Cape Peninsula
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An assessment of citizen benefits of enterprise resource planning systems in municipalities

by

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DECLARATION

I, Takauya Chandiwana, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

In this information age, Enterprise Resource Planning (ERP) system implementation simplifies complexities within organisational heterogeneous Information Systems (IS). Following the early era of computerisation, ERP systems were designed to provide a formal integration of the whole enterprise with a business focussed approach to the application of Information and Communication Technology (ICT). With the advent of ERP systems, organisations in industry have invested substantially in these systems to assist and augment their ability to form more effective management of their resources across corporate walls and business functions through an integration of information and operations.

In the public sector, governments at all levels have also turned to ERP systems to address their needs. As such, ERP implementation has become a new solution that many public institutions are venturing into, based on the evidence of benefits in the commercial sector. However, in the public sector, ERP systems should not be focussed on just internal organisational benefits. Due cognisance must be given, during design and implementation, to the citizen, who is the key public sector beneficiary. The benefits from ERP systems implementation and utilisation are well researched and documented by various scholars. However research has mainly focused on the private sector. Given the growing importance of ERP systems in the public sector it has become imperative to advance understanding in the arena of government with regards to public ERP system implementation and utilisation.

Thus, an important question that warrants investigation is: "*What are the benefits for the citizen when ERP systems are implemented by municipalities?*"

The empirical work reported in this research investigated, via an in-depth case study, how the citizen benefits from ERP implementations in municipalities. Fifteen respondents, who are employees the City of Cape Town Municipality, were interviewed. Their interview transcripts, together with the other supporting documents they supplied and information from the City's website, were analysed through hermeneutical analysis. The analysis of the data was facilitated by the use of Atlas.ti, a computer-aided qualitative analysis software tool.

Four key findings emanated from the analysis.

- Indirect ERP-system benefits: The benefits in this category denoted those benefits that are generically found in any ERP system regardless of it being implemented in a private or public enterprise setup.
- Direct citizen benefits: These are the benefits that are noticeable and directly extended to the citizens even without the knowledge of the existence of the ERP system.
- Effective ERP system benefits management: This finding elaborated how the ERP system can be sustainably managed to ensure that it delivers maximum benefits to the citizens in a long term.
- Efficient and effective use of public money: This finding explained the outcomes of utilising the ERP system, specifically in public enterprises, such as municipalities.

The findings of this study are important in that they would assist to articulate and improve the business cases when municipalities commence with planning for ERP system acquisition. This is especially important given the high cost related to ERP system implementation. More importantly, the findings provide a basis for the identification of citizen benefits which are related to ERP system implementation. This provides municipal management a frame within which to improve the on-going management of ERP systems. The findings thus support improved ERP system benefits management and which would in turn ensure improved service delivery to the citizenry.

ACKNOWLEDGEMENTS

I wish to thank:

- My wife, Charity
- My little angel Allyson
- My first supervisor (2009 – 2010), the late Professor Vesper Owei
- My second and current supervisor (2011 – 2013), Professor Shaun Pather.

The financial assistance of the National Research Foundation towards this research is acknowledged. Opinions expressed in this thesis and the conclusions arrived at are those of the author, and are not necessarily to be attributed to the National Research Foundation.

The co-operation of the City of Cape Town is also acknowledged. In particular, the Information Systems and Technology Department for allowing me access to my respondents.

DEDICATION

This thesis is dedicated to my father, Lazarus Mugumo Chandiwana, in recognition of his unswerving support. I am indebted to him for his boundless vision, which has guided me from my youth.

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RESEARCH OUTPUTS

The following research outputs were produced during the course of this study:

- Chandiwana, T., Oni, J. & Owei, V. 2010. Enterprise architecture implementation in the developing world: issues and a critical analysis. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010*: 1633-1640.

- Oni, J., Owei V. & Chandiwana, T. 2010. E-Business Projects Implementation: Hurdles, Challenges and Issues. *Proceedings of the International Conference on Information Management and Evaluation* (2010): 528-534.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE RESEARCH

1.1 Introduction

In the last eighteen years of democracy in South Africa, the level of change in the lives of the people has not met the expectations of especially the poor and historically marginalised communities. There are continued problems at local government level, including protests against service delivery, financial mismanagement, and an unacceptably high number of qualified audits from the office of the Auditor General (DNT, 2010). Many underlying issues are attributed to these problems. Amongst these, the role of computer information systems in improving the ability of local government to support and improve service delivery is deserving of attention (Diga et al., 2013). The question of how modern Information and Communication Technology (ICT) systems support and facilitate the mandate of local government to ensure citizen benefit is important. A benefit is “an advantage on behalf of a stakeholder or a group of stakeholders” (Ward & Daniel, 2006). Therefore, an ERP system citizen benefit is an advantage provided to citizens because of meeting the overall ICT utilisation objectives.

Over recent years, we have seen some municipalities investing in Enterprise Resource Planning (ERP) systems to assist and augment their ability to form effective management of resources across corporate walls and business functions through an integration of information and operations. In general, organisational performance and survival depend on the successful implementation and use of ERP systems (Markus, et al., 2000). Scholarly researchers who explored the area of identifying and managing ERP system benefits both theoretically and practically informed this notion (Samira et al., 2013). Examples of studies, which have investigated the general nature of ERP system benefits, include: Rosemann and Wiese, 1999; Legare, 2002; Murphy and Simon, 2002**;** Shang and Seddon, 2000; 2002; Stratman, 2007; Schubert and Williams, 2009; 2010; Williams and Schubert, 2010; Beaubien, 2013; Clegg & Wan, 2013; Hwang & Min, 2013.

The research reported in this dissertation investigated how the citizens benefit from ERP implementations. Hwang and Min (2013) argue that the internal customers such as the citizen command the influence over the ERP system implementation. The research was motivated by what appears to be increasing frustration in some communities with service delivery, and various sources, e.g. Stratman (2007), who posit that it is difficult to find documented evidence of quantifiable benefits from the implementation of ERP systems. Schubert and Williams (2010:470) noted that the existing academic research “pays little attention to the locus of the benefit and to whom the benefit applies”. Their study recommends that further investigation be required to understand the beneficiary, and more

specifically, how far the customers benefit. Dezda (2012) also supports the foregoing, that the academic literature lacks research in developing nations.

Markus and Tennis (2000:173) note that “Integrated enterprise systems deserve serious research attention because of their great potential for financial, technical, managerial, human, and strategic benefits, costs, and risks” [*sic*]. Markus et al. (2000) also discovered that the success of an ERP depends on not only who measured it, but also when it is measured. This further underscores the need to study benefits of ERP in terms of stakeholder contexts.

When the Enterprise Resource Planning concept was introduced in the 1990s (Al-Mashari, 2003) as cross functional systems, it centred on integrating core operations and processes such as accounting, human resources, and project and inventory management. The aim was to integrate all the above with all other functions of the organisation, taking advantage of robust and efficient networking technology now available. Strategic business units are now clearly paying attention to ICT and its benefits when making decisions (Basahel & Irani, 2010). It is important to understand benefits of any investment and, according to Lagsten, and Goldkuhl (2008), one major reason for doing evaluations of information systems is to take actions based on the results of the evaluation. Therefore, the study of ERP systems benefits fits within the ICT management domain.

The rest of this chapter is structured as illustrated by the Figure 1.1 below:

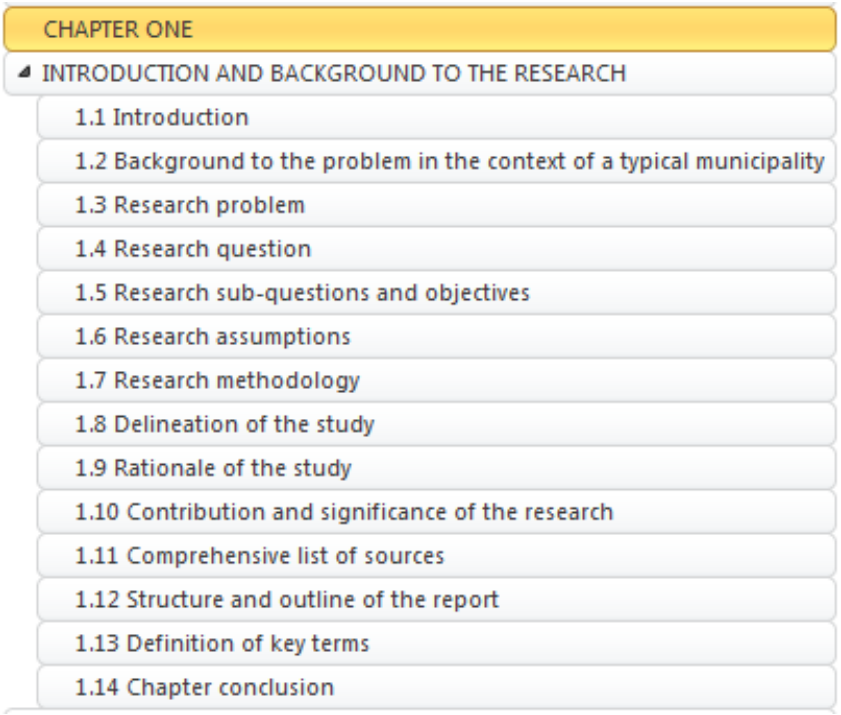

Figure 1.1: Structure of Chapter One

1.2 Background to the problem in the context of a typical municipality

During the research problem conceptualisation stage, several visits were undertaken to various departments of the City of Cape Town such as Hospitals, Traffic Department offices, Utility Services, Housing, etc., to observe how ICT services are used to support day-to-day service delivery. As a citizen, I was aware of the ERP system implementation, given publicity about the project in newspapers, websites and conferences. However, my observation was limited to the effects of this from a citizen's perspective. This prompted me to obtain a more in-depth perspective from the city management, through research.

As part of this problem-scoping exercise, three departments were selected for a service encounter. These were typical examples of departments that provide an interface between the citizens and the City. A local clinic, a traffic department office, and a utility services municipality general cash hall. In each office, I was required to bring in identification documents and proof of residence. These documents were then used to register me in the various independent systems with each department, irrespective of my having registered with any other department. This citizen interaction experience was indicative of lack of Information System (IS) integration even though the Municipality of Cape Town was already running an ERP systems.

This aroused my interest to investigate how citizens benefit when ERP systems are implemented by public organisations such as a municipality. It was observed that one of the ways in which the City of Cape Town could enhance its quality of service is through the ERP system where a resident registers only once into a common repository and is then able to access all other services with efficiency. This is one in an array of direct and indirect benefits that are extended to the citizens by ERP system utilisation.

1.3 Research problem

Against the above background, the research problem that formed the basis of this study is: Although there is an investment in ERP systems at local government level, the municipalities appear to under-utilise the functions that provide citizen benefits, which results in poor service delivery.

1.4 Research question

The main research question was thus formulated as follows: How can an operational ERP system contribute to citizen value within the public sector?

1.5 Research sub-questions and objectives

The purpose of the research is to investigate how the citizens could benefits from ERP implementations in municipalities. In support of the research question stated above, the investigative questions, or sub-questions, which were researched, read as follows:

Table 1: Research sub-questions and objectives

Research sub-question	Research method(s)	Objectives
Questions which frame the literature review		
1. What are the capabilities and functionality of an ERP system?		To establish and highlight the relevancy of ERP implementation in a municipality
2. Why do some ERP systems fail while others succeed?		To identify the critical success issues affecting ERP implementation.
3. Regarding IS benefits management: 3.1 What is I.S. benefit management and what models and frameworks can be applied to understand benefits in ERP systems? 3.2 What are the benefits to the citizen?		To analyse available models and frameworks for understanding the benefits to the citizen of ERP implementation
4. What are the typical benefits that are derived by citizens of municipalities which have implemented ERP systems?		To identify the typical benefits of ERP system implementation, so as to obtain an initial understanding of the citizen benefits.
Research sub-questions and objectives		
5. What is the status quo of ERP system implementation at the Municipality of Cape Town?	Case Study: Interviews and analysis of data.	To establish the current status of ERP application at the Municipality of Cape Town (the Case Study)
6. How does an operational ERP system contribute to citizen value?	Interviews and analysis of data.	To identify the benefits which have been created by ERP implementation in the case study
7. How could the Municipality management ensure maximum delivery of citizen benefits?	Interviews and analysis of data.	To find out if citizens are afforded maximum value from these technology investments in municipalities
8. How are the identified benefits related to each other?	Interviews and analysis of evidence.	To find out how the overall relationships among benefits affect the citizen benefits

1.6 Research assumptions

This study took the following assumptions into consideration:

- the ERP system at the Cape Town Municipality is not fully utilised;
- municipalities are implementing ERP systems to support internal processes, ignoring the direct citizen benefits;
- every organisation is trying its best to embrace ICTs in the day-to-day running of its core business; and
- the Municipality of Cape Town, as a public enterprise with a solid asset base, has the capacity to fully implement and utilise an effective ERP system within its current budget limits.
- The City of Cape Town municipality did not follow a framework for adopting ERP system.
- Municipalities are implementing ERP systems but do not understand the direct citizen benefit.

1.7 Research methodology

The research design used an interpretivist approach with a qualitative paradigm orientation. The study started with an indepth literature study. The research data was then gathered from a sample of top management and IT specialists in the City of Cape Town, using semi-structured interviews as the main data collection method. A case study was used with a qualitative approach given that the nature of the problem and the main research questions did not lend themselves to quantitative evaluation. A theoretical saturation point was reached after interviewing fifteen respondents. Further details of the sampling procedure are discussed in the third chapter of this study report. The research sample was determined through selective and snowball sampling from the target population. The secondary data was derived came from the website of the City, newspaper articles, legislation and subordinate legislation, policy documents, official memos and reports. The evidence was analysed using hermeneutical principles of qualitative data analysis. A computer software tool, Atlas.ti, facilitated the coding and analysis through management of the voluminous qualitative evidence. The themes that emerged were narrated as findings.

1.8 Delineation of the study

This research was limited to one public institution, the Municipality of Cape Town, located in the Western Cape province of South Africa. It targeted the ERP system (as far as the planning, implementation and management is concerned) and the employees who have direct contact with the current information systems at the Head Office and other points of service delivery to the residents. It considered the use of ICT within the service delivery

framework of ERP implementation and utilisation. It concentrated on the functions of the ERP system that have a direct impact on the citizens as part of service delivery. The focus of the research was on the management of the ERP system that goes hand in hand with the implementation and utilisation. The study was concerned with how the ERP system creates citizen and social value, which forms the basis for citizen benefits. Thus the benefits of the ERP systems is investigated from an operational and strategic perspective. The study focusses on the managerial and organisational planning level. Thus the views and perceptions of citizens are not part of the study. It is the citizen benefit perspective as it prevails at a management level which is the focus of the study.

1.9 Rationale of the study

In the current era of an increasingly networked society, there is an increasing trend among local governments to invest large financial resources in ERP systems (DNT, 2010). This is especially true in big metropolitans in South Africa, for example Cape Town, EThekwini and Johannesburg. This has been prompted, in the main, by the creation of metro cities where smaller municipalities have been merged. In addition, other smaller municipalities are also turning to ERP systems to improve efficiencies, but of course, ERP systems are not new technologies as they have been used in the private sector since the early 1990s.

The question, however, that needs to be asked is: “How does the Municipality’s key customer namely the citizen, benefit from those substantial investments?” This question has become even more relevant in recent years if one notes:

- The growing discontent among citizens, as witnessed by service delivery protests seen on television and written in all newspapers on a daily basis.
- Increased pressure on government by the auditor general to ensure that the public funds are is being spent wisely and transparently (DPSA, 2011).

This research is also in line with the City’s plans for “Citizens to deal with local government services in an integrated manner (e.g. via one-stop shops)” (City of Cape Town, 2002:4). This is well supported by the City’s Integrated Development Plan derived from the City’s five-year plan for the period 2007 to 2012, of which the Smart City Project is an important component. All this comes against the requirement by the South African Auditor General for public entities to report annually on institutional performance in relation to their strategic objectives, according to the Framework for Strategic Plans and Annual Performance Plans of 2010. The Department of the Presidency is enforcing an outcomes oriented planning approach that checks on not only the difference made by a programme, but also whether it improves the lives of the programme participants (DNT, 2010). It therefore calls for research

into how the clients, who are the residents of the municipalities, benefit from the implementation and utilisation of ERP systems.

1.10 Contribution and significance of the research

The fact that we see citizens expressing their anger by protesting on a daily basis confirms the importance of finding how service delivery can be improved. The outcomes of this study validates the existing literature through an exploration that investigated the level of ERP system implementation and adoption and the contribution of ICT in improving access to information amongst communities in Cape Town through the proper usage of ICT in information management and dissemination. This has a direct impact on the quality of service delivery the Municipality is providing. This research study aims to contribute towards improved management and utilisation of ERP systems through the identification and elaboration of recommendations that may be used by municipalities and other public service providers within local government.

This research study also provides a basis for further research on ICT utilisation and adoption in the information systems service delivery sector of South Africa. The research becomes important as it raises awareness as to how the use of ICT enable equal access to services. Its drive is to expose all the factors that are worth considering in the implementation of ERP systems in local government and other similar organisations. This may help form the basis for a diffusion and adoption framework that could be adopted by the City in addressing the quality of service delivery amongst the residents of Cape Town.

This research also contributes to the body of knowledge to provide a platform for future research through conference papers, a journal article and the thesis. Secondly, it highlights the implications of the current issues of growth of technology such as the benefits that can be gleaned from the full implementation and utilisation of ERP systems for improved service delivery for the City of Cape Town residents. Finally, it could possibly create a basis for municipalities to implement ERP systems and exploit the benefits from the overall service delivery efficiency.

Notably, the general cost of living in towns and cities is rising daily. Attached to this are the rates and levies that are paid to the responsible authorities, the municipalities in this case. It then calls for a need to justify the expenditure, especially given the costly projects such as an ERP system implementation. The expected justification must divulge not only the obvious but also the expected and the hidden benefits that come with the ERP implementation and utilisation. In fact, principles of good governance and financial management require proof

that some advantages are made possible that would not be there, had the ERP system not been implemented (Ward & Daniel, 2006).

1.11 Comprehensive list of sources

A comprehensive reference is a crucial component of any academic study and is provided at the end of this dissertation.

1.12 Structure and outline of the report

This research is divided into five (5) chapters as follows:

Chapter One: The Scope of the Research

The first chapter introduces the scope of the research in terms of the background and the introduction to the study. It also details the research problem, the research question, sub-research questions as well as the relative objectives. It explains the rationale for undertaking this study, giving details on its contribution and significance to the research community and local government. It finally summarises the report structure to give an overview of how the report was compiled.

Chapter Two: The Literature Review

This chapter presents the literature review. It starts by defining ERP systems and then elaborates its origins, capabilities and the successes and challenges associated with ERP systems implementation. It further analyses public ERP systems implementation literature with a discussion on benefits management issues. The chapter finally gives an analysis of the possible approaches to evaluate ERP system benefits. It then concludes by assessing the sub-research questions that were answered in this chapter.

Chapter Three: The Research Methodology

This chapter focusses on the research design and methods. The main source of information, the case study, is introduced. The chapter also details why a qualitative content analysis approach was chosen in conjunction with the use of semi-structured interviews. The chosen research approach is justified as being able to gather enough information to render the results scientifically acceptable. The research strategy is outlined and includes a description of how data was gathered and analysed making use of the case study and a qualitative data analysis approach. The data analysis is detailed on a step by step basis, including how the software tool was used to facilitate this stage.

Chapter Four: The Case Study, Research Findings and Discussion

In this chapter the case study is presented to give the setting in which the study was undertaken. The research findings are then narrated along the thematic lines that emerged from the data analysis. The findings are supported by quotations from the actual words of the respondents and a discussion of these findings ends the chapter.

Chapter Five: Conclusions, Evaluation and Recommendations

This chapter gives the importance of the findings and then proceeds to elaborate on the relevance of the key findings as it concludes on all the findings separately. It then details the measures that were taken to ensure the integrity of the study. The recommendations follow and finally the concluding remarks on the study are presented.

This report structure can be summarised diagramatically as depicted in Figure 1.3 below:

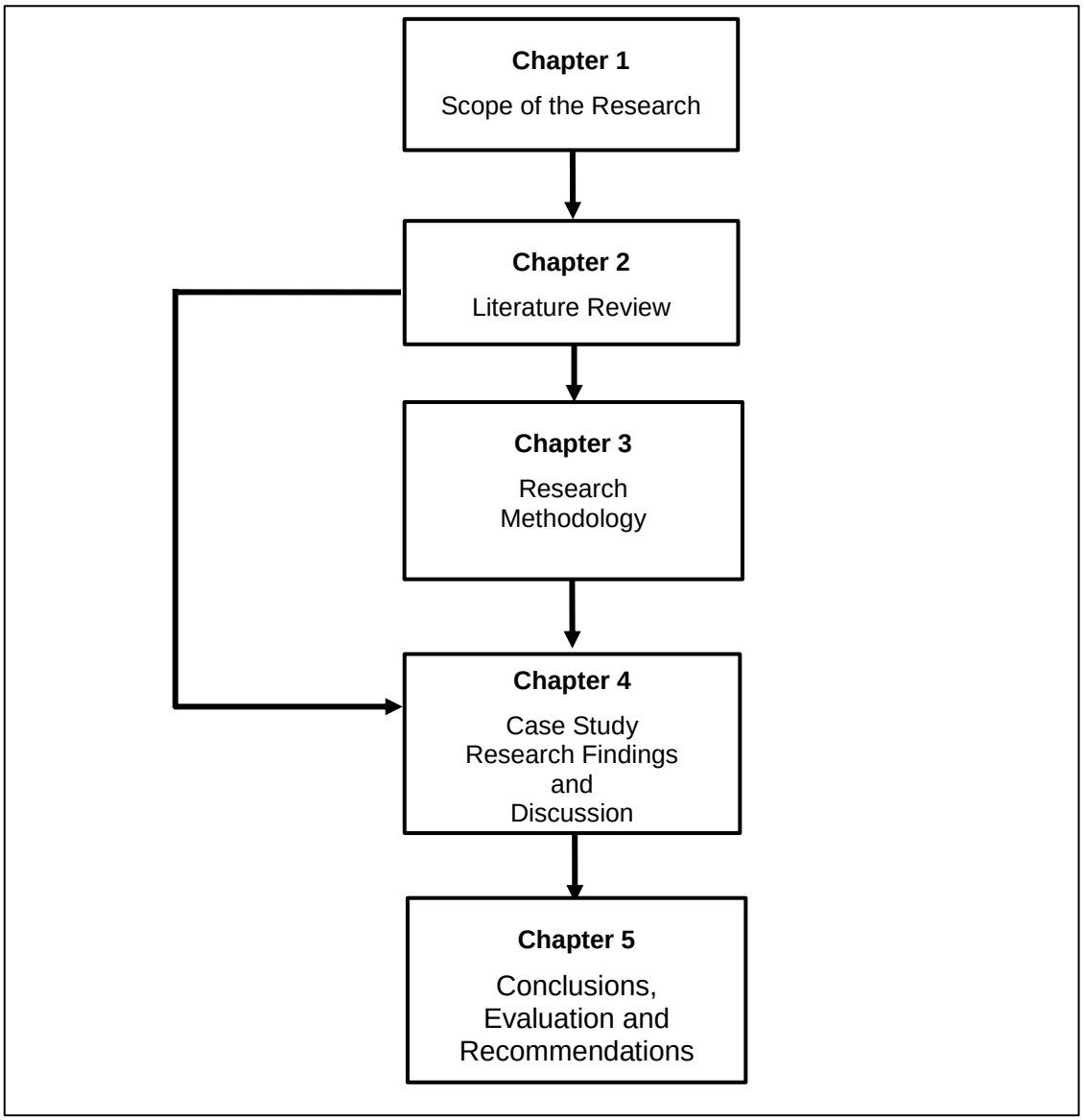

Figure 1.2: Organisation of thesis

1.13 Definition of key terms

There are different definitions that have been used by different academic writers for the concepts used in this research. To limit confusion and avoid misunderstanding each term that was perceived as controversial was defined before use.

1.14 Chapter conclusion

This chapter provides an introduction to the research by providing the background and the scope of the study undertaken on a public institution. It also details the research problem

within the information management domain, the research question, research sub-questions as well as the relevant relative objectives of the study. It elaborates the rationale for undertaking this study with details on its contribution and significance. Finally, a high level overview of the whole structure of the thesis is given and diagramatically illustrated.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents an analysis of the extant body of literature pertaining to the research problem. I reviewed the already accumulated body of knowledge to assess what is known about the research question before attempting to answer it myself. Neuman (2011) outlines a number of goals, including familiarisation with the subject, to discover prior research, summarise what is known and learn from others. This helps to link and integrate the current project before stimulating new ideas. This literature review is organised according to the following structure:

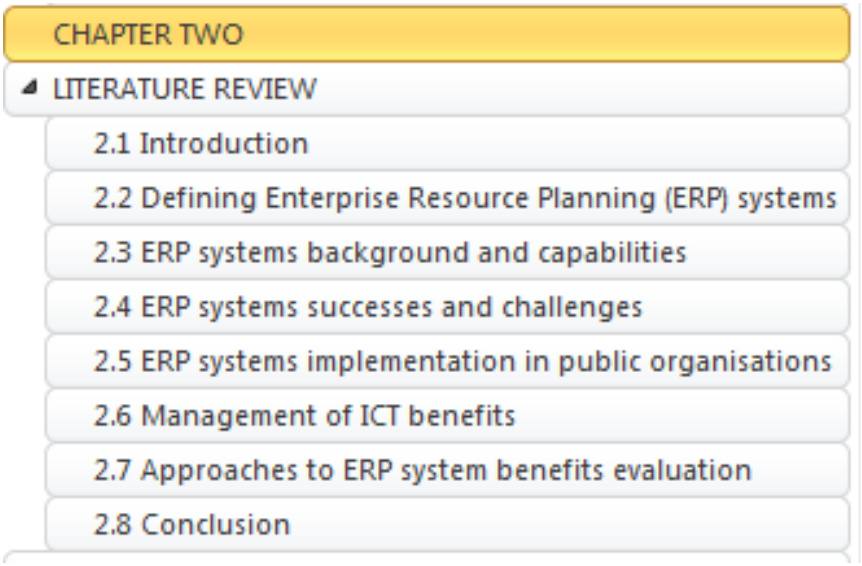

Figure 2.1: The structure of the Literature Review chapter

Within the above structure Figure 2.1, the literature review highlights aspects of the relevance of ERP systems in organisations. It begins by exploring ERP system implementation and utilisation in general; then finally it analyses ERP system capabilities and ERP system implementation in public institutions with particular reference to the Cape Town Municipality. Insights gained from this examination will then be offered to help improve future implementations of ERP systems.

2.2 Defining Enterprise Resource Planning (ERP) systems

Klaus et al. (2000) and Markus and Tanis (2000) note that there is no agreed definition for ERP systems. Nevertheless, a number of researchers have derived working definitions for an ERP system:

- "ERP system suites are configurable, off-the-shelf software packages that provide an integrated suite of systems and information resources ..." (Ward & Daniel, 2006).
- Markus et al. (2000) and Lee et al. (2003) describe an ERP system as an enterprise-wide software solution, designed and implemented to increase efficiency in the flow of data across the different organisational functions.
- ERP systems are configurable information systems packages that integrate information and information-based processes within and across functional areas in an organisation (Klaus et al., 2000; Kumar & Van Hillegersberg, 2000).
- Al-Mashari (2003); Gattiker and Goodhue (2005) and Wickramasinghe and Gunawardena (2010) suggest that an ERP system is a kind of software used to integrate the process of each functional department in the entire enterprise. If there is a strong dependency among different functional departments of an enterprise, the ERP system will fit the requirement of enterprise general process.
- Holland and Light, (1999) describe an ERP system as software that automates core corporate activities incorporating "best practice" that facilitates rapid decision-making, cost reductions and greater managerial control".
- ERP system software includes pre-packaged best business practices in many different industries in the form of Blueprints (Arif et al., 2004).

Based on the above descriptions, the following definition is derived for the purpose of this study: An ERP system offers organisations a comprehensive and integrated solution for managing services (such as financial, revenue, human resources, maintenance, procurement, leasing and customer care, amongst others) on a single integrated software system. At the core of ERP system is a centralised data repository that acquires information from and supplies information to the fragmented applications operating on a universal computing platform. This organisation-wide system of interconnected solutions is primarily related to the operations of the organisation such as finance, sales, etc.

2.3 ERP systems background and capabilities

Since the 1980s, Information and Communication Technology (ICT) has been a facilitator of change in the business world. This has been driven by the advancement in processing speeds and the capacity to store information and share it with each other through seamless integration of organisation's processes and systems (Davenport, 1998) irrespective of time and distance (Stephenson & Sage, 2007b). In 1990, Gartner Group first employed the

acronym ERP system as an extension of material requirements planning (MRP), later manufacturing resource planning, and computer-integrated manufacturing. By the mid–1990s, ERP systems addressed all core functions of an enterprise. Beyond corporations, governments and non–profit organisations also began to employ ERP systems. Thus, ERP systems are relatively new phenomena within the software industry (Samira et al., 2013); thus their implementation methodologies are still developing (Robertson, 2013). Nevertheless, a number of authors and practitioners introduced several approaches and methodologies, according to Holland and Light (1999). ERP systems give organisations competitive advantage (Al-Mudimigh et al., 2001) by exploiting business opportunities or creating new organisational competencies (Peppard et al., 2007). However, many organisations still view ICT investments as costs (Levy et al., 1998).

The above-mentioned scenario of integration facilitates smooth sharing of resources and information within the entire organisation (Simpande & Javokljevic, 2003). This initiated a number of new ways in which organisations deploy ICTs. Amongst these technological advancements, ERP systems became one of the more significant ones. Zachman (1987) posits that the cost involved and the success of any business organisation depends on a disciplined approach to the management of the increasingly complex and distributed systems. The tight integration of all departmental information systems into a single Enterprise Architecture[1] (EA) is a requirement for ERP system success (Murphy & Simon 2002). This is made possible through provision of the following capabilities:

2.3.1 Flow of Information

Many ERP systems can now facilitate the **flow of information** across all business processes internally and externally (Robertson, 2013). This enables **reusability** of services across the organisation. Consequently, it is cheaper for the organisation to run its day-to-day tasks using shared and coordinated resources. Typical examples are sharing the same human resources systems and management, databases, etc. Ordering and purchasing using principles such as just-in-time (JIT) inventory replenishment, transferring funds, and electronic authorisations become some of the benefits[2]. This enables efficiency and **greater control over inventory** and its distribution (Nah & Lau, 2001).

[1] Enterprise Architecture (EA) can be described not only as a management program but also as a documentation method that provide a useful and planned view of an enterprise's strategic direction in terms of business process integration and standardisation (Chandiwana et al., 2010).

2

2.3.2 Interoperability

Liimatainen (2008) emphasises that **interoperability** in organisations enables some centralised governance structures which are helpful in evaluating the benefits of enterprise-wide systems. Interoperability is the ability of information systems and the business processes they support to exchange data and enable sharing of information, especially through customer data integration (Themistocleous & Irani, 2001). Customer Relationship Management (CRM[3]) applications will not automatically work successfully within the organisation. The old adage "garbage in, garbage out," definitely applies to the realm of CRM. If organisations do not have clean, reliable, centralised data, their customer view will not be complete or accurate, and their business goals will not be achieved. Any change of processes must be aligned to corporate strategy (Remenyi et al., 2000).

2.3.3 Unification

Nafeeseh and Al-Mudimigh (2011) write that an ERP system enables **unification** of fragmented business units and operations. Where Service Level Agreements (SLA) are used enterprise-wide and/or extended to external partners (e.g. suppliers) to improve collaboration within the enterprise and with external partners, an ERP system smoothens monitoring and evaluation of these crucial SLAs. Shin and Lee (2013) note that the ERP system implementation provides the basis for a continuous auditing system that eventually assists both internal and external auditors. This means that the ERP system is capable of auditing the auditors. Murphy and Simon (2002) further explain that Enterprise Architecture Integration (EAI[4]) enables some linking, leasing, customer care, improved customer access, customer service, and/or satisfaction on a single integrated IT system. EAI is an integration of IT architecture with Business architecture, according to De Vries and van Rensburg (2008).

2.3.4 Compatibility

Compatibility is becoming a requirement by business partners where any organisation has to process financial transactions. For electronic funds transfer between different banks, for example, compatible systems are required. Daneva and Wieringa, (2006) aver that ERP

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[3] CRM is a widely implemented strategy for managing a company's interactions with customers, clients and sales prospects. It involves using technology to organise, automate, and synchronise business processes—principally sales activities, but also those for marketing, customer service, and technical support.

[4] The literature review indicates that ERP, EAI and enterprise-wide system are terms used interchangeably by different authors to refer to the same technologies. In this research the term ERP system will be consitently used. Also the term ICT will be used for ICT, IT and IS in accordance with the literature available.

system implementation enables **adoption** of cross-organisational ERP systems that are crucial for Electronic Data Interchange (EDI[5]), especially in inter-organisational integration. Cane and McCarthy (2007) support the same argument by postulating that EDI with business partners results in good relationships with trading partners through operational efficiency and accurate, quality and timely information interchange. ERP systems facilitate the collection and dissemination of information to managers timeously, thus improving their ability to process and analyse accounting information (Davenport 1998). Updates and new software components will always be standardised and thus compatible if an ERP system is in use. Different independent, or nearly independent, businesses can be integrated by an ERP system, according to Daneva and Wieringa (2005).

When organisations automate basic processes, it results in **cost saving** through fast and accurate transactions (Teltumbde, 2000). It enables reduction in headcount by eliminating duplication of tasks, reduction in inventory carrying, counting and re-fulfilment costs. An ERP system eliminates redundancies by providing some solid back-office systems that are up-to-date, functionally adequate, and properly integrated. ERP systems enable the ability of corporate accounting to consolidate the books more efficiently because all inventory and order status information is on one database, rather than on numerous independent systems (Gattiker & Goodhue, 2005).

2.3.5 Centralised monitoring

Incorporation of Geographical Information Systems (GIS) enables a wide range of users to access valuable data, for example, town planners, traffic controllers, property tax assessors, etc. (Goldstein, 1997). It provides a platform for a merger or acquisition through **centralised monitoring**, configuration management, service lifecycle and deployment management. In addition, an ERP system supports continuous improvements in addressing operational inefficiencies (Stephenson & Sage, 2007a).

2.3.6 Auto-error handling

An ERP system provides the technical ability to **track and monitor** business events and processes in real time to enable **auto-error handling** and publishing. This is possible through standardisation, reuse, analysis, and risk monitoring, according to Dameri (2009). This also includes efficient automated audits (Shin & Lee, 2013).

[5] EDI is the structured transmission of data between organisations by electronic means. It is used to transfer electronic documents or business data from one computer system to another computer system, i.e. from one trading partner to another trading partner without human intervention.

2.3.7 Accurate data

ERP systems adoption enables the creation of some social value where systems facilitate the formulation and enable the implementation of socially responsible policies and tariff structures. Equipped with adequate and **accurate data**, the authorities can make informed decisions, especially in differentiating between those residents who cannot pay and those who just do not want to pay (Diga et al., 2013). Saloojee and Groenewald (2007) found that efficient information management results in improved service delivery.

2.3.8 Common user interface

Finally, as a single, **common user interface** that can hook to other systems outside its design (Klaus et al., 2000). Web-enabled ERP systems can facilitate self-service usage and link organisations in the supply chain management and thus obtain increased performance benefits (Chen, 2001). Data and information sources used in managerial decision making are also integrated (Ward & Daniel, 2006). This argument is supported by the notion put forward by Lee et al. (2003) and Themistocleous (2004), both sources avering that that ERP system implementation introduced an alternative approach to EAI. EAI as a technology emerged to integrate ERP systems, according to Themistocleous et al. (2001). This confirms that an ERP system is a complete application package that can be used to achieve enterprise-wide coherence.

From the literature summarised above, it is clear that ERP systems have a list of salient characteristics. Firstly, it has a complete set of integrated software modules (e.g. production, logistics, finance, human resources, and output design). Secondly, it has cross-functional and integration software (intra-organisation). Thirdly, it has configurable software that suits different needs. In addition, as a single and common, enterprise-wide database, it spans across enterprise business processes (inter-organisation). Finally, the focus of an ERP system is on the integration of organisational systems for corporate computing to accomplish everyday tasks.

Based on the above, this research notes that an ERP system offers organisations a comprehensive and integrated solution for managing services such as financial, revenue, human resources, maintenance, procurement through a common repository and with various data entry points. ERP systems make it easier to track the work-flow across various departments and reduce the operational costs involved in manually tracking, and perhaps duplicating, data using individual and disparate systems. They actually equip organisations with the tools they need to cut costs, improve operational efficiency and make smarter decisions faster and more competitively. Some researchers argue that it is not as much

about the technology as it is about the integration of business processes contained within the system.

From the documented literature, this research also gathered that an ERP system provides a complete visibility into all-important processes. It also automates workflow and enables a unified reporting system, e-commerce integration, business intelligence functionalities on a secure centralised repository. This makes it easier for order tracking, revenue tracking and other related essential business activities, even in a globally dispersed organisation. Generally, ERP systems positively influence businesses' financial performance (HassabElnaby et al., 2012). In spite of the above-analysed advantages, ERP systems implementations seem to be challenging. This is evidenced by the high failure rate that is well documented. The section that follows analysed some issues that organisations have to take into consideration to implement their ERP systems successfully.

2.4 ERP systems successes and challenges

When an organisation implements an ERP system, its overall objective is to glean benefits (such as reduced costs, improved operational performance, and new capabilities creation) and to satisfy its clients (Ward & Daniel, 2006). This objective can only be met if the ERP system is successfully implemented and utilised. Given the high cost of implementing and running an ERP system, an introspection of critical success factors becomes important. A number of academic articles and white papers document several factors hindering successful implementation or utilisation of ERP system in several different disciplines (Lyytinen & Hirschheim, 1987).

These success factors contribute to the different types of systems failures. Unfortunately, failures of ERP system implementation are known to lead to organisational bankruptcy (Davenport, 1998). This is due to the high costs and importance that ERP systems command (Markus & Tanis, 2000). Once an organisation gets committed, then it can only abandon an ERP system project when it really cannot fund it anymore. They cause adverse effects that come as "disbenefits" (Ward & Daniel, 2006:22). Thus, ERP system failure is when the project organisation fails to obtain sufficient support to enable continuity. According to Lyytinen, and Hirschheim (1987) the failures include:

- correspondence failure – which is failure to meet the required objective;
- process failure – which can be total failure to produce the sytem or failure to produce it within the time frame or budgetary constraints;
- interaction failure – where the system fails to satisfy the users; and
- expectation failure – which is the inability of the system to meet specific stakeholders' expectations.

The above-listed failures are related but target different stakeholders. Subsequently, this research is interested in the “expectation failure” where the stakeholders involved are the clients. These clients are the main stakeholders in a public institution such as a municipality. Below is an analysis of pertinent issues that encumber smooth realisation of ERP system benefits and which have been documented in the literature.

2.4.1 Hardware and Software Compatibility

A computer system is composed of the equipment and devices that make up the physical component and the programs used on it. These two are always upgraded by their manufacturers to keep up with the advancement in technologies, to solve emanating problems or to include new features. There is a need to use corresponding versions to have a compatible set that works harmoniously. “The range of hardware configurations and versions of software in use should be established” (Remenyi et al., 2000). Technological incompatibility and technological complexity are challenges in modern day dynamic data needs (Melin & Axelsson, 2009). Some systems are inefficient because of hardware and software incompatibilities (Remenyi et al., 2000). New versions and upgrades sometimes come with technical problems (Fan et al., 2000). Limited customisation may not sufficiently integrate the ERP system with the business process (Clegg & Wan, 2013). However, too much customisation may slow down the project and make it difficult to upgrade as too many bespoke amendments to the package can cause cost and time overruns (Ward & Daniel, 2006). Organisations must take advantage of standardisation and collaboration among vendors and consultants and appropriately choose compatible hardware and software. This requires adequate consultation before choosing the best combination in terms of availability of versions of technology and versions control. Technological advances render some systems out-of-date before implementation is completed (Remenyi et al., 2000). This is due to new technologies that come onto the market each day, forcing the need to update both hardware and software accordingly.

There must be some corresponding changes in the supporting computing platform, including the telecommunications infrastructure amongst others. This is external in most cases but is critical to provide a common backbone to ERP systems. A fully fledged ERP system has to be web-enabled for the clients to access, especially for self-service services (Simpande & Jakovljevic, 2003). This becomes a challenge when the majority of the clients cannot access the internet. Generally, under-developed nations have poor ICT infrastructure in general, as noted by the ITU (2007). The following excerpt supports this notion:

"While the world saw 281 million broadband subscribers by the end of 2006, one million, less than 0.4 per cent, had subscribed in Africa. Since broadband access is a major tool for e-government as well as e-commerce, this is a striking indicator for Africa's future development" (ITU, 2007:2).

According to Markus and Tanis (2000), upgrades are inevitable but some organisations are unwilling or unable to make technological upgrades. Failure to upgrade systems results in incompatibility that affects most decentralised organisations with disparate business processes and systems (Ward & Peppard, 2002). This is critical when it comes to inter-organisational links in the customer relationship connections.

2.4.2 Legacy systems and data

Holland and Light (1999) identify legacy systems as a critical success factor that needs special attention in ERP system implementation. Bennett (1995) and Adolph (1996) note that legacy systems are "the business and IT systems that sum up" the existing business processes, organisation structure and culture and information technology. Organisations, therefore, will always have legacy systems from previous operations and systems. The challenge is to convert the previous data to be compatible with the new system successfully. Bisbal et al. (1999) detail that the most serious of these problems are faults which are difficult to trace because of lack of documentation. Lack of clean interfaces also makes them very difficult, if not impossible, to expand.

Dealing with legacy systems to import data is always a problem, especially when organisations try to implement a complete overhaul of the system (Lam, 2005). Researchers (such as Lam, 2005; Mckeen & Smith, 2002) elaborate that EAI is the same as integrating existing IS rather than developing a new one. This gives an impression that an organisation can integrate its old systems and come up with an ERP system. Nevertheless, legacy data are equally involved. There is always some legacy database and data to import, and some organisations end up transferring unnecessary data from previous systems or fail to transfer crucial data. Management of the gap between the legacy systems and the new functional system is a challenging issue (Ross & Petley, 2006).

Migration of existing data to the new ERP systems is always difficult to achieve as with integrating ERP systems with other stand-alone software systems. Proper consultations and analysis to determine and filter relevant data are required to avoid carrying over unnecessary information. Most organisations need to transfer numerous records from their old system to the new one and if there is no backward compatibility between the two systems, the organisation ends up migrating with unnecessary data, or worse still, leaving out important information. Markus et al. (2000) postulate that the data must be clean in order to get

accurate information, which is an essential part of ERP system success. Their argument is in line with the common adage “garbage in, garbage out”.

2.4.3 Change management

Change management is either omitted or under-estimated, thus compromising the enormous potential benefits of IT. This happens when an organisation uses an ERP system to entrench old work processes and organisations rather than to redesign them (Ward & Daniel, 2006). ERP systems must provide the capability to enable change to occur rapidly with minimum resource consumption (Schekkerman, 2004; Wickramasinghe & Gunawardena, 2010). Consultants and vendors impose change, but it is the duty of management to come up with a proper programme to involve and motivate individuals to reduce resistance to change. In fact, organisational process re-engineering must precede ERP system configuration (Nah & Lau, 2001). The benefits list provided by vendors must be accompanied by the associated organisational changes to manage benefits (Ward & Daniel, 2006).

2.4.4 User-training

Many organisations overlook user–training, resulting in high reliance on vendors for technical support (Gupta, 2000; Markus et al., 2000). Dezdar (2012) notes the relationship between user training and ERP system implementation success. Exhaustive training of system users with qualified and experienced experts usually enlightens stakeholders. Training is crucial for successful implementation of ERP system projects as these systems are generally difficult to use and learn (Dezdar, 2012). There must be a commitment to train the users (Remenyi et al., 2000). Lack of training is suicidal because of the complex nature of these systems (Lam, 2005). Some organisations fail to establish a change management programme to change the business culture or fail to support it by a two-way communication channel (Legare, 2002). A user advisory council to mediate with the users to reduce resistance to change is required. The projects have to be planned and must appear as such to all the stakeholders with updates following at all stages. System owners as risk takers need a proper programme, which will give them the confidence to invest. Zhang et al. (2013) found out that training is necessary to enhance communication during ERP system implementation.

2.4.5 Real costs

Many academics researched and documented the high costs of ERP system implementation. Nevertheless, the projected costs usually increase, sometimes owing to inflation or miscalculations, to the detriment of the whole project. These costs are attributed to ERP system software, project planning, customisation, configuration, testing and implementation (Wagle, 1998). Levy et al. (1998) note that the initial costs for IT investments can be very

high for organisations. Besides that, there are always some hidden costs adding on to the hard costs. Most organisations will only realise these costs when they are already committed to the new system and when it is too late to abort the project (Remenyi et al., 2000). Some of these additional indirect costs, such as new IT infrastructure, upgrading the WAN links, just to mention two, are difficult to predict as organisations usually under-estimates the differences between ERP system and other common applications. Many studies report that cost change is due to the dynamics of projects and is exacerbated by the context specificity of costs (Farbey et al. 1999).

Wagle (1998) argues that the promised benefits should be more than the costs of integration, process redesign, and training. He further argues that real costs should take into consideration unanticipated cost overruns, schedule spillage and spiralling costs. These force organisations to compromise some aspects of their planned ERP system, resulting in malfunctions. Some end up using departmental architectures or modules when their allocated funds run out.

Usually, too many needs and projects competing for limited resources result in project failure. De Vries and Van Rensburg (2008) summarise it citing the major reason as short-term financial focus and measurement. Singh and Mkhize (2010) argue that most IS projects are difficult to define, resulting in under budgeting.

2.4.6 Project monitoring and evaluation

Nah and Lau (2001) found project management, monitoring and evaluation of performance among the critical elements in ERP system implementation. Dezda (2012) cites project management as the most important success factor within the project environment. Organisations with poor auditing policies and procedures to apply when dealing with vendors will not identify problems in time. Working with independent consultants is a necessity throughout the entire implementation process to evaluate compliance malfunctions, possible system failures, and access control (Dameri, 2009). Their research concludes by recommending automated audit systems. Project monitoring and evaluation are suitably done through appropriate audits.

The audits can be facilitated and augmented by project management software, especially before the ERP system takes over the audit function. Measures of effectiveness have to be laid down, according to Stephenson and Sage (2007b). Most organisations assume that projects are always under control, but this is not the case. Benefits and performance measures must be defined for every business process. The focus should be on the benefits to be delivered by business process rather than individual requirement. Failure to realise all

the possible benefits or mismanagement is because benefits management ends with closure of a project (Glynne, 2007).

2.4.7 Technical and customer support

Moore and Benbasat (1991) note that 70% of IT innovation failures are due to technical and 30% to non-technical organisational factors. The concept of cross-functional configuration and testing is new to organisations, tempting them to stick to a modular approach causing conflicts with consultants and vendors. Unfortunately, for the ERP system to be complete and successful the “cross-functional function” is a requirement (Markus et al., 2000). To glean most of the benefits of the ERP system, organisations need to train both management and users intensively (Chen, 2001). Shang and Seddon (2000) advise that putting an ERP system in place requires employee training and both managerial and technical support. Different organisations have different needs; thus vendors and consultants must provide a proper support plan, including back-up plans for recovery and fault-tolerance.

Once an ERP system is implemented, it becomes a single vendor lock-in for further upgrades, customisations, etc. Some vendors do not provide necessary upgrades, and this affects compatibility in the end. A high level of vendor dependence promotes complacency within organisations. This is fatal if the organisation decides to change the vendor or if the vendor liquidates. Reputable vendors, such as SAP, Oracle, J.D. Edwards, PeopleSoft and Baan (Roseman & Wiese, 1999; Fan et al., 2000; Klaus et al., 2000; Kurmar & Van Hillegersberg, 2000; Al-Mashari, 2003; Trott & Hoecht, 2004) provide better technical support. The cheaper ones are usually “short-cutting”. In developing countries, the quality of technical support is poorer, as experts are always moving to developed nations in search of perceived greener pastures and better life prospects. Zucker (1986) suggested the use of escrows as third parties to guarantee the expected outcome of transaction.

2.4.8 Poor communication

Lack of user acceptance of data and reporting can lead to de-installation of the system or resistance to further upgrade an ERP system (Holland & Light, 1999). Markus et al. (2000) also support the above notion and advise organisations to consult users and use the feedback. Since an ERP system spans all the departments of the organisation, everybody within the organisation becomes a stakeholder, from the system owners to the system users and system builders.

Singh and Mkhize (2010) note that some failures in public organisations are due to directives issued by political leaders or management that force architects to hastily implement solutions. Gupta (2000) found resistance to change among the problems associated with

ERP system implementation. At the end, if all stakeholders constantly get updates, everyone should feel ownership, and this will reduce resistance to change. It is well documented that employees view computerisation and automation as a threat to their employment and thus are bound to resist ERP system implementation.

ERP system implementation is a socio-technical challenge in which communication plays a central role in securing the essential processes for successful implementation (Dezdar, 2012). Different processes at different levels and positions in the organisation are coordinated through communication (Zhang et al., 2013). This makes communication a critical factor (Al-Mudimigh et al., 2001). Only communication to explain and help employees understand that it is complementary will help.

2.4.9 Security issues

Melin and Axelsson (2009) note security issues as a concern. According to Singh and Mkhize (2010), present day business problems are new and complex and are outside daily experiences, leaving very few knowledgeable experts to handle most of the threatening scenarios. The most feared issue is information theft and/or destruction, and most organisations breach correct procedures when they try to tighten up security. “Computer and network systems fall victim to many cyber-attacks of different forms” (Ye et al., 2006:135). Of course, this issue needs to be addressed well and on time, to avoid total abandonment to some implementations, especially where threats exist. In fact, the security threat issue is exacerbated by the fact that most of the data and documents are now in electronic form and thus must be protected not only from unauthorised access but also from malicious code and denial-of-service attacks (Gollmann, 2011).

The delicate balance between acceptable risk and usability is always a challenge to strike, given the complexity of an ERP system. An ERP system reduces risk by providing secure approved standards for enterprise information access (Beaubien, 2013). Individuals prefer working on an independent computer, as they feel insecure with connections to the networks. The situation is aggravated by the fact that organisations in the developing economies are taken as soft targets by hackers from the developed side who often are highly experienced and sophisticated in identifying loopholes in most systems. General computer security consists of physical access, authorisation and disaster recovery (Remenyi et al., 2000). It is arguable that using Critical Success Factors (CSFs) without aligning them to the types of strategic objectives pursued by the firm and the current state and position of the firm is not adequate protection for modern organisations. CSFs are those factors that should be considered to ensure successful project implementation (Holland & Light, 1999).Critical success factors are the basic determinants of success or failure as organisations rush to

implement ERP systems (Ward & Peppard, 2002). These factors also help inform the research on benefits expected by the organisations. This means that organisations that undertake costly projects without proper analysis of such issues often fall victim to one or more of the pitfalls. It is therefore imperative for all prospective implementers to consult, comprehensively and adequately, throughout the project's life cycle (Ward & Daniel, 2006). From the above discussion, the main challenges that come with the ERP system implementation are the time it takes, its overall costs (i.e. training, integration, data analysis and conversion, consultation) and, of course, security issues.

The fact that these critical success factors are foreseen means that any responsible organisation must seriously consider them despite the cost. This is even more important when we look at publicly funded projects, as in municipalities. Management of these organisations must also consider that their clients come from diverse backgrounds when they deal with these issues, which can be perceived differently in terms of their relevancy. Therefore, a strict monitoring and controlling function must be utilised to ensure that all the stakeholders understand and accept the steps taken in implementing the public systems. The section that follows analyses the relevance of ERP systems in public organisations more specifically.

2.5 ERP systems implementation in public organisations

According to Holland and Light (1999) and Stratman (2007), organisations generally expect to realise benefits from their ERP systems in operational efficiency and productivity through automated transactions and better decision-making (Al-Mudimigh et al., 2001). ERP systems are now considered the "price of entry" for running a business, and also for being connected to other enterprises in a network economy (Kurmar & Van Hillegersberg, 2000; Wu & Wang, 2007). This applies to all organisations, be they public or private. This explains why most organisations, regardless of their size, strive to implement an ERP system.

2.5.1 Public vs. private ERP system implementation

Public organisations such as municipalities are not profit driven. According to Liimatainen (2008), the objectives of a public organisation include improving the quality and performance of public service delivery, or attaining a more efficient and effective public sector. Better service delivery is the main objective for making the decision to commit public funds to what many consider being "just a computer system". Morganwalp and Sage (2004) suggest that a government can justify the costs and resources it incurs only through positive effects. Diga et al (2013) advise that ICT policies should ensure a certain level of technology and services available to citizens. As detailed above, the role of ERP systems in municipalities becomes

clearer and critical, given the comparison that the citizens make with the other organisations they interact with in day-to-day business transactions in the private sector.

One of the questions that need to be answered is: “why are municipalities using disparate systems, if other business units such as banks are conveniently managing?” Other questions inquire whether there are any benefits for the citizens who are indirectly paying for the implementation through their rates and taxes. The ordinary resident expects clean administration and no fruitless and wasteful expenditure, which in turn results in unqualified audits irrespective of ERP system implementation or not. Themistocleous and Irani (2001) noted that ERP system implementation is a very high-risk project. Convincing all the stakeholders in a public organisation of the usefulness of an ERP system requires some intensive research into the benefits of ERP system implementation (Markus & Tennis, 2000). In fact, obtaining the agreement of all stakeholders, especially with varied opinion, is difficult (Ward & Daniel, 2006).

The challenge is that most of the benefits derived from ERP systems are intangible (Murphy & Simon, 2002) and are realised indirectly by the various stakeholders. Nevertheless, all benefits must be measured (Murphy & Simon, 2002). Some stakeholders choose to ignore these, especially for political reasons. An ERP system is an abstract concept to the general citizen, making it even more difficult to reach an agreement with all stakeholders who are always pursuing their own, sometimes different, interests (Yeo, 2002). Unlike in the private sector where all stakeholders have a single agenda of maximising their profit, stakeholders in public sectors aim at value–for-money service provision (Ward & Daniel, 2006). Sometimes these stakeholders have different, if not conflicting, motives. For example, management is there to run the organisation in the most efficient way, the politicians need to please those who voted them into power, the workers are interested in keeping their jobs, etc.

As outlined above, goals for privately owned organisations are usually profit driven. They differ, therefore, from those of public organisations but the way the ERP system enables their realisation is similar in both circumstances. Given that the business case is generally different from the private sector, this difference calls on all stakeholders to be on the lookout to ensure that the public funds involved are utilised not only for the right cause but also in the best possible way.

An ERP system takes the transformation dimension framework for IT investments where it changes the business processes (Ross & Beath, 2002; Al-Mudimigh et al., 2001). This enables the organisation to change its business processes. Clegg and Wan (2013) also argue that it is necessary to change business processes to embrace the ERP system. In public organisations, the intended transformation has to fit in the background together with

the beneficiaries' needs (Irani et al., 2008). It is agreed among researchers that the cost of implementing and adopting an ERP system is the biggest obstacle (Remenyi et al., 2000). This problem is exercerbated by the fact that benefits are gleaned later while costs are incurred immediately (Love et al., 2004). The benefits of a successful implementation are also well researched and published. This is very clear in private organisations, as there are many well documented case studies.

However, academic research about the implementation of ERP systems in government is scarce (Melin & Axelsson, 2009) even though many public organisations are already running these systems. Melin and Axelsson (2009) further advise that lessons learnt from the private sector can be used in the public sector even though they accept that organisations in this category possess some unique format. While ERP system implementation comes to support the goals and objectives of an organisation, it cannot be over-emphasised that the objectives of a public organisation such as a government differ from those of private institutions. With the latter the main goal is to glean as much profit as possible for the shareholders through increase in sales, profit, earnings per share and return on investment. Public organisations, however, mainly aim to improve the quality and performance of public service delivery, or to attain a more efficient and effective public sector with a high "CITIZEN VALUE". Beaubian (2013) avers that enterprises can gain superb control through the implementation and utilisation of an ERP system.

Before implementing a big project such as an ERP system, an organisation needs to create a sound Business Case. A carefully planned sound business case can easily justify ERP system projects (Holland & Light, 1999; Hong & Kim, 2002). This can be done by creating a clear vision and objectives for the ERP system project that are consistent with the global strategies and goals of the organisation. If a sound business case stays "on the table", then the escalating and hidden costs will be easier to identify and justify. Unfortunately, in ERP system projects, there is a lack of academic literature that deals with business case comprehensively. The little available is fuzzy and fragmented under different topics (Nafeeseh & Al-Mudimigh, 2011). Ross and Beath (2002) argue that the business case is not enough to justify or pre-empt success in ERP systems and they advise a multiple approach. This research noted that there is ERP system implementation going on in municipalities in the Republic of South Africa and thus reviewed the available literature in the section that follows.

2.5.2 ERP systems in South African municipalities

Although this research could not find academic literature and reports documentation on ERP systems in South Africa, it gathered from cursory news reports and other sources that there

are ERP system implementations in other municipalities, e.g. City of Johannesburg and eThekwini Municipality. This section provides an overview of ERP system implementation in the South African context, gleaned from available reports. It covers the level of involvement of the South African government in supporting ICT implementation initiatives in public institutions. The research notes that South Africa, specifically the Municipality of Cape Town, is among those organisations in developing nations that are still striving to make use of the efficiencies brought about by the ICT innovations. Most governments worldwide are appreciating the critical role of ICT to change their countries and have started to adopt these for national development. The advent of ICTs enabled several transformations in the way governments operate. Scott et al. (2005) report that most African countries have acknowledged the information revolution, although the use of technology differs from country to country (Enakrire & Onyenania, 2007).

The South African government has emphasised the development of an ICT sector through the formation of a national ICT strategy that addresses ICT penetration and adoption in all sectors (Department of Service and Administration (DPSA), 2011). According to the Department of Trade and Industry (2007), there has been the formulation of the South African Information Technology Industry Strategy (SAITIS), which is a bilateral project between the South African government and the Canadian government. This initiative seeks to contribute to sustainable economic growth, 'social up-liftment' and empowerment. Apart from SAITIS and Info 2025 Vision that have been assigned responsibility of building ICTs infrastructure, there is the IT Council, responsible for local and provincial government information technology functions (Digital Opportunity Initiative, 2001).

In addition, the ERP system implementation project is aligned with the government's plans to improve the service delivery to the citizens (DPSA, 2011). A number of objectives of the Batho Pele principles support the ERP system implementation. The following table 2.1 gives the medium term objective as given by Roberts and Hemson (2008). Their research on how the eight Batho Pele principles apply to the daily experiences of citizens at municipal level within the South African context detailed a number of positive responses. These findings reflect how these strategic objectives are in line with Government's major priorities.

Table 2.1: Batho Pele principles aligned to current service delivery
(Adapted from: Roberts & Hemson, 2008)

Batho Pele principles:	SASAS Statements (five-point agreement scale)
1 Consultation (BP1)	Municipalities consult communities enough on basic services
2 Setting service standards (BP2)	Government is providing basic services that are of good quality
3 Increasing access (BP3)	Government is making progress in giving all SA equal access to services
4 Courtesy (BP4)	Municipality treats people with respect
5 Providing information (BP5)	Municipality provides people with good information about basic services
6 Openness and transparency (BP6)	Municipality provides regular information on its performance in delivering services
7a Redress (BP7a)*	Municipality responds quickly to complaints about problems with services (redress: rapid response)
7b Redress (BP7b)	Municipality does a good job of following through and fixing problems (redress: fixes problems)
8 Value for money (BP8)	People are getting good value for the money they are charged for basic services

*The Redress principle was divided to allow respondents to distinguish whether rapid response to complaints led to problems being fixed.

South Africa occupies the 40th position and top for Africa on the digital development (e-readiness rankings) annual benchmarking study by The Economist Intelligence Unit (ITU, 2013). This study measures the ability of governments to utilise ICT to improve service delivery. The study uses six pillars of e-readiness:

- connectivity and technology infrastructure;
- business environment;
- social and cultural environment;
- legal environment;
- government policy and vision; and
- consumer and business adoption.

Further analysis of the study shows that South Africa has a very highly ranked government policy and consumer and business adoption and it was globally ranked at number 84 and medium on “The ICT Development Index” and third in Africa by the ITU (2013).

There is all of this regarding ERP systems in general, ERP systems in municipalities and specifically the ERP system implementation in the Cape Town municipality. However, the issue of how ERP system provides benefits, and the management thereof, has not been academically researched. Thus, the review will now examine the literature regarding benefits management.

2.6 Management of ICT[6] benefits

With the insight of what benefits can be extended by ERP system implementation, the next issue is how to maximise and sustain these benefits from the implementation stage throughout utilisation. This can only become clear if an analysis of how best these benefits can be managed is undertaken. Below is an account of a number of studies that researched best benefits management styles.

Organisational benefits are advantages provided to specific groups or individuals as a result of meeting the overall objectives (Nafeeseh & Al-Mudimigh, 2011; Ward & Daniel, 2006; Remenyi et al., 2000). The same writers then define a “*benefit owner”* as a group or individual who gains advantage from a business benefit. ICT benefits accrue to an organisation in three ways: through innovations or by improving the performance of essential processes or by stopping unnecessary activities (Remenyi et al., 2000). Ward et al. (1996) note that organisations do not have benefits management methodologies, resulting in little effort being extended to ensuring that the expected benefits are realised. Ward and Daniel (2006) identify four categories of stakeholders as accommodators and resistors, who receive fewer benefits, and collaborators and compromisers, who glean most of the possible benefits. The benefit owner is not necessarily responsible for realising the benefit, even though, according to the definitions above, the benefits belong to individuals or groups who expect to obtain value from an investment (Glynne, 2007). This supports the argument of this study that internal stakeholders, the organisation’s management, should provide benefits to external stakeholders, the residents.

The management referred to above must provide a business case that should describe not only the benefit but also the actions and who is required to manage the benefit (Ward &

[6] In the academic literature referenced, different writers refer to Information systems (IS) as Information and Communication Technology (ICT) or even Information Technology (IT). This research will adopt ICT for simplicity’s sake.

Daniel, 2006). The value of computer-based systems ought to be measured by its ability to realise business benefits for the organisations. ICT benefits can be categorised into the tangible and the intangible (see Section 2.5.1). Nevertheless, both tangible and intangible process change benefits are measurable (Remenyi et al., 2000). Benefits management comes as an extension of the traditional investment appraisal approach and focusses on benefits realisation and evaluation (Glynne, 2007).

Benefits management and realisation is a practice that seeks to replace the traditional investment appraisal approach with a focus on the active planning of how benefits will be realised and measured (Glynne, 2007). A benefit is 'an advantage on behalf of a stakeholder or a group of stakeholders' (Ward & Daniel, 2006). Therefore, they are always measurable improvements resulting from meeting objectives. Glynne (2007) asserts that stakeholders who obtain value from an investment own benefits.

Benefits management involves identifying and structuring benefits, planning benefits realisation, delivering, evaluating and reviewing these benefits, (Remenyi et al, 2000). In turn, each high level stage has a number of key objectives, activities and deliverables associated with it. In fact, it comprises all the activities designed to ensure that an organisation realise the benefits it plans to achieve from an IT investment (Farbey et al., 1999). To attract adequate commitment to realising benefits across a range of levels of stakeholders an agreed governance model that ensures ownership and accountability in reviewing and evaluating benefits is required (Glynne, 2007, Ward & Daniel, 2006). The benefits management strategy can be summarised into a cycle that explains the continuous and on-going nature of the IS benefits management process.

2.6.1 Benefits classification

ICT benefits can be categorised into the tangible, those that can be easily quantified and measured, even by traditional means, and the intangible, which are difficult to measure. Tangible and intangible (Farbey et al., 1999; Remenyi et al., 2000; Ward & Daniel, 2006) value types constitute the most common distinction between benefits. A tangible benefit is one that an organisation can easily measure, monitor and control. An organisation can measure by objective, quantitative and financial measurement criteria (Ward & Daniel, 2006). Examples are number of people employed or amount of money saved or earned. On the other hand, intangible benefits tend to be qualitatively measured and subjectively judged, even though most organisations treat them as equally important (Ward & Daniel, 2006). Their book gives examples, such as improvement in general circumstances of staff or clients, improvement in employee or customer satisfaction or identifiable performance improvement, none of which can be monetarily quantified. Cost benefit analysis techniques such as "cut off

period, payback period, discounted cash flow (DCF) and return on investment (ROI)" traditionally addressed tangible benefits (Remenyi, 2000). These techniques are inadequate for the "invisible" ICT contributions enabled by new technologies.

Another way of classifying benefits is to determine the target beneficiary. Most benefits are intended for a particular stakeholder group even though some benefits will be shared between or among more groups. From the ERP system benefits compiled by Madapusi (2008) from eleven academic researchers, only three of the benefits (i.e. information availability, information quality, and customer satisfaction) are directly aligned to the client stakeholder. This is typical of the literature that I found and supports the reason why more research is needed to find out if ERP system implementers ever think about their clients. However, Remenyi et al. (2000) assert that the ICT function is aimed at satisfying the customer and go on to relate the tangibility of the benefits to their quantity aspect. Their study argues that some tangible benefits are quantifiable while some are not and the same can be said for intangible ones. They gave examples of those intangible and unquantifiable benefits as those that are difficult to put a financial value, such as increase in customer perception and confidence. These are the most crucial aspects this study is interested in the municipalities.

Ward and Daniel (2006) also classify ICT benefits, distinguishing them into those that are financial, quantifiable, measurable and observable. They emphasise these differences in a matrix that defines four levels of explicitness (see Table 2.2). Their matrix is crucial in giving a rich description of all the benefits expected from an ICT project. The matrix becomes even more crucial, if you look at the three possible benefit realisation tactics suggested, i.e. doing new things, doing things in a different or better way and stop doing unnecessary things.

Table 2.2: Classifying the benefits by the explicitness of the contribution
(Adapted from: Ward & Daniel, 2006:173)

Degree of Explicitness	Do new things	Do things better	Stop doing things
Financial	By applying a cost/price or other valid financial formula to a quantifiable benefit a financial value can be calculated		
Quantifiable	Sufficient evidence exists to forecast how much improvement/ benefit should result from the changes		
Measurable	This aspect of performance is currently measured or appropriate measure could be implemented. But it is not possible to estimate by how much performance will improve when the changes are complete		
Observable	By use of agreed criteria, specific individuals/groups will decide, based on their experience or judgement, to what the benefit has been realised		

This study also concluded that ICT benefits can be categorised into tangible, those that can be easily quantified and easily measured, even by traditional means, and intangible, which are difficult to measure or unquantifiable (Irani & Love, 2001; Ward & Daniel, 2006). Irani and Love (2001) further classify the benefits into strategic, which are more difficult to quantify, and operational, that are easily quantifiable. The strategic benefits are the future-defining benefits, such as adaptability and sustainability, while the operational are the on-going benefits such as customer satisfaction. Therefore, a financial value can easily be attached to a more quantifiable benefit.

2.6.2 Benefits monitoring and review

Both Ward et al. (1996) and Glynne (2007) assert that benefits have to be monitored to check if the delivery of planned benefits is not affected by any changes that occur either internally or externally. Benefits monitoring should cover the whole benefit management cycle from planning to review. We must be able to search for unexpected benefits (Farbey et al., 1999). Delone and McLean (2003) note that the measurement of IS success affects the value and efficacy of IS management actions and eventually IS investments. Continued monitoring of benefit and performance measures provides a sustainable mechanism to encourage continuous improvement, which contributes to building a culture of benefit delivery. It is very difficult to measure ICT investments such as ERP system implementation, specifically the measurement of information management and the benefits (Saloojee & Groenewald, 2007). Liimatainen (2008) postulates that evaluation and measurement of costs

and benefits in government organisations is difficult. However, with huge sums of money being spent on ICT (ERP systems, to be specific), one would expect that managers and researchers would devote considerable effort to assessing which forms of ICT expenditure are most effective (Seddon et al., 1999). In fact, the high cost of implementing an ERP system calls for evaluation (Teltumbde, 2000; Morganwalp & Sage, 2004). Organisations can make effective use of information systems they understand. Reliable and valid measures are prerequisites to cumulate ICT knowledge, according to Bailey and Pearson (1983).

Researchers (like Doll & Torkzadeh, 1988; Delone & McLean, 2003) recommend that organisations measure the success of an ICT system by its end users. The updated Delone and McLean IS Success Model demonstrates how the system, information and service quality can determine the net benefits (see Fig 2.2 below). The results expected are the net benefits that should accrue to all stakeholders. Wagle (1998) posits that ERP system investments should be made on good judgement and not on faith. This supports the argument that ERP system benefits have to be measured to justify investments. A number of authors researched the benefits of ICT systems as the significant aspect that could discriminate successful implementations from unsuccessful implementations. According to the academic literature available, this research notes that the success of an ERP system does not depend on one measure.

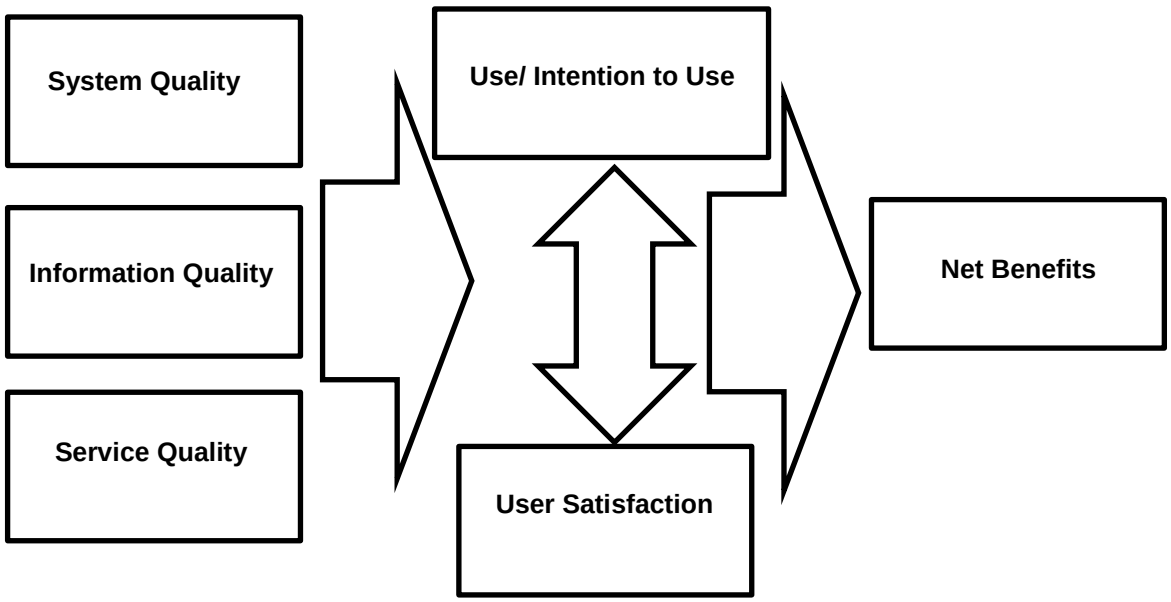

Figure 2.2: Updated D&M IS Success Model
(Source: Delone & McLean, 2003:24)

However, organisations use their business case and its alignment to the objectives to give a clue as to “what and why” to measure. The research also noted that some other benefits overlooked by the business case might be visible at a later stage. This makes sense as system owners are willing to re-invest in either re-training or system update or overhaul only when clear results are available showing some shortcomings within the organisation. These shortcomings can only be identified if there is a proper evaluation of the ERP system benefits management system. Ward and Daniel (2006) argue that benefit evaluation has been one of the latest additions to benefit management.

Previous related studies identified and evaluated a number of different IS aspects. Some of them measured the system stability (e.g. Wu & Wang, 2007) and project completion time and budget (e.g. Hong & Kim, 2002). Others measured clarity (e.g. Delone & McLean, 2003), accuracy (e.g. Wu & Wang, 2007), user satisfaction (e.g. Bailey & Pearson, 1983; Doll & Torkzadeh, 1988; Wu & Wang, 2007), timelines (e.g. Bailey & Pearson, 1983; Wu & Wang, 2007), efficiency (e.g. Seddon et al., 1999), users’ perceived benefits (e.g. Wu, 2011) and content and efficiency (e.g. Delone & McLean, 2003).

Each research treats an aspect as a major concern in evaluating IS/ICT implementation project performance. Comparisons become difficult since different researchers concentrate on different dimensions (Wickramasinghe & Karunasekara, 2012). This motivates this study to choose to evaluate the benefits by assessing whether the citizens are afforded the benefits accordingly especially considering a public organisation. Stakeholders must agree on a governance model that ensures ownership and accountability while the benefits are reviewed and measured (Ward & Daniel, 2006; Glynne, 2007). A number of models are documented that help inform management of ICT benefits. One of the models found relevant to this study is the benefits management cycle by Ward and Daniel (2006) that depicts the key areas of difference in the benefits management approach (see Figure 2.3).

2.6.3 The Benefits Management Cycle

The benefits management cycle suggested by Ward and Daniel (2006) gives a number of stages that each organisation implementing an ERP system undergoes. As elaborated, an organisation needs to identify and structure its benefits in line with its objectives and plan the procedure for maximum benefit realisation. The organisation then needs to utilise and then evaluate and review the whole benefits management approach, as illustrated below.

Figure 2.3 below shows that benefits management is a cycle. Each organisation has a challenge to keep on assessing itself as to which part of the cycle it will be on at any particular time. This will give it an idea of what needs to be done to appropriately manage IS

benefits. Organisations need to identify and structure the possible benefits before they plan the realisation framework. The chosen model should deliver and sustain the benefits. This should be followed by expansion, where channels are opened for further potential benefits in line with organisational objectives.

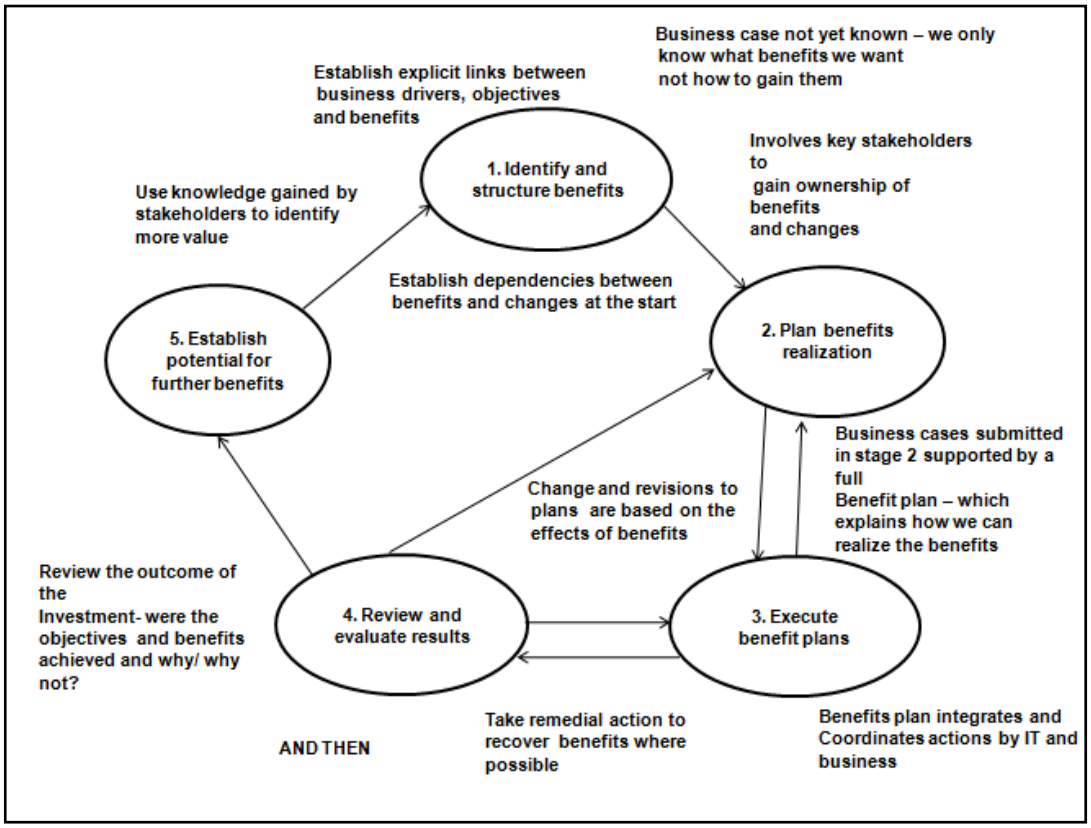

Figure 2.3 Benefits Management Cycle
(Source: Ward & Daniel, 2006:119)

This research noted that different studies emphasise different stages from all these steps involved. Schubert and Williams (2009) note that researchers have differing motivations that cause different reach and scope in their investigation into organisational benefits. In line with the above diagram, researchers analyse different stages of the benefit management cycle. This renders secondary data less reliable. They summarise the dogma by saying that:

> *"However, given the differing theoretical lenses being applied and therefore the different levels of analysis and interpretation it is not a straightforward matter to compare or combine findings due to epistemological incommensurability" (Schubert & Williams, 2009).*

In order for an organisation to improve its benefit realisation and management, all stages have to be correctly undertaken. The emphasis is on evaluation, as this is an on-going stage that determines performance. There are various reasons why evaluation becomes the integral stage of the benefits cycle. These include: the need to direct behaviour. The need to clarify expectations, enabling objectivity and accountability; and the provision of the bases for goal setting and execution (Spitzer, 2007). Feedback facilitation promotes consistency that improves decision-making and alignment to problem solving. It also enhances understanding of processes and prediction of trends as early warning signals become visible. Positive feedback always motivates the individuals concerned. However, Spitzer (2007) also reminds us that it is not about measurement but how the measurement is used to improve the overall benefit management plan.

For the “benefits management plan” to work there is need to involve all stakeholders to identify and agree on desired benefits (Glynne, 2007). These benefits must be affordable and possible. Authors (such as Farbey et al., 1999; Ward & Daniel, 2006) recommend formal analysis of benefits through description; its measurement; the perceived value; the perceived change in current processes; its effect on other benefits and when the stakeholder can expect the benefit.

Another diagrammatic representation (see fig 2.4) incorporates the importance and the main benefits management steps of a well-structured business case. The main steps outlined are benefits identification and structuralisation; benefits realisation planning; realisation and tracking of benefits; review and evaluation of benefits (Glynne, 2007) elaborated above. These outlined steps comprise the benefits management process. Fabey et al. (1999) support the notion that benefits management comprises a range of management activities designed to ensure benefit realisation from an investment. It is crucial for any organisation to consider all stakeholders at all these stages of the benefit management cycle. This research noted that this cycle augments the one by Ward and Daniel (2006). It also noted that the most important part is the evaluation of the benefits as it is the process that is on-going in both cycles.

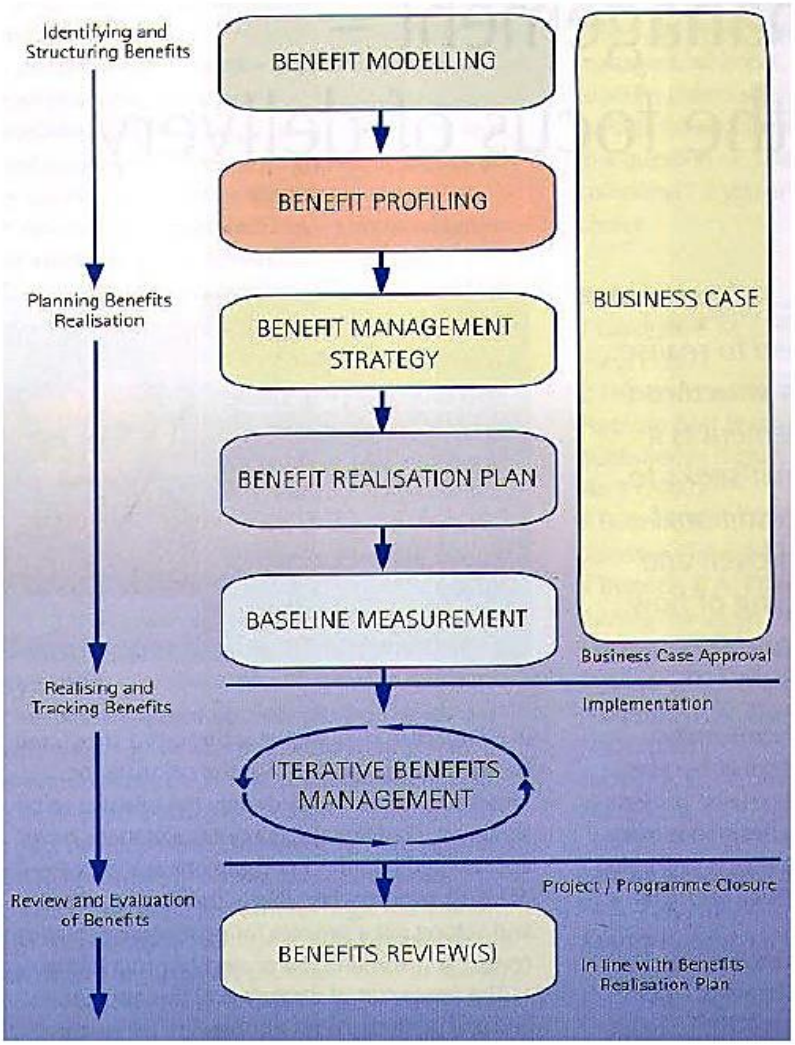

Figure 2.4: Best Practice Benefits Management Cycle
(Source: Glynne, 2007)

In analysing both benefits management cycles above, this research concluded that most of the steps are taken occasionally, with the exception of the evaluation part that must constantly be carried out. This becomes crucial: it determines whether an organisation needs to restart implementation or abandon any running project as it reveals whether the system is fulfilling its intended purposes. In fact, Remenyi et al. (2000) proposes a framework, the Active Benefit Realisation (ABR) approach that has an evaluation as part of ICT management. Lindstrom (2006) defined an approach for developing enterprise-specific ICT management assessment. These studies emphasise the need to assess the benefits as part of proper benefits management.

2.6.4 Evaluation of IS benefits

There is a broad agreement to evaluate systems (Farbey et al., 1992). Remenyi et al. (2000) argue that benefits can only be achieved if they are measurable, irrespective of their being tangible or intangible. IS evaluation is undertaking processes for searching the impacts of an IS project (Farbey et al., 1999). Many organisations in practice pay little attention to the formal evaluation of IS/ICT investments (Farbey et al., 1992; 1999). Those who do pay attention to it are stakeholders who evaluate IS/ITC investments to determine how much they serve their interests (Yeo, 2002). The evaluation has to be both quantitative and qualitative and requires an estimation of the perceived costs and benefits throughout the life cycle of ERP systems. This need arises because of the complexity of the ERP system software and the intangibility of the costs and the benefits (Ward & Daniel, 2006). The objective of IS evaluation is mainly to compare the effectiveness of the project in realising the proposed benefits (Remenyi et al., 2000). As outlined in the "business case"; secondly, to compare planned costs and benefits with actual costs and the benefits expected within the business case. In addition, to capture and document any lessons learned which give rise to recommendations for future projects; and finally, to reveal opportunities that increase the benefits of a given project (DFPNI, 2011).

Evaluating and measuring performance is an important activity for all organisations. Ward et al. (1996) postulate that the evaluation and benefits realisation mechanisms can expedite the organisational learning. More so as IS spending grows and as many organisations continue to wonder if the IS spending is justified (Farbey et al., 1992). Organisations are also worried as and whether the IS functions are effective (Delone & McLean, 1992). Based on the analysis of previous research, Delone and McLean (1992) developed and proposed a measure for IS success in form of a Model from the recognition that there is a need to measure the success of an IS implementation and a responsibility to measure its impact on business performance. This is an all-encompassing framework that shows how different measures are related. This measure became popular and several studies then validated it thereafter, according to the evidence found by Delone and McLean (2003), who then came up with an updated success model. The new model incorporated the net benefits in addition to the information, system, and service quality, the use, the intention to use and user satisfaction dimensions (Delone & McLean, 2003). The new and updated model is more meaningful and relevant to the modern organisations because it hinged more on "net benefits" as the ultimate measure of ICT success (Delone & McLean, 2003; Ward & Daniel, 2006).

Measuring the above-mentioned net benefits is very difficult because ERP systems are complex. There is an intangible nature to both costs and benefits (Remenyi et al., 2000), which evolve over time, as a result of their organisational, technological and behavioural impact. For those who are aware of benefits of IS spending, it is still harder to identify and quantify benefits than costs in post-implementation audits, according to Seddon et al. (2002). The situation is exacerbated by the contingency factors which may include, for example, the industry situation (stable or changing), and the leadership role of the organisation (pioneer or follow) (Farbey et al., 1992). IS implementation projects vary in scope as organisations choose different approaches, ranging from full suite implementations, implementation of a single module, expanding, or upgrading an existing system, etc. This affects the whole management system. The expected benefits in simpler projects usually have arguably measurable benefits (Schubert & Williams, 2009). Organisations should come up with both formative and summative evaluations where the former merely give the overall evaluation without giving diagnostic information about how the evaluated situation came about. Thus in complex organisations such as municipalities, evaluations are difficult.

Generally, municipalities face several challenges that include larger capital and operating budgets, very high responsibility (such as the need for transparency and accountability), and high political, financial, and service exposure. This calls for the need for the robust ERP system practices to aid in making more complex service decisions. The rationale for ERP system implementation can be categorised into technical and business reasons. The technical reasons are concerned with aspects that consolidate and integrate applications across functionality (Nah & Lau, 2001) and business, that standardise procedures and streamline financial consolidations (Wagle, 1998) which finally result in enterprise wide improved decision making (Markus & Tennis, 2000), improved efficiency and effectiveness and several other goals (Remenyi et al., 2000).

Ward and Daniel (2006) and Peppard et al. (2007) make an analysis of the post-implementation phase of some ICT projects, linking the business case benefits and emphasising the need to review and evaluate them. Markus and Tanis (2000) noted the third stage for technology implementation and business improvement in an organisation as a phase during which the company captures the majority of business benefits from the ERP system.

Peppard et al. (2007) emphasise that organisations need to identify benefits to be able to sustain them. In fact, Peppard et al. (2007) postulate that IT projects should be benefit driven rather than technology driven. Following the “benefits management approach”, their research claims that this framework has been adopted as the basis for the “best practice framework”

for all IT investments in Australia. Peppard et al. (2007) then note that some European governments are now also adopting their proposed framework. Ward and Daniel (2006) advise on benefits management specifically, definition, identification and realisation; then they summarise the benefit management approach. Their literature emphasises the effect of poor benefit management on the long-term investments in IT. Rosemann and Wiese (1999) argue that the success of most ERP systems is judged on whether delivery was on scheduled time and within budget. These criteria are not enough, as there can be un-used ERP system opportunities. This means that failure to realise expected benefits on time is considered as systems failure.

Although several models are available to assess efficiency aspects of private ERP systems (e.g. comprehensiveness of the ERP systems and maturity of ERP systems development processes), little guidance in measuring public ERP system benefits or effectiveness is provided. Effectiveness in this regard is defined as the degree to which the objectives (i.e. the purpose of organisational performance improvement) that organisations have set with ERP system are being attained. Traditional measures of IT that emphasise efficiency only are proven inadequate for modern IT projects (Teltumbde, 2000; Ross & Beath, 2002). Their research also noted deterioration in evaluation of IT investments in general and ERP systems specifically.

Academic writers (such as Murphy & Simon, 2002; Saloojee & Groenewald, 2007) categorised methods for evaluating IT into tangible and intangible benefits. They listed the tangible benefits evaluation methods as return on investment, cost benefit analysis and return on management. The intangible benefits were given as multi-objective, value analysis and critical success factors. Their research emphasised the process of obtaining agreement on objectives through a process of exploration and mutual learning. An analysis of ICT benefits is crucial because ICT investments are not seen as directly linked to the profit making aspects of any business venture. Each organisation must then be aware of the need to manage these benefits for long-term benefit to sustain its viability, especially in this “information age”.

2.7 Approaches to ERP system benefits evaluation

This section provides an analysis of possible frameworks and models that can be adopted for assessing the ERP system benefits. This assessment can either take the form of checking whether there are any expected benefits or how far these expected benefits are extended to the relevant stakeholder. The rationale for measuring any IS success is analysed before an analysis is given of the frameworks used in previous related studies as well as those recommended in the literature review. Every organisation that implements an ERP system

expects some benefits. Thus measuring them is the only way to ascertain achievement in that respect. These frameworks include: the Delone and McLean Model, the task-technology fit model, the Resource-Based View model, the Bailey and Pearson instrument, the Shang and Seddon Framework, the LISREL Measurement Model, the “exp-ben” Framework, and the Balanced Score Card.

The different categories of benefits thus call for different approaches to their measurement. In trying to identify a suitable framework to evaluate the benefits accrued from an ERP system implementation in public organisations, the following frameworks and models were analysed:

2.7.1 The Bailey and Pearson Instrument (1983)

Researchers such as (Bailey & Pearson, 1983; Doll & Torkzadeh,1988; Wu & Wang, 2007) developed some instruments to measure information systems through user satisfaction. User satisfaction is the opinion of the user about a specific computer application, which they are using. User information satisfaction is probably the most widely used single measure of IS success (Doll & Torkzadeh, 1988). Unfortunately, this research does not target the users of the system, who are the employees, but the management, who are the ERP system planners and implementers. Thus, it will not be able to give us a good indication of how the residents gain from an ERP system implementation from the implementers’ point of view.

2.7.2 The Miller-Doyle Approach (1987)

The Miller-Doyle approach makes use of an instrument that taps the perceptions of respondents regarding how they rate IS performance (Miller & Doyle, 1987). According to Remenyi et al. (2000), measuring perception and user satisfaction is one area that has been explored by the “use of this reliable and valid instrument”. The Miller-Doyle Approach instrument consists of five parts. Part A assesses perceived important facets while Part B checks on future needs. Part C analyses the actual performance achieved and finally, part D explores the organisation’s performance in developing a new system and finally, the last part rates the overall ICT performance. Of the seven dimensions revealed, three of them are directly linked to the client. These are: amount and quality of user involvement; ability to respond to end user computing needs; and reliability of services (Miller & Doyle, 1987).

2.7.3 The Balanced Score Card (BSC - 1992)

Kaplan and Norton (1992) developed the Balanced Score Card (BSC), which they proposed to measure customer satisfaction and any other organisational activities, including financial measurements. The rationale underlying the BSC is that organisations should not use a

single financial indicator to measure business performance. It groups several indicators into four perspectives:

- customer perspective;
- internal perspective;
- innovation and learning perspective, and
- financial perspective.

Kaplan and Norton (1992) point out that the operational measures drive financial performance. The focus of the BSC is on the whole organisation, i.e. integration, business process re-engineering and customer service initiatives (Kaplan & Norton, 1992). The BSC highlights aspects such as financial, where ordinary and traditional measurements are taken and include risk assessment and cost benefit assessment; secondly, customer centricity where the focus is on satisfying the client by analysing leading and lagging indicators. It covers business and support processes conformance to customer requirements and objectives alignment. Finally, it covers learning and growth where training needs and corporate cultural attitude are defined.

A number of researchers (such as Rosemann & Wiese,1999; Kaplan & Norton, 2001; Huerta & Villanueva, 2004) used the adaptation of the Standard Balanced Scorecard after adjusting its perspectives. Others used it to explore the effects of ERP systems on organisational performance and got evidence in private companies. Huerta and Villanueva (2004) argue that BSC is a very powerful framework to assess ICT performance because it uses a number of perspectives. Bhilkhu-Thompson (2003) analysed the BSC and came up with a checklist to support its usage in the healthcare ERP systems. Johanson et al. (2006) give a deep analysis of the use of this tool citing its weaknesses, such as that it does not measure issues like over-simplification and its lack of focus on intangible factors, to mention but a few. This weakness becomes more critical when we try to align the BSC to public organisations, such as the Municipality, especially when considering the need to assess both tangible and intangible benefits. They even admit that the BSC does not have the public sector in mind. Finally, this research could not adopt it because it is more of a long-term management tool than an evaluating tool.

2.7.4 The Task-Technology Fit Model (1995)

Goodhue and Thompson (1995) propose user evaluation through a task-technology fit model that measures objective performance. Their research identified data quality, floatability of data, access control to data, data compatibility between systems, training and ease of use, production timeliness and systems reliability among the factors that influence task-

technology fit. Their research concluded that the technology fit model is not sufficient. The weakness is that it concentrates on the systems designer more than the system user and the client, who are on the ground. They then advise that organisations should also measure system utilisation where users and clients are involved. For that reason, this research cannot adopt the task-technology fit model because it is interested in the perspective of resident, the client to the Municipality.

2.7.5 The Mirani and Lederer Instrument (1998)

Mirani and Lederer (1998) also supported the concept of benefit measurement. Their research then developed a thirty-three item instrument to measure benefits gleaned from ICT projects. The instrument was specifically developed to measure organisational benefits of IS projects. This would serve as an invaluable aid in demonstrating the benefits (or lack thereof) of ICT investment in organisations. The framework identified thirty-three potential benefits of IS projects from different researches. The identified benefits are all referenced to a wide collection of researchers, ranging from 1978 to 1991.

The framework categorises benefits into strategic, informational and transactional. It thus relates to the ERP system benefits even though it was targeting IS in general. Strategic benefits are further broken down into competitive advantage, alignment and customer relations. Informational category is divided into information access, quality and flexibility. Finally, transactional benefits category is divided into communications efficiency, system development efficiency and business efficiency. The research also advises that users have a better appreciation of the benefits than IT professionals do. The instrument is actually a checklist of anticipated benefits, making it the best framework that could be adopted in this research. However, Mirani and Lederer (1998) admitted that their instrument should be used in conjunction with others as it cannot be used as a comprehensive, superior, stand-alone tool. This framework will not be suitable for this study because it emphasises the evaluation more than the management of benefits. It would need some modification to fit well with this research situation. Thus, a number of questions and guidelines were adopted.

2.7.6 Shang and Seddon Framework (2000)

Another comprehensive benefits framework was proposed by Shang and Seddon (2000). This can be used not only as a foundation for planning, justifying and managing the ERP system but also as good communication tool and checklist for consensus-building in organisations' discussions on benefits realisation and development (Shang & Seddon, 2000). The framework identifies twenty-one benefits that can be gleaned from an ERP system implementation. This framework categorises the ERP system benefits into information

technology infrastructure benefits, operational benefits, managerial benefits, strategic benefits, and organisational benefits. This framework was put to the test in their 2002 study with thirty-four (34) managers from different organisations that were using an enterprise system. However, this framework is biased towards management view as it emphasises better decision making to support better resource management. This means that it will be difficult to consider it where the emphasis is on external stakeholders, the citizens benefits. Nevertheless, the research can use many features from this framework. The details of this framework can be seen in the following table:

Table 2.3: Proposed ERP system benefits framework
(Source: Shang & Seddon, 2000:1006)

Dimensions	**Sub dimensions** *(21 in total at this stage)*
1.Operational	1.1 Cost reduction 1.2 Cycle time reduction 1.3 Productivity improvement 1.4 Quality improvement 1.5 Customer services improvement
2.Managerial	2.1 Better resource management 2.2 Improved decision making and planning 2.3 Performance improvement
3.Strategic	3.1 Support business growth 3.2 Support business alliance 3.3 Build business innovations 3.4 Build cost leadership 3.5 Generate product differentiation (including customisation) 3.6 Build external linkages (customers and suppliers)
4.IT Infrastructure	4.1 Build business flexibility for current and future changes 4.2 IT costs reduction 4.3 Increased IT infrastructure capability
5.Organisational	5.1 Support organisational changes 5.2 Facilitate Business learning 5.3 Empowerment 5.4 Built common visions

2.7.7 Resource-Based View Model (2005)

Ravichandran and Lertwongsatien (2005) propose a Resource-Based View (RBV) model based on resources and capabilities of the organisation values. To assess ERP system

benefits a RBV of ERP system is another model available for use. This has a weakness that it focusses on private organisations as it emphasises competitive capabilities, which do not apply in a public sector scenario. Stratman (2007) noted that the RBV theory was used to justify the performance and competitive capability relationship of the organisation but without any empirical test. HassabElnaby et al. (2012) also applied the RBV model to research on the impact of ERP systems on organisational capabilities. Unfortunately, their study was based on private organisations that are very sensitive to the return on any investment, whereas public institutions are not. Moreover, since ERP systems are universal, differences in needed resources become very difficult to identify. For that reason, it will not work for this research, which is public institution based.

2.7.8 The exp-ben Framework (2009)

Another option is to use the expectation-benefits (exp-ben) framework as an analytical lens to identify and understand realised benefits. This framework was developed through a thorough literature analysis that was followed by coding and further analysis that resulted in taxonomy. This framework emphasises benefits categories as a way of assessing ERP system benefits in organisations. It further categorises these benefits into “Planned” and “Realised and Unexpected” Benefits noting that by virtue of implementing an ERP system, an organisation extends more than the targeted benefits. Nevertheless, their research also noted that benefits differ even within the private organisation, citing the manufacturing and trade industries. The advantage is that its focus is on Customer Relationship Management (CRM), which gives special attention to the customer as it deals with contact management, communication (mailings), marketing, contracts, call centre and so forth (Schubert & Williams, 2009; 2010). The framework not only identifies but also classifies benefits expected and/or realised by the firm from the business case (desired benefits) through to in-use (realised benefits). Schubert and Williams (2010) acknowledge that further work is required to distinguish the locus and level of benefits within individual organisations. However, this framework does not cover the actual management of benefits, but concentrates on the assessment only. Assessment of ERP system benefits without understanding their management results in identification of direct benefits only. This makes it difficult for this study to adopt it in the public sector scenario because of its rigidity. For that reason, the research will not use it but will borrow some aspects of it to incorporate into its framework.

2.7.9 Framework for Strategic Plans and Annual Performance Plans (DNT, 2010)

The presidency through the Department of the Treasury proposed a framework that helps public organisations assess achievement of their objectives. This framework is proposed for

adoption by all public institutions. According to DNT (2010), it takes a result-oriented approach that puts emphasis on two questions:

- “How has the programme made a difference?” and
- “Are the lives of the programme participants better as a result of the programme?”

The ERP system is making a difference in the lives of the Municipality residents by providing the capabilities as expounded in Section 2.3. This is mainly due to the variety of potential effects, according to Shang and Seddon (2000). Application of this framework to assess the impact of the ERP system from the perspective of the citizen would possibly come out as Figure 2.5 below.

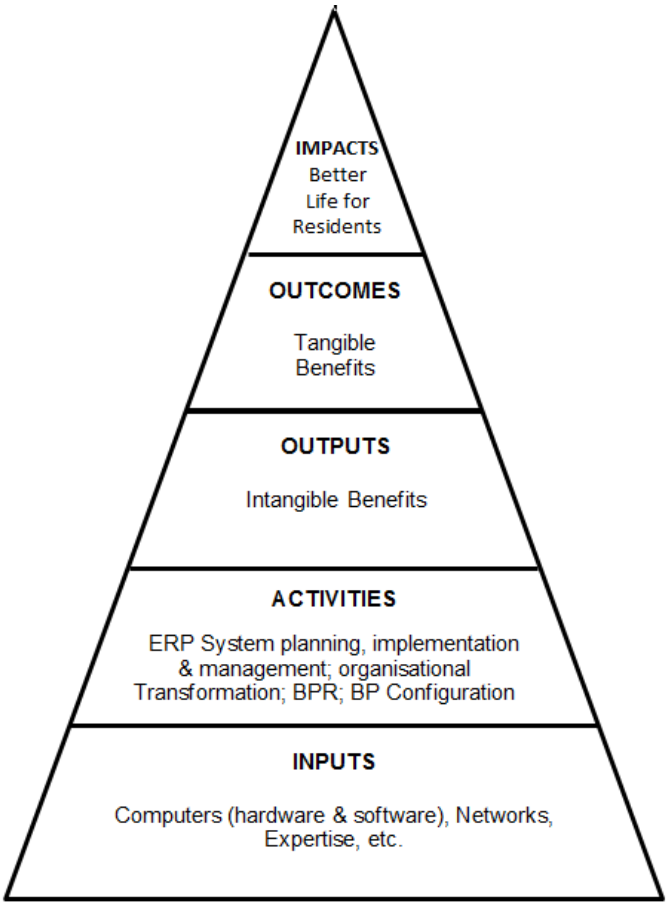

Figure 2.5: Key performance information concepts

(Adapted from: DNT, 2010: Foreword)

However, the structure of this framework is too generic and needs modification to fit well into the citizen’s perspective of the ERP system implementation as a project. It concentrates on the achievement of planned goals, meaning that if the Municipality does not plan to extend

benefits to the citizen, then this framework would nevertheless ratify its implementation based on any other objectives. For that reason, this study was hesitant to use this framework even though many aspects were borrowed from its structure.

2.7.10 Summary of available frameworks and models

This section summarises the identified frameworks and gives a succinct explanation as to why they did not fit into this study. More details about each framework or model are found at the relevant section within Section 2.7.

Table 2.4: Summary of available frameworks and models

Framework/Model	Reason for non-adoption
The Bailey and Pearson Instrument (1983)	User information satisfaction targets users and in this research, management is targeted.
The Miller-Doyle Approach (Miller & Doyle,1987)	This approach assumes that the organisation is already rating the ERP system performance, which is not the case.
The Balanced Score Card (Kaplan & Norton, 1992)	It lacks focus on intangible factors; citizen benefits are possibly intangible.
The Task-Technology Fit Model (Goodhue & Thompson, 1995)	This model targets system designers and not necessarily implementers.
The Mirani and Lederer Instrument (Mirani & Lederer, 1998)	This framework is insufficient to cover public organisations as it focusses on internal processes, i.e. intangible benefits only.
Shang and Seddon Framework (Shang & Seddon, 2000)	This framework is biased towards management as it emphasises better decision making to support better resource management whereas this study is focussed on assessing how the citizen benefits.
Resource-Based View Model (Ravichandran & Lertwongsatien, 2005)	This model places the emphasis on competitive capabilities; this does not apply in public organisations.
The exp-ben Framework (Schubert & Williams, 2009)	This framework does not cover the actual management of benefits, but concentrates on the assessment only. This makes it difficult for this research to adopt it in the public sector scenario because of its rigidity
Framework for Strategic Plans and Annual Performance Plans (DNT, 2010)	This framework is too broad: it lacks the technical aspect of the ERP system, especially at the assessment part. It would need another framework to use for assessment.

Therefore, the Literature Review search showed that there is no one framework that is suitable to investigate citizen benefits and therefore, the empirical study had to take a more open-minded approach of qualitatively inquiring to answer the research question.

2.8 Conclusion

The chapter reviewed a number of issues that are important to ERP system adoption, implementation and utilisation. The literature review revealed that academic literature on ERP system implementation in public organisations, especially in the developing countries, is very scarce and fragmented. Researchers concentrate on the private sector even though public organisations are remarkably adopting ERP systems. The research then made an analysis of the available literature from mainly private sector application to find similarities that can be adopted in the public sector scenario.

This was done through the following headings:

What an ERP system is: the background and capabilities, including scope of functionality of an ERP system in general and in municipalities. The reasons follow why ERP systems deliver desired results for some but fail for other organisations. ERP system implementation in public organisations, management of ICT benefits in general and, most importantly, an analysis of the possible framework to be used to evaluate the benefits from the ICT investments such as an ERP system are then discussed. However, literature on ERP systems implementation in municipalities is scarce; thus, an analysis of those issues that apply to municipalities was explored.

A literature search was undertaken to find out about existing literature on the research topic. The literature search includes searches of relevant books, journal articles, academic papers, newspaper articles, the Republic of South Africa Constitution, legislation and subordinate legislation, policy documents, official reports, websites, unpublished research and other applicable published and unpublished material. Data for the research was obtained from relevant sources such as those mentioned above. Several policy documents were accessed from stakeholders, such as the Municipality management and the South African Government Departments of: Communication; Finance and Personnel Management; National Treasury; Public Services and Administration.

The key findings from the literature as related to the research question are:

- The ERP system is capable of improving business processes for any organisation be it private or public enterprise.
- ERP system implementers should be aware of the critical success factors so as to successfully implement one.

- The objectives of public enterprises are different from those of privately instituted enterprises, where the former aims at improving service delivery while the latter is profit driven.
- South African municipalities are now implementing ERP systems to improve service delivery. The drive is coming from both technological advancement and government initiatives.
- ERP systems benefits can be can be classified into two categories, tangible and intangible. These benefits are extended by introduction of new business processes or stopping of old and inefficient business processes.
- The benefits are gleaned in a cycle, which need to be managed with the emphasis on planning, executing and evaluation for sustainability.
- ERP system evaluation should be cautiously done to compare the realised benefits with the expected benefits. An appropriate and suitable framework is needed.

This Literature Review above answered the following research sub-questions:

1. What are the capabilities and functionality of an ERP?
2. Why do some ERP systems fail while others succeed?
3. Regarding ICT benefits management:

3.1 What is ICT benefit management and what models and frameworks can be applied to understand benefits in ERP systems?

3.2 What are the benefits to the citizen?

4. What are the typical benefits that are derived by citizens of municipalities which have implemented ERP systems?

Research sub-question four was partly answered in this section. Specifically, Section 2.2 and 2.3 answered research sub-question 1. Section 2.4 documented sub-research question 2 and Sections 2.5, 2.6 and 2.7 targeted research sub-questions 3.1, 3.2 and part of research sub-question 4. Even though sections 2.2, 2.4 and 2.5 responded on sub-research question four, typical of a public enterprise ERP system were scarce, thus more evidence is provided in the findings from the empirical data. However, from the foregoing conclusions and the findings in this literature review, it is clear that the research questions raised in this research remain a challenge and emphasise the importance of this study to the academic community. This literature also provided an appropriate foundation on which this research was designed, as outlined in the next chapter.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the philosophical assumptions underpinning this study and details of the research design and the empirical techniques applied in the research study. It provides comprehensive details as to how, where and when the research was conducted. As outlined in Chapter One, the purpose of the research was to investigate how citizens benefit from ERP system implementations in municipalities. In the context of this study, an ERP system is viewed as being an innovative application of ICTs to enhance service delivery amongst communities in Cape Town. This chapter is divided into four sections. Subsequent sections include: the research design, which justifies the choice of a qualitative interpretive paradigm; and a case study research design; descriptive details of the location and specifics of the case study; the selection of key respondents and other respondents; and the justification for using interviews as a data collection method. Finally, the ethical issues and data analysis techniques employed are discussed in this chapter. An overall structure of this chapter is given in Figure 3.1 below.

Figure 3.1: The Overview of the Research Methodology Chapter

Research Design is described as a detailed plan of how the research is conducted (Manheim, 1977). Brink (1996) further describes a research design as the set of logical steps taken by the researcher to answer the research question. Research methodology, on the other hand, focusses on the research process and the kinds of tools and procedures involved in the research (Mouton, 2000). Research methodology can be further described as an "operational framework" within which the facts are presented for a clearer meaning (Leedy, 2001). There are some instances in which students and novice researchers use the terms research design and research methodology interchangeably. The distinction between these two key components of research by Babbie and Mouton (2004) is thus important. It differentiates that the focus of research design is on the end product while the methodology focusses on the research process. It also notes that the point of departure of the design is the research problem or question while that of the methodology is on specific tasks. Finally, this chapter looks at the logic of the whole research whereas the research methodology concentrates on individual steps (see Table 3.1 for the summary of the differences).

Table 3.1: Differences between research design and research methodology
(Source: Babbie & Mouton, 2004:75)

Research Design	**Research Methodology**
Focusses on the end product: What kind of study is being planned and what kind of results are aimed at.	Focusses on the research process and the kind of tools and procedures to be used.
Point of departure = Research problem or question	Point of departure = Specific tasks (data – collection or sampling) at hand
Focusses on the logic of research: What kind of evidence is required to address the research question adequately.	Focusses on the individual (not linear) steps in the research process and the most "objective" (unbiased) procedures to be employed.

The sections that follow draw on Table 3.1 above to describe the research design and the research methodology.

3.2 Research Design

Based on the explanation by Babbie and Mouton (2004) in Table 3.1, Section 3.1, I planned and designed a template for the research informed by the kind of the results I was expecting to adequately answer the research question. I also considered the research environment, and assessed how best the research questions could be answered. Careful thought was given to the type of data that was needed and how conducive the environment would be for

the collection of such data. The environment that prevailed called for a qualitative approach based on a case study. The following sections give in detail the adopted research design.

3.2.1 Qualