that CPM could exist without many of these specific tools in place.

Statutory and Financial reporting in this context is defined by Rayner (2005a) as mostly consisting of flexible reporting environments that can handle the complexities associated with regional reporting. Generally these toolsets are mostly Business Intelligence (BI) applications that extract, transform and load (ETL) the data in a technical environment optimized for reporting. A report writer tool is employed to author reports from this environment. These environments are referred to as Online Analytical Processors (OLAP) and form the bread and butter of Data Warehousing (DW).

Financial Consolidation tools mentioned earlier are clearly different in that the process of data consolidation often entails more rigor and control than that associated with the Extraction, Transformation and Load (ETL) process of a standard Data Warehouse application. In many cases the Consolidation application would need to support the direct entry of journal entries or other transactional processes to complete the Financial Consolidation process. These additional business processes would also need some degree of 'auditability'.

2.3.3.3. Planning and Forecasting Applications

Planning and Forecast applications are primarily tools supported by flexible data structures that enable the capture of and storage of quantitative plan and budget data at appropriate organisational levels to support the planning and budgeting cycle of an enterprise. They generally provide advanced tools supporting the aggregation and distribution of value both up and down the planning structures within an organisation. Typically these are the first tools implemented to support CPM (Van Decker, 2010a).

Rayner (2005a) defines the key planning processes that should be supported by the toolset as follows:

- **Budgeting** – This functionality should enable the definition of short-term, financially oriented plans, which set financial targets for revenue, expenditures and cash generation. This would normally be presented in the form of financial statements.
- **Planning** – This functionality should enable the process of creating a plan of business activities that spans any time frame from short to long term. It should enable the evaluation of alternative strategies.
- **Forecasting** – This functionality should enable the extrapolation of new budget or planning versions based on the analysis of historic plan or actual data. It should support both simple scenarios and more complex statistical techniques.

Focused Planning and Forecasting tools also provide value by centralising the storage of this data where in many cases historically this has been done using simple spreadsheet packages (Heiser & Buytendijk, 2005). Bad press associated with using Spreadsheet packages to do this critical function and the risks associated with following this approach (Heiser & Buytendijk, 2005) has also emphasized the importance of implementing focused tools to complete this function. Gartner Researchers (Chandler et al., 2010) still estimate that 50% of large enterprises and 75% of midsize business still have spreadsheets embedded in their existing planning and reporting processes.

Wade and Recardo (2001, pg. 114) highlight the importance of the planning processes and toolsets within the context of CPM, however they do not see these as specifically aligned to financial planning and budgeting as do the Gartner Researchers. The planning processes they articulate supported by the toolsets are agnostic of business function. They concentrate on reporting on performance to strategy. This more inclusive definition of planning and forecasting toolsets in the context of CPM is superior.

The time benefits of centralising the data capture associated with Budgeting and Planning has also meant entities can move away from the traditional annual or quarterly planning cycles to shorter or rolling planning cycles. Many of these tools also include workflow applications for approval and amendments as well as centralised tools for distributing centrally decided plan changes.

2.3.3.4. Modelling Tools

Modelling Tools are closely associated with Planning and Forecast Applications. They however provide a “what-if” analysis capability by allowing for the modelling of a given scenario within a simulation environment.

Chandler et al. (2010) align modelling tools primarily to their application in modelling profitability. This is supported by Rayner (2005a) who sees these tools as primarily providing for the support of activity based costing (ABC) that determine and allocate costs as a high level of granularity. The granular apportionment of cost allows for accurate profitability modelling. This however would appear to be a small component of the toolset capability in this area. Advanced modelling tools have a capability to explain and predict market forces and profitability in a stable well-understood market.

This would involve the configuration of a business model within the modelling toolset and the inputting of constants, constraints and variables to provide a forecasted outcome. It stands to reason the forecast or what-if scenario generated through these tools would only be as good as the model the forecast was based on.

The Gartner Research papers were however the only publications reviewed that mentioned the relationship of these tools to CPM. Wade and Recardo (2001) in their comprehensive coverage of the topic make no reference to the importance of these tools. It should therefore not be seen as a core component of a CPM product toolset, but rather an area that could potentially be leveraged.

2.3.4. The Key Benefits of CPM

Each component business process within CPM can deliver benefits in isolation, but these benefits cannot be specifically related to the main defined CPM process. For example there are clear benefits in having timely and accurate financial statements that may come from a system included in a wider CPM infrastructure, but these benefits are not directly attributable to CPM, but rather to a competent reporting solution. When trying to understand the key benefits of CPM it is necessary to identify the benefits of the whole rather than the component parts.

The main benefits of CPM can be interpreted through understanding the benefits of bridging the gap between strategy and execution. Moncla (in Eckerson, 2006, pg. 32) sees three key benefits flowing from this area:

- **Improving Communication** – CPM provides executives with a means for communicating strategic objectives down the organisation and provides management a means of reporting performance up the organisation.

- **Improving Coordination** – CPM has the effect of aligning organisational activity to corporate goals. CPM can be seen to foster two-way exchange of ideas and information both vertically and horizontally within an organisation.
- **Improving Control** – CPM enables business to adjust plans continuously and improve operations in a timely manner by providing up to date information about corporate performance and market conditions.

This list is clearly not comprehensive, but there is a lack of empirical evidence supporting the identification of any key benefits from CPM. This could either be explained by the fact that many organisations have not adopted a comprehensive CPM business process or that once adopted the benefits are minimal or difficult to quantify. Additionally it could be that for competitive reasons they are unwilling to publicise these.

2.4. The Adoption of CPM

The organisational adoption of specifically CPM (or BPM and EPM) is not widely researched. It could be argued that in many cases this research has fallen under the umbrella terms of EIS or DSS in academia. But even after extending the literature reviewed to include these additional areas there is still not a large amount of published material available. That said it is possible to understand adoption in this context indirectly through published research in related areas. The assumption being made here is that the organisational adoption of CPM is fundamentally similar to the organisational adoption of many other related MIS applications. As such research relating to EIS has been reviewed along with the larger body of research covering ERP adoption. It is suggested that by broadening the scope of the literature survey it will be possible to gain a richer understanding of organisational adoption in this context.

The initial organisational processes relating to software selection have been excluded from the scope of this study. These would indicatively include some kind of software requirements scoring as well as implementation partner selection. It is however useful to understand that there are additional complexities associated with this selection decision. There are also some interesting theories in this area put forward by Li (2004) relating to the role of herd mentality and the impact of word of mouth on these. Zaltman (in Gallivan, 2001) sees this simplistically as a two-stage approach made up primarily of the adoption decision by those in authority followed by the secondary adoption of the actual organisational users.

This secondary adoption is of primary importance in the context of this study and where this literature survey focuses.

Continuing with the introduction to adoption in this context Bajwa et al. (1998) investigated the drivers for EIS implementation success using positivist research methods and raised the importance of senior management support to the overall success of the implementation. Salmeron and Herrero (2005, pg. 8) used a positivist approach to identify the critical success factors of EIS implementation. This research suggested that soft factors like “right information needs”, “user’s interest” and “executive sponsor’s support” played more of a critical role than hard factors like “flexibility of the system”. Overall they found that presenting the right information was the most important of these soft factors (Salmeron & Herrero, 2005). This is supported by March & Hevner (2006) who use General Systems Theory to emphasize the importance of data availability for successful DSS. Singh et al. (2002) researched specifically the support EIS provided to the strategy processes of the organisation. This study suggested that within CPM different areas experience greater degrees of success than others (Singh et al., 2002).

Other less research-based articles took a more technical approach to the critical success factors that drive implementation success. Buytendijk (2002a) sees the alignment of the application to the corporate strategy methodology and the alignment of the BI platform to the CPM tool as playing a key role while Rayner et al. (2005c) see vendor selection as being critical to the overall success.

Early strategic performance reporting used standard Business Intelligence tools to perform some aspects of CPM (Cooper et al., 2000). This meant that although the reports were not collectively grouped using a specific methodology, the components were individually reportable. The research in this area measured the success of this Business Intelligence system using a case study, but crucially did not comment on the acceptance of the system within the organisation. It is inferred therefore that success of the system in the organisation is purely an implementation issue rather than an organisational adoption issue.

Fichman (in Gallivan, 2001, pg. 59) attempts to categorise adoption into four main quadrants in order to identify the different contexts when reviewing the literature on personal and organisational adoption. This categorization is as follows:

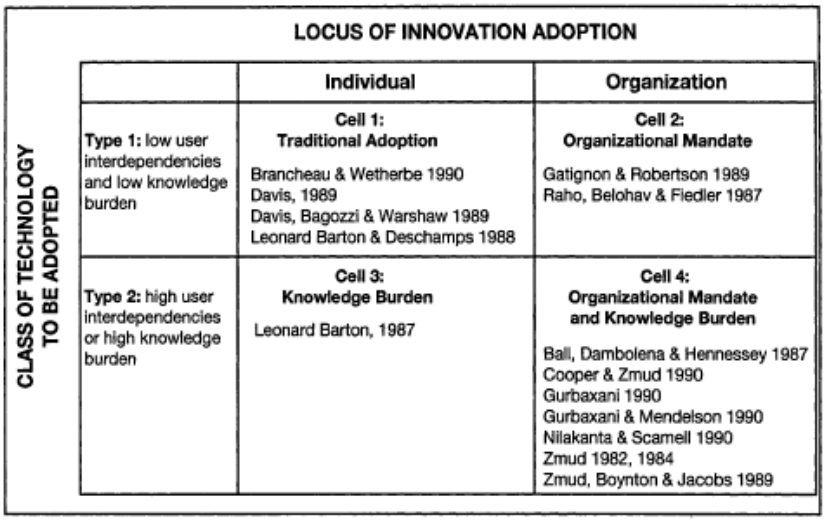

Figure 4 – A Classification Matrix for Traditional Innovation Adoption Research (Source: Gallivan Modified from Fichman, 2001)

It is proposed that the quadrant "Organisational Mandate and Knowledge Burden" is most appropriate when looking at CPM adoption. This categorization means the locus of adoption being organisational, and a class of technology to be adopted as "high user interdependencies or high knowledge burden". The organisational locus of adoption is irrefutable, but it could be argued that in some respects CPM may have low user interdependencies and low knowledge burden. It is the author's contention however that this would depend a lot on the scope of the CPM implementation. In order to deliver to the full promise of an integrated CPM business process it is suggested that the former categorisation would be more pertinent.

2.4.1. Personal Adoption Theoretical Frameworks

There is a large body of published research covering personal adoption and diffusion. This has generally converged on a core set of theoretical frameworks that attempt to explain adopter attitudes and their innovation-related behavior (Gallivan, 2001). These core frameworks are:

- Technology Acceptance Model (TAM) (Davis, 1989)
- Diffusion of Innovations (Rogers, 1995)
- Theory of Reasoned Action (TRA) (Ajzen and Fishbein in Gallivan, 2001)
- Theory of Planned Behavior (TBA) (Ajzen in Gallivan, 2001)
- Social Cognitive Theory (Compeau and Higgins in Gallivan, 2001)

These models have all been widely validated using positivist research principles where adoption decisions are made individually and autonomously (Gallivan, 2001). In this limited context the models have shown significant value (Davis, 1989). The models have however shown weakness in the context of mandatory adoption in an organisational context (Gallivan, 2001). Gallivan (2001, pg. 255) describes the occurrence of this weakness as follows: “when they are misapplied in situations where their underlying assumptions are not met, they are likely to produce findings that are weak, unstable, or open to question.” He goes on to specifically identify mandatory adoption in an organisational context as one of these misapplications. (Gallivan, 2001, pg. 255)

For the purposes of this literature review personal adoption models have not been reviewed in detail based on their documented weaknesses in the context of organisational adoption. The review has focused rather on the academic development of these in the context of adoption in an organisational context.

2.4.2. Organisational Adoption Theoretical Frameworks

Organisational adoption has been widely researched as illustrated in the proceeding diagram from Gallivan’s paper (2001); however there is no single theory that dominates the area. From a positivist research paradigm many have built on the work of strong traditional adoption models with varying degrees of success.

Hodgson and Aiken (1998) propose a model strongly based on the TAM (Davis, 1989) to seek to explain IT enabled organisational change. In this they use the core constructs of TAM - Perceived Usefulness and Perceived Ease of Use - and append to these the additional constructs of: Implementation Gap; Transitional Support; Organisational Change; General Attitude Towards Change. Together these all contribute to the key construct of Attitude Towards Specific Change. This would be synonymous with the Behavioural Intent construct of the TAM.

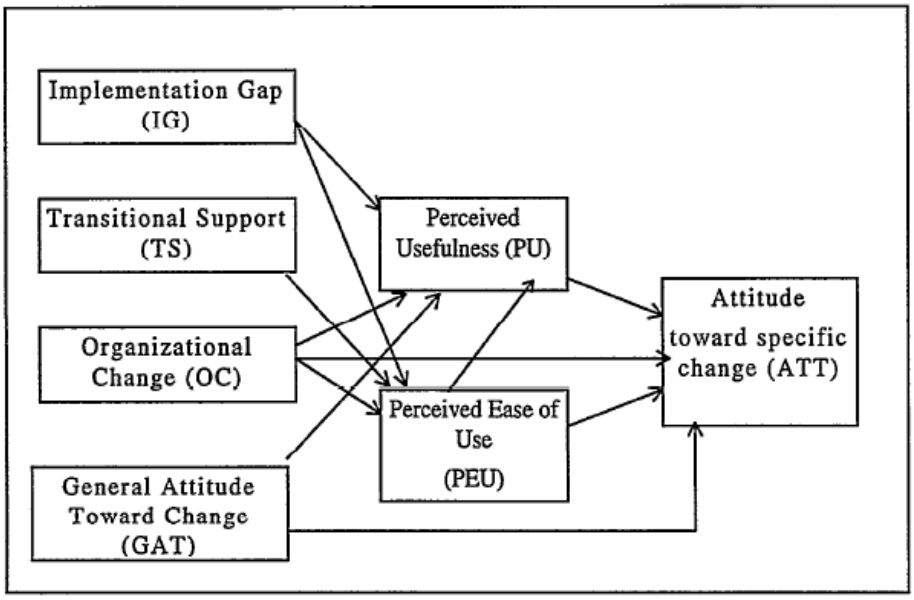

Figure 5 – Model for IS-Enabled Organisational Change
(Source: Hodgson and Aiken, 1998)

This model is interesting from the perspective of understanding the potential application of the key traditional innovation adoption models to organisational adoption. Early feedback showed the model providing some useful insights in a questionnaire administered to a large corporate, but the results were not completely analysed and validated in the paper. It is also difficult to try and understand how the average Attitude Towards Specific Change can be calculated at an organisational level. The average score across all the questionnaire respondents may not necessarily equate to a true organisational value and the study did not mention how this could be calculated. This study did however seek to prove that the adoption of the traditional innovation adoption models to an organisational context could not be achieved simply, but did not validate this.

Malhotra and Galletta (2004) follow a similar path in their model of IT enabled organisational change. They also base their model on the TAM and add additional constructs for User Commitment and User Motivation.

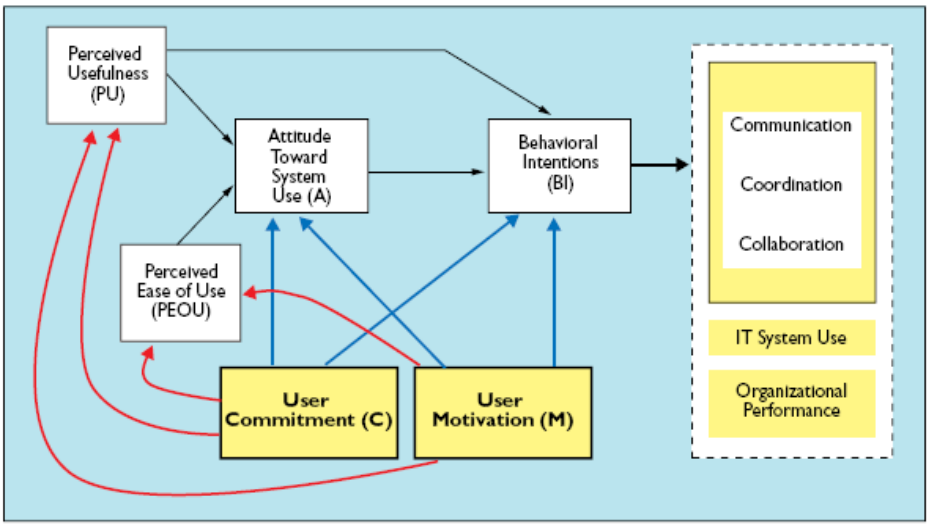

Figure 6 – Organisational Adoption Model using TAM
(Source: Malhotra & Galetta, 2004)

In their model the calculated Behavioural Intent of the users would provide some insight into the IT System Usage that in the context of their research would be aligned to Organisational Performance. The constructs of Communication, Coordination and Collaboration were not generalisable as they were indicative of the good internal usage of the adoption of the ICT being researched. In the conclusion of the research they emphasize the importance of user behavioural issues in light of their impact on business performance (Malhotra & Galetta, 2004). They emphasize the importance of leveraging what they define as behavioural enablers of user commitment and user motivation.

Again this model cannot be regarded as widely generalisable as it fails to take into account any of the complexities associated with a modern organisation. It does however illustrate that even relatively recently researchers have still been pursuing this approach.

In much of the non-academic work in the area of organisational adoption of technology authors have tried to identify critical success factors in the implementation. Although clearly this does not allow for the rigour associated with the validation of a model, it does provide

some useful insights into the factors that may need to be taken into account when creating an all-inclusive framework.

Some academic articles have followed this approach as well. Salmeron and Herrero (2005) however tried to empirically rank identified critical success factors in the implementation of an EIS. They identified a simple model that suggests in the implementation of an EIS there are factors associated with IT, Human Resources and System Interaction that to a greater or lesser degree define the success of an EIS. It is difficult to argue with the model due to its simplicity; however the power of the model would be in understanding how comprehensive the list of identified factors was in terms of the complete list of all influencing factors. This is difficult to define or quantify.

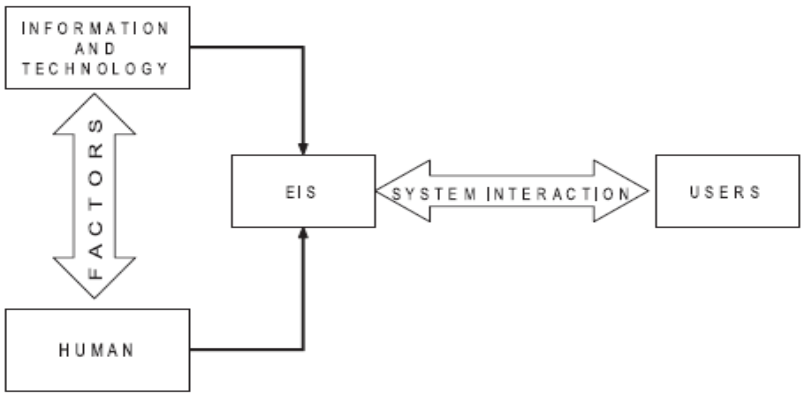

Figure 7 – Critical Success Factor Model
(Source: Salmeron and Herrero, 2005)

In the study they limited themselves to two or three factors in each category. The results of their study were as follows:

CSF ranking with global weights

CSFs	Global weights	Category
1. Right info needs	0.532	Info tech resources
2. Users' interest	0.153	Human resources
3. Executive sponsor's support	0.084	Human resources
4. Tailored system	0.067	System interaction
5. Suitable hard/soft	0.066	Info-Tech resources
6. Competent and balanced EIS staff	0.046	Human resources
7. Flexible and sensitive system	0.038	System interaction
8. Speedy development of a prototype	0.014	System interaction

Figure 8 – Ranking of Critical Success Factors
(Source: Salmeron and Herrero, 2005)

As discussed the completeness of the list of factors is questionable, but what is useful to understand is the perceived comparative importance of each factor. If we look at the top three CSF's as reported in this research it is interesting to note that both "Right info needs" and "Executive sponsor's support" would be difficult to include in the organisational models derived from traditional approaches to Technology Adoption.

Bajwa et al. (1998) took a similar approach in identifying constructs critical to EIS success, but researched these within the context of a proposed model. Their basis for using the limited set of constructs was said to be due to their prevalence in their reviewed literature. Their proposed model is as follows:

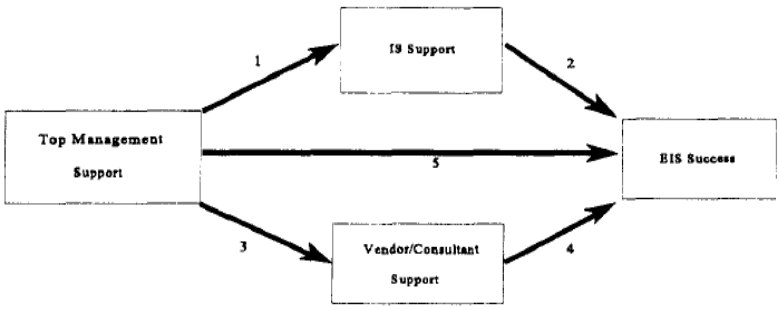

Figure 9 – EIS Success Model
(Source: Bajwa, Rai and Brennan, 1998)

The model hypothesises that there are three key determinants of EIS success (interpreted for the purposes of this literature survey to be synonymous with wide adoption). These are Top Management Support that acts directly to impact EIS success as well as influencing IS Support and Vendor Consultant Support that in turn also impact EIS success (Bajwa at al, 1998).

Interestingly in comparing this research with that of Salmeron and Herrero (2005) two of the three constructs have comparable CSF's (Top Management Support – Executive Sponsor's Support; IS Support – Competent and Balanced EIS Staff (a moderate match). The third being Vendor \ Consultant support is not mentioned. This is supported in the results of the research in that amongst other things they found Vendor Consultant support to have little or no impact on EIS success. However they did caution that this goes against their understanding of the knowledge in this area.

The noteworthy aspects of this research were firstly that the researchers found Top Management Support to have no direct impact on EIS Success, and secondly that IS Support was found paradoxically to have a direct link. While it is possible to delve into the shortcomings of this research to find reasons why it delivered such contradictory findings, it is more important to accept the possibility that organisational adoption is harder to model than the simplicity associated with the traditional adoption models. It is easier to accept this statement when ERP adoption research is reviewed.

Here many authors appear to agree that Change and Project Management are the critical success factors for an ERP implementation success (Davenport in Buonanno et al., 2000; Mandal & Gunasekaran in Buonanno et al., 2000; Motwani et al. in Buonanno et al., 2000).

A study by Soh et al. (2000) seeks to understand ERP adoption in an Asian context. They found that although the ERP package they were researching had enjoyed wide success in a European and American context there were various barriers to the successful adoption of the same package in Asia. The importance of this research is not that it to a certain degree invalidates the simplicity of some of the previous traditional adoption models, but rather that it emphasises the importance of a system's cultural setting to understanding its adoption.

It can be argued that the body of positivist research in the area of organisational adoption has consistently extended the general understanding of the constructs associated with the phenomena. However the fundamental weakness in much of this research has been the failure of the traditional adoption models to perform well in the more complicated context of

organisational adoption. This has led to increasingly more complicated models being proposed in academia to explain the area more completely (McFarland & Hamilton, 2006).

The lack of a coherent and consistent positivist model for the adoption and diffusion of technology in organisations would seem to suggest that potentially the positivist research paradigm is to blame.

Tornatzky and Fleischer's (1990) Technology-Organisation-Environment (TOE) framework borrows from the field of organisational psychology in an attempt to explain the social complexities inherent in organisations and how these relate to technology adoption. The framework defines three broad contexts, these being: technological; organisational; and environmental. This is illustrated in Figure 11. It further breaks these down in an attempt to define a comprehensive structure to describe the whole. The framework is broad and has been used successfully in IS research covering the organisational adoption of Radio Frequency Identification in the Healthcare Industry (Lee & Shim, 2007) as well innovation assimilation of E-Business across countries (Zhu et al., 2006). More recently it has been applied to the study of the strategic use of Information Systems (Masrek et al., 2009). The framework has been seen as both supporting qualitative and interpretive research, but like many of the previous positivist theories on organisational adoption it adds complexity in order to explain complexity. The significant positive aspect of the framework is the example it sets in extending traditional technology focussed IS theories by drawing on existing knowledge found in complementary academic areas like organizational psychology.

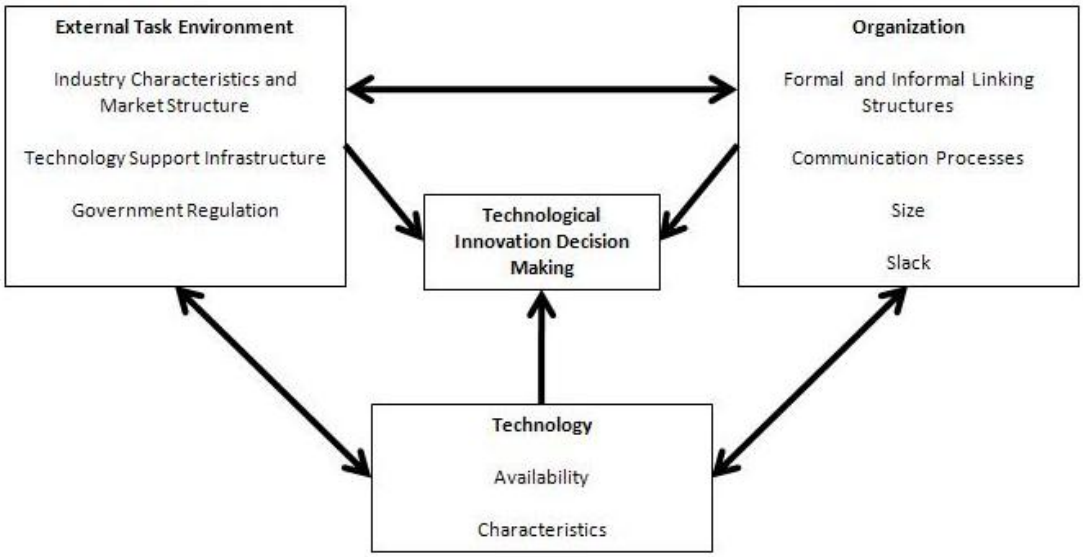

Figure 10 – Technology-Organisation-Environment Framework
(Source: Tornatzky and Fleisher, 1990)

This was done many years before in Markus' (1983) respected research. This took a different approach from much of the prevailing research at the time by using an interpretivist case study to try and understand the power and politics associated with an MIS implementation in a specific context. The research has been widely acclaimed to provide a rich understanding of the phenomena present in MIS implementation within a specific organisational context.

Markus (1983) based her approach on the theories of Kling (in Markus, 1983). Kling identified six theoretical perspectives pertinent to understanding resistance in an organisational context. These were: Rational, Structural, Human Relations; Interactionist; Organisational Politics and Class Politics. A detailed explanation of Kling's work is beyond the scope of this paper, but formed the theoretical basis for Markus' interpretive approach.

Markus (1983) puts forward three theories to explain resistance within an organisation:

1. Internal factors to the person or group. These could be common in one group of people or unique to a specific individual.
2. Inherent factors in the application or system being implemented
3. Factors that arise through the interaction of characteristics relating to the people and characteristics relating to the system.

Fundamentally the paradigm and approach put forward and used by Markus (1983) suggest that when trying to understand the phenomena present in MIS implementation within an organisation it is not possible to simply model this quantitatively. It is critical to understand the social context of the phenomena at work. The phenomena are therefore intrinsically linked to their social setting. This is a clear interpretive approach and was put forward in her Interaction Theory.

Markus (1983, pg. 440) admits that her Interaction Theory has "the apparent disadvantage of providing no universal, non-contingent advice to system analysts and implementers of systems". She goes on to point out that in her opinion "it is more useful than other theories for predicting resistance and for generating varied and creative strategies that will help both to prevent it and to deal with it when it arises."

Her final two observations on the theory were:

- The implementer should consider themselves one of the parties involved and not try to understand the encountered resistance without self-examination of interests, motives, payoffs and power bases.
- The analyst should recognise that the aim is not to overcome resistance, but to avoid it, or deal with it constructively when it arises. An implementation is made up of many small decisions; it may be worth conceding in some areas to make the overall implementation a success.

Markus' (1983) research was ahead of its time in many respects. It would tend to be in direct opposition to the positivist work of Salmeron and Herrero (2005) and Bajwa et al (1998). In these models the researchers were trying to find universal Critical Success Factors and Success Models where Interaction Theory would suggest that universal truths are less likely. The positivist work should not however be discarded, as it is beneficial to the identification of the relevant constructs when seeking to understand implementation success and resistance. The Interaction Theory of Markus it is suggested would explain the interactions between these constructs more richly than hypothesizing around their universal rank of importance as was done by Salmeron and Herrero (2005).

Markus' (1983) influential paper has been widely cited in academia since its publication (Peszynski & Corbitt, 2003). Over this time it has been reviewed widely. Some criticism has been levelled at it arguing the research did not offer a rich discussion on the power in Management Information Systems, "but only dealt with the obvious role of influence and politics and agendas with organisations dealing with information systems" (Peszynski & Corbitt, 2003). More recent research has sought to understand the nature of power in seeking to add more depth to all aspects of the Interaction Theory put forward by Markus and argued "power is more diffuse and non-systematic than Markus had argued" (Peszynski and Corbitt, 2003, pg. 2). While this research has been considered by the author to be useful it has not called into question the validity of Interaction Theory itself.

Markus' (1983) paper has been both seen as seminal from a positivist and interpretivist approach (Peszynski & Corbitt, 2003), which is unusual. An argument about the paradigmatic categorization of the paper is beyond the scope of this literature review; however it is clear that the approach taken has clear interpretive case study characteristics. In order to gain a more broad understanding of organisational adoption from an interpretive perspective it is necessary to review the existing theories and approaches in this area.

The Grounded Theory (GT) approach provides the methodology for much of the interpretive knowledge in the area of organisational adoption. GT was initially advocated by Glaser and Strauss (in Oliver et al., 2005) and is based on discovering concepts and relationships in raw data and organising these into an explanatory scheme.

Oliver et al. (2005) take this approach in seeking to explain ERP adoption as well as to validate the application of GT to their research context. In this work they identify: Technology; Process; Organisation; People as the initial conceptual categories on which to build their theory (Oliver et al., 2005). In the research they study the adoption of ERP in eight Universities in the USA and Australia using case studies of each implementation. From this data they build a conceptual model in seeking to explain the phenomena encountered.

Their model is illustrated in Figure 11:

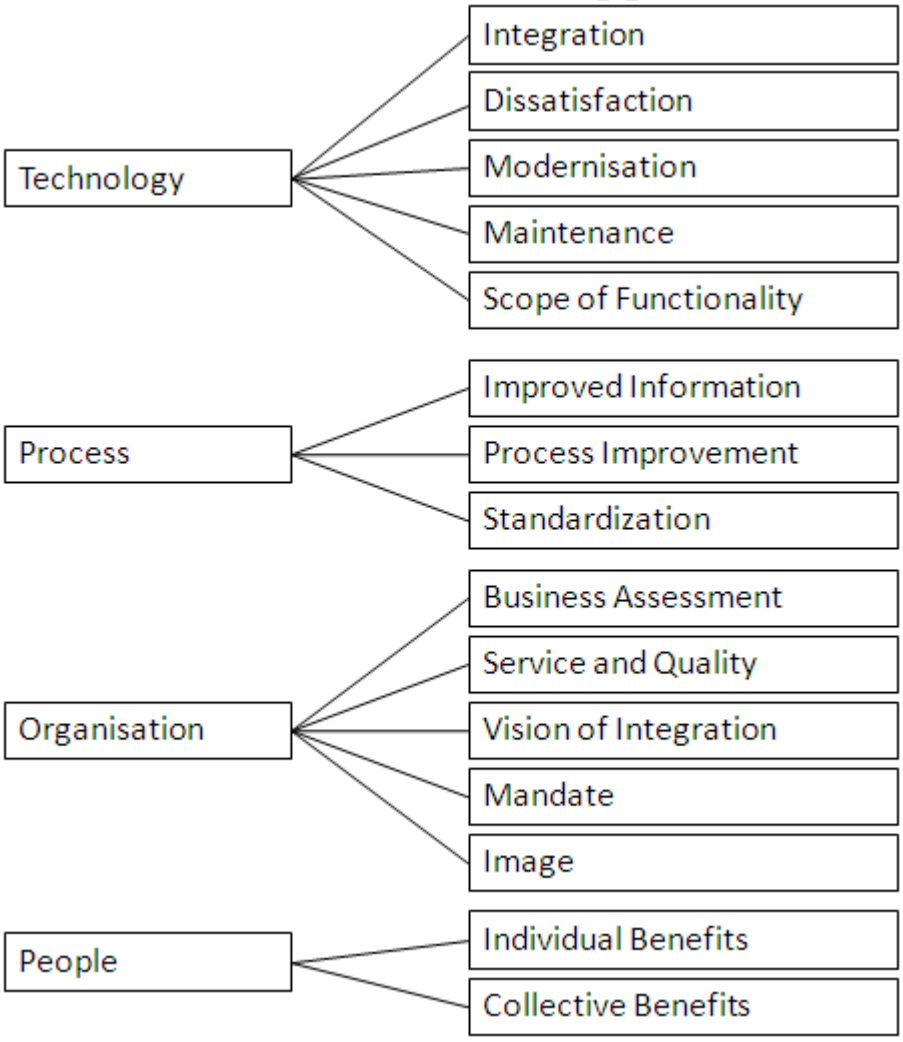

Figure 11 – Grounded Theory Model for ERP Adoption
(Source: Oliver, Whymark and Romm, 2005)

The one criticism that could be levelled at this research is that in attempting to build a universal model of all phenomena present, it fails to explain completely any of the phenomena encountered. In many respects this research is similar to the positivist research conducted by Salmeron and Herrero (2005) in that it identifies key constructs future researchers can use, but falls short of providing a detailed understanding of any of them. This Grounded Theory research also did not attempt to place any scale of importance on the constructs identified, in contrast to the research by Salmeron and Herrero (2005).

More recently Elbanna (2007) uses Actor-Network Theory grounded in an interpretivist paradigm to examine critically a successful organisational ERP adoption focussing on the role of the social fabric of the organisation. Her findings are similar to those of Markus in many respects, highlighting the political complexity of modern organisations and the impact of marginalisation of key business units during the implementation. Critical though was the successful use of Actor-Network theory in providing the analytical lens through which to investigate this organisational adoption.

Other interpretivist Case Study research into the adoption of ERP has included work on the appropriation (Boudreau & Robey, 2005) of these systems by organisational users and the agency uncovered. This study questions the inscription of these enterprise systems through identifying examples of human agency – in this case in a government implementation users either avoided using the system or used it in unintended ways. This research is persuasive as it successfully investigates the organisational appropriation of similar technology using an interpretive approach.

As has been shown by the highlighted literature organisational adoption is an extensively researched yet widely misunderstood area with no research covering specifically the adoption of CPM systems. It is the authors contention based on the literature reviewed that a less inclusive but more complete understanding of a single specific example of organisational adoption, as was the case with Markus (1983), has the potential to deliver greater benefits to the body of knowledge in this area than attempting to define an all encompassing organisational technology adoption model. Actor-Network Theory has also been seen in recent organisational adoption research (Elbanna, 2007) to provide a research framework to successfully investigate phenomena in this area of Information Systems.

2.5. The Role of IT in Support and Facilitation of CPM

The role IT plays is sometimes difficult to separate from the various other aspects of any implementation project. For example it may be difficult to separate the supportive role of the technology or toolset from the success or failure of a performance methodology within an organisation. It may also be difficult to quantify exactly how supportive or un-supportive a technology was in the success or failure of a particular implementation. However it is clear that when the technology aligns closely to what an enterprise is aiming to achieve in implementing the business processes associated with CPM the combination can ultimately change the performance and culture of the business (Dover, 2004).

Markus (1983) saw the importance of "Inherent factors in the application or system being implemented" as one of the key items in explaining organisational adoption. In trying to analyse this further this research introduces the concepts of support and facilitation.

As with other areas of this paper there was no wide body of knowledge covering the role of IT in the support and facilitation of CPM specifically. The research that this literature survey supports investigates this area in some detail to provide some clear descriptive examples.

2.5.1. Support

The word "support" in The Concise Oxford Dictionary (1991) means to "keep from failing". In the context of IT support for CPM it implies not only that IT can clearly enable the processes associated with CPM, but also that this support is so durable and efficient it plays a role in preventing the process from failure.

Common sense would suggest the automation of the CPM business processes using the available toolsets would improve the performance and efficiency of many of these processes. The efficacy of this support however is dependent on various factors, some of these having been identified in existing literature and previous research.

Hostmann and Strange (2002) argue that the underlying data models are critical to an IT infrastructure being supportive of CPM and point out that the complexities of interfacing the various streams of data into a single data store should not be underestimated. Invariably this would mean a centralised Data Warehouse environment would need to be in place to support any CPM initiative. If this architecture were not followed it is suggested this would lead to the implementation of isolated CPM tools that Rayner (2002a) argues would be

significantly less successful organisationally. There are significant technical architectural decisions to take into account when building an Enterprise Data Warehouse (EDW) but these should be seen as a necessary antecedent to any CPM implementation.

Once the common environment is in place there should be significant benefits in the alignment and sharing of data between the CPM business processes (Rayner, 2002a). This should provide the much aspired to "single version of the truth" from a reporting perspective. IT is essential to supporting this aspiration. In explaining this benefit Buytendijk and Rayner (2002b) write: "Systems help to create a fluid user experience, and share data and metadata to be able to feed and align".

These supportive characteristics are fairly generic in nature and it could be argued are not essentially CPM specific. Singh, Watson and Watson (2002) however did a far more specific analysis of how an EIS can support what they called the Strategic Management Process (SMP), which in many respects forms the core feedback loop of the CPM business processes put forward in the definition of CPM in this paper. The detailed similarities and differences are not critical at this point; suffice to say that it is believed the findings of this research would be persuasive in understanding IT support for CPM.

They defined the strategic management process based on earlier work by Hoffa (in Singh, Watson and Watson, 2002) as follows:

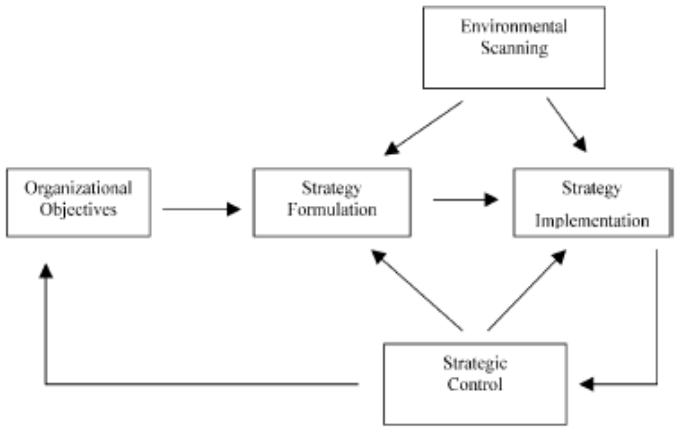

Figure 12 – The Strategic Management Process
(Source: Singh, Watson and Watson, 2002)

The primary limitation of this research in this context is that it does not include all the applicable business processes of CPM. Secondly it does not look at how IT can support the process, but rather how an EIS in general can support it which is slightly dissimilar.

The results however indicated potentially support for all aspects of the SMP with significant support for the organisational objectives and the strategy implementation phase (Singh, Watson and Watson, 2002). The study also tried to link this perceived level of EIS support with overall implementation success (Singh, Watson and Watson, 2002). However this area did not provide conclusive results (Singh, Watson and Watson, 2002). In reviewing this research the key aspect that it provides is some historic data supporting the notion that IT can in some respects support the processes of CPM. This will need to be investigated further.

No other research work was uncovered in this area that investigated or supported this notion.

2.5.2. **Facilitate**

Facilitate is defined in The Concise Oxford Dictionary (1991) as to "make easy or less difficult or more easily achieved". Clearly support and facilitation are two closely aligned concepts and it would be difficult to find a situation where IT provides low support but facilitates well. The key aspects that the word facilitate is trying to identify in the research are areas within CPM that the technology itself has made possible where previously without IT it has been difficult or unworkable to achieve. This would align in many cases to the positive impact of the recent application of new technologies in a CPM context. It seeks to investigate whether the technology is now making possible a "single version of the truth" where previously this had not been attainable.

The key to this idea is the successful application of the correct technology to the correct problem within CPM. The benefits of doing this are explained in a statement by Dover *(2004, pg. 43).*

> *"The right technology can tell you how your business is performing at any moment. That technology produces dashboards, which can ultimately change the culture of your business by transforming it into a performance-accountable company. A company begins to become a performance accountable-organisation when management commits to increasing each person's knowledge and understanding of what drives performance."*

There is not a significant amount of literature on this facilitation role of technology in the business processes of CPM. From an academic perspective Melchert & Winter (2004) see the convergence of technologies like Business Process Automation, Real-Time Analytics and Process Performance Management all having an enabling role on the final success of Business Performance Management; however this opinion is a prediction rather than a current status.

Gartner researchers argue (Heiser and Buytendijk, 2005) that spreadsheets still pervade many reporting processes in organisations as well as CPM. The reason for this, they contend, is the flexible nature of the application and the ease with which ad hoc applications can be authored. They go on to argue from a risk and control perspective (elevated in importance with Sarbanes-Oxley compliance at stake) the wide use of these spreadsheet applications is untenable and see BI and CPM applications replacing many of these ad hoc applications in the short to medium term (Heiser and Buytendijk, 2005).

This high degree of reported spreadsheet use would tend to indicate a substantial amount of required manual intervention in the processing of this data within many organisations. This in turn would indicate a non-responsive business process from a CPM perspective. Conversely one of the key benefits gained by corporations seeking to implement IT CPM toolsets is the responsiveness gained through the integration of the various business processes (Hostmann and Strange, 2002). The technology could be seen to improve for example: the quality and consistency of the data; the timeliness to develop and deploy strategy; the breadth of the data model supporting the strategy; the provision of in-depth supportive performance data; the timeliness of incremental updates; the adoptability to change; the performance and scalability of the solution (Hostmann and Strange, 2002). Although all of these examples can be categorised as benefits, research would need to support any claim that these benefits perform a facilitation role.

Melchert and Winter's (2004) views around the delivery capabilities of technology in the wider area of Business Performance Management would appear to be a long way off. It would seem reasonable however to expect the promised integration within the available IT toolsets to facilitate the CPM business processes. This area would however benefit from sound empirical research as no direct literary evidence was found.

2.6. Conclusions Drawn from Literature

Corporate Performance Management (CPM) is a relatively new term used to describe the process of aligning key high-level strategic reporting processes with the various reporting cycles that cascade down a modern organisation. The emphasis on the cyclical nature of these reporting processes and the inherent feedback loops between the organisational levels at which they operated are seen as key to delivering the potential value of CPM. Fundamentally CPM delivers organisational alignment to strategy by enforcing the consistent and reporting of performance to strategy throughout the various management layers within an organisation. It is understood this strategic alignment will enable responsive and timely reporting environments that will ultimately enable more educated management decisions to be taken based on relevant information.

The term CPM in describing this process is not used exclusively. Various other terms exist for describing the same or various aspects of the process. Business Performance Management (BPM) is as widely used and in many cases synonymous with CPM. When identifying research on the topic it is necessary to understand the historic progression of terminology relating to IT enabled reporting. By doing this it is possible to identify related research applicable to a CPM context. This paper argues that MIS, DSS, EIS, ERP, OLAP and BI all share a common history and research in each area has some degree of relevance when researching CPM.

No empirical research covering the adoption of CPM in an organisational context could be found when conducting this literature review. In trying to understand and review the phenomenon in this area it is useful to understand both the positivist and interpretive work in general first. The traditional positivist personal technology adoption models it is argued based on their published shortcomings have little relevance when seeking to understand technology adoption in an organisational context. The further academic development of these models in relevant organisational contexts has not provided significant usable frameworks. Additionally there is little commonality between the developed models themselves. It is argued that this could be indicative of the shortcomings of the positivist research paradigm in the context of organisational adoption.

Interpretivism provides a paradigm capable of providing a rich understanding of the phenomena present in this area. Widely respected academic research done by Markus (1983) provides a workable interpretive framework to research the area along with

additional research using Actor-Network Theory (Tatnall and Guilding, 1999; Elbanna, 2007). Interpretive works in similar contexts (Boudreau and Robey, 2005) provide some relevant insight, however research using this paradigm and dealing with organisational CPM adoption is lacking. This gap in the body of information system knowledge is primarily what this research aims to begin to satisfy. An appropriate interpretive research methodology is formulated in the proceeding chapter.

In order to provide a more complete understanding of adoption in this context the themes of Support and Facilitation were reviewed. It is suggested that through the understanding of these themes it may be possible to understand the environment in which adoption or non-adoption occurs. Support and Facilitate are closely related, but subtly different. The concept of Support is essentially interpreted as preventing from failure. There is little academic work covering this idea. This research tries to understand the role of the technology in supporting or causing organisational adoption on non-adoption of CPM to take place. Some useful insight is present in existing literature, but falls short of providing a comprehensive understanding. The concept of Facilitation is interpreted as simplifying or enabling processes that previously were difficult or impossible. In a way Facilitation will lead to Support in some respects, but the main idea is to understand the role of technology in enabling business processes to occur in the context of CPM. There is limited literature covering this topic and no empirical research supporting the ideas put forward.

3. Research Approach

3.1. Introduction

This research paper seeks to empirically investigate by way of an interpretive case study the subject of organisational adoption of CPM. The motivation for this proposed research methodology originates in the pluralist ideas put forward by Orlikowski and Baroudi (1991). They write that the domination of a single research perspective is too restrictive and go on to motivate for the acceptance of interpretive and critical research paradigms. They write: "there exist other philosophical assumptions that can inform studies of the relationships between information technology, people, and organizations" (Orlikowski & Baroudi, 1991, pg. 1).

3.2. Research Philosophy

The starting point for any research is the identification of the research philosophy on which to base the study. Orlikowski & Baroudi (1991) identify three philosophical perspectives: positivist, interpretive and critical. Historically there has been a tendency in IS research to use positivism as the philosophy of choice. In reviewing the literature on adoption in an organisational context this was shown again to dominate the majority of adoption studies (Davis, 1989; Rogers, 1995). However there has been a shift to more interpretive aligned frameworks borrowing from related academic disciplines like the TOE Framework (Lee & Shim, 2007).

In this research the decision between research philosophies comes down to a decision between positivism and interpretivism as there is little that could be interpreted as being emancipatory in nature thereby ruling out the critical research paradigm. (Orlikowski & Baroudi, 1991) It is the author's contention that applications of both research philosophies within Information Systems can generate valuable knowledge with neither being a superior philosophy. The application of each research philosophy to a specific research problem can provide useful views of the same subject matter. Clearly where conflicting knowledge or insight into a specific area is published this pluralist approach can cause divergence. It could be argued however that the dialog caused by this divergence could lead to more the generation of more robust and inclusive theories. It is therefore the author's contention that neither philosophical framework should hold dominance in Information System research, but rather researchers should attempt to use the strengths of each philosophy in a constructive manner to further the acquisition of knowledge.

Orlikowski & Baroudi (1991) argue that the domination of any one philosophy in a particular area has the potential to provide a one dimensional view of the phenomena. When applying this concept to organisation adoption studies it is clear to see the domination of positivism in this research area. The Technology Acceptance Model (TAM) by Davis (1989) based on the Theory of Reasoned Action (TRA) is possibly one of the most applied theories in Information Systems research and appears to have been overextended in its use within organisational adoption. Additional theories have tried to address the apparent weaknesses in the initial underlying model by adding additional complexity. An example of this is the work by Venkatesh et al. (2003) where they extend the model further into the Unified Theory of Acceptance and Use of Technology (UTAUT).

There is still some disagreement academically as to whether the underlying epistemologies of positivism and interpretivism are necessarily opposed or whether they can be accommodated in one study (Meyers, 1997). The fundamental interpretive assumption that access to reality is only through social constructions such as language, consciousness and shared meanings is consistent with the context of organisational adoption. Interpretive studies primarily attempt to understand phenomena through the meanings that people assign to them and interpretive methods of research in Information Systems are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham in Meyers, 1997, pg. 468). “Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of the social phenomena human sense making as the situation emerges” (Meyers, 1997, pg. 468).

It can be argued that in specific contexts like personal adoption the Technology Acceptance Model is extremely valuable as the findings from existing research would illustrate; however in other contexts like organisational adoption or adoption of information systems where usage is mandatory, it has been shown to be weak (van der Heijden, 2004). It is the researcher’s view that in these areas it is necessary from a positivist perspective to accept the seeming weakness of existing theory and to explore the use of interpretivism to address these inadequacies. Interpretivism was therefore adopted as the philosophical grounding for this work.

3.3. Selecting a Methodology and Following Guiding Principles

Interpretive research largely uses qualitative research methodologies. "Qualitative research involves the use of qualitative data, such as interviews, documents, and participant observation data, to understand and explain social phenomena" (Meyers, 1997, pg. 241).

There are various existing and durable interpretive methodologies that can be used in the execution of interpretive research. Each was evaluated in turn to identify the most appropriate methodology for this study.

- **Action Research** – "Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework" (Rappaport in Meyers, 1997, pg. 241).
- **Ethnography** – "Ethnographers immerse themselves in the lives of the people they study and seek to place the phenomena studied in their social and cultural context" (Lewis in Meyers, 1997, pg. 241).
- **Grounded Theory – "**Grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analyzed" (Meyers, 1997, pg. 241).
- **Discourse Analysis-** Discourse Analysis is a general term for a number of approaches to analyzing written, spoken or signed language use.
- **Case Study Research** – "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context" (Yin in Meyers, 1997, pg. 241).

The immersive nature of Action Research and Ethnographies made each of these difficult to pursue as both required lengthy and direct involvement in the phenomena being researched. Discourse Analysis was also not appropriate as it was not thought sufficient textual data would exist to support this method of analysis. This left both Grounded Theory and Case Study Research Methodologies as viable alternatives. It was however decided that the exploratory undertone of what was being researched was better suited to Case Study Research and hence this methodology was employed.

Markus and Lee (1999) highlighted the need for a clear understanding of what a Case Study is as well the clear distinction that should be drawn between the application of a Case Study methodology from the different philosophical foundations. Klein and Meyers (1999)

responded to this call with the publication of specific principles that they believe should be found in the execution of Interpretive Case Studies. Prior to the publication of these guidelines the paper by Lee (1989) was widely referenced. This interestingly used the Case Study by Markus (1989) as one of the exemplary examples of how research using this methodology should be conducted.

The seven principles defined by Klein and Meyers (1999) are now well established in IT research and formed the foundation for the findings presented in this research. A summary of these principles is included in Appendix A. It is important to note however that these principles were not only reviewed at the start of the research, but that it was necessary to act on them throughout the lifecycle of this study to the point that this internal evaluation became second nature. A critical evaluation of how successfully these were implemented is included in the concluding discussion.

3.4. Research Theory

Any study seeking to research organisational adoption is confronted with a complex system that it is necessary to understand and describe in order to adequately provide context to the findings put forward. This complex system involves a number of entities that are both human and non-human in nature as well as some entities that could be explained as hybrid. The complexity associated with this investigation required a durable and descriptive theory that could be used to both drive the research and provide a means of describing the phenomena at play. Tatnall and Gilding (1999) also support conclusion and suggest that as a methodology it is especially useful for researching the implementation of information systems and in other situations involving technological innovation, having used it successfully to research the adoption of a B2B Portal. Elbanna (2007) has demonstrated the successful use of the theory in investigating of organisational adoption of ERP which itself is closely related in many respects to CPM as has already been discussed.

3.4.1. Background to Actor-Network Theory (ANT)

Actor-Network Theory was developed by scholars Latour, Callon and Law (Tatnall and Gilding, 1999). Latour (in Atkinson, 2002) describes this as a “Heterogeneous Network of aligned interests”. Critically however “ANT deals with the social-technical divide by denying that purely technical or purely social relations are possible, and considers the world to be full of hybrid entities containing both human and non-human elements” (Tatnall and Gilding,

1999). Actor-Network Theory has been growing in usage in the IS field that many align to the increase in interpretive based IS research (Cordella & Shaikh, 2004).

An Actor-Network therefore consists and links together both technical and non-technical elements into what Atkinson and Brooks (2003) refer to as a Humanchine .This differs from Grounded Theory that adopts mostly a binary approach to entities and sees them as being either social or technical in nature (Tatnall & Gilding, 1999). The adoption of Actor-Network Theory thus interprets the questions of "is it social?" or "is it technical?" as missing the point. It encourages questions "is this association stronger or weaker than that one?" (Latour in Tatnall and Burgess, 2002, pg. 183).

Hanseth & Monteiro (1993) describe an Actor-Network using the example of driving a car. The process of driving a car is influenced by a variety of things like traffic regulations, prior driving experience, the car's manoeuvring ability etc. All these factors are related or connected to how the driver acts. The act of driving and all the factors should be considered together when attempting to understand the whole. This is what Hanseth & Monteiro (1997) therefore identify as the definition of an Actor-Network – it is the act linked together with all of its influencing factors producing a network.

An Actor-Network comes into existence via a process that Callon (in Atkinson, 2002) refers to as **Convergence**. This could happen where previously no network had existed before or within a complex ecosystem of existing Actor-Networks.

3.4.2. Actors in an Actor-Network

An actor is not seen as a point-object but rather an association of heterogeneous elements themselves constituting a network (Tatnall & Burgess, 2002). Thus the framework is scalable enabling the actor to be defined at the level most appropriate. Actors themselves are only seen as the sum of their interactions with other actors in the network (Tatnall & Burgess, 2002).

3.4.3. The Focal Actor

A focal actor is the central actor within the network. It is this actor that attempts to translate the interests of other actors within the network to their own. Atkinson (2002, pg. 2) uses a description from Latour to describe an actor as "Any element which bends space around

itself, makes other element dependent upon itself and translates their will into the language of its own". This process of translation is of central importance in the context of applying ANT to adoption research.

3.4.4. Translation

When applying Actor-Network Theory to technology adoption, Callon (in Tatnall & Burgess, 2002) refers to this process as translation. The actors within the organisational Actor-Network need to translate the innovation or information system for use. Callon further (in Tatnall and Burgess, 2002) defines this process of translation as having four "moments".

The first of these moments is **Problematisation.** This is described as when "one or more key actors attempt to define the nature of the problem and the roles of the other actors to fit the solution proposed" (Tatnall & Burgess, 2002, pg. 185). "The problem is re-defined in terms of solutions offered by these actors who then attempt to establish themselves as an 'obligatory passage point' or OPP which must be negotiated as part of its solution" (Tatnall & Burgess, 2002). Atkinson (2002, pg. 2) defines this OPP further as "A situation that has to occur for all of the actors to be able to achieve their interests, as defined by the focal actor ".

The second moment of translation is **Intéressement** or 'how allies are locked in place' (Tatnall & Burgess, 2002, pg. 185). It involves the process of locking in place the identities and roles defined in the Problematisation by interesting or attracting an actor by coming between it and another actor (Law in Tatnall & Burgess, 2002). Atkinson (2002, pg. 2) describes this more simply as "a process of convincing the actors to accept the definition of the focal actor"

The third moment of translation is **Enrolment** 'how to define and coordinate the roles'. This will lead to the establishment of a stable network of alliances (Tatnall and Burgess, 2002, pg. 186). Atkinson (2002, pg. 2) sees this as a "situation when actors accept interests defined for them by the focal actor".

The final moment of translation is **Mobilisation**. This occurs when those enrolled act as spokespersons for the network expanding its influence (Tatnall & Burgess, 2002, pg. 186).

Collectively these moments of translation provide a powerful means through which to describe the apparent stages through which Actors progress in their translation from one network to another.

3.4.5. Inscription

The notion of **Inscription** refers to the way technical artefacts embody patterns of use (Akrich in Hanseth & Monteiro, 1997). Atkinson (2002) describes inscription as the protection of interests through the creation of technical artefacts thereby linking inscription to the interest of specific actors. An objectivistic stance takes the view that artefacts determine their use while a subjectivistic position would hold that artefacts are always interpreted and appropriated flexibly (Hanseth & Monteiro, 1997).

> "The notion of an inscription may be used to describe how concrete anticipations and restrictions of future patterns of use are involved in the development and use of technology" (Hanseth & Monteiro, 1997, pg. 185).

Inscription is famously illustrated by Latour (in Hanseth & Monteiro, 1997) using a hotel key. Management of a hotel wanted to inscribe a desired pattern of behaviour with regards to hotel guests leaving their hotel keys at the front desk when leaving the hotel. Initial weak inscriptions included the use of a sign requesting this of guests as well as employing a manual doorkeeper but these had little effect. Hotel Management then stepwise increased the weight of the knob on the key chain. The stepwise increase in the weight of the knob finally inscribed the desired behaviour through successive translations.

3.4.6. Betrayal

Atkinson (2002, pg. 2) describes **Betrayal** within ANT as "a situation when actors do not abide by the agreements (translations) achieved by their Representatives".

3.4.7. Irreversibility

Irreversibility describes how translations between Actor-Networks are made durable and how they can resist change from competing translations (Callon in Hanseth & Monteiro, 1997).

3.4.8. **Black Boxing**

Black Boxing is closely tied to a key characteristic of ANT being that of scalability. The granularity of analysis using ANT is critical as the phenomena being analysed could include both micro and macro phenomenon. ANT does not distinguish between the micro, meso and macro level and offers a uniform framework regardless of the unit of analysis (Hanseth & Monteiro, 1997). Black Boxing enables actors in an Actor-Network to be viewed and analysed as either a larger macro entity (Black Box) or broken down into its own Actor-Network and analysed at this level. The scalable nature of the theory is of significant value.

3.4.9. **StructurANTion**

Atkinson and Brooks (2003) attempt to combine ANT and Structuration Theory (ST). They argue that ANT translation explains large steps in adoption within the hybrid societies of human and non-humans, but that Structuration Theory is better suited to explain how one "Humanchine" and its associated structurated order are translated from one network into another. They argue this new hybrid theory is more suited to the complexities of organisational adoption.

Their theory primarily argues that through successive translations, Actor-Networks display increasingly concerted agency, robust organisation and identity. Such networks and their actors are also under threat of being themselves translated by more powerful focal actors into other networks. Networks are also networks of other networks (Latour in Atkinson & Brooks, 2003). They argue that these features of networks and their interaction are well suited to the application of Structuration Theory.

> "Within ANT, the network's actor's communications, sanctions, and power are not mediated by commonly shared modalities and structures; networks are relationally flat. A network is bound together (if by anything) by a controlling focal actor who aligns all the others actors' interest with theirs through the moments of translation and on whose behalf it acts. ST does address networks, through the recursive cycle of agency and, modally mediated, cognitive structures, but only with respect to humans. If we combine the two theories together we get a structurated, persistent human/machine network that exhibits agency"(Atkinson & Brooks, 2003, pg. 4).

This close relationship of theories is also explored by Johnson (2001). In this paper he describes how ANT can be seen to develop from a natural beginning within Situated Action and Structuration Theory. He does not however specifically make the jump to the formation of a single hybrid theory.

This research paper primarily employs Actor-Network Theory; however the application of Structuration Theory is explored briefly in the analysis of the collected data. This draws more from the work of Johnson (2001) where phenomena within the integration of Actor-Networks could be explained using ST.

3.4.10. Shortcomings of Actor-Network Theory

As with any social Theory ANT is not without its criticisms. Walsham (1997) highlights the importance of IS researchers to be aware of these in order to be apply the theory in an informed way and to be mindful of its limitations. These are summarised as follows:

- Limited Analysis of Social Structures – Habers (in Walsham, 1997) argues that the theory concentrates on how things get done to the virtual exclusion of the way existing social structures shape these actions. Latour (in Walsham, 1997) points out that this seems to miss the point in that the macro society structures are made up of the same stuff as the micro structures and that both can be investigated using the same tool. This will be taken into account when conducting this research.
- The Amoral Stance of ANT – It is put forward by some that ANT fails along with social constructivism in general to describe the disenfranchised few in a seemingly stable network. This concept will be evaluated in the current study if necessary to highlight the disenfranchised few.
- Symmetric Position for People and Things – It is argued that the analytical view of treating humans and non-human actors on an equal footing does not seem acceptable where they are so different. Walsham (1997) sees value in this argument in an age of blurred boundaries, but does not accept the extreme position of symmetry. It is the author's contention however that the ability of ANT to describe agency in socio-technical actors is one of its strengths. It is argued that to limit the application of the theory through the symmetry of human and machine actors would limit its application and scalability.
- Problems of Description – the last item Walsham (1997) mentions is what he describes as the rather more mundane issue associated with the output associated with this type of research and the practical problems this causes for an area dominated by paper-length formats. This is of no relevance to this research.

3.5. Research Method

3.5.1. Objectives

ANT as has been discussed is in many ways an exploratory framework and cannot cater for the research of specific objectives. That said the broad exploratory objective of this research is to investigate the issues encountered by an organisation when implementing and adopting a CPM system. Breaking this down further in light of the weaknesses found in existing literature the following objectives were defined:

1. To explore the reported journey of an organisation implementing CPM and correlate this with that reported in literature.
2. To explore the organisational adoption of CPM within a specific context using Actor-Network Theory.
3. To explore the role of ICT in supporting and facilitating CPM.

The research aims to provide a rich description of a single context and the current status of adoption within this context. It will not aim to provide broad generalizations. It is hoped however, that although specific some of these themes and findings could be generalisable. This however will not sway the findings and could be considered a by-product of the research. These objectives are also in line with the stated gaps in knowledge identified in the literature survey.

3.5.2. Scope

The Cape Town Municipality was selected as the organisation in which to complete the research. They were in the final stages of taking live a SAP Corporate Performance Management solution and were happy to allow themselves to be researched.

The methodological recommendation for ANT is that the researcher follows the actors within the network when completing the analysis of the Actor-Network. The data gathering phase of the research should only conclude when no change occurs in the Actor-Network through the analysis of the data provided by additional interviews (Latour in Tatnall & Burgess, 2002). The scope is therefore defined by the Actor-Network being investigated rather than through any initial scope limiting definition. It was however understood that during the research a number of networks would be encountered and it would be necessary to limit the research through the “black boxing” of those networks displaying agency that could be

explained at a meta level as opposed to trying to break each network into its detailed micro components. It was anticipated that this would be one of the biggest challenges associated with this study.

It was understood from the outset that the research would be limited in some respects by the Cape Town Municipality itself. The availability of all potential actors in the network could not be guaranteed. It was known that this could potentially limit the scope of the research and its findings, however it was believed this could be mitigated through highlighting where these issues arose within the study and the potential impact this has on the findings. To this end these limitations are highlighted in the findings, discussion and conclusions.

3.5.3. Expected Findings

The belief on the part of the researcher at the start of this exploratory study was that a complex web of competing networks would exist within an organisation such as the Cape Town Municipality. The task of describing the convergence of the Actor-Network associated with the adoption of CPM would therefore be difficult. This preconception was rooted in an understanding of the size of the organisation and the inherent political nature of corporate performance within a South African Municipality. It was anticipated that the scalable characteristics of Actor-Network Theory would be tested fully with this study.

Additionally it was expected that some of the themes in the literature review relating to adoption of CPM would emerge or be supported through the exploration of the Actor-Network.

3.5.4. Data Collection

Data collected was of a qualitative nature consistent with the overall principles laid out in the research methodology. Due to time and budget constraints the researcher was the only interviewer. The interviews took place at a variety of locations either at the Municipal Offices or in the case of one of the interviewees – at her consulting Head Office near the Municipal Office. All took place in a private meeting room or in the private office of the interviewee. They were all digitally recorded and later transcribed in full by the researcher to allow for detailed analysis. During the interviews the researcher took detailed notes that provided an immediate insight into the themes discussed. This enabled initial analysis to be done during the interview cycle itself. This was however limited, with the majority of the key findings only

identified during complete analysis of all the collected data. The interview notes were however sufficient to guide the researcher through the interview cycle and follow the identified actors.

In addition to the interviews the researcher spent time on site at the Municipality offices understanding the social context of the implementation, some understanding of the organisational culture as well as a complete understanding of the technical solution being implemented. This was done through informal discussions with Municipality staff and detailed online analysis of the implemented CPM tool itself. The data collection took place over a 2 month period when the implementation had in theory been live for 2 months. This timing was planned 1 month prior to go-live by the researcher and the SAP Programme Manager.

The researcher is fully employed in the field of SAP Consulting and has subject matter expertise in the area of SAP Corporate Performance Management. The subject matter expertise introduced a risk that the research would be guided by theoretical preconceptions in line with Klein and Meyers' (1999) principle of Dialogical Reasoning. This was always in constant critical evaluation in the mind of the researcher.

The researcher in his professional capacity as a SAP Consultant in Performance Management software had already had a few interactions with the Cape Town Municipality prior to the research commencing and as such knew a number of the interviewees. This had the clear benefit of providing an understanding of the general context of the research, but introduced a risk of potential bias in terms of the researcher's objectivity. Additionally this prior interaction did have the benefit of putting at ease a number of the interviewees in the interview setting and making the interviews seem less formal, however the researcher was always mindful of how this professional relationship could potentially impact the results. This meant a constant consideration of the social interaction between the interviewer and interviewee making the interviews in many respects more difficult. This relationship was always critically reflected on in both the execution of the research and the analysis of the data.

The CPM toolset that was being implemented by the Municipality was a SAP offering which meant in some cases the interviewees were interested in gaining knowledge from the interviewer based on his known subject matter expertise. This made the dynamics of the interviews different in some respects as the emphasis shifted to the provision of information rather than the collation of data. At these points the interviewer was careful to guide the

discussions back to the research topic at hand. This issue was however limited to the interviews where the interviewees were performing a technical delivery role within the CPM implementation team, namely the BI Team Lead and CPM Technical Architect. Again this relationship was critically reflected on in both the execution and analysis to avoid any undue influence on the results. The questions did however provide valuable insight into the capability of the technical staff asking the questions, which in some respects enhanced the findings.

The interviews were all staggered over a number of weeks, allowing for critical reflection between each interview. This allowed time for careful evaluation of the material from each interview as well as adjustments to be made to the sequencing and content of future interviews.

All interviews consisted of a core set of open questions around the implementation of CPM within the organisation. These questions sought to uncover the emergent Actor-Network with regards to CPM adoption as well as investigate the themes of facilitation and support that were examined in the literature survey. In building an understanding of the emergent Actor-Network specific actors identified in the interviews were investigated where possible. In some cases this was not possible due to seniority within the organisation like the Executive Mayor, or lack of availability during the research timeframe. These limitations are highlighted in the research findings.

ANT does not separate the research steps of data collection and analysis. The researcher attempted to identify moments of translation during the interviews themselves. Key to this analysis was the identification of the macro and micro organisational and personal problematizations vocalised by the interviewees. These were investigated where identified within the interviews themselves. The emerging Actor-Network did in some ways make it simpler to structure the later interviews and gain more value from the time spent with each of these interviewees as opposed to those interviews completed at the start of study.

3.5.5. **Challenges**

The research had a few significant challenges that it was necessary to overcome. The biggest challenge was the selection of an organisation that would allow the necessary access to its people and its systems in order to successfully complete the research.

At the time of this study CPM was not a widely implemented toolkit within the context of private or public sector organisations within South African. As such it was difficult to find an enterprise that was both implementing CPM as well as supportive of the research objectives. CPM as a tool deals with strategy and many private sector organisations are hesitant in granting access to evaluate the systems controlling this sensitive information, let alone allow these findings to be on public record. The Cape Town City Municipality however proved to be the perfect candidate. They are a public sector organisation with much of their strategy on public record. This made any reference to strategy or corporate vision non contentious. They were also crucially in the middle of implementing and rolling out SAP Corporate Performance Management. Public sector organisations are however complex organisations with a convoluted mix of permanent employees and elected political appointments within a single structure. Researching an Actor-Network within an organisation such as this within the time allowed was going to be challenging.

Resource availability on the part of the organisation was also identified early as a challenge. Participation in research is generally optional on the part of the employees and within the City of Cape Town (CoCT) this was no different. It was always understood upfront that not all requested interviews would be granted. While it was known that this could undermine the findings in some areas, it was accepted that this was unavoidable. It was expected that where this absence was to prove material it would be highlighted in the findings.

3.5.6. Confidentiality and Ethics

There were no ethical issues associated with the execution of this research. The Municipality is a public sector organisation with much of the referenced material on public record so there was little contentious that could come out of the research. As such the entity placed no restriction on the findings and did not request anonymity for its participants. The researcher did however use pseudonyms for those directly referenced in study to avoid any direct repercussions should any of the findings prove contentious. As has been mentioned there were a few access limitations in terms of some potential interviewees, however these are highlighted in the findings and conclusions of the research.

3.5.7. Trustworthiness of Results

This research aims to deliver detailed and rich descriptions of the encountered phenomena using a durable and scalable methodology in ANT and following sound and accepted

interpretive case study principles (Klein & Meyers, 1999). It was expected that the process followed would deliver trustworthy results with a defined caveat associated with the extrapolation of these to other CPM implementations within other organisations. This extrapolation potential was not a stated aim and should be seen as a measure of the trustworthiness of the findings.

The limitations imposed on the research in terms of the scope of the study within the organisation along with the limitation from the Municipality relating to actor availability, could discount the quality of the findings, but it was hoped it would be possible to identify these within the findings themselves. Additionally the subject matter expertise of the researcher in the research field and his previous engagements at the City of Cape Town could also affect the findings, but again it was expected that continual personal reflection would mitigate this risk.

4. Analysis

This chapter describes the process followed in collecting the data, provides a description of the background to the case study and describes the initial actors encountered. Within the context of an Actor-Network Theory the Analysis section has been referred to as a "Description of the Parts" as opposed to a "Description of the Whole" provided in the Discussion section of the dissertation (Trusler, 2004, pg. 4).

4.1. A Practical Description of the Process

Permission was requested and granted via email to conduct the research at the City of Cape Town Municipality. Once this preliminary correspondence had concluded an initial meeting was conducted between the City of Cape Town SAP Programme Manager, Andrew Stedman and the researcher. This interview was not transcribed as it was meant purely to provide background to both parties; however the meeting lasted 90 minutes and provided detailed insight into the history of the overall SAP programme and the CPM implementation that was currently going live. The researcher provided a detailed explanation of Actor-Network Theory to the SAP Programme Manager to provide insight into the research. Detailed notes were taken from the session and expanded on once the meeting had concluded. This session provided an initial list of interviewees that would start the Actor-Network Analysis process. It was however understood by the SAP Programme Manager that the approach was to follow the actors and not to simply define an interview schedule and begin working down the list. He provided assurances that he would facilitate this process wherever possible.

The first interview was set up and conducted with the CPM Project Manager, Lesley Meade from the Consulting Partner assisting the Municipality with its implementation. The availability of the interviewees from both the City of Cape Town and the Consulting Partner meant that most interviews could be scheduled at relatively short notice with a lead time of approximately a week. It was therefore possible to define the proceeding interview structure to a certain extent based on the cumulative knowledge coming out of all preceding interviews. This relaxed interview scheduling also allowed time to reflect on the findings from one session to the next and to dynamically decide which actor to investigate further as a result of the cumulative findings of the preceding interviews and investigations. By the time the interviews were concluded the CPM Project Manager from Accenture had left the programme with the BI Team Lead, Ilse Maine taking over the Project Leadership. Richard Bennett provided the Technical Architect of the solution. The Business Analysis work was

conducted by a small team of which Wendy Vineguard played a key role. At the time the interviews were conducted the CPM technical solution had just been taken live with some technical difficulties. The team was also no longer at full strength as two resources – one in Project Management and one in the CPM technical team had already rolled off.

During the interview process available documentation as well as the implemented system was also reviewed. The documentation related to the CPM implementation, the structure of the CoCT, the published strategy of the CoCT as well as published legislation dealing with Performance Management within Local Government in South Africa. The SAP CPM system was logged onto and reviewed and investigated in its live environment so the researcher gained a good understanding of the context of this implementation.

Once the interviews, documentary and system reviews were concluded a final interview was conducted with the SAP Programme Manager. In this session a number of topics from the initial session were again discussed along with some of what had been uncovered in the research.

All interviews were then transcribed by the researcher. The process of transcription provided an opportunity for the researcher to again review in detail the data provided by the interviews. Once transcribed the text was then analysed to identify key themes from the interviews as well as emergent actors in the Actor-Network present in the implementation. These findings were then explained using the concepts of Actor-Network theory to provide insight into the adoption of the CPM system researched.

4.2. The Case Study

In order to understand the complexity of the moving parts and the convergence associated with the Actor-Network involved in the adoption of the CPM system within the Cape Town Municipality it is necessary to have a detailed description of the context of this case study. It is suggested that without this rich contextual knowledge the findings could be misunderstood.

4.2.1. Municipal Government within South Africa

Municipal government within South Africa experienced fundamental changes as part of the post-1994 reforms. Nationally there are now 284 Municipalities within South Africa that each

govern on a four-year term basis. They can either be Metropolitan Municipalities or District or Local Councils. They run local affairs in line with the principles of co-operative governance of National and Provincial government and are subject to legislation passed down by both these legislatures. The seven largest local municipalities in South Africa are known as Unicities. The Cape Town Unicity uses a Mayoral Executive System. This is explained by The Department of Cooperative Governance and Traditional Affairs as follows:

> "The mayoral executive system allows for the exercise of executive authority through an executive mayor. The executive leadership of the Municipality is vested in this individual. The executive mayor may be assisted by a mayoral committee."
>
> "If a municipal council has more than nine members, its executive mayor must establish a mayoral committee. The mayoral committee consists of councillors appointed by the executive mayor to serve on the mayoral committee."
> (Department of Cooperative Governance and Traditional Affairs, n.d)

From this brief description it is clear that Municipal Government within South Africa is a complicated mix of co-operative governance between National, Provincial and Local authorities. The complexity of this co-operation would be amplified through any change in the political affiliation of any of these government bodies.

4.2.2. Performance Management within Local Government

The legislative environment for performance management within local government is onerous. A recent master's dissertation in Business Administration in Local Government investigating Performance Management within Cape Town Municipality analysed 12 separate documents all contributing to and impacting on the execution of the performance management business process. (Jantjes, 2008)

The two central legislative documents that lay out the framework for performance management within local government are however:

- The Municipal Planning and Performance Management Regulations of 2001 that provides the regulatory requirements relating to Integrated Development Planning (IDP) and Performance Management. (National Treasury, 2001) and
- The Municipal Finance Management Act of 2003 (National Treasury, 2003) that lays out the requirements for a Service Delivery and Budget Implementation Plan (SDBIP).

The relationship between these two key strategy and performance management documents is described in the published City of Cape Town SDBIP for 2007/2008 (City of Cape Town, 2007).

> "The City developed a five year IDP that facilitates infrastructure-led economic growth that will promote job creation and meet residents' needs for jobs, housing, and safety and security. The Service Delivery and Budget implementation plan (SDBIP) gives effect to the IDP and the budget of the Municipality. It is an expression of the objectives of the City, in quantifiable outcomes that will be implemented by the administration for the financial period from 1 July 2007 to 30 June 2008 (the City's financial year). It includes the service delivery targets and performance indicators for each quarter which should be linked to the performance agreements of senior management. It therefore facilitates oversight over financial and non-financial performance of the Municipality and allows the City Manager to monitor the performance of the Executive Directors, the Mayor/Council to monitor the performance of the City Manager, and the Community to monitor the performance of the City Government."

Performance to the Integrated Development Plan is legislated as using the Balanced Scorecard.

It is clear that although complex, the legislation provides a solid foundation from a performance management perspective in line with the key expectations of a CPM business process. The planning process is legislated, the key planning deliverables are explained and written into legislation, and the performance management methodology is in place and agreed. The key legislation articulating this process was in place 4 years prior to the implementation of this CPM system. It should however be noted that rather than coming from the organisation itself and being facilitated within the organisation these CPM processes are essentially legislated and are more an act of compliance on the part of the Municipality.

4.2.3. The City of Cape Town Municipality

In 1996 the Cape Town metropolitan area was divided into six smaller municipalities. By 2000 these various municipalities were merged to form the City of Cape Town as a single metropolitan Municipality governing the whole metropolitan area. This was referred to internally within the Municipality as the Unicity. The process of merging these six smaller organisations into one Unicity was a challenging and uncomfortable time for the

Municipality. In addition to this the political leadership governing the Municipality also changed once since the formation of the Unicity causing additional instability. Initially the Unicity had been governed by an African National Congress lead council, but on March 15 2006 this changed to one lead by the Democratic Alliance with Helen Zille elected as the Executive Mayor.

Geographically The City of Cape Town Municipality covers an area of 2 461km^2 with a population size of 3.27 million and an estimated 904 000 households (Jantjes, 2008). It is governed by a 210 member city council that elects the executive mayor who in turn chooses an 11-member Mayoral Committee in line with legislation. The city is divided into 105 electoral wards with each ward electing one member to the council. The other 105 councilors are elected based on party list proportional representation. (Jantjes, 2008) In line with local government legislation the Executive Mayor leads the city with her Mayoral Committee. Working with this elected and political body is The City Manager. This office is contractual and viewed as partly political. Reporting into The City Manager is the Executive Management Team made up of a team of eleven. These are all permanent employees of the Municipality and have no political affiliation. Reporting into the Executive Management Team are the various senior Managers within the organisation. This organisational structure is reflected in Appendix B. The political leadership within The Cape Town Municipality had changed in 2006, 2 years prior to the research being conducted. The performance management process within the Municipality aims to define and measure performance of the management structures reporting through the Executive Management Team to the City Manager.

The amalgamation of the various municipalities in 2000 brought with it a challenge both from a business process perspective as well as information technology perspective. This is illustrated in the sentiments from Nirvesh Sooful, the Chief Information Officer for the City of Cape Town at the time. (SAP, 2006, pg.1)

> "We were faced with a very difficult decision. In my mind, unification meant delivering a single view of the city and a single view of the citizen. The only way to achieve this was through a single ERP system."

In 2001 the city sought the advice of Gartner to assist them in the selection of an ERP solution and implementation provider. The result of this selection process was the inception of an SAP ERP implementation programme named Ukutinga which means "to soar" or "to fly" in Xhosa, with Accenture as the lead implementation partner in a consortium including

four other smaller vendors. The project was at that time the largest local-government Enterprise Resource Planning system in the world. The implementation began in early 2002 and was broken into 2 initial releases going live in December 2002 and mid 2003 respectively. The implementation of SAP software has been a cornerstone of the city's ERP software strategy and has continued with organic maintenance to the initial system and additional growth into other solution areas like Customer Relationship Management and the implementation being the subject of this dissertation.

The SAP initiative at the City of Cape Town was begun prior to the establishment of the Unicity. It was clear from the interviews with the SAP Programme Manager that the challenge of establishing the Unicity gave clear direction to the ERP implementation. It meant the challenge of the ERP implementation was not just about establishing information technology supported business processes within a single organisation, but to agree them across the seven authorities.

4.2.4. The SAP Lead Transformation Programme

The problem that the Unicity encountered is explained by Lesley Meade who was at that point part of the Management Team associated with implementing the SAP ERP Solution. She subsequently also ran the CPM Project as the Accenture Project Manager.

> "In merging the 7 into 1 you had at least 7 different sets of systems. You had different levels of service in HR and putting in SAP helped facilitate that transition moving them onto common processes with a common platform [thereby] centralising a lot of the functions that had previously been decentralised and multiplied by 7. Because there were for example 7 finance departments or 7 whatever it was that were using at the time."
> CPM Project Manager – Lesley Meade

Where Lesley sees the ERP system as merely facilitating this process Andrew takes the role of technology further when describing the content coming out of the multiparty forum to that of organisational transformation.

> "So coming out of that was a business flavour to it but a very good business understanding that we were doing SAP ERP. From a business transformation perspective we were going to try and facilitate the merger and transform the organisation in the process."
> SAP Programme Manager – Andrew Stedman

He goes on to suggest that ERP implementation actually held the Unicity together through the political instability since its merger.

> "Looking back now it was probably the best decision ever because if it wasn't for that the political instability we've had over the period since 2002 the city would never have lasted if it hadn't had that core backbone hanging it together. We always talk about having a stream of pearls – if it wasn't for those ERP business processes being the string then the pearls would have gone all over the place with the lack of leadership and instability that resulted in local government in Cape Town."
> SAP Programme Manager – Andrew Stedman

It was clear based on feedback from the SAP Programme Manager that the Unicity relied heavily on the inscribed processes within SAP ERP to facilitate this business transformation. On further investigation however it emerged that Information Technology was only one stream within the overall initiative to unify the councils. The unification process was not structured specifically around technology although in many ways it became that through the eyes of the SAP Programme Manager. This provided him with a precedent for technology led business transformation within the Municipality using SAP technology.

4.2.5. The SAP Implementation Roadmap

The fact that the CPM implementation is based on SAP technology makes the history and development of the SAP Implementation Roadmap relevant to research topic. The SAP Programme Manager explains how these initial steps towards ERP and then SAP were taken within the context of putting together the Unicity systems.

> "The people who were at that stage involved were predominantly technologists who were from your traditional IT departments and one of the first things they did was an investigation by PWC into the suitability of existing applications. The result of that investigation was that PWC started adding a bit of ERP thinking to the forum and a guy like Nirvesh Sooful was key in that and said 'Hold it, this is not just about the transaction and the application it about how do you manage processes across the enterprise and you need to consider ERP rather than try and find the best payroll system and the best ledger system'."
> SAP Programme Manager – Andrew Stedman

It is therefore clear from Andrew's perspective that the discussions moved from best of breed software selection to what he referred to as "ERP thinking". This movement was then continued in the further strategy aligned work that Gartner and Accenture were engaged by the city to deliver:

> "I think the PWC investigation was very much a look at doing an ERP. 'Your existing applications would not do it so you need an ERP'. What was meant by an ERP and what was the scope and how that potentially would grow into a complete end to end solution I think only really took place when we started working with Gartner and later Accenture around determining scope and looking at the change components of it and what was going to take place over a 5 year horizon."
> SAP Programme Manager – Andrew Stedman

This would suggest that the path to ERP implementation was affected by a number of external parties who together with the city put together an ERP aligned technology strategy that the city could then execute against.

This translated via a vendor selection process into a 10 year plan connected with SAP software to support the vision and the wider economic development that was necessary to support the programme, including the establishment of local SAP competence to support the implementation.

> "It was a 10 year plan. Its core, and it acceptance and its thinking come from the 2001 year. So it is sort of a 10 year plan – 2001 to 2010. I won't go into too much detail there. It is a very comprehensive – it sees IT not as just getting the payroll to work and information around payroll, but it looks even outside of the organisation and the economic development and opportunities. One of the things we did just to give you a flavour for it in support we actually went out to create SAP competencies in Cape Town through this project and wrote into the contract that Accenture's would have to leave and we would have to create smaller

> companies that create this competence. And we have been quite successful in that. So it was much bigger than just that."
> SAP Programme Manager – Andrew Stedman

The impact of this on the CPM implementation was that this was being completed well into this 10 year plan. The initial implementation partner was in the process of concluding their initial obligations with the Municipality which was increasingly needing to draw on the smaller companies for required competencies.

4.2.6. The Logical Progression from ERP to CPM

The implementation of the CPM was a direct follow-on project to the initial implementation of ERP. There was essentially no separation between them as it was included as a contractual deliverable of the initial implementation partner. The logical progression from ERP to Management Information was discussed with Andrew and he provided clarity in terms of the thinking behind the strategy. It was very clear that there was an agreed strategy in place:

> "We also at that stage took a very calculated decision saying 'We are not going to push management information, dash-boarding, corporate performance indicators, as part of the initial rollout [of ERP]. We need to consolidate the organisation and its processes and we need to give it opportunity to come to grips with it and to make sure that the information that is to be generated by it and processes through the system has a reasonable level of reliability."
> SAP Programme Manager – Andrew Stedman

Andrew explained quite clearly the background to this decision when questioned further:

> "There was a large push to actually start doing this from the start. So it was actually a conscious decision to say "No let's take the foot off the accelerator in that area and let's try and get quality information in our transactional system that we can then serve through other tools. But doing the warehousing, KPI's, dash-boarding, performance management was absolutely part of the vision and the thinking."
> SAP Programme Manager – Andrew Stedman

It was not apparent from the interview with Andrew that he saw CPM as an integrated whole as opposed to merely a grouping of its component parts as he mentions in this statement. What is clear however was that he did see the components as a logical progression from the establishment of the transactional system.

The implementation of CPM was included in the initial contractual relationship and was therefore very clearly in the implementation partner's mind in terms of completing to their initial objectives of the systems implementation. This is highlighted in the input from Lesley:

> "One of the conditions of that contract was that a number of projects were implemented along with the support of the existing systems and the final project was the implementation of Performance Management.
> CPM Project Manager – Lesley Meade

This logical progression followed very clearly the natural progression from Management Reporting to Corporate Performance Management explored in the literature survey. The timeframe within the Municipality's case was however accelerated over less than 5 years.

The initial ERP implementation had been well received from a business process perspective however the operational reporting was starting to falter due to the data volumes encountered causing performance problems. These performance problems are useful to take note of at this point as they put some context around the performance problems that occur in the CPM implementation. In addition these issues are consistent with the natural development of reporting within an organisation that was described in literature. The Municipality therefore was at a point where technology was to be relied on to deliver a more workable solution in terms of Transactional Reporting. It was the classic motivation for a functional data warehouse to support management reporting.

> "The business was pulling us towards where transactional reporting failed, but it was predominantly around data volumes that transactional data was failing them."
> SAP Programme Manager – Andrew Stedman

The Municipality at this stage was not pushing for balanced scorecard aligned strategic reporting as the legislative requirement was not in place yet. It was purely about getting simple management reporting based on the data volumes of the largest Local Government SAP ERP implementation in the world at that time.

> "They weren't really pushing for KPI's and automated dashboards and all the flash. They were really saying "We've got a million contract accounts or three million contracts – running a transactional report to try and find the top 10 debtors is not working". So that started pushing us down the road to say in response to that operational business need we need to put a warehouse in."
> SAP Programme Manager – Andrew Stedman

The SAP Programme Manager highlighted that clearly at that time he could see the connection between this reporting solution platform and the future CPM reporting solution that was to come. He mentioned this many times:

> "Originally where it came from was to say I need better operational reporting. And the technology serving better operational reporting and future performance management is the warehouse layer and at the same time I said well this is going to be the source of our future performance management and KPI dashboard reporting."
> SAP Programme Manager – Andrew Stedman

It is likely this connection would have been highlighted by both SAP as a software vendor and Accenture as the implementation partner. Interesting the implementation of CPM replaced the implementation of CRM as the follow on implementation initiative after the ERP system stabilised. This was not mentioned by the SAP Programme Manager in his discussion around the progression to CPM however Lesley Meade who worked for Accenture mentioned this:

> "Where BI starts giving you your operational, your management view and CPM would now give you a strategic view on that same information. There was also some feeling that at the time we did the implementation the City of Cape Town wasn't necessarily ready for an implementation of CRM yet."
> CPM Project Manager – Lesley Meade

Additionally what was highlighted by Lesley was the fact that Andrew as the leader of the ERP programme was the clear driving force behind the implementation road map. He was from her perspective the central person behind the strategy and the push behind implementing the technology associated with performance reporting.

> "There was a natural momentum. Although CRM was scoped and documented three years ago, almost 4 years ago, the implementation plan that has been very much driven by Andrew Stedman in terms of the vision for implementing SAP or ERP at the City of Cape Town was to put the transactional systems in place and get the day to day under control and then to starting working up through the organisation and to provide visibility of performance within the organisation."
> CPM Project Manager – Lesley Meade

It is clear from the interviews conducted that there was a perceived natural progression in the implementation activity associated with the roadmap. This moved the organisation from ERP, to simple Operation Reporting, to more complex Management Reporting, to Dash-

boarding and ultimately to a full blown Corporate Performance Management solution. This implementation plan was essentially driven by the SAP Programme Manager although with agreement from a SAP Steering Committee. It essentially locked in place the programme's implementation activities over a rolling period.

In the context of CPM, the progression from ERP also had some shortcomings. The logical progression seemed to address the issues encountered in terms of providing an effective reporting solution for CPM. This however discounts the complexity of what true CPM aims to achieve. The key process put forward by Buytendijk (2002a) emphasise the cyclical nature of CPM and its close integration of forecasting, planning & budgeting, communication and monitoring. The emphasis articulated by the SAP Programme Manager and the CPM Project Manager in these descriptions of the CPM implementation have really only concentrated on the monitoring aspects, potentially creating problems when looking at CPM as a whole.

4.2.7. The CPM Implementation

4.2.7.1. The Background to the Implementation

The CPM project was started in 2007 following on from the go-live of the second phase of the ERP implementation in 2003. The implementation completed its go live in 2008 just prior to this research being conducted.

The implementation was overseen by the SAP Programme Manager as part of the wider SAP ERP implementation at the Municipality and as mentioned, led by Lesley Mead from Accenture. The CPM team was responsible for the requirements analysis process along with implementation of the SAP CPM module to deliver to these requirements. Working alongside them the Data Warehouse team was responsible for supporting this initiative through the provision of reports sourced from the existing SAP Data Warehouse implementation.

The SAP CPM Project Team consisted of two smaller teams namely the Business Analysts and the Technical Application consultants. The Business Analysts were tasked with engaging with the Business to understand and document the requirements to be delivered by the initiative. The Technical Application consultants were tasked with the delivery of these requirements through the configuration and development of the SAP CPM solution. Overseeing the architecture of the solution across these two areas was a Technical

Architect. The team implemented the SAP CPM toolset that technically existed in the same environment as the SAP Data Warehouse solution.

The implementation was tasked with the delivery of two key components:

- Balanced Scorecard – The balanced scorecard delivered the required legislated reporting solution. It reported and tracked the performance of the key agreed strategic indicators in the Integrated Business Plan. The solution required targets to be set and commentary to be recorded against KPI in accordance with the legislation.

- Management Dashboard - In addition the project was required to deliver a Management Dashboard that would enable the organisation to track additional KPI's that were not tracked within the Balanced Scorecard. These would be reported on alongside the Balanced Scorecard with the aim of delivery both tactical and strategic items that had been identified by the business. There was no legislative requirement attached to the Management Dashboard implementation. The emphasis of the Management Dashboards was tactical reporting.

It should be noted however that where the Balanced Scorecard was part of a wider CPM legislated business process, the management dashboards were not and were essentially highly formatted management reports.

The implementation had run into early problems with regards to the technology platform. SAP had a number of applications that could potentially deliver the requirements so a substantial portion of the project was technically evaluating what the preferred technology stack was.

> "We looked at CPM. The corporate performance measurement tool within the management [dashboard] and we looked at Visual Composer and we looked at Web Application Designer 3.5 and 7.0 and then we evaluated what our strategy would be. A lot of time was wasted evaluating the tools. The tools just don't do or are not as flexible as we wanted."
> Technical Architect – Richard Bennett

It would appear that at this stage much of this evaluation was based on usability rather than performance and more focused on functionality as opposed to delivering a more ERP-

aligned CPM business process. The unclear direction in terms of an agreed toolset could also be ascribed to the experience of the technical staff performing these evaluations.

The driving force behind the implementation was not consistently explained by each of the interviewees, however certain commonality existed.

- There was required legislative compliance in terms of delivering a balanced scorecard (SAP Programme Manager)
- The implementation fitted into the wider SAP implementation strategy (SAP Programme Manager)
- It was a natural progression for the SAP ERP programme (SAP Programme Manager, CPM Project Manager)
- There were requirements from the performance management department that had been scoped as part of the programme (CPM Project Manager, Business Analyst)
- There was an available tool within SAP that could deliver the requirement (Business Analyst)

This does however provide context to the exposure of each of those interviewed. The SAP Programme Manager and CPM Project Manager are clearly more aligned to the overall strategic roadmap and "external" requirements placed on the programme. This is in contrast to those "internal" to the project that mentioned only the technology and the business requirement without mentioning the strategic context of the project.

4.2.7.2. The Approach to the Implementation

The implementation aimed to bring live a working solution that delivered to the core requirements of both the balanced scorecard and the management dashboards. In the discussions however it became clear that there was no "burning platform" or a critical point at which the system needed to deliver a complete working solution. There were manual processes in place that could perform the majority of the processes being implemented. The approach to the initial implementation could loosely therefore be described as a proof of concept as was done by the CPM Project Manager.

> "The scope of the project was to do a proof of concept for the first phase of the automation of the city's metrics. Now there were actually two objectives there...The city does currently have metrics in fact it has many metrics. So obviously you will have duplication of effort when the same data has to be collected and reprocessed for the same metric in different places or alternatively inconsistencies where you have a particular metric calculated using different

> data sources across the organisation. So what we were looking for was to try and get a consistent set of metrics which also reduce the effort in overhead of going through the collection. So one of the objectives was to automate a subset of the existing metrics."
> CPM Project Manager – Lesley Meade

Calling the implementation a proof of concept was slightly contentious Lesley Mead from the perspective of Accenture as the implementation partner and the description was modified as follows:

> "Let's not call it a proof of concept, let's call it Phase One with the objective of proving the concept. Because a proof of concept suggests you throw it away. Within Phase One we did a proof of concept and then we implemented. So rather than calling it a proof of concept say it is Phase One and will be an ongoing. The demand is already there to automate the rest of the metrics."
> CPM Project Manager – Lesley Meade

What was clear was that at the inception of the project the implementation focused on the delivery of an initial technical solution to automate aspects of the Balanced Scorecard. This would support the legislated submission of performance data in 2001. This then expanded to include additional management reporting requirements that were not included in the initial scope.

4.2.7.3. The Objectives of the Implementation

No formal Terms of Reference document was referred to by any of those being interviewed although this was not specifically asked for. The inference here was that these objectives were not well defined or communicated.

The contentious naming of the project has already been mentioned, but from an implementation partner perspective the objectives of the programme were all limited to a proof of concept relating to the automation of the Balanced Scorecard. In addition this automation was limited further to calculations based on ERP data and the alignment of the formulas associated with each of the KPI's. This sought to address a concern around the systemic inaccuracy of existing manual submissions. By performing the calculation in an automated manner this risk would be mitigated. This is illustrated in the quote below:

> "The first prize was if data was available in SAP. If we were using an external data source - that the external data source was regarded as reliable. So that one is obviously something that is a little more difficult to verify. But in automating the existing metrics that is how we managed, how we managed to choose a subset. So in going through the design of those metrics we were looking at where we could use existing BI content that we already have activated. So percentage capital spend, percentage OPEX, absenteeism, employment equity, all of these we could pull 100% out of SAP so they are totally automated. But that brings me to the second objective in the implementation. The first one was purely let's automate. The second one is to be able to provide an opportunity to be able to highlight where through changing or how shall one say – aligning the formula with the data available in SAP to be able to get a verifiable result because a lot the metrics we termed them direct captures. "
> CPM Project Manager – Lesley Meade

This was generally supported by the Technical Architect:

> "The fourteen identified balanced scorecard measures were those that were prioritised based on complexity, based on accessibility of getting that information. So is it in SAP? What other systems is it in? How difficult is it going to be to achieve that? And then thirdly – what is the third factor – Whether it was reliable – whether the source was reliable and signed off and audited? Those were the three clarifications of the full balanced scorecard measures."
> Technical Architect – Richard Bennett

Clearly there was an initial objective around leveraging the available data from the ERP transactional system in the calculation and submission of the legislated KPI's. It was understood this automation would provide real benefits in terms of accuracy and reliability and hence the clear emphasis of the programme as explained by the CPM Project Manager:

> "Now and important thing about our implementation was that we didn't redesign – we automated. So what we said is we are not going into a design process. We are going to automate. So we took the existing SDBIP and workshopped with some of the guys from performance management, from ERP and came out with a basket of – started out to be 12 metrics from the SDBIP. The SDBIP has about 40."
> CPM Project Manager – Lesley Meade

It became clear however when the definition of the KPI's was unpacked that not all the anticipated KPI's could be calculated exclusively using SAP data, making their automation difficult. This again aligned to the academic literature that emphasised the criticality of the

completeness of the data structures supporting a CPM implementation and the complexity of achieving this (Rayner, 2005a).

> "Well we knew what was in BI so as we unpacked… The first time we went through it was a bit of an educated guess. We didn't understand what the metrics were measuring so we looked at the definitions for example. And at that stage we weren't down at a low level yet. Some of the definitions were at a high level or in some case a bit confusing I suppose. We would look at it and say ok the indicator is housing so the data must be coming from real estate so we chose that particular metric. Once we got down to the nuts and bolts of sitting down with the person that calculates that number on a monthly basis and saying to them what is the formula and where do you get the data from it turned out that that data wasn't actually in SAP."
> CPM Project Manager – Lesley Meade

This same difficulty was highlighted by the Business Analyst:

> "However initially it was thought we would get everything we need from SAP, but it ended up that most of the stuff wasn't in SAP yet and we still need to get a lot of it into SAP. So the initial plan was that we have this system, we are going to pull out everything we need, automation, everything is just going to go without a problem. After they went through the list of KPI's we saw that most of it doesn't exist in SAP yet so about 10% exists in the current SAP system. The other 90% still needs to be captured."
> Business Analyst – Wendy Vineguard

This provided significant challenges for the implementation, especially when the implementation was seeking only to automate 12 existing KPI's that were understood to be sourced from SAP exclusively.

The implementation partner sat with the existing owners responsible for calculating the KPI's and helped them define functional specifications.

> "For example service delivery electricity sits underneath the utilities ED [Executive Directorate]. And then there is a manager who on a monthly basis is responsible for actually putting in and publishing that metric. So we would sit with him and say ok every month you pull out a number how do you get it? Show us your spreadsheets? Translate that into a functional specification and then that is what we built."
> CPM Project Manager – Lesley Meade

What again mirrored the literature was that the implementation of the CPM within the Municipality was essentially replacing manual spreadsheet processes (Heiser & Buytendijk, 2005).

The identification of the KPI's to include in the implementation was also not without its challenges. The political leadership changes in 2006 meant that there was a concept of permanent KPI's as well as politically topical KPI's that would be tracked, based on the political party in power at the time. The programme therefore concentrated on the KPI's that were permanent in nature first.

> "The criteria that we used in selecting those 12 metrics was that we believed they were going to be – let's call it permanent. It wasn't a metric that would fall off at the end of the year. Metrics that were quantifiable and measurable and where we believed we could find the data for it."
> CPM Project Manager – Lesley Meade

Even having taken this approach there was still movement in the KPI's that were chosen for the initial implementation:

> "When we started out we chose a basket of 12 metrics. A month later one of them had fallen off the SDBIP. So that one we put on our dashboard – it happened to be absenteeism."
> CPM Project Manager – Lesley Meade

Looking beyond the nature of the KPI's that were initially selected the discussion with the SAP Programme Manager highlighted a deeper aim of the implementation from his perspective. He highlighted the fact that through extending the implementation to cover a wider dataset of KPI's in the Management Dashboard it may be possible to get the organisation to modify their strategy to address what the KPI was telling them. He explains this as follows:

> "What we are trying to do is – well time will tell if you can actually influence strategy through, let's call it measures, which is the exact opposite to what text books are saying. What we are trying to do is to say we need to bring some realness to what is being measured and what we actually project as being our focus areas in the organisation. So we are actually trying to build up a whole list of KPI's over and above those that the city has identified as its key measures. And stuff that we can pull out of the transactional systems. So put business processes in place, put measures on them and expose them to the organisation and perhaps through that the organisation will say 'You know we didn't realise that the following was a

reality. Perhaps we should put in place a strategy to pick up that measure to improve the output.' "

SAP Programme Manager – Andrew Stedman

4.2.7.4. The Moving Scope of the Implementation

The initial plan for the implementation was simple. The SAP CPM system would be implemented, with KPI's sourced exclusively from the SAP ERP related data in the connected SAP Data Warehouse. This was seen as a simple exercise that would provide a manageable scope for implementation as explained by the CPM Project Manager:

> "In our case we put in BI, there is enough stability in the system, expanded the scope and built CPM we could do it in a relatively short timeframe because obviously CPM is involved building BI and CPM. And I think if you combine those two I think you are going to get quite a challenge. Whereas we could in a lot of instances focus on the metric and then suck the data up without having to focus on the data, the extraction - the BI part of it. "
>
> CPM Project Manager – Lesley Meade

During the initial implementation it was however decided, based on pressure from the Executive Mayor and SAP Programme Manager, to extend the scope to cover all KPI's rather than those sourced from SAP exclusively. The impact of this is explained by the technical architect of the solution:

> "We want to get all the balanced scorecard measures on now so there has been a change of strategy. Maybe just to backtrack a bit before I go there - we've got two types of measures at the moment. We've got what we call direct capture measures and that used BPS [SAP Business Planning and Simulation – Planning Toolkit in SAP CPM] functionality. You don't know what the source is. We delivered some of those measures now and then we delivered the SAP data based measures - a combination - so going forward it's been decided that we will get all the measures on immediately using the data capture method and then transfer them so at least we are looking on one tool. There's obviously dangers in that but the sort-of long-term goal is to then convert each of those measures that are captured into the systems, auditing the systems and then bringing it into SAP wherever possible."
>
> Technical Architect – Richard Bennett

This had the benefit of ensuring completeness in terms of the dataset for both the Balanced Scorecard and Management Dashboard however it introduced other challenges. What started out as essentially a proof of concept delivering 8 KPI's that it was thought could be automated from SAP data now ballooned into a substantial data capture and publication

exercise to provide that elusive "single version of the truth" as described by the Technical Architect.

4.2.7.5. The Technical Architecture

The selection of technology for the implementation was a combination of technologies from a SAP perspective. The Balanced Scorecard application was seen as stable, but old and inflexible. The Management Dashboard however was the antithesis of this – new, unstructured but unproven and ultimately unstable. These were however combined from a reporting perspective into a single divided portal screen referencing both toolsets. The balanced scorecard was rendered on the left of the screen with the management dashboard on the right.

> "The one was the balanced scorecard and for that we used SAP SEM BSC [SAP Strategic Enterprise Management Balanced Scorecard]. Pretty structured, old, inflexible but it was stable. That is what we used for the SDBIP metrics [Balanced Scorecard] that we automated. Then what we did was we used the Web Application Designer, a little bit of BPS [Business Planning and Simulation] code and a little other things… We created a dashboard. On the dashboard every metric that occurred in the balanced scorecard was also reappearing on the dashboard and other metrics that we added that were not balanced scorecard or SDBIP metrics we published there. "
> CPM Project Manager – Lesley Meade

From an architecture perspective the project was following the recommendations in literature by using CPM technology aligned to their data warehouse infrastructure as, both toolsets were (Hostmann & Strange, 2002). Additionally their selection of multiple toolsets to address the challenges of CPM is again consistent with the reviewed literature. The cutting edge nature of the Management Dashboard is the most contentious aspect of their architecture as this was ultimately where they experience the biggest perceived performance issues. Within the context of this implementation it is undeniable that there were realised performance issues, but looking at this in the wider CPM software market there is nothing to suggest that this is an inherent issue with this specific application. This would therefore suggest that the technical architecture was sound.

4.2.7.6. The Organisational Challenges

As a public organisation there is clearly an underlying public expectation of transparency in terms of both strategy and performance to strategy. This is to a certain degree legislated in

terms of the defined approach to strategy determination and agreement and measurement in terms of performance to strategy. It can be argued though that this culture of transparency has not always existed in public sector organisations within South Africa. Recent legislation has forced some to learn this relatively new public responsibility.

The CPM Project Manager defined the project role as being all about completing the design and implementation of the technical solution focussed clearly on solution delivery with no reference to adoption. There was no resource in the CPM implementation team addressing the challenges of organisational change in preparing for adoption and this was never mentioned as being a project responsibility. This position is explained by the CPM Project Manager.

> "My role in the project was as project \ programme manager. So I was responsible for the technical implementation or design and implementation. As you know I had been at the City of Cape Town for quite a while playing the role specifically of implementing the project there very much in terms of getting the project done."
> CPM Project Manager – Lesley Meade

The philosophy of transparency and awareness was something that the implementation team highlighted as key to what they saw they were delivering:

> "The whole philosophy is transparency."
> BI Lead - Ilse Maine

> "The whole dashboard concept is to raise the awareness."
> Technical Lead – Richard Bennett

However the organisation was not totally receptive to these key ideals as explained by the BI Lead. The levels of management mentioned by her relate to the executive levels within the organisation. Level 0 is the City Manager, Level 1 is his direct reports for each directorate, level 2 are then their direct reports and this continues down to Level 5.

> "I know from Andrew Stedman's side there was a bit of resistance to change. There was a lot of debate around who should have access. He wanted to put it down at least initially from 0 – 5. Performance Management was a huge debate of the fact that everybody could see everybody's KPI so there was some sensitivities to that. We sort of met halfway and agreed on 0 – 3 with the idea of rolling it out to the lower levels in Phase 2 and Phase 3. There were issues around that. One of the main things for Andrew Stedman I think is the usage. I think we are going to have to do a big drive to get the usage up. "
> BI Lead - Ilse Maine

4.3. Emergent Actors

This section introduces the identified actors within the context of the implementation and discusses their seeming impact on the path to implementation and adoption of CPM within the Municipality. It does not seek to define the Focal Actor upfront, but seeks rather to describe the parts of the investigated Actor-Network with a view to bringing these descriptions together in the proceeding chapter when explaining the network holistically.

4.3.1. National Government, The Treasury and Legislation

As with most countries in the world National Government in South Africa has a powerful method of inscribing desired behavior in Regional and Local Government in the form of Legislation. The complexities of the interaction between Local, Regional and National Government were not investigated within the scope of this research. Once legislation is passed the Executive Mayors within local governments have a responsibility to conform to the prevailing legislation whether in agreement or not. As such National Government in this context translates the interest of local government through their definition of the OPP (in this context being the legislation) and expects the enrolment and mobilization of all those in leadership positions to deliver based on legislated timelines.

Legislative Compliance was highlighted by the SAP Programme Manager as a key driver to the implementation of CPM and is therefore a key actor to understand more fully. Legislative compliance was however only mentioned by him. None of the other interviewees mentioned this in any of their discussions meaning that this was not visible to the majority of those implementing the project.

Legislation is comprehensive and defines in detail the business process that local governments need to instigate to drive their Integrated Development Plan (IDP) and their Service Delivery and Budget Implementation Plan (SDBIP) as well as the reporting processes associated with its service delivery associated with these plans. It defines quite clearly a Corporate Performance Management framework for local governments using a Balanced Scorecard model. Service delivery is reported by The City of Cape Town through the Treasury on an annual basis. Their performance is audited and can result in a qualified audit that would negatively impact the council in a number of substantial ways. Compliance

in terms of accurately reporting service delivery as well as attaining key performance levels is vital to the Municipality. This is explained by Andrew Stedman below:

> "Legislation has come in that says, yes your organisation needs to work from a process perspective and from a service delivery perspective but I need you guys to report to us in national government and I am going to legislate that as to how you guys are complying with that. So the administration has responded to that from a compliance type of response. I need to make sure I get an unqualified audit, am I seen by national government to be compliant.
>
> So for instance national government through national treasury will specify a whole host of reporting KPIs that everyone needs to comply with – yes they stratify the local governments by high capacity, medium capacity and low capacity but they are pushing the whole time saying you need to report like this.
>
> So in response to this legal and legislative requirement you started seeing after 2000 the emergence of performance management departments. In the past they used to have things called OAW – Organisation and works departments which were really guys with the white clipboards counting how many bags of cement you could load per labourer per truck and then coming up with some recommendation around which truck to buy, or to get rid of the labourers, but there was nothing like a high level corporate performance management reporting."
> SAP Programme Manager – Andrew Stedman

One of the key issues raised in one of the interviews was the lack of workable information systems to support the requirements of the existing legislation. The legislation in many respects appeared to be well respected, however the practicalities of actually supporting these with information systems was seen to be missing in the discussion with the SAP Programme Manager.

> "I think one of the things is the significant influence of legislation in our environment. There is some really good legislation in a South African local government context - progressive stuff. But the reality is the systems to support that do not exist - the information systems."
> SAP Programme Manager – Andrew Stedman

It is clear that a key motivation for the delivery of performance management within the Municipality is one of legislative compliance and this is supported in the interview with the SAP Programme Manager. However when describing the organisational response to this he explains it as one of compliance as well as lacking the technological support to deliver it successfully. Legislation has therefore provided an initial Problematization that the

Municipality as a whole has responded to; however this in many ways did not impact directly the decision to implement the technical CPM solution as the legislation came into effect a number of year prior to the CPM implementation. A distinction should be drawn here between the implementation of CPM processes and the implementation of the CPM system. This research aims specifically to understand the latter, however from an adoption perspective these appear to be inextricably linked.

For the purposes of this study it is useful to group National Government, The Treasury and Legislation into a single Black Box displaying collective agency.

4.3.2. Strategic Advisors and the ERP Roadmap

A Municipality the size of the City of Cape Town employs a number of consultancies to assist them in defining and executing their strategy with regards to their Information Infrastructure. The impact of this strategic advice is clearly substantial on the strategic direction of the organisation. Consultancies are also products of the business environments in which they operate and are normally impacted by the prevailing themes in the market at a point in time. Three consultancies were mentioned in the interviews as playing a role in a number of the key historic phases of the overall programme. This included the initial move to ERP thinking, the ERP Software selection as well as Implementation Partner selection.

Interestingly this is either described by named individuals like Nuvesh Schifor (from PWC) playing a key initial role in the move to an ERP system thinking or by the consultancy name like Gartner playing a role in the ERP software selection. It would be interesting to investigate the relative impact of the consultancies on the overall implementation programme however again this is outside of the scope of this research.

These strategic advisory services were however all historic and had been translated into a Strategic Roadmap for ERP within the Municipality. This in turn rolled up into a wider Business Roadmap.

None of the interviewees made any reference to any strategic advice from any parties relating to the CPM implementation. The Roadmap had meant minor decisions could be made within the confines of this broader agreed strategy without revisiting the overall plan on a regular basis. The defined strategy was to use SAP software for all Enterprise Processes and use an Accenture Consortium to support the initial implementation of the

core components before moving to a number of smaller local sustainable consultancies after a 3-5 year period.

Interestingly in the interviews themselves budgetary constraints were also mentioned in a similar context to the agreed Roadmap. For example from the Technical Architect:

> "I think the budget for the project has been a very calculated strategy on Andrew Stedman's part. This is my interpretation on what I have seen is that he had a specific vision with [ERP] coming in and the [SAP Data Warehouse] coming in to facilitate [Corporate Performance Management] kind-of applications and he had a specific plan in mind to do that. He, ahead of time, budgeted that way. So it wasn't a matter of the mayoral guys having to approve the budget, the budget was already there."
> Technical Architect – Richard Bennett

This does not tie back to what the CPM Project Manager said in her interview about the Strategic Roadmap for the SAP implementation or what the SAP Programme Manager himself had reported in terms of the strategic priorities for the City. But clearly this impression had been created. What would appear to be the case is that budget was approved within the context of the wider agreed Strategic Roadmap unlocking capital for use.

Within the context of this study the strategic advisors along with the roadmap that they articulated and the budget associated with this roadmap was simplified into a "black box" again displaying agency. The impact of this "black box" was through the definition of an OPP that the SAP Programme was compelled to be enrolled by. It was however accepted that as SAP Programme Manager could with little effort translate the SAP Strategic Roadmap to his own interests as there appeared to be little Irreversibility from his perspective as demonstrated by the movement of SAP CPM ahead of SAP CRM.

4.3.3. Political Parties, The Executive Mayor and the Mayoral Committee

The elected Executive Mayor and her selected Mayoral Committee are all political appointments. These officials define the strategic direction for the Municipality as well as the management emphasis within the organisation, all within the context of their political agenda.

Party politics has a direct impact on the measures within CPM. This was explained by the SAP Programme Manager as emphasizing strategic priorities within the organisation that would differ from one political leadership to the next.

> "So here's an example. For many years – it also depends which political party is in power – the focus shifts. Local government has a social responsibility and a let's call it service delivery operational responsibility and it is very seldom that you hear leadership actually push both of them equally strongly. Usually it is all about social or it's all about service delivery."
> SAP Programme Manager – Andrew Stedman

It was also highlighted by one of the interviewees that a number of the Key Performance Indicators would be relevant independent of political affiliation of the leadership.

> "There are a lot of the KPI's that are relevant across the board independent of political party. There would probably be a handful of new additional ones but there is a lot of generic stuff that we could tap into irrespective."
> BI Lead - Ilse Maine

In addition to this it was also interesting to understand the political impact of the information that is reported.

> "There is a desire for more information. The question is sometimes what is making them hungry for information. The one is they need to know more than the other person, especially if the other person is a politician. So there is a long to know what is happening in this organisation to keep me one step ahead of my political boss. And then the other one that is pushing quite hard or influencing them quite hard is why they are looking for information is to say I need to know about the problem before the problem arises. Not perhaps so that I can put a measure in place to prevent it, but perhaps I can it. OK, so falling back on the old skill, but wanting early warning."
> SAP Programme Manager – Andrew Stedman

So from this evidence it is accepted that the political party in power directly impacts the measures reported within CPM and that party politics drives the strategic priorities within the Municipality. Additionally the political impact of the information itself may drive the organisation to make this information visible in tighter timescales. Accepting this it is however suggested that the adoption of the information system itself that supports this process should be seen as independent of the measures themselves and therefore not directly affected by party politics. Political influence will be present in the political

appointments within the Municipality and indeed in some of the legislation itself, but there was no evidence that this political influence played any role in the implementation or adoption of the system itself. In addition it was not possible to measure or define the subtleties of this indirect influence on the defined political actors themselves.

Elections take place every four years so there are inherent challenges associated with changing strategic direction from one political party to the next. This frustration is explained from the perspective of the implementation programme by the CPM Technical Architect:

> "If you were to think about the city, if you were to think about any company, if it were to change its management every 4 years it just wouldn't because you are just getting your strategy going and then it changes."
> Technical Architect – Richard Bennett

There was however no change of political leadership that effected the CPM implementation, although this had occurred during the initial ERP implementation.

Beyond direct party politics it is then the personal management emphasis of the Executive Mayor and her Mayoral Committee that affects the implementation and adoption directly. In the Case Study the Mayor was mentioned by all interviewees as positively supporting the programme. The SAP Programme Manager explained her involvement as follows:

> "Another role player has come to the fore and this is in our scenario and that is the current Executive Mayor. The current Executive Mayor is much more closely aligned to the whole measurement and management through measurement way of thinking. She has started saying "I want to have a daily scorecard, I want to have KPI's". In fact she goes beyond where sometimes it gets a bit confusing in that there will be the corporate scorecard and five year plan and the priorities. Then the mayor will have scorecard as well which is more tactical with her executives in measuring and managing. So she is saying: 'Yes you need to comply legally, yes you need to have a vision, but by the way it's about today and tomorrow and how many squatters, how many foreigners are at Soetwater. I need that kind of tactical information on my desktop real-time'. So she is pushing a Corporate Performance Management initiative to satisfy her need for information to understand what is happening in the organisation."
> SAP Programme Manager – Andrew Stedman

This direct involvement and drive by the mayor was again reported in the interview with the technical architect of the solution and the BI Lead.

> "One of the major drivers came later in the project was the mayor's requirement for a dashboard to easily be able to put a finger on what's going on at a given point in time. So there was a big drive from the mayor. That is actually where the big emphasis came in the middle of the project and towards the end of the project."
> Technical Architect – Richard Bennett

> "Yes, there was the mayoral suite which obviously was a key impact to getting the momentum going. "
> BI Lead - Ilse Maine

This involvement was also beyond that which would normally be seen in a programme sponsor. She was reported providing detailed requirements to the programme:

> "Getting back to Helen Zille – the mayors approach. She [wanted] a dashboard where she can actually go in there and see there's a red light. And then she can speak to the directorate guys over here with water and ask what is going on. She herself is going into the system."
> Technical Architect – Richard Bennett

This desire for online detailed performance information was linked back to the Mayor's personal agenda and management priorities. Interestingly this was never mentioned with regards to any other Mayoral Committee member. In addition her requirements went further than reporting only on the legislated KPI's but included additional tactical information linked to a far shorter time horizon to the KPI's coming from legislature. When asked about the difference between the legislated KPI's and the KPI's requested by the mayor he responds:

> "It is a much shorter timeline. It's a more tactical operational type of plan and she is saying 'I need these measures to be maintained and available to me when I am sitting on the plane in Jo'burg.' She is saying I need information to know what is going on. And that has given a whole host of momentum to a more automated corporate performance management process and solution that provides real-time information. So the other one - you can actually work on spreadsheets and count the guys with TB, get it into the annual report and send it off."
> SAP Programme Manager – Andrew Stedman

This requirement around extending the legislated KPI's to cover tactical KPI's that could then be actioned by management was also highlighted by the technical architect of the solution.

> "We had the measures in the dashboard already so to provide her with a combination of the two to be able to manage the city easily. So to be able to pick up and say there's a problem there and then push it down to the relevant person to investigate and feedback."
> CPM Technical Architect – Richard Bennett

This presented data would suggest a number of key conclusions should be drawn in the context of the Actor-Network explored.

- No Political interference in the process of implementation or adoption of the CPM information system or business process was reported or uncovered therefore excluding this from future commentary.
- There was little or no impact from the wider Executive Committee or Mayoral Committee on the implementation up to the point the research was conducted. Only the Executive Mayor was mentioned as providing meaningful input into the process.
- The ubiquitous impact of the Executive Mayor on the implementation was reported by all human actors interviewed making her interests central the identified ecosystem that was the Actor-Network involved in the adoption of the CPM business process.
- These interests extended well beyond those of the seeming OPP laid out by National Government and published in legislation but were essentially limited to the business processes of CPM as oppose to the technical Information System. Her management style was reported as being more KPI focused than the prevailing organisational culture.
- This support led to the reported additional momentum associated with the implementation of the Information System.

4.3.4. SAP ERP Programme Steering Committee

The SAP ERP implementation work was managed as a programme reporting to the SAP ERP Steering Committee that oversaw this activity. The SAP Steering Committee was made up of a number of key stakeholders within the Municipality as well as the leadership of the SAP ERP Programme, primarily the SAP Programme Manager. It was not possible and seemingly unnecessary to break apart this "Black Box" within the wider implementation and adoption network of CPM. No direct involvement by the steering committee was reported by any of the human actors and no involvement was uncovered through any other means that supported this assertion.

This body did however control the SAP ERP Implementation Roadmap, but it was expected would be guided in many respects by the SAP Programme Manager who was reported more widely as driving the direction of the wider SAP implementation as has been shown in previous direct quotations.

4.3.5. SAP Programme Implementation Partners

The implementation partners were engaged to deliver the initial defined SAP roadmap with the CPM implementation concluding this commercial responsibility. This was explained by the CPM Project Manager as follows:

> "It was a 3 year contract which ended the end of September [2007]. One of the conditions of that contract was that a number of projects were implemented along with the support of the existing systems and the final project was the implementation of performance management."
> CPM Project Manager – Lesley Meade

As such the implementation partner's management would have been incentivized to conclude their commercial responsibility to the Municipality. It could be argued that is why CPM was accelerated at the expense of a far more complex and lucrative Customer Relationship Project that would be delivered separately. However the reasons for re-ordering the SAP implementation roadmap was consistently reported between the SAP Programme Manager and the implementation partner so it is unlikely this was the case.

Similarly to a political party the influence of the Implementation Partner would be felt indirectly through the motivation of the resources engaged on the programme. As such this influence was limited to their project manager as well as any influence that they could excerpt on the steering committee.

No significant influence was attributed to the Implement Partner themselves and hence they have been excluded from any future analysis. Clearly however the role of their resource in the CPM Project Manager remains, with some of her interests clearly aligned to her employee.

4.3.6. SAP the Software and Service Provider

SAP as an organisation was engaged throughout the duration of the CPM implementation programme. This was limited initially to the provision of advice relating to the software selection based on communicated requirements as opposed to the provision of professional technical resources to assist in the implementation itself.

As performance problems arose in the implementation there were official escalations that led to the deployment of specific technical resources to address these issues. This only occurred once the solution had gone live.

SAP as the software and professional service provider did not play a central or pervasive role on the project leading up to the performance related escalation as the Municipality and their implementation partners were comfortable handling these implementation activities themselves. In support of this statement it is also noted that they were not mentioned as an organisation or as a named resource in any of the conducted interviews. The reason for this chosen lack of involvement was reported to be one cost – the day rate of the SAP Consultants was substantially more than those employed by the Municipality. This was ascertained in informal discussions with the SAP Programme Manager rather than documented in the transcribed interviews.

This situation will always put the software provider in a difficult position as their name and software will be associated with the success or failure of the implementation. They will be incentivised as an organisation to make a success of the project where possible. However leading up to the performance escalation they showed no direct involvement in the implementation or its adoption and were also excluded from any further detailed analysis. As an organisation on the defensive in terms of protecting their software's reputation it is expected they would respond collectively displaying agency through shared messages across all their business units from the client management to the support organisation.

Leading up to go live of CPM they were essentially uninvolved in the implementation and formed no material part in the implementation or adoption actor-network. From a strategic perspective the Municipality relied on other professional entities to guide their ERP strategy so SAP were essentially perceived as purely the software provider and escalation channel for issues associated with their software.

4.3.7. SAP Programme Manager from the Municipality

The SAP Programme Manager had an overall responsibility for the ongoing support and implementation of the SAP ERP system as well as defining and driving the overall SAP strategy within the organisation. This was primarily achieved through his management ability and impact on the strategic roadmap and steering committee. He appeared, based on all input received both formally and informally, to be very well respected by both the Municipality and implementation partner. At the time of the SAP CPM implementation this was his key focus in terms of the implementation activity within the SAP Programme and as such he was very involved in the project. He also had a long history within the Municipality outside of IT, having worked in a number of the directorates in various roles before becoming involved in the SAP ERP programme during the formation of the Unicity.

The significant impact of the SAP Programme Manager in the CPM implementation was mentioned by all the interviewees. This impact was broad and included helping to drive the overall CPM project from a management perspective with the CPM Project Manager, the provision of business requirements to the implementation team, as well as ultimately driving system adoption and usage within the organisation. These items are illustrated in detail below.

The CPM Project Manager identified him as helping manage the SAP product usage strategy within the Municipality rather than referring to the agreed implementation roadmap or steering committee as would be the expectation.

> "There is no thought process. SAP is generally the standard and Andrew Stedman helps manage that process to keep them off none SAP products. In Cape Town they are getting pretty good at saying all the projects go through the IT projects department and if they are looking at implementing a package the question is asked 'Why can't SAP do this?'."
> CPM Project Manager – Lesley Meade

In the context of the CPM implementation the BI Team Lead saw him as driving the vision. She too made no reference to any defined or documented strategic roadmap:

> "I think it was his vision initially and then they build a small prototype which people delivered to CPM and then from there the idea grew about how many KPI's."
> BI Lead - Ilse Maine

At a detailed level the Technical Architect credited him as defining what the problem was that the implementation was trying to address.

> "I think it came out of the fact that there are sources for measures. There's the balanced scorecard but then there are a whole lot of other sources so there varying different measures all over the City and to get a centralised "one version of the truth" so a particular measure at this high level is made up of all these lower level measures. That they are in one place and verifiable definitely came from Andrew Stedman. He identified that as a problem. He had a vision in mind especially for specific indicators."
> Technical Architect – Richard Bennett

The collective picture we have is of someone inextricably linked to the implementation of SAP within the organisation. He is seen by those interviewed as driving this process and effectively translating those within his team to effectively support his interests. He created the OPP in terms of the installation of the SAP CPM solution and translated those within the implementation team to work towards its delivery. What is harder to establish based on the material gained in the study is how this translation within the wider business is progressing or the Actor-Network associated with this adoption.

He was seen by the Business Analysts as being in touch with the business requirements to the point of making the connection between them and the available SAP technology to address these.

> "I think he is a big driver in this whole CPM. He is definitely because the business, I don't think they necessarily know all the systems that are available, there are a few but do they actually fit the business requirement? I think the driving stick is coming from him with a need from the business as well."
> Business Analyst - Wendy Vineguard

From this it is clear that she sees him as a key driver for the CPM implementation, but from the perspective of bridging the gap between the business requirements and the solution. She goes on to say:

> "The balanced scorecard is like your set structures for the year that you capture your figures in whereas the dashboard should be those highlighted things that happen on a day to day basis like your requisitions, your lead-time – things like that. I think that what's his view on that is. He wants push the dashboard more so that it highlights those things that are not necessarily on the scorecard."
> Business Analyst – Wendy Vineguard

This however is a requirement that the SAP Programme Manager had already reported as originating from the Mayor. Some members of the team seem to be misinterpreting these organisational goals to personal goals of the SAP Programme Manager.

The CPM Project Manager saw his involvement being less requirements focused but more aligned to organisational change. She suggests that his motivation for the system is more to deliver visibility and transparency to allow for performance management to effectively occur at all levels within the organisation. She also credits him with being very much in touch with the problems with the business.

> "The target audience for the BI implementation was levels 0 to 4. 0 is the city manager, level 1 are your [Executive Directors], level 2 are your Directors. For performance management we have targeted that same group. Ideally you would only be targeting your 0 to 3's, but the approach that Andrew Stedman has always been driving in the City of Cape Town is one of visibility, one of transparency and it is important that your level 4's are able to see that level of transparency because the level 1 sees the red robot and phones the level 2, the level 2 sees his is a red robot and phones the level 3 eventually it ends up with the level 4. Beyond that anyone that asks for access as long it is approved by their directorate can get it... What we did was we looked at using the knowledge that we got from Andrew Stedman who's very in touch with the business problems are lieing."
> CPM Project Manager – Lesley Meade

What this would suggest is that she views Andrew as having ideas beyond purely the SAP implementation activities and more aligned to IT enabled business transformation. Ultimately she also saw him as actually positively assisting in the adoption of the SAP CPM system through his engagement with senior management.

> "Every time Andrew Stedman goes into a session, and this had already started. Every time he goes and talks to the ED's and directors he brings up the screen and says guys let's just have a look at the capital situation and through that."
> CPM Project Manager – Lesley Meade

It is clear from this evidence that we have a SAP Programme Manager with a long history within the organisation. We have someone that has a defined strategy that they are following that is founded on an agreed roadmap that ultimately ties back to the Integration Business Plan of the Municipality. This however may not always be visible to everyone in the implementation team and is sometimes misinterpreted. The SAP Programme Manager

is actively engaged in bridging the gap between the team implementing a system and a business that may not always know the best direction to give the team. This inherently carries a risk in that this gap may not always be bridged effectively if the requirements from the Programme Manager do not align to the true business requirements in the Organisation.

The collective picture we have is of someone inextricably linked to the implementation of SAP within the organisation. He is reported by those interviewed as driving the process and effectively translating those within his team to support his interests. He created the OPP for the SAP Programme in terms of delivering a SAP CPM solution to continue the SAP strategy. To do this he translated those within the implementation team to work towards its delivery. What is harder to establish based on the material gained in the study is how this translation within the wider business is progressing or the Actor-Network associated with this adoption.

He successfully created an OPP with the business as illustrated by the business agreeing to support the SAP CPM implementation and provide resources to assist in the implementation project. This they did at the expense of other solutions they had been looking at installing. The capabilities of the SAP CPM technical solution will however ultimately determine in many respects the level of business translation. It is suggested that in many respects the implementation activity is essentially a long process of Enrolment of the business by the SAP Programme Manager.

4.3.8. Corporate Performance Management Department

The Corporate Performance Management Department is the business owner of the implemented SAP CPM solution. The establishment of this department was aligned to the legislation requiring municipalities to submit KPI related data to central government. This is explained by Andrew Stedman:

> "Those KPI's – it comes through the Integrated Development Plan. An SDBIP. Service Delivery Budget Implementation Plans. All these kind of KPI reporting business planning and reporting on the business planning that resulting in corporate KPI's has resulted in probably the first time corporate performance management departments being established in local government."
>
> SAP Programme Manager – Andrew Stedman

From this it is clear that the department is new to the organisation and does not have longstanding stable business processes associated with the capture of KPI's. Prior to the implementation of the SAP CPM solution a loose system of Excel data capture had supported the KPI planning and reporting process. This was reported as not being unusual in much of the literature.

They had been looking to develop a solution that would do something to automate the capture and calculation of the KPI related information, but nothing had as yet come from this initiative until the SAP programme became engaged in the solution. This is explained by the Business Analyst:

> "They have their spreadsheet system. They want something better. Something more that they can get their information quicker from. I know in the meeting that I had with those people they were looking at using, I think, Sharepoint to get that information as well in a similar fashion. That also didn't seem to go according to plan. The main push – I think it would be a combination of factors. A combination of what we have on this floor [the SAP implementation] and the business saying we need something because of the current paper based and spreadsheet system is not the best thing out there."
> Business Analyst – Wendy Vineguard

Her concepts are very simple – the department wanted a better system because "spreadsheets were not the best thing out there". In her role as a Business Analyst however she would not have been best suited to understand these motivations more clearly. The CPM Project Manager explains things slightly differently:

> "It was a combination of them coming to him [SAP Programme Manager] and them being part of his strategic plan. The performance management guys have been looking at tools for possibly the last 2 years. I know Microsoft has been in there and show them some really fancy stuff that wowed them but obviously no backend."
> CPM Project Manager – Lesley Meade

Strategy is mentioned along with the request from the Corporate Performance Management Department. Additionally from this it is clear from this that the CPM Project Manager believed the challenge in the solution lay in the backend or data management rather than the mere presentation of the data. It was not clear whether this view was shared by the Corporate Performance Management Department. The department had had previous initiatives in the Microsoft space which had not addressed their challenges in the past. They had also proactively agreed budget spend for the automation of the overall solution.

> "They were always pretty proactive. I think from last year they had already put money in the budget to be able to have it automated because to be able to collect the city's metrics every year takes a lot of effort."
> CPM Project Manager – Lesley Meade

The Corporate Performance Management Department were not however reported as engaged in the implementation project as some of the team would have liked. The CPM Project Manager explains:

> "He [The CPM Department Resource on the Project] was supposedly the business owner \ project manager from their side. He didn't get involved with the implementation. He did help us with getting to the right people and in some of the metrics. He obviously takes ownership of it now from a business perspective"
> CPM Project Manager – Lesley Meade

The lack of reported involvement from the CPM department resource seems to have been addressed by the extension of the SAP Programme Manager's involvement and his direct relationship with the business and the office of the Executive Mayor. It seemed from the reported involvement by the SAP Programme Manager that many of the key requirements came through him from the Mayor rather than through the Performance Management Department. This however would not have replaced the key involvement and future ownership of the solution required in order for the PM Department to fully adopt the solution. This is supported by the business analyst interviewed being unclear as to whether the PM Department would actually be required to sign the solution off:

> "The CPM owner, I think he will sign it off or not? We are actually waiting for his signoff."
> Business Analyst – Wendy Vineguard

At this point in the implementation when the system was running in a live environment you would expect the required signoff to be clear. This did not appear to be the case along with some uncertainty as to whether the existing performance issues with the solution would prevent this taking place.

The lack of project involvement by the CPM department was going to be an issue in terms of solution ownership unless addressed through increased participation in the implementation. They were not involved in a number of the additions to the solution that seem to have come directly from the business and Executive Mayor like the addition of the

tactical dashboard that had been delivered. The department was primarily responsible for the legislative compliance related KPI's. Ownership of the tactical performance KPI's appeared to vest with the mayor based on feedback from the SAP Programme Manager.

The involvement the department did have in terms of the administration function also was reported as not being done effectively although clearly being their responsibility.

> "Those CPM people are supposed to check that the data does get captured. They are administrators of the CPM system. They are supposed to make sure that the data that is meant to get captured gets captured."
> Business Analyst – Wendy Vineguard

The prevailing performance issues had prevented much of the handover of the technical solution to the CPM department from taking place. The technical handover had taken place, but the project team was essentially administering the system while the performance issues were addressed.

From a research perspective it was not possible to interview any of the resources in the CPM department so in many respects it was treated as a "black box". The contact that was mentioned in the interviews with the CPM Project Manager did not make himself available for the study. This did make this area of the actor-network harder to describe and it did not have the same degree of validation as experienced in other areas. It would have been preferable to break apart the "black box" and understand the internal relationships within the department; however this would have also increased the scope of the research fairly dramatically.

The description of the department through the human actors interviewed did however provide some useful insight. We have a clear picture of a department that in a way has been sidelined as much of the performance requirements were aligned to the management dashboard that was the Executive Mayor's initiative. There is a general perception from business that the department was more compliance aligned as opposed to performance improvement enabling. The Mayor was generally reported as providing the real performance drive within the organisation. The CPM department was also reported as not as involved as they should have been in the implementation and were reportedly not to be taking over their system administration responsibility. However they did own the budget for solution and had proactively looked for alternative solutions in the past. They had clearly bought into the OPP of the SAP Programme Manager, but appeared to be unconvinced by the system to date.

There were no human actors in the department that seemed to have reached Enrolement with the SAP CPM solution weakening the chances of wider departmental Enrolement. It is suggested that without a champion, departmental Enrolement would be fraught. Additionally there did not appear to be any notion of Irreversibility in the new SAP CPM solution with existing processes able to continue.

4.3.9. KPI Owners in the Organisation

The KPI Owners within the organisation are defined for each KPI in the Balanced Scorecard and Management Dashboard. These KPI owners are mostly made up of Executive Directors (ED's) within the Municipality and are primarily responsible for capturing commentary associated with the performance of the KPI's they own. They are not involved in the calculation or capture of KPI information – only the data entry of the commentary which in some cases they delegate.

For the Balanced Scorecard KPI's there is a critical relationship that exists between the reported KPI's and their remuneration. This is explained by the Project Manager of the CPM implementation.

> "The ED's have performance based bonuses. Their performance based contracts include all those metrics. So that is where it becomes sensitive again. 'I am happy that my metric drops from 97 to 95 because you are replacing it with good data, but I don't want to get penalised because of the technology wasn't available earlier. So if you align my targets to something I can achieve then we're fine. If you don't I am going to resist it.' So there is quite a bit of change management there."
> CPM Project Manager – Lesley Meade

The implementation of a system that would potentially provide more accurate performance KPIs would require some alignment in terms of performance based salaries. This could create negativity towards the technical solution, but this did not appear to be the case as explained by the Project Manager.

> "Occasionally we had to tweak just to get it to work, we weren't redesigning so where we for example picked up inconsistencies we highlighted them. It is up to the process owner to say let's change the formulae because you are quite right the way we were doing it wasn't right and that did happen in one case. I think they changed it four times."
> CPM Project Manager – Lesley Meade

None of the interviews reported any degree of resistance from this user community. The SAP Programme Manager was reported as handling the engagement with them on a regular basis seeking to get buy-in from them which was unusual. The expectation was that this would have been done by an Enroled CPM department.

> "Andrew Stedman also goes to council, to the ED's on a monthly or two-monthly basis he's being going to the sessions with ED's and telling them about corporate performance management - showing them little bits and pieces. He is getting the buy-in from them. Also he can't go ahead with something like Corporate Performance Management unless the ED's know about it."
> CPM Project Manager – Lesley Meade

The CPM Project Manager also clearly highlights the fact that from an organisational perspective Executive Directors need to "know about" an initiative like CPM in order for it to "go ahead", however the detail behind this statement was not investigated further.

There was no specific mention of any KPI requirement emanating from the Executive Directors indicating little in term of a "pull" from a Performance Management perspective which was of interest to note. Only the "pull" relating to the Executive Mayor's emphasis on Performance Management was mentioned. This is also aligned to the feedback relating to the organisational challenges associated with performance management discussed in this paper. The Executive Director community was however reported as being central to the performance management process, but did not appear to have bought into the system. This is explained by the business analyst.

> "The owner of the KPI is supposed to assess the KPI's. That is also mandatory on a quarterly basis or annual basis. After our first phase that wasn't really done. So hopefully now with this project finishing now with most of the KPI's being on the scorecard I think now they are going to drive it now. Those are mostly very senior people that are supposed to do that and it's not that easy to tell them to capture [their performance commentary]. For someone at that level they don't want to capture [commentary] you know what I mean. So they are suppose to assess why their KPI's look that way, but it is the guys at the bottom that understand why it looks that way, they just feed the information up. "
> Business Analyst – Wendy Vineguard

It is clear that the designed system required them to physically login and enter a written assessment of the recorded KPI which also appeared not to be consistent with

organisational culture and the reported level of computer literacy. This process had not been done historically by this community and there was no indication that this would be done going forward. Overall it seemed that this wider community had neither adopted or rejected the CPM system, but were critical to its success in the future.

There was no person specifically mentioned from this community in any of the interviews that had played an active role in the implementation activities or had supported the implementation beyond attending the required workshops. This would suggest that although Problematisation has taken place with the CPM Programme Manager seeking to define the OPP being the SAP CPM implementation, Intéressemment and Enrolement had not taken place with any of this community. From an adoption perspective they could also be treated as a "Black Box" involved in Intéressemment. It is not clear if they had actually bought into the CPM processes or the technical SAP solution

It was not possible to extend the research to include interviews with this wider community, but the picture generated by those human actors interviewed was consistent. It would have been preferable from a completeness perspective to have interviewed a few of these owners but the scope of the research did not allow for this.

4.3.10. KPI Responsible Person within the Organisation

The KPI Responsible Person is the person in the Municipality that actually calculates and captures the KPI in the SAP CPM system where it is not possible to automate. They essentially perform an administration function.

> "The ED will get measured, but the responsible person is the one actually making sure that the number comes out."
> CPM Project Manager – Lesley Meade

It was reported by the Business Analyst that much of her time was spent with the person who had historically physically done the KPI calculation namely the KPI Responsible Person rather than the performance owner. This was necessary in order to understand how the calculation was performed. If it was possible to automate the KPI then this was done, otherwise in the new system they were still required to either capture the result or its components in the SAP CPM solution.

> "The people that it effects – those are the people that we had to deal with to actually find out what is your actual KPI, how is it measured, what does it involve? So the actual owners of the KPI [calculation] – the people that are actually calculating those values – those are the people. Those are the main people that we dealt with from our side." Business Analyst – Wendy Vineguard

It was clear from the interviews that the majority of project interaction with the business was done with the KPI Responsible Person. This could be aligned to the planned prototype nature of the original implementation work where the emphasis would have aligned to getting the technology working.

The KPI Responsible People were designed to be mandatory users of the system however with the experienced performance problems their usage was not being enforced. The KPI Data Captures would need to calculate and enter the KPI's that they owned via a SAP front-end Screen. The KPI Owners would then need to enter their assessment of performance associated with each of the Balanced Scorecard Metrics. This commentary was not necessary for the Mayor's Dashboard. The impression from all of the interviews was that this wider community had not yet bought into the wider benefits of performance management and as such just saw the system as another data capture task. This was explained by the Business Analyst:

> "I don't think when the business hears performance management – it is not the most exciting thing to do. They just go 'Oh, we have to fill in our stuff. Oh that must be due by Friday'. So no one is ever excited. I have spoke to most of them. 'So this is another system where they have to capture information'. And they are like: 'Oh another one'. " Business Analyst – Wendy Vineguard.

Some of this apathy could have come from the fact that the Municipality had gone through a number of initiatives to capture KPI's in order to comply with legislation and there was a level of frustration and misunderstanding that this would now supersede all previous to provide a single solution. However as a wider community they were still in Problematisation and while there were technical performance issues with the SAP CPM solution they would not be convinced that the proposed solution was the right path forward.

Again there was no-one mentioned in the interviews that suggested any specific user in this community had had a significant influence on the programme beyond the required involvement. It would again suggest that this community had progressed no further along translation by the focal actor than Intéressemment.

4.3.11. The Organisational DNA

The organisational culture or as the SAP Programme Manager defined it – "the organisational DNA" - is important to understand in order to understand the context into which the CPM system is being implemented. The public sector is very different to the private sector in many respects. The complexities of these differences are explained by the SAP Programme Manager.

> "The skill that gets you to the top in the public sector due to its high political involvement is the skill of managing perception not the skill of management in fact. So if I can spin a story, if I can create the illusion, if I can create the public believe that all is well – it's cool. Nobody ever says actually what do the numbers say which is what you probably find in a more commercial environment where you can actually reduce it all down to a single bottom line figure. You will never actually hear in local government 'What do the numbers say?' because as soon as you ask that question there will be a hundred other people saying 'But hold it, it is not about the numbers. We are not supposed to show a profit, we are not supposed to do this'. You go into the fuzzy world of debate where fact is perhaps secondary to the ability of managing perception."
> SAP Programme Manager – Andrew Stedman

This is a very important distinction to be made in terms of the implementation of CPM. Many of the methodologies have come from the private sector and have been applied to public sector without perhaps an understanding of the idiosyncrasies of how a public sector organisation operates. This is further explained by the SAP Programme Manager specifically relating this to the Balanced Scorecard Methodology that was used to present the strategic KPI's from the Integrated Business Plan:

> "The other component of what came out of that was the adoption of a balanced scorecard. So the balanced scorecard methodology is as you know embraced but the mechanics and the *living it* and the *using of it* to influence the operations - that has never become part of the DNA of the organisation. It is done by a group of guys on the outside that irritate the hell out of me from time to time when they ask me to update a spreadsheet. "
> SAP Programme Manager – Andrew Stedman

A CPM system being implemented in an organisation that collectively has not bought into the processes of performance management will find adoption difficult. The system merely automates a business process. You could argue that it is as important to study the adoption

of the processes associated with CPM and performance management independent of the system that support the process. The implication for this study was however to understand that as an organisation these did not appear to be supported by the business. This is explained further by the Business Analyst interviewed.

> "There was a lot of negative feedback like: 'Why do we have to do this again? There are places where this stuff has been done already. This is just another system where data gets captured or the data gets stored'... At the end the day they have to comply. If there KPI is on that scorecard then they have to submit."
> Business Analyst – Wendy Vineguard

It is clear that the business processes around data capture relating to performance management have not been clear or fully rationalized. The issues also essentially seemed to relate to the administration function as oppose to the actual performance management process. It would appear that there is a certain degree of double capture while the SAP CPM system was not fully implemented. This negativity would also only relate to those KPI's not possible to automate.

It is also apparent that there is concept of mandatory adoption for those entering data in the system, but this mandatory adoption by actors cannot be inscribed within the technology. Physically a person will need enter data in the system and disciplined by management it not compliant. It would therefore be up to management to enforce personal adoption in some of these contexts. It management themselves have not been through Enrolement in the CPM processes they will not enforce CPM usage.

The implementation of CPM at the Municipality is really about continuing the Technology led Business Transformation that was initiated by the SAP ERP programme. It is about getting the organisation to buy into the processes as well as the system to support it. This makes the study associated with the adoption of the technology slightly too constrained. It is for this reason that much of this study has not specifically drawn this distinction and has looked at the adoption of the new system in conjunction with the adoption of the new CPM related business processes.

This technology lead transformation is explained in a reported analogy from the SAP CPM Project Manager

> "Andrew Stedman always uses a lovely analogy. He says you know that movie Field of Dreams. "If you build it they will come". Because [for an] organisation like the City of Cape Town something like a performance management system will never be a priority. There will always be other things to do instead of that, so it is never going to be urgent but it will always be important. The challenge that performance management [and] Andrew Stedman have going forward is that they now need to say "We've got this tool and performance management is important. It should be important to you as the head of electricity what your trend is in electrification."
> CPM Project Manager – Lesley Meade

It can be argued that Organisational Culture is merely the collection of all the complex Actor-Networks that make up the Municipality's whole. It this argued however that in the context of this research the behaviour of some of the actors – primarily the SAP Programme Manager – were influenced by the perceived and encountered organisational culture that was not aligned to a specific community but rather the collective community of the organisation. Organisational culture can therefore be seen to be behaving as an actor by as Callon and Latour (1981) put it "bending space around itself" and "translating their will into the language of its own".

4.3.12. CPM Implementation Team Project Manager

The project manager of a CPM implementation team took responsibility for planning the project, reporting back on to progress to programme management, completing and closing the phases of the project from requirements definition to final solution delivery into the production landscape. Lesley Meade from Accenture took this responsibility to essentially get the project done and complete the commercial responsibility of the consulting partner. This was described by Lesley Meade as follows:

> "My role in the project was as project \ programme manager. So I was responsible for the technical implementation or design and implementation. As you know I had been at the City of Cape Town for quite a while playing the role specifically of implementing the project there very much in terms of getting the project done."
> CPM Project Manager – Lesley Meade

She was clearly aligned to the SAP Programme Manager's thinking with regards to the CPM implementation and corroborated all aspects associated with the overall ERP strategy and the implementation roadmap that he spoke about. She was clearly in a state of Mobilisation with both the Municipality and her employers relying on her as she puts it to the get the

project done through bringing live the SAP CPM solution. This was aligned to both these Actors interests. Her influence however appears to have been restricted to the technical delivery of the system primarily the implementation team.

The performance issues that were being experienced at the time of the research were not seen as a problem associated with the management of the implementation itself which was of interest. By the time these were identified her engagement at the city had already concluded and the support team was essentially dealing with these.

4.3.13. CPM Implementation Team Technical Architect

The technical architect of the solution had the responsibility to put in place the technical architecture to deliver to the specified requirements. This involved selecting the appropriate SAP Application to support and deliver the requirements. This was described by Richard Bennett as follows:

> "My role was to work with Lesley Meade. She took on more of the business analysis side of things in the project and I was the – I guess you could call it the technical architect. So I worked with her translating what she had received from the business into a technical solution. I was from the technical perspective the team lead to prototype things, define the standards and the approach and to mentor the other people in the team to actually run with the prototype and implement to the various different areas."
> Technical Architect – Richard Bennett

He did not however manage the technical resources in the team delivering the defined technical solution. This was up to Lesley Meade as the project manager.

The evidence from the interview suggested again the he was completely supportive of the interests of the SAP Programme Manager in terms of the delivery of the SAP CPM system. He was therefore seen as in a state of Mobilization, however similarly to the CPM Project Manager his impact on human actors was limited mostly to within the programme team.

Crucially though it would seem that his ability and that of the team to translate the SAP solution to the requirements of the project failed as the performance problems arose in the application that they could not address.

4.3.14. CPM Implementation Team Business Analysts

Lesley Meade in addition to being the CPM Project Manager led a small team of business analysts on the project. The role of the business analysts was primarily to understand the existing CPM business processes and document these as requirements. There role was explained by Richard Bennett as follows:

> "We have kind-of a team split here where a business analyst has the business knowledge and a BW consultant or configurer who has the technical knowledge kind-of merge and deliver it that way. And so it is those business analysts that understand the business who fed in a lot of the non-balanced scorecard measures. So they said look – this is kind-of their involvement with the business and this is what they see as missing and this would be something good to have on the dashboard. "
> Technical Architect – Richard Bennett

The business analysts led by the CPM Project Manager were also in a state of Mobilisation from the perspective of the SAP Programme Manager. They were clearly focused on capturing the requirements and assisting in the delivery of durable solution, however no impact on wider organisation from an adoption perspective was uncovered in the research.

4.3.15. CPM Implementation Team Technical Consultants

Once the requirements were fully documented and understood they could then be passed to the Technical Architect who would design an appropriate solution that could then be built by the technical consultants proficient in the SAP CPM Software. These resources were not interviewed but were really only tasked with delivery against defined requirements.

None of these resources were specifically mentioned in any of the interviews as effecting the solution in any way – either positively or negatively. They should really be seen in a similar light to be in a state of Mobilization with regards to the interests of the programme manager with Enrolement having taken place through the project management structures.

4.3.16. Existing Information Infrastructure within the Municipality

The overall solution had to be delivered into the existing technical landscape within the Municipality. This landscape currently included the live SAP ERP Applications and the SAP

Business Warehouse solution. From a technical compatibility perspective this technical architecture limited the potential SAP solutions that could be implemented to deliver the CPM requirements. This limitation however did not prove material as the preferred SAP solution was technically compatible to implement on the existing SAP landscape.

Technically the SAP CPM solution ran on the same physical and logical environment as the existing live SAP Data Warehouse solution. The ongoing maintenance of this solution took precedence over the CPM Project which led to the migration of CPM from one technical environment to another near go-live. This caused general problems in CPM as there were issues with the reports coming from the SAP Data Warehouse. This unstable reporting solution led to the CPM implementation team being sidetracked to sort out these upgrade related issues. This is described by the Technical Architect as follows:

> "I have been through various different upgrades of BW and this is the most unstable one I have ever seen. We've got lots of problems so that's caused a bit of a delay – a loss of emphasis actually."
> Technical architect – Richard Bennett

Additionally during this upgrade period and extending to the project go-live some technical performance issues could not be isolated to either the CPM solution or the upgrade. Ultimately these were found to be CPM solution related, but the instability in the existing information infrastructure lead to misconceptions around where the problem lay. Ultimately in viewing the information infrastructure as a sociotechnical actor it is clear that the inscription found within the technical landscape had led to an uncomfortable translation of the CPM implementation team. They did not have the subject matter expertise in this area and there did not appear to be a human involved in this actor-network to explain adequately the information infrastructure to address their concerns.

4.3.17. SAP CPM Software Solutions

SAP Software offer a variety of application toolsets that can be used to deliver a CPM solution. The project team led by the Technical Architect in conjunction with minimal input from SAP did a prolonged analysis of the available toolsets available to decide which matched more completely the defined requirements. This analysis had a negative impact on the timeline of overall implemented solution as a substantial amount of implementation timeline was spent analysing tools rather than implementing a solution. This then meant there were time pressures during the system build activities. Additionally it is vital to note

that neither the implementation partner or software vendor led this piece of work as the subject matter expertise was sourced from the internal technical team at the Municipality.

Ultimately a combination of two solutions was chosen to deliver the requirements of the Municipality. At this point there was clearly an opinion that the solutions could be translated by the technical team in place to inscribe the required solution. To a large degree this was accomplished except for the performance issues encountered.

5. Discussion

This section covers two main topics. Firstly it uses Actor-Network Theory to describe holistically the Actor-Networks involved in the adoption of the CPM system. It does this by describing the key networks at play and linking together the identified actors into "black boxes" that assist in understanding the process and degree of adoption emerging in the Municipality. It then uses these established Actor-Networks to help explain key emergent themes from the case study as well as specific concepts investigated relating to support and facilitation of CPM by information technology.

5.1. The Description of the Whole

The complexity associated with understanding the Actor-Network at play within the investigated Municipality has a lot to do with understanding the level at which the Actor-Network is described.

5.1.1. Central Government as the Focal Actor

South African Central Government inscribes the desired behavior with regards to core CPM processes within Local Authorities through legislation. This published legislation does not define information technology usage, only the planning and reporting processes required within a local authority. The process of legislating has its own network of translation where Central Government seeks to translate Local Authorities with a consultative process of white paper publication and open discussions. Ultimately however it is left to legislation to inscribe the desired behavior.

For the purposes of this study the complexity associated with the interaction between Central and Local Government has been simplistically understood but generally ignored as non-material to the central research relating to the adoption of the CPM system by the organisation. As legislated the Municipality is required to deliver core CPM processes that report to central government. The accountability for this performance reporting requirement sits ultimately with the Executive Mayor. This is the case due to the political nature of the Mayors position. If Central Government were not happy with the submission of performance indicators or the process associated with arriving at the reported KPI's it would hold the Executive Mayor accountable.

From this perspective simplistically Central Government has defined an OPP being the legislation that will translate Local Government who at this level display agency and can be treated as a “black box”. Breaking apart this “black box” clearly reveals the Executive Mayor playing a key role in translating the local government in question.

However when you apply this to the CPM implementation at the Municipality Legislation is only a piece of the overall requirement. The requirement for the management dashboard did not come from legislation.

5.1.2. The Mayor as the Focal Actor

In the research however two key human actors emerged in the Actor-Network these being the Executive Mayor and the SAP Programme Manager. The evidence would suggest that all the interviewees perceived the SAP Programme Manager to be the main Focal Actor however all also made reference to additional involvement from the Executive Mayor. From a project team perspective grounded essentially in organisational leadership this would be normally expected following organisational reporting lines. However when delving deeper into the adoption process it is possible to gain more insight into how this network currently exists and how it will potentially develop further.

5.1.3. Moments of Translation within the Network

The mayor has been Mobilised through legislation to deliver CPM business processes within the Municipality and as such is seeking to translate the interests of others to meet this requirement. Problematisation occurs in this network with the mayor as the focal actor and the OPP the delivery of CPM business processes within the Municipality to enable compliant planning and performance management.

It is argued that the SAP Programme Manager progresses through the moments of translation relating to the Business Processes of CPM at pace as his interests are aligned with those of the Mayor’s. His interests however lie in the technology to support the CPM processes rather than the benefits of the business processes themselves that the mayor would be motivated to deliver. Essentially he sees the provision of a system to support the Mayors CPM business process objectives as an opportunity to advance the SAP Programme through additional implementation activity. There is a strategic SAP ERP

related roadmap that has the implementation of a Performance Management Solution as a key medium term objective. His Intéressement aligns his goals to that of the Mayor's and becomes a key ally in delivering to the initial Problematization of the Mayor. His progression through Intéressement, Enrolment and Mobilization is complete. He can now be seen from a technology perspective to be the focal actor of a smaller network with the OPP being the implementation of a CPM information system.

This assists in explaining the behavior of the actors associated with the implementation of CPM as it is possible to see two closely associated co-operative networks rather than one single complex network covering both the technology and the business processes. The one network is aligned to the adoption of the business processes associated with CPM with the Executive Mayor as the Focal Actor and the other aligned to the information technology to support these business processes with SAP Programme Manager as its focal actor. Essentially the network focused around that SAP Programme Manager being a subset of the wider CPM business process adoption network focused around the Executive Mayor.

With this distinction in mind it is then possible to explain the translation of all the actors with a clear context relating to their involvement in each network. It should also be noted at this point that the majority of the research concentrated on investigating the actors associated with the technology implementation and adoption rather than that of the business processes adoption. This was essentially a technology adoption piece of research; however it is argued that it is very difficult to understand the technology adoption without understanding the business process adoption hence this has been included to a limited degree.

The concept of Technology Led Transformation in this context is of interest as it combines the interests of both Actor-Networks. The Municipality believes in this principle as illustrated by the following quote from the SAP Programme Manager:

> "I don't think the functionality helps from a thinking perspective, alright, but we are very firm believers of technology led transformation at the business process level. And what that in essence entails is our organisation like most organisations has such a momentum that any change that if you don't do it through hard coding it into the organisation, the organisation will revert to its old ways".
> SAP Programme Manager – Andrew Stedman

From this perspective we see the technology or technical artifact as leading transformation in the business and inscribing the "right" behavior to avoid it reverting back to previous ways

of working. This appropriation of technology by the implementation team however has to ultimately correlate with the management principles that the Executive Mayor is seeking to establish in the municipality.

> "The current executive mayor is much more closely aligned to the whole measurement and management through measurement way of thinking. She has started saying: 'I want to have a daily scorecard; I want to have KPI's '. "
> SAP Programme Manager – Andrew Stedman

The SAP Programme Manager made sure that from a programme perspective there was nothing blocking the implementation activity. This involved passing the implementation plans through the steering committee as well as making sure CPM was on the implementation roadmap to start with. There was nothing that could be reviewed to investigate the translation of these bodies and artifacts, but it would seem that there was little blocking the SAP Programme Manager in either of these actors or anything to suggest that they required much persuasion or effort. The implementation partner also saw this as the next logical step in the SAP implementation activity and the last contracted deliverable from their perspective, so they were also aligned to his interests. SAP the Software Provider had little influence on the overall process implementation decision. They had no strategic planning resources advising the client and their involvement was purely associated with the charging of additional license fees. Additionally the mobilized implementation team under the CPM Project Manager would also have aligned to the SAP Programme Manager's implementation goals as organizationally and from a leadership perspective they would be considered Enrolled within his Actor-Network. No dissention in the ranks was uncovered in the interviews conducted. So all actors from an organisational perspective within the implementation programme were in alignment and were essentially enrolled.

What became clear as a key problem was the implementation's team ability to configure (or translate from an ANT perspective) the SAP CPM solution to deliver to the requirements of the programme. The configured SAP CPM Solution was not delivering the required performance in line with a workable solution. From a functional perspective however the solution was reported to deliver what was required for both the Legislated Balanced Scorecard as well as from the Mayors Management Dashboard. In both of these contexts the SAP solution has been widely implemented globally with over 100 reference sites, so the technology itself should be stable and durable. At the City of Cape Town however, the performance of the solution was a major issue adversely effecting the adoption of the solution. The BI Lead saying "It is unworkable" and the Technical Architect saying "We can't

train because it takes too long…It takes 10 minutes…15 minutes for this to open". When asked if it is possible to resolve the performance issues the BI Lead responded "It is a needle in a haystack". The team clearly had a sense of betrayal in that they felt the technology had not delivered to promise.

A technology artifact is clearly a powerful tool for enabling technology led transformation within an organisation through inscribing the right business process behavior, however when the technology does not provide a viable or workable solution it cannot enroll the wider organisation. It is clear that satisfactory performance in the solution is necessary to enroll the organisational users and while the technical solution remains in this non-performing state, it blocks the OPP proposed by the SAP Programme Manager. This is described as the implementation and adoption of SAP CPM solution amongst all user communities. Adoption within the three identified user communities would therefore be blocked. This being adoption by the Corporate Performance Management Department, the KPI Owners including the Executive Mayor and the KPI Capturers. They had been persuaded that the SAP CPM solution would meet their requirements, however their translation had stagnated with the performance issue. The expectation is that they would all ultimately feel a sense of betrayal if the problems were not addressed and the implementation failed to deliver a workable solution.

Compounding the negative impact of the performance problems when interacting with the system was the reported obstacle with the organisational DNA that was not aligned with the aspirations of CPM or the principles of management by numbers. The SAP Programme Manager did however think this could be achieved based on his experience with implementing the ERP solution. He believed that people would respond to published indicators; however this would only happen if these indicators were actually used to drive management meetings within the organisation. He did however concede that this organisational behavior was "light years" away. As a collective actor in the network the organisational DNA is negatively impacting the adoption of both the business processes of CPM and the follow on systems to support these. It has yet to be fully engaged in the Problematisation. It is suggested that this would need to be addressed by the mayor as she attempts to change this organisational mindset but there was no evidence that that was taking place successfully although this could not be adequately assessed as part of this research.

5.1.4. Inscription and Irreversibility

The SAP Programme Manager clearly saw the benefits of inscribing the approved CPM processes in the technical artifact of the SAP System and was a "firm believer in business process transformation". This was borne out by his experience with the "business transformation" delivered by the ERP programme following the buy in to what he called ERP thinking and the adoption of the SAP ERP System associated with this. He saw this as a two stage process as he puts it "It is like the adoption of ERP thinking and the ERP system is just a component that enables it". It is that he saw the system as playing a key role in terms of creating an irreversible process that once adopted, created an insurmountable barrier to change. This is illustrated as follows:

> "I don't think the functionality helps from a thinking perspective... but we are very firm believers of technology led transformation at the business process level. And what that in essence entails is our organisation like most organisations has such a momentum that any change that if you don't do it through hard coding it into the organisation, the organisation will revert to its old ways. So there are numerous examples of this like going off on the "bosberaad" [Afrikaans term meaning conference] and deciding how we are going to do this tomorrow. If you don't translate that into process change and other changes it just reverts back to the old way of doing things. Now in SAP we have been very successful..."
> Andrew Stedman

It is argued however that a CPM system is very different from an operational type system like ERP from where his thoughts appear to originate. In ERP data processing is necessary to support the day to day operation of the organisation. For CPM there is no transactional imperative from a business continuity perspective – there is only the management pressure on the KPI capturers and KPI owners if they do not follow the process and deliver to their responsibilities. It is suggested that a CPM implementation will not deliver the same "business transformation" benefits as seen in the ERP system as the nature of the processes are too distinct.

In the discussions with the SAP Programme Manager it was clear he was seeking to inscribe the right CPM process in management within the Municipality using technology thereby making the KPI system the single version of the performance truth. While the system suffered performance issues this inscription was weak and to a certain degree non-existent.

5.1.5. StructurANTion

Attempting to apply the concepts put forward by Atkinson and Brooks (2003) relating to StructurANTion within the CPM implementation at this point would seem premature. The system had not been handed over to the business and in addition the KPI Owners and KPI Data Capturers had not been interviewed. Their thoughts and input on key topics put forward in the literature like emancipation and agency could not be assessed.

Having said this it is useful to apply the simple concepts of StructurANTion Theory to provide some additional insight into the inception of the implementation.

Over time an existing Actor-Network had been established to support the existing CPM processes that the implementation of SAP CPM aimed to supersede. This actor-network existed as a loose conglomeration of a number of tools including Sharepoint, Excel spreadsheets and manual processes along with the associated humans that collectively formed this loosely affiliated network. There was little structure imposed on or processes inscribed in this network. There were also inherent issues in terms of multiple versions of the truth as relayed by the CPM Technical Architect. Over time however this loose network of Humanchines developed to become more durable as all actors evolved to provide a stable and durable network. It is argued this evolution from a loose to a stable network could be well described using the Theory of Situated Action, Structuration Theory and Actor-Network Theory as put forward by Johnstone (2001). However when this process or structurated order is interrupted by the CPM implementation of SAP Technology, this substantial and complete translation of all the actors is more challenging to describe using these constructs.

Atkinson and Brooks (2003) argue a computer based information system “consolidates a network’s structurated order if its structurated order is commensurate with that of the humans”. Technologies therefore make society durable but not immutable. (Latour in Atkinson and Brooks, 2003). If there is inconsistency between between the existing network and the structurated order of the technology this leads to the disruption of the humanchine network (Atkinson and Brooks, 2003). The findings of the research would indicate this to be the current state of the implementation at the Municipality.

Orlikowski (in Atkinson and Brooks, 2003) identifies that at this point there is a melding together of the human and technology over time with a new structurated order emerging. The implementation at the Municipality is at the start of this process as this melding of the

technology inscribed processes and the human actors within the network has not yet taken place. The Actor-Network is therefore still unstable and could be rejected. This is illustrated by a quote from the Business Analyst.

> "At the moment they just look at it as a tool – another tool that they must capture information in. I think that is one of the biggest challenges especially in an organisation such as this where they are set in their ways."
> Business Analyst – Wendy Vineguard

It is the contention that Actor-Network Theory is better suited to explaining emergent Actor-Networks associated with dramatic change. This contention is based on the application of these concepts to the conducted research and is also supported by Atkinson and Brooks (2003) where they suggest dramatic change and its associated point of emancipation and translation for humanchine actors is well explained using Actor-Network Theory.

It was however harder to apply the concepts of situated action and structuration theory based on the status of the CPM implementation when the research was conducted. It is suggested however that this would explain more fully the progression from the point of dramatic change associated with the implementation to the stable humanchine network that will occur over time.

5.2. Findings and the Way Forward

The emergent Actor-Networks provide the context in which to review the themes investigated or uncovered by the Case Study. To this end the concepts of IT support and facilitation that were investigated during the research interviews are discussed first. The emerging themes associated with system adoption, the go-live and the way forward for the implementation are then discussed.

5.2.1. IT Support for the CPM Processes

The SAP Programme Manager as discussed earlier saw the clear benefit that the SAP software could deliver from a process support perspective for CPM. He likened this to the process lead transformation that the Municipality had experienced in their ERP implementation. There was no evidence of doubt in his mind that the technology would not be able to support the processes of CPM.

This belief appeared to be shared by the CPM Project Manager and the Technical Architect. The Project Manager believed the technology could deliver to promise and wanted to demonstrate this, while the Technical Architect genuinely believed it made the business process simpler.

> "We needed to demonstrate a capability so that people wanted to be able to logon every morning and quickly see how their KPI or set of KPI's are doing."
> CPM Project Manager – Lesley Meade

> "I think from the CPM guys perspective it makes their life much easier."
> Richard Bennett – CPM Technical Architect

There appeared little doubt if any in their minds that the technology could deliver the anticipated support for the processes of CPM.

The SAP Programme Manager wanted to move away from the unstructured systems of the past to the structured system the technology offered.

> "There is the performance management that takes place without the structure and their performance management that happens within the structured environment. I think that is where we need to move towards."
> Andrew Stedman – SAP Programme Manager

His motivation for this appeared to be the lack of consistency and a lack of trust in the previous systems that were in place to support these processes, but he was not clear in this motivation. Essentially though he saw the move to SAP CPM as delivering the required automation that he had committed in support of the Executive Mayor's interests. The Technical Architect suggested that the new system would streamline the process and that this had been accepted by the CPM department; however this acceptance could not be verified.

> "There was almost like an acceptance especially from the CPM department that it would streamline the process so you would capture and then from an administration perspective in BPS [A technical planning component of SAP CPM] you could see who has done what. It is much easier to control that way."
> Technical Architect – Richard Bennett

Overall it was clear from the interviews conducted that both The Programme Management Team and the Technical Team implementing the solution agreed that the technology

supported the processes of CPM within the context of the Municipality. There was no doubt in the minds of any of the interviewees that the technology could deliver the functional requirements of the Municipality. If anything it seemed that at times the technology was driving the process as discussed in terms of "technology led business process transformation". This view of reliance on technology led transformation was not however shared between all those interviewed. In the case of Business Analyst, she saw the technology as really only supporting the Business Process, with the Business Process existing with or without the technology.

> "I think the technology is supporting the process. The process will still work without it. The process will still work fine from their side. This is just an add-on to their current way of working... At the moment I think it is actually an add-on to their current. I don't think it is driving their current process – it is supporting it. Obviously because it is still quite new in the business you have to change people's perceptions of this whole thing and how they should be using it. "
> Business Analyst – Wendy Vineguard

The support the technology provided to the business process did however have interesting effects. There was clearly a perception in the Municipality as mentioned by the project manager below that the system was there to highlight problems as oppose to celebrate success. This could however be explained by the immaturity of the organisation with regards to the CPM business processes. The system agnostically reported all performance in a consistent and transparent way. Additionally the project manager mentioned another key benefit in terms of support – it provided a monitoring function as opposed to a quarterly snapshot of performance. Previously for a number of the performance metrics, performance was only assessed infrequently. This meant poor performance was not acted on when a downward trend was identified - it was picked up by the media when published on an infrequent basis. It was expected that the monitoring of performance on a regular basis using the automation the system offered would mean poor performance could be more effectively dealt with before it became a significant issue.

> "One of the key messages is that the system was not built to be a big stick it was built to be able to show what is going on so we can fix it and also what is going on so we can allow our celebration of success. Everybody only talks about the red robots, when there is a green robot you should know that as well. And obviously providing a tool specifically at your upper levels where they can monitor trends so if there is a downward trend it enables the city to be proactive not only in addressing it but also before the Argus has a front-page splash on the city not being able to spend its capital budget. Now you can in fact go to the newspaper and

> say we have noticed a downward trend in our capital expenditure. At this rate we won't be able to make it therefore we have the following plans in place. Suddenly you are sitting on the back page or on page 12 a small article."
> CPM Project Manager – Lesley Meade

This concept of automation was undermined by many of the KPI's not being possible to automate completely and needing to be captured manually. This was one of the key challenges the implementation had to address in support of CPM. In the context of the Balanced Scorecard and the Management Dashboard the KPI calculations were fairly complex. The CPM implementation had complete data for only KPI's calculated exclusively on the SAP ERP dataset. This meant that any KPI that required data external to this needed to be manually captured either as a final result, or in its component form meaning all the pieces of data that made up the final result. This was therefore a manual process with little system benefit other than being a central repository.

From this it is clear that although the business process was supported when reliant purely on SAP ERP data, this was only one aspect of the overall solution. Ideally the CPM system would need to have access to all operational data or essentially all data required to calculate the management KPI's. In the context of this Municipality this was never going to be the case as the KPI's calculation relied on much data that did not reside in any of the operational systems. This external data would include for example population figures, birth rates, literacy rates etc...This meant that there was always going to be a certain degree of manual capture limiting the goal of CPM performance report automation.

Finally it is worth noting that this implementation of CPM was not the wall-to-wall integrated process mentioned in the literature surveyed. The system being implemented was one aspect of CPM that sought to link plan performance with actual performance. This context needs to be understood when drawing conclusions from this research. Support for the processes associated with capturing, calculating, commenting and reporting on performance was reported by the interviewees as being present in the technology. All other processes within CPM, for example those associated with strategy formulation and performance based modification, were not present in this implementation and could not be assessed as part of this research.

5.2.2. IT Facilitation of the CPM Processes

Facilitation as a theme came up a number of times in the interviews. Generally this occurred when discussions in the interviews went into detail relating to how specifically certain KPI's were calculated. A number of themes relating to facilitation were mentioned and each of these is discussed below.

The CPM implementation led to increased accuracy in the KPI's that could be automatically calculated based on available data in the SAP Data Warehouse. It also led to the modification of the ERP system to capture additional information that would make the calculation simpler. This was a significant improvement on the error prone spreadsheet calculations of the past. The SAP CPM technology in this context can be seen to be facilitating this process. This is explained by the project manager when she was explaining the benefits they could realise when the data was found already in SAP or could be inserted with minor business process modification:

> "*But guys, the data is actually also available in SAP. Why don't we look at changing the SAP business processes to capture the number of houses for example*, or in some cases it already exists – all we need to do is pull the rental units or housing units out of real estate [SAP Real Estate]. "
> CPM Project Manager – Lesley Meade

Again however as you would expect this ease of calculation was aligned and limited to whether the data was SAP ERP sourced. In addition KPI's were inserted into the solution based on their availability from the ERP system rather than based on a captured requirement. Where this was not the case the new CPM system provided essentially a controlled central environment for capturing the KPI's, but lacked the automation and accuracy of the SAP ERP based KPI's. This is explained in part by the CPM project manager below:

> "Looking at what data we had available in SAP... We already had the data available and can use it with relatively few modifications and this would be a useful metric. So under that we provided absenteeism metrics, employment equity metrics, plant maintenance metrics – average age of a work order, notification backlog as a vehicle to be able to show the organisation look what information is here by looking at this you can see why your citizens are complaining that the potholes don't get fixed because every notification is taking hypothetically 5 months to be actioned. Your little robot is showing that your average

> notification closure time is 5 months. You need to then track that and work to bring that down."
> CPM Project Manager – Lesley Meade

This is explained through the influence of the SAP flavour of the solution – both from a technical infrastructure perspective as well as from a Programme Management and implementation resource perspective. All the SAP actors in the wider network were co-operating behind a common purpose. But it could be argued that this purpose was not always necessarily aligned to the organisational requirements of the solution.

When the data was SAP sourced it meant that the programme team had a very clear understanding of this based on their previous involvement. This in turn led to some valid challenges in terms of the accuracy of historic calculations as well as improved accuracy in the actual delivered solution within CPM. This is again explained by the CPM project manager.

> "So in the one case for example where we actually brought the data through from SAP because we got the formula from them and they signed it off. We had a lot of trouble with the data and trying to understand it and eventually we got the numbers out. We looked at the numbers and compared them to last year's numbers because we pulled last year's numbers through CPM and they just didn't balance. Eventually we went back to the guy responsible and said we just can't get these to balance is there something we've missed? He said "No, no, no we don't actually use that formula". So we said "Why is it wrong?", "No the formula is right, because we haven't had the data the number of this is X and that's the number we always use". Where suddenly now we were pulling out the live data and until then they had never had anything to verify it against. So they were using the number that they had been using since 2000 and whatever. We were able to give them the exact and accurate number but the impact was that they would have dipped so in that case we changed it to a direct capture KPI so we directly put in the number he's already got and then we start working with him on a parallel one that we can build on the dashboard. "
> CPM Project Manager – Lesley Meade

From this example it is again seen that the technology has facilitated the overall detailed accuracy of the calculation. However it could be argued that this could have been achieved historically had the business understood the available data within SAP and sourced it appropriately. The CPM implementation merely facilitated this communication rather than CPM technology facilitating the process. This was again true in terms of some of the calculations, however in this example it is clear that the system is facilitating the process by

providing a central repository of source data that can be called by all the calculations that require it rather than being independently sourced as was done in the past.

> "We did have instances as I say that the data could be extracted from SAP but is currently not being used. What's being used is the project managers spreadsheets for example. We also had examples where the organisation – we said to them 'O, this is how you are doing it, why don't you use the data from SAP?' They said that that was fine, but as soon as we did that we found the results were different from what they were used to because they are used to saying there are always that number of taps therefore this is the number. The organisation is not averse to changing the formulae – the problem is they now need to go through the change management process with corporate performance management of changing the targets."
> CPM Project Manager – Lesley Meade

The improved accuracy of the data also has some fundamental impacts on the established targets set within the performance management framework. If the targets were set using incomplete or inaccurate data it was necessary to revisit these. This example is relayed by the CPM Project Manager.

> "We go through the process and that is the way we should do it with performance management with the ED to say. To say "Guys we know your target is 90% we know you are sitting on 97%. We are going to bring in the real data. You are going to drop to 95%" hypothetically. See if they go up they don't mind. The target should probably be realigned to 96 or pick a number. So you then start working it from that base. 95% actually isn't bad because it is the same number of streetlights there were yesterday it is now we know there are 95% of houses electrified and not 97."
> CPM Project Manager – Lesley Meade

The automation put in place has therefore facilitated accuracy in the reporting and target setting of the performance objectives of the Municipality. In addition the system also forced common usage of shared components across KPI's for example the number of households in the city. This is an important divisor for many of the KPI's the Municipality publishes. This meant that departments that had previously calculated their own KPI's using their own data were now forced to use a common definition and value where historically this had not been done. The CPM technology therefore facilitated the use of global constants where in the old manual processes this had never been achieved. This is illustrated in the examples below from both the Project Manager and the Technical Architect.

> "So one of the things we need to drive with them was to say "Guys you need to decide. Tell us what your definition is going to be. Tell us one number". In the past there were instances where the number of houses I used and the number of houses you used were different. Now we both need to use, and the system is built like that, the common number. So one of the advantages you are starting to introduce global constants."
> CPM Project Manager – Lesley Meade

> "We then bought the same data and the two didn't tally up so someone obviously was fudging the numbers in the manual exercise. Well not really fudging the numbers, that's not the right way to describe it. It is two different departments and they didn't connect. They are two separate KPI's that were delivered to Walton but from two separate sources and the underlying data was never checked."
> Technical Architect – Richard Bennett

Another by-product of the solution closely aligned to accuracy was the increase in the analysis work done on top of the existing ERP data. There was an instance where the detailed analysis of the ERP data to support the automated generation of the KPI for CPM led to issues being raised about the validity and completeness of the SAP ERP data. This could not realistically be categorised as IT facilitation of CPM, but rather a benefit of a durable and accurate CPM process.

> "A classic example is the device management functionality in R/3. We extracted it to BW. There's KPI's around that. What we picked up when we actually got the data in is that there were two measures – electricity and water. The fact that in R/3 the relationship between electricity and water meters was not right. So that something that is highlighted to the business to go and work out what's going on with core masterdata and reverted to a core capture problem for now because we couldn't deliver it because there was this discrepancy. It was like there were a thousand electricity meters and fifty water meters. So something was wrong somewhere so they had to do typical data cleansing to check if there is a meter there or physically what is going on."
> Technical Architect – Richard Bennett

The technology facilitated transparency of the data within the organisation. Within the implementation this was limited from a license and authorization perspective however clearly the technology facilitated the publication of meaningful KPI related information to the applicable and targeted managers. This is explained by the project manager:

> "The target audience for the BI implementation was levels 0 to 4. 0 is the city manager, level 1 are your ED's, level 2 are your directors. For performance management we have targeted

> that same group. Ideally you would only be targeting your 0 to 3's, but the approach that Andrew Stedman has always been driving in the City of Cape Town is one of visibility, one of transparency and it is important that your level 4's are able to see that level of transparency because the level 1 sees the red robot and phones the level 2, the level 2 sees his is a red robot and phones the level 3 eventually it ends up with the level 4. Beyond that anyone that asks for access as long it is approved by their directorate can get it. "
> CPM Project Manager – Lesley Meade

This ideal of visibility and transparency is easily achieved with accessible technologies. The CPM toolset enabled the publication of both the Balanced Scorecard and the Management Dashboard to the intranet via the SAP Portal. This essentially meant that anyone with appropriate access would see this performance related information when they logged into SAP via the SAP portal. This visibility and transparency however would not amount to much were the information not presented, understood and acted on in a timely manner. It is clear that information technology facilitates these ideals however with the current release of SAP CPM the SAP Programme Manager still thought that these were still too pull focused relying on users to access the reports. His aspiration was to make use of more push technology as the implementation developed over time and the maturity of the organisation with regards to CPM improved.

Closely aligned to transparency was the concept of visibility of the whole that the technology facilitated. Previously the use of spreadsheets did not provide easy visibility of the overall status of performance within the Municipality. There was a required elapsed time that was necessary in order to provide a consolidated performance position that was not very rigorous in terms of how it was presented from a traditional balanced scorecard perspective. This consolidation however using the SAP CPM toolset was no longer necessary as the central repository made this immediately accessible once captured. Additionally the tool had standard balanced scorecard related functionality that produced an academically aligned and compliant scorecard in line with the legislative requirements.

> "There was positive influences in that instead of having a spreadsheet you see how all the perspectives fit into objectives and how it looks holistically instead of looking at all the spreadsheets. It puts it all into perspective. It's a nice way of looking at it and also it does...it did highlight things however the fact that you could not always see it was a problem. "
> Business Analyst – Wendy Vineguard

The implementation did also raise issues associated with the completeness of the existing KPI model relating to the Management Dashboard. For example when reviewing the ERP

related data to make accessible to the CPM solution it became clear that some major expenditure from an ERP perspective was not covered by performance KPI's. The CPM Project manager explains:

> "A good example there is that out of all of the city's 40 SDBIPs KPI's there was not one that referred to plant maintenance. Now your operational budget that obviously is covered by plant maintenance takes up a large portion of it. That is a significant amount of expenditure – that is probably a third of the city's expenditure is not being monitored because previously the data wasn't on the legacy systems. So when we implemented plant maintenance one of the biggest success stories has been bringing plant maintenance onto the system. Just an example when we did the original implementation there was only one system that was being used for plant maintenance. "
> CPM Project Manager – Lesley Meade

It is unlikely however that this would be found in other implementations, although clearly this was seen as a benefit facilitated by information technology on this implementation.

5.2.3. The Conflicting Organisational Culture

A clear emerging theme from the interviews was the misalignment of the Organisational Culture and internal management systems regarding the principles and objectives of CPM. Already mentioned were the SAP Programme Manager comments about CPM not being in the DNA of the organisation. This has led to much of the CPM business process activity within the Municipality being more associated with compliance than true CPM as articulated by the SAP Programme Manager.

> "Unfortunately because of the lack of probably 2 things: good systems and also of how people who find themselves in senior positions in local government, the background skills that they have has resulted in this being more of a compliance exercise."
> SAP Programme Manager – Andrew Stedman

The literature reviewed referenced CPM as being driven by an internal performance imperative (Wade & Recardo, 2001). Reducing this to a process of compliance it is anticipated would have significant impact on the effectiveness of the process and any information system seeking to support it.

In the SAP Programme Manager's mind this state of affairs is made worse by the nature of the agreed indicators included for strategic purposes. He questions the value of many of these.

> "The KPI's are being dictated by line and line is actually – it is actually quite embarrassing to look at some of the KPI's that line regard as being key measures. 'Compliance with a plan', 'Adherence to a philosophy' is the kind of fairy, fairy stuff and don't try and turn this into a quantified, quantifiable indicator or number. So the emphasis in why we do corporate performance is from a legal reason in my perception. We commit to it to the level to insure compliance that's primary and we don't really use it... The reality is that local government is responding to corporate performance management because of legal pressure. It has not been instilled in the organisation as a manner of working because a lot of your senior managers don't have an analytical capability and have never had access to quality information. So they acquired the skill to manage on gut feel, to manage on what they believe to be the necessary priorities."
> SAP Programme Manager – Andrew Stedman

These are strong opinions of the organisational culture and capability. Again legislative compliance is mentioned as a key driver as opposed to performance improvement or strategy execution. He went on to soften the tone of this message slightly later in the interview by indicating that over time the business is however "maturing" in its use of KPI related management reporting.

> "The organisation is maturing now to the point where they are saying "Hold it; I want to see measures and indicators to pre-warn me about events. "
> SAP Programme Manager – Andrew Stedman

This organisational maturity in management reporting was not however mentioned in the other interviews.

5.2.4. **The Required Cultural Shift**

The interview process led to detailed discussions with each interviewee as to what they were trying to achieve in terms of organisational adoption of CPM. This led to varied responses that provided insight into some of the challenges associated with implementing the system successfully.

The SAP Programme Manager concentrated on explaining adoption from the perspective of embedding the process within the organisation. He seemed to see this as the significant challenge for the programme as he had already taken time explaining the contradictory organisational culture. He explained successful adoption as simply "When it is so integral to your day to day operations that you don't even know about it." Operational adoption of performance management however implies both business process adoption as well as system adoption. He went on to illustrate very clearly how he would gauge this adoption in future:

> "You will hear words like *'I am having my performance review'* or '*I need my dashboard updated because I am having my meeting with the mayor for my quarterly review*.' "
> SAP Programme Manager – Andrew Stedman

Interestingly in his initial explanation of adoption the system was not mentioned. It would appear that he did not see this as the challenge in terms of adoption within the organisation, however when pressed on system adoption he related this to the example of email adoption.

> "Email is very well entrenched in the organisation. Even those guys that regard themselves as being PC challenged will switch the email on if nothing else just to see what is coming through the email inbox. How many people switch on the corporate dashboard? The first thing to do is walk in and say "What do the indicators look like this morning?" The kind of behaviour you get at the stock market."
> SAP Programme Manager - Andrew Stedman

Again in his explanation he saw this as involving minimal interaction on the part of the wider user. They were merely seen as recipients of the information on performance, that by actively seeking and acting on would meet the Focal Actor's definition of adoption. He did not include in this definition however the challenge in the user base to support the CPM solution. There were already challenges in getting the KPI Responsible Person to perform the KPI calculations and enter the results in system where necessary as well as to get the KPI Owner to capture performance commentary to comply with the process. Overall he seems to discount these problems when comparing them with the organisational cultural challenge. The Municipality required this process to be completed and therefore it would be complied with like any ERP process.

Organisational change was also mentioned by the CPM Project Manager when questioned around what would constitute adoption.

> "You need people to want to use it. You can't send that group or audience onto mandatory training. You will never get them there so you have got to actually make them want to use it."
> CPM Project Manager – Lesley Meade

She is clearly aligned in her thinking with the SAP Programme Manager in terms of the challenges associated with organisational adoption.

The Business Analyst was also aligned in terms of measuring adoption based on organisational usage of the data captured in the system. Additionally however she also speaks about the adoption and the enforcement of the processes that generate the data that is reported. This was not mentioned by the project and programme management. It would indicate a better understanding of the practical challenges in the business of complying with these processes. Ultimately however she relates adoption of the system to activity in the business based on what is reported – something gets done based on the reported information.

> "I think when people actually see the benefit of what is being measured and also what is being measured is what is most crucial or most critical. Also that when the people know they are suppose to be doing their capturing for example this gets done and if you don't do it then it is going to affect something on the other side... If things are showing Red or are showing Green or whatever then something is actually done about it at that point in time. I think that's what makes it – that is the point of the actual system. It is not meant to just look colourful... I think the owners – they are meant to actually check it. They are meant to assess it on the system and say why it is going wrong. Get down on your line departments and say something is not right here. That is successful adoption - something gets done from the result of something."
> Business Analyst – Wendy Vineguard

It is interesting to see from this feedback that this definition is more practical than that from management. She gets past visibility of the data and her definition is clearly about compliance to the processes and organisational usage of the data.

The discussions around adoption with the Technical Architect and BI Project Manager concentrated on the technical challenges of the solution like the performance issues and the unstable technology as well as the clear realizable benefits for the CPM department. They saw the solution as providing key technical benefits through automation of the calculations and explained that there were no issues in terms of gaining buy-in and ultimately adoption from the department responsible for this, based on the usability of the system. Crucially

however they also spoke of the challenges in terms of getting the organisation to make use of the captured data, supporting the previous findings.

Two ends of the spectrum are clearly emerging. Programme management has understood the complexity of organisational adoption and has concentrated their efforts there. The technical team has understood the complexities of the operational solution and has concentrated their efforts there. The Business Analyst potentially provides the most balanced view of the challenges of organisational adoption and the path there by linking process usage and compliance to organisational action. There does not however appear to have been a universally understood and balanced view of adoption across the team. Programme Management by concentrating on the substantial challenges associated with organisational change has missed managing the key performance problems that ultimately could cause adoption to fail.

5.2.5. System Requirements to Enable Adoption

It was accepted by those interviewed that adoption within this organisation was going to be challenging. In order to enable this to take place certain key required qualities of the system emerged.

The first related to agility. Strategic KPI's within the Municipality change on a regular basis and as such the system needs to be able to change as the indicators and strategy changes. The example mentioned by the Project Manager was around the 2010 Soccer World Cup in Cape Town – in 2011 these will no longer be relevant. This imposes certain challenges in terms of sourcing appropriate data to drive automatic calculation.

Strategic planning in the city is on an annual cycle and takes a few months to define – generally in March and April every year. This process essentially defines new metrics that will need to be planned and measured. The CPM Programme Manager explains:

> "They go through it in about March or April. When they relook at the performance targets, they relook at the metrics. It is meant to be a living document. You know it is meant to be something you look at and say "Right, what are our priorities at the moment?" That is how it is meant to be linked. The document as you look at it is a massive document. It is linked to the city's objectives, the city's strategic priorities."
> CPM Project Manager – Lesley Meade

At the time of the research the project team had not yet been through a full iteration of the planning cycle, although this required agility was understood. How difficult this would be to deliver against could not be evaluated and was not known although the technical implementation resources all were concerned around the level of change they would need to deliver.

Secondly the project team's experience around performance had led them to look at substance over form. As the Business Analyst puts it:

> "Obviously it should work optimally so the people can go in and use it but I think the main important part is actually the business making use of it. It is pointless you have this flashy system that works that no-one uses."
> Business Analyst – Wendy Vineguard

The Business Analyst appears to have become pragmatic about what to achieve using the available technology targeting a solution that delivered a workable solution based on the requirements rather than deliver all the 'bells and whistles.

Thirdly there was a clear requirement to make the system as easy to use as possible. The computer literacy levels within the organisation were reported to be challenging therefore a lot of technical effort had been expended to make the system as simple as possible. This was explained by the Technical Architect and supported by sentiments from the SAP Core Programme manager.

> "The balance scorecard it is using standard functionality which is very easy to use and then we got quite advanced with the web templates we used 7.0 functionality. It is very usable, it is designed for the 0 – 3's so you see a year and then you click and choose another one."
> Technical Architect – Richard Bennett

In addition he went on to explain the detailed feedback sessions they had had during user acceptance testing to keep usability a top priority.

The Project Team appear to have had a good understanding of the challenges associate with organisational adoption and the key characteristics understood to be required of a solution in order for it to be adopted, however during the life of the project a number of key issues arose.

5.2.6. Issues in the Existing Implementation

Some of these issues were essentially risks that had to be managed over the duration of the implementation. Others however were open issues that were essentially blocking the progression of the implementation and hindering adoption with the business.

The CPM business processes that the implementation was seeking to automate were not entrenched in the organisation and were not complete. As has already been discussed there were issues associated with the misalignment of the culture. In addition however the implemented processes that were motivated out of compliance lacked rigor. There was no durable cyclical process reported by the interviewees with the main focus centered around performance reporting.

Essentially the cyclical process of CPM existed, but as the SAP Programme Manager puts it were "paper thin". He explains:

> "The strategy is there but because the diversity of the organisation and the size of it. So you will have 10 focus areas, strategic objectives. What then would happen was 9 departments would come up with KPI's and measure to say how they support these strategic objectives. Now the quality of the link between that strategic measure and the objective – that's failing. So is the quality of the calculation of that measure is dubious. So you've got this – but you also have this illusion that it works perfectly because it follows the theory perfectly – there's strategy, there indicators, there measures you know – but its paper thin."
> SAP Programme Manager – Andrew Stedman

So within the context of this poorly implemented business process you have the challenge of trying to automate a solution. The SAP Programme Manager's thinking was to use the system to drive the establishment of the business process as had been achieved in the ERP space within the Municipality, but without the operational criticality of the business processes it was doubtful this could be achieved.

In addition to this risk were the inherent problems with a model that relied on the manual capture of the majority of KPI's. This is explained by the SAP Programme Manager:

> "They are KPI's that you find very difficult to calculate. Well you've seen our dashboard report. Those 5 or 6 or 12 that are there are predominantly the ones from the 60 KPI's in the city that we could derive from transactional data. The other 40 we've now just put onto the dashboard are all direct capture. And you know the reliability I have on directly captured information is – well you tell me what you want me to have produced and I will comply."

SAP Programme Manager – Andrew Stedman

The benefit of automation and its associated improvement on accuracy were therefore only felt in at most 20% of the total KPI dataset for the Balanced Scorecard and Management Dashboard. The other 80% of the dataset had some improvements in terms of standardization and centralization of the data, but the implementation was under no illusion around the accuracy of the data that the solution held. Again this was explained by the SAP Core Programme Manager:

> "Tell me what you are going to measure me on and I will show you how I will behave and also calculate the measure and I will manipulate it."
> SAP Programme Manager – Andrew Stedman

In defence of the organisation the CPM Project Manager conceded that a number of these KPI's were based on data that was difficult to source accurately or verifiably. She explains:

> "This is where the verifiable and quantifiable comes in is that a lot of their formulae or a lot of their metrics at this point you cannot accurately – they are difficult to quantify. They will have a metric which is for example saying "Percentage progress in having a provincially representative employment plan" and so you'll say "Ok, so what percentage? 80%." So how do you measure it?"
> CPM Project Manager – Lesley Meade

This would seem to illustrate that the process of defining strategic objectives had critically not taking into account measurability when defining these objectives. This would seem again to suggest a lack of maturity within the business process itself. These complexities associated with the KPI's that cannot be measured easily, based on the data not existing in the data warehouse, would not be easily be addressed by a technical solution. There are only two options – measure the objective using an alternative indicator that can be derived based on good quality data or source the data required for the calculation.

Senior Management support and sponsorship along with visibility within the organisation was always present for the implementation as is explained by the BI Lead:

> "What we did have, we actually had a launch that presented the whole balanced scorecard plus the dashboard. We obviously had UAT [User Acceptance Testing] with the business to get signoff of those KPI's. Once everything was in place there was an official launch with all our managers – level 0 to 3. We had [The Mayor] officially launching the whole project. We also had Belinda Walker so there was a general awareness. There was a build-up at the

> Exco Meeting in that Andrew Stedman mentioned that CPM is on the radar. We had that build up before the go live."
> BI Lead – Ilse Maine

However when performance problems proved to be a substantial issue much of this publicity was stopped essentially stalling the project as explained by the business analyst:

> "Now what we did with the performance management is that we didn't do a lot of publicity. We wanted to go in and make sure the system was actually right"
> Business Analyst – Lesley Meade

The lack of momentum was clearly present within the implementation at the time the research was conducted. The implementation was live, the implementation partner project manager had left having completed the implementation, but the performance problems were blocking progress.

5.2.7. Technology Not Delivering to Promise

Performance problems were mentioned by all the interviewees except those in management – these being the SAP Programme Manager and the CPM Project Manager. This would seem to indicate that from their perspective performance issues were only a minor technical hiccup that could be overcome with the real challenge lying in the organisational adoption. From the technical team however it was seen as an insurmountable problem.

The performance was reported by the BI Lead as follows:

> "We are stable now it is just the performance is very; very slow...It is unworkable. It just falls over completely."
> BI Lead - Ilse Maine

From this it is clear that in her opinion the system does not produce a workable solution for the organisation. This opinion is shared by the Technical Architect.

> "At the moment the guys are struggling, logging things and looking for things. So to give you an idea our training is postponed till next year because we can't train. It takes 10 – 15 minutes – you just can't train like that... To give you an idea a dashboard used to open within 30 seconds to 50 seconds before the AIX upgrade or the conversion of hardware to 64 bit to now where it takes 10 minutes 15 minutes for this to open... There have been big delays because of performance. We can't train because it takes so long."
> Technical Architect – Richard Bennett

10 – 15 minutes is not a workable solution for any kind of management reporting let alone a summary Balanced Scorecard or Management Dashboard. Additionally from this statement it is clear that training is not taking place. This was backed up by both the Business Analysts and BI Lead. The Technical Architect however goes on to provide actual volumetrics to illustrate the problem. The Business Analyst had the following opinion on performance:

> "It is at that point when it is ready to just open up and flourish – it is halted at the moment because it... it... it was a bit slow, no-one really went on to tell people to use it because we had a lot of issues with it."
> Business Analyst – Wendy Vineguard

In her opinion the performance issue was blocking wider adoption. This is easily explained by the fact that training was stopped. The execution of training was critical to the adoption of those that needed to enter data. Currently only a very limited group had been trained with the remaining user communities requiring training before gaining access as explained by the BI Lead:

> "It was more the budgets people that are already using CPM at the moment. The broader business community I think it is still very limited. Very limited use. Once the training starts taking place I think we will get people using the system."
> BI Lead - Ilse Maine

It is surprising that based on the size of the issue this was not highlighted by any of the management resources. They were however aware of the issue based on feedback from the technical team. In the opinion of the technical architect the problems started when there was an upgrade to the operating system of the underlying hardware that was hosting the solution however he could not back up this opinion in fact. In-fact an SAP resource that was called in to address the performance issues after the interviews were concluded found clear issues with the technical configuration of the solution.

What is clear from all the feedback from the technical team was that there was a performance issue that was having a negative impact on the progress of the implementation and by extension its wider adoption in the organisation. It had had a significant impact by blocking the execution of training and essentially stopping the continued roll-out of the solution. Additionally there was no ownership of the performance issue – no-one was mentioned as owning the working of the issue and owning its resolution. The implementation partner had also by this point already removed their Project Management and Business Analyst resources from the implementation and took no responsibility for its

resolution. The technical implementation team seemed to pass the issue to the infrastructure team but had no basis for doing this other than gut feel. The software provider being SAP had had no escalation at this point. The SAP Programme Management appeared to be slightly in denial expecting their technical team to sort this out on their own. What is material to understanding the issue was that its ultimate resolution pointed to the fact that from an SAP perspective the solution had not been configured optimally causing the performance problems. This would appear to indicate a lack of technical resource to implement the solution required.

This was also back up by feedback from Technical Architect during the interview:

> "So technically one thing was the software itself. Another thing was the level of skills and understanding – people with the right skills. There were very few really experienced people that we could get involved. And we ended up not as I told you we took that architecture work on ourselves and met with people to do it. Obviously we had Noel who was very strong on the BPS side of things and the data capture and all of that, but otherwise the team was quite a junior team. I saw that as a bit of a challenge especially with the timelines we had. It was a highly pressured project".
> Technical Architect - Richard Bennett

This would seem to indicate that the root cause of the performance issues was essentially a junior team that potentially did not have the experience from an SAP perspective to configure a workable solution. This assertion is also supported by the escalation to SAP ultimately resolving the performance issues. The counter argument is that the system itself is unduly complex in terms of identifying performance problems. It should not be necessary to require a very experienced resource to deliver the technical CPM solution. However when you look at the problem, in the context of this implementation, the team appeared to lack experience in the toolset they were implementing that ultimately led to the encountered performance issues.

While this root cause of the performance problems had not been accepted by the implementation team other issues were also mentioned relating to the toolset and information infrastructure. These all ultimately were a way of explaining the predicament of the implementation.

Generically the CPM Project Manager referred to issues relating to using cutting edge technology as being part of the problem. This is supported by the Technical Architect. This could again be the result of a less experienced project team as opposed to the technology itself causing the issues.

> "We were using the latest and greatest – I don't even want to call it bleeding edge technology I just refer to it as plain slaughter. We had a lot of problems with the technology because it was very new."
> CPM Project Manager – Lesley Meade

The Technical Architect of the solution also makes reference to an upgrade that was performed on the release of the underlying SAP Data Warehouse software as also causing delays. He did not however link this upgrade to the performance issues.

> "I have been through various different upgrades of BW and this is the most unstable one I have ever seen. We've got lots of problems so that's cause a bit of a delay – a loss of emphasis actually."
> Technical Architect – Richard Bennett

Ultimately however the infrastructure change that caused the most issues related to the operating system change to the underlying environments. The timing of this upgrade was also problematic as it occurred the week before the system was planned to go live. The CPM Project Manager explains:

> "We were using the very latest technology. So we went live and communicated that but quite quietly for 2 reasons. 1 is we just wanted to allow the system to stabilise. The other is the City of Cape Town is re-platforming all their hardware. Literally a week after we went live the BI platform got re-platformed. You don't really want to scream and shout about a brand new system which then goes down 2 days later to be re-platformed."
> CPM Project Manager – Lesley Meade

By the time that the hardware upgrade had happened the CPM Project Manager had already left the project with the BI Lead picking up the management of the implementation. The hardware upgrade was then blamed for all issues associated with performance as it coincided with the go-live.

> "We actually upgraded to a 64 bit environment and it has actually got worse with the improvement in hardware."
> Technical Architect - Richard Bennett

The source of the problem was not collectively understood across all the team with the BI Lead (who had taken over managing the project resources after the departure of the CPM Project Manager) unable to identify with her team what was causing the problem.

> "I don't know if it's our network... It is a needle in a haystack."
> BI Lead – Ilse Maine

The implementation and its ultimate adoption were at the time of the research blocked by the technology and that was unable to be configured by the project team to deliver the performance that was required.

> "From a technical perspective the process delivery is already nailed down now, we're just have problems with the technology."
> Technical Implementation Lead – Richard Bennett

This point of stagnation was described by the Business Analyst as follows:

> "I think there are two sides to it. The one is the technology – the fact that the system was not up to peak performance as it should have been. The other one is the owner or the business people not actually getting the system because they couldn't really access it in any case. So I think the technology was a driver. And the other thing was that it only went to so many places. It only affected so many areas. It didn't affect enough of the organisation for it to have a full impact or to be completely adopted."
> Business Analyst – Wendy Vineguard

In this statement however it is clear that both "sides" mentioned are blocked by the experience performance problems. Without the performance issues being addressed the system will not be rolled out to enough of the organisation.

5.2.8. The Path Ahead

The SAP Programme Manager was under no illusion that the adoption of the system was assured. If anything the impression from the interviews was that this was the start of a long process of adoption entailing both the business processes of CPM as well as the system to support the process.

He saw two alternative responses from the organisation after technically publishing performance indicators within the Municipality. The managers affected would either respond with a true performance improvement imperative or they would simply tactically try and address the issue causing the problem. Interestingly though he never mentioned the system

as being the catalyst to this process and in addition he had no idea how the organisation would respond although he did expect some response as oppose to inaction.

> "People will start responding to the indicators... Either they will respond and say: *What is giving rise to that indicator being like that? How can I go in and fix it? How can I go in and fix the process?* And then we are talking performance management process. Or the alternative response will be: *What can I just do quickly at a level to change the indicator?* Preferably to make the indicator go away."
> SAP Programme Manager - Andrew Stedman

The organisational change in his eyes was the more significant issue for him to address. This prioritisation was supported by the CPM Project Manager who also placed a large emphasis on change management within the business; however she attaches change management to the implementation of the technical solution. This connection was not made by the SAP Programme Manager that saw this change irrespective of the system in his reference to the organisational culture not being aligned to performance management. The CPM Project Manager explains her thoughts on the change management challenge once the system has been implemented:

> "Now the change management comes in and it's not something the Executive Steering Committee can do, it is something the Executive Steering Committee can assist with and guide but Performance Management [department] should actually be in there. Internal audit who we also worked with as part of the project should be in there and be able to say *Guys, according to SAP the count is X, according to you the count is Y. Take the direct capture out a replace it with X.* Somebody has to be creating enough of a storm to say *You want your metric to go down, because then it means your metric is not wrong anymore*."
> CPM Project Manager – Lesley Meade

She evidently believes that the technology can support the process when she makes reference to the use of the automated KPIs from SAP however she does see a need within the Municipality to drive both the adoption of the automated KPI solution – essentially the SAP CPM implementation – as well as the adoption of a performance based management style correlating with the two identified Actor-Networks.

These beliefs were echoed by the Technical Architect who said the following:

> "If the CO is saying: *Why is that red?* And someone has to respond to the guy or lady that the CO or Mayor asks. They are going to say to their department: *Why is it red?* And the analysts

> will go and determine why. If you get that buy-in from the top and you get those questions asked down the chain then you should have a successful system."
> Technical Architect – Richard Bennett

By analysing this statement one can make a few inferences. He sees Performance Management in a traditional sense – Senior Management taking remedial action when things go wrong making no reference to essentially staying on track. This could be his personal beliefs or it could be his exposure to the organisation that has instilled this essentially negative approach to performance management. He also sees performance management as essentially a top down change process meaning that junior management will only respond to senior management's biddings. This certainly aligns to the organisational culture picture painted by the SAP Programme Manager.

Organisation change was also mentioned by the BI Lead. Interestingly however she correlated the system adoption directly with the organisational change relating to performance management and saw the SAP Programme Manager driving this change.

> "I think the objective and drive in management meetings is to get them to start using the tool. So Andrew Stedman will probably go to the key management meetings and start introducing the tool."
> BI Lead - Ilse Maine

This concept of CPM system adoption being closely correlated with the adoption of performance management processes was also supported by the business analyst.

> "Up until now obviously the adoption has been difficult and also there has been a lack of KPI's on the system. It wasn't big enough to affect everybody so you can't see how it could have been adopted yet because enough of the role players were not affected. I think only once this phase is now in and you can see whom it is all affecting."

> "Maybe after time people will start looking at the organisation generally. When I spoke to a lot of people in the organisation they said you know we only have the city scorecard at the moment, they want a directorate scorecard where they can see their KPI's. You know what I mean? There are maybe two KPI's on the city scorecard but they are more interested in their specific ones. So if they check that scorecard they are mostly going to go and check their own ones."
> Business Analyst - Wendy Vineguard

From the analyst who is far more closely connected to the users in the organisation the system and the business process are one. The line between where the system ends and the processes begin is blurred.

From these statements it is clear that there are challenges for both Actor-Networks seeking to gain adoption of CPM. The adoption of the business process has been reported as misaligned to the organisational culture. It is clear that the SAP Programme Manager is trying to use the SAP technology to drive this business transformation or organisational change, but it is not clear at this stage as to whether this will be successfully achieved.

What is clear from the research is that even with the challenges they have faced in this implementation the resolve of the SAP Programme Manager remains firm as he looks for new technologies to continue this process using more push based technologies.

> "I think what is going to happen – tools are going to help us and that is why I am pushing for the Business Object suite. The old SAP suite in my mind was great for the analyst, but you had to want to do it. It is not pushing it to you. It is not in your face. It is not desirable to actually go and look at it and find it. That is what we are hoping to do with the Business Objects stuff is to push it in their faces."
> SAP Programme Manager - Andrew Stedman

This idea of technology lead transformation in the context of CPM was supported by the Business Analyst. She clearly saw a correlation between the visibility of the application in the organisation and its usage. At present within the lifecycle of the programme she however saw training as being the key activity to drive this adoption as opposed to the use of another toolset. This training however we have already discussed was blocked by the performance issue.

> "The capturers have been trained. But I mean training... more of an awareness. Push stuff towards them so they can actually see the value because if they don't get to see this thing they will just know that there is a system out there that they have to capture the information into that someone has to look at. Also the driver is actually the CPM department. They have to push it into the organisation as well from their side so we will be training them and they will train their business, more on actually using this tool. So it is a training and awareness issue really."
> Business Analyst - Wendy Vineguard

What is clear from the feedback is that this initial implementation of CPM technology is the first step in what will be a long road ahead to gain organisational buy in to CPM and to

successfully deliver a functional solution that fully supports and facilitates these processes. It is a journey that has just begun. The thrust and success of this first implementation effort is explained by the CPM Project Manager.

> "The technology is the platform. The effort in the first implementation was getting the platform to work to a large extent. The effort going forward for it to be successful will be to get the organisational buy in. The first effort was to train the team, get the technology up, get the implementation approach, how best do we do things, how do we do all these different targets and stuff like that. But to get the value out that what we've already done needs to become visible because there is a lot of really good work that's in there that can help the organisation. It is not just providing the red light, we've brought in alternate views of it so you can actually see where's my problem come from, when did it come on, which's category of expenditure is creating the variance. On some of the metrics especially on the dashboard we have up to a dozen alternate views of related information. And that is where you can start questioning and understanding it."
> CPM Project Manager – Lesley Meade

The technology platform has been established with some fundamental technical issues that need to be addressed; however even with a clean technical solution the organisational challenge would still have been present. The priority for implementation to progress with adoption of the technical solution has to be to concentrate on resolving these short-term technical performance issues. These are blocking both training and publication that are critical to the successful continued adoption of the application. There is still a real risk that the implementation will fail as vocalised by the Technical Architect.

> "There is also potential that it falls away and doesn't get used which I have seen in other situations and other companies."
> Technical Architect – Richard Bennett

This failure within the organisation has a clear link at the moment to performance as this appears the most pressing issue from an implementation team perspective.

> "They are actually using the tool in the meetings so it's live, it's there, it's a reality. Which gets back to the performance – you can't do that if you are going to be sitting there for 10 minutes waiting for the thing to open."
> BI Lead - Ilse Maine

Its use is also not being pushed to the wider organisation due to the performance issues. This wider publication was seen as crucial in terms of driving adoption in the organisation due to visibility of the KPI's in the solution. As there was no publication happening due to

performance issues the KPI's themselves were not being captured. All of the existing usage related issues seem to be rooted in the performance problem. This current state of affairs is explained by the Business Analyst.

> "We did not really want to overpush it. What are you going to look at when you get in there, half the time it was too slow to use and the data was not all up to date because people weren't even doing the capturing. So now we are trying to get the CPM people, you know the people with Mark Van Tonder, quite a few of his team there as well. So hopefully they will see the importance of people actually capturing the information and the administration of things from their side I think is critical because if they don't do their administration then there is not much to show, but also that the important people that should actually be taken are actually the owners of these KPI's because if they see there is no capturing being done then it reflects badly on them. They should actually make sure the people them are actually doing their job. So I think it is both the administration side of the CPM and also the actual owners of the KPI's to understand the importance of them actually doing something."
> Business Analyst - Wendy Vineguard

It was not clear from the research in terms of what would remain from an adoption blocker perspective were the performance issues resolved. The application needed to perform in order to be pushed into the organisation and this was the current critical issue. At this point in the implementation there was too much doubt for any of the interviewees to commit that the solution would ever be fully adopted.

> "Fully adopted - I am not sure. I don't know... "
> Business Analyst - Wendy Vineguard

6. Conclusions

6.1. A Review of the Theory

The literature survey provided a solid foundation of the existing knowledge of the subject area. The key definition of CPM was explored and shown to be well documented and available within the published body of knowledge. The business processes associated with CPM were also well defined within the wider body of knowledge and reviewed. Key determining characteristics of CPM and its associated toolsets were highlighted as being their tight component integration and their cyclical nature. The clear message found in the literature was that technology and toolsets exist to address the complexities of addressing the complexities of the CPM business processes. Additionally some evidence was presented to support the fact that technology was already supporting and facilitating these in some contexts.

The literature survey went on to review the existing knowledge relating to the organisational adoption of these toolsets. It was shown that the general subject of adoption of IT was widely dominated by positivist research that was ill fitting in the context of the complex nature of organisational adoption of these types of toolsets. Finally the work by Markus (1983) was highlighted as a relevant interpretivist piece of research that could be applied to the context of organisational adoption of CPM.

This led to the identification of a number of research areas for further study relating to the complexities associated with the implementation and adoption of CPM related systems. Critical however was the acceptance of the pluralistic ideals of Orlikowski and Baroudi (1991) that suggested a more complete view would be gained through the use of other research paradigms as opposed to those prevailing. This supported the use of an interpretivist paradigm using Actor-Network Theory thereby addressing the existing positivist bias found in the literature.

6.2. Reflections on the Approach

The aim of the study was to gain a deeper understanding of the implementation and adoption of CPM within the context of the Cape Town municipality. It was primarily exploratory in nature and did not try to produce theories for wider application. An interpretive paradigm was adopted to conduct the Case Study research using ANT. ANT provided the framework in which to analyze the research.

Actor-Network Theory's strengths aligned well to the challenges of the research. ANT provided a number of key benefits to the research. It provided the vocabulary through which to describe the Actor-Networks in existence, it provided a scalable theory that could be adapted to both the macro and micro interactions of the various actors involved, and it provided a theory that could be applied to all actors involved irrespective of their human, machine or combination characteristics. As such it provided an inclusive theory in the context of this study.

6.3. Reflections on the Analysis and Discussion

The analysis and discussion produced a number of items that are discussed within the body of the dissertation. It is however important to note that the aim of the study was not to provide any concrete conclusions but rather to explore and describe fully the phenomena encountered in the context of the Case Study.

The first conclusion to be drawn from the study was that ICT did play a role in supporting the processes of CPM within the context of this case study. Specific examples of this were uncovered in the Case Study and discussed with a view to gaining a rich understanding of the specific nature of this support and facilitation. A key concept discussed in the study with regards to support and facilitation was 'technology led business transformation'. The case study highlighted a clear belief in this principle within the organisation based on past successes in ERP, however no proof was found to support this concept in the context of CPM implementation.

Secondly the Case Study revealed the close correlation between the adoption of the business process and the adoption of the technical artifact to support the business process. This study highlighted the difficulty in trying to draw a distinction between these two adoption networks, but illustrated how these could be explained through understanding the differing focal actors responsible for each. It was suggested that it was not possible to achieve full adoption of the technical artifact without initial business process adoption taking place. The case study illustrated that without this occurring the implementation of CPM turns into a process of compliance.

Thirdly the performance culture of the organisation plays a significant role in the adoption of CPM. The organisational culture of the Municipality explored was reported to be significantly

contrary to the spirit of CPM, however it was not possible to evaluate to what extent this impacted the adoption. Specific illustrations of this contrarian culture were provided by those interviewed supporting the opinion by those involved in the study that this would be a significant hindrance to the adoption of the CPM business processes. The challenge uncovered in the Case Study was how a toolset influences this culture from the top down and what it could achieve in this context. This however produces a paradox between the organisational adoption of the CPM business processes and the technical adoption of the CPM toolset – which adoption comes first? It is suggested that it is neither – this should be a cooperative endeavor of the organisation. This is reflected in the sentiments highlighted earlier by Dover *(2004, pg. 43).*

> *"The right technology can tell you how your business is performing at any moment. That technology produces dashboards, which can ultimately change the culture of your business by transforming it into a performance-accountable company. A company begins to become a performance accountable-organisation when management commits to increasing each person's knowledge and understanding of what drives performance."*

Fourthly within the context of this Case Study ICT will at times not always deliver to its promise when poorly implemented. The performance problems experienced by the implementation with regards to the toolset were out of keeping with the literature reviewed and the topics of support and facilitation. The existing literature suggested that although challenges do exist in terms of the overall architecture and integration associated with CPM solutions, the available technology is capable of delivering workable and valuable solutions. The implemented technology in the Case Study proved that the technology is not however foolproof and that its associated failure through mis-configuration can cause stagnation and potential failure in a CPM implementation.

Finally the study indicates that the research framework used can produce meaningful and rich data relating to the field of organisational adoption. The research indicates that the field of adoption of management information systems within organisations would be better suited to research methods and theories that are scalable and provide an approach for explaining the social complexity. In addition the research indicated the benefits of grouping communities of humans and machines displaying agency through a single framework. This supports strongly the user of Actor-Network theory in future contexts.

6.4. Critical Reflection

It is important to critically reflect on the completed study in order to enable the improvement in future studies using similar methodologies over similar subject matter. It also is important to understand the limitations of this study.

The complexity of the Actor-Networks involved in the subject matter researched was in many ways underestimated. The use of Actor-Network theory and the key principle of "following the actors" embedded in this theory made it at times difficult to limit the scope once the complexity had been uncovered. This was an unexpected challenge, but addressed successfully in the research. The impact of this on the study was the concentration placed on the implementation activity up to the early point of go-live as opposed to the wider user community of the CPM system. This did provide a rich description of the challenges during this period of organisational adoption that future research can build on through exploring future periods in the implementation.

The study was conducted essentially at a distinct point in the process of organisational adoption of CPM. It is expected that a more prolonged research timeline as that used by Markus (1983) would lead to a richer and more complete description of this complex area.

The principles of interpretive Case Study research as defined by Klein and Meyers (1999) provided a key foundation for the Case Study research. Consistent use of them during the execution and subsequent write-up of the research had a substantial positive impact of the overall quality of the research. It is expected that these will be entrenched in most I.S. Case Study research in future.

6.5. Implications for Future Research

This research lays an initial foundation that should lead to further study as the IS discipline seeks to gain a better understanding of the complexities associated with the organisational adoption of CPM. This interpretivist research should be seen as an initial step to understand the phenomena found in this subject area more fully and to address the dominance of positivist research in the wider literature describing adoption in general. It is suggested a more balanced view would lead to a more complete understanding of the area.

The conducted research concentrated on the implementation activity leading up to the go-live of the system and could not investigate fully the actual usage of the system within the wider organisation. Embarking on research into this system usage would provide a more complete picture of organisational adoption, but would require significant resources due to the size and complexity of the civil service studied in this context.

Future research should aim to target CPM implementations where complete cyclical processes and toolsets are being implemented. A weakness in this research was the “paper thin” cyclical nature of the CPM process within the investigate Municipality. It is anticipated this would impact the findings were the business processes and systems supporting these cyclical and self-reinforcing. Additionally the performance issues found within this Case Study that although valid, blocked an adequate understanding of the adoption of a functionally sound CPM solution. It is hoped that future research would be done on a more stable CPM environment.

In conclusion it is hoped that a clear understanding of the correlation between the adoption and the CPM business processes and the information systems that support these will be sought. The public sector context and organisational culture of the municipality investigated raised some interesting questions around the dependency of the business process adoption on the information system adoption that would be of value to investigate further. It is expected that this would lead to findings suggesting that CPM information systems could not drive technology led transformation as has been experienced elsewhere in the ERP area in both the private and public sector.

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8. Appendix A – Key Principles for Interpretive Case Studies

These 7 key principles were defined by Klein and Meyers (1999) to assist in defined sound guidelines for the execution of interpretive case studies. They guided the execution of this study and provided a quality benchmark in order to constantly evaluate the findings from the research.

The Principle of the Hermeneutic Circle – The principle suggests that all human understanding is achieved through iterating between the consideration of the interdependent meaning of parts and the whole that they form. In many respects this research does not aim to define or postulate a comprehensive theory of user acceptance of CPM, but rather to describe a specific example.

The Principle of Contextualisation – The principle requires a detailed explanation of the context or research setting as a key requirement to any interpretivist research. The detailed contextualisation of the undertaken research attempts to address this principle.

The Principle of Interaction Between the Researcher and the Subjects – This principle requires critical reflection on the part of the researcher on how the data generated as part of the research was itself socially constructed through the interaction of the researcher and the subjects. This has been included in the articulation of the findings and taken into account during the execution of the case study itself.

The Principle of Abstraction and Generalisation – This principle requires the relating of unique details revealed through the interpretation of data in the light of the Hermeneutic Circle and the Context to the general concepts that describe the nature of human understanding and social action. In the context of this study this principle suggests that it is a clear requirement in the analysis of the findings that explanations are put forward that adequately explain the idiosyncrasies identified as part of the research based on human understanding and social action.

The Principle of Dialogical Reasoning – This principle requires the researcher to accept that their theoretical preconceptions guide the initial research. To mitigate the effects of this principle it is necessary to make this initial understanding available to the reader of the research. This philosophical base has been included in the dissertation.

The Principle of Multiple Interpretations – The principle requires the researcher to actively seek out multiple interpretations of a given occurrence documented in the research and seek to explain the multiple viewpoints. This has been taken into account in the interpretation of the data generated from the case studies.

The Principle of Suspicion – The principle requires sensitivity to possible distortions in the narratives collected from the participants. Narrative collected as part of this proposed research will be evaluated for possible misrepresentations of an underlying truth as part of the analysis process.

9. Appendix B – City of Cape Town – Organisational Structure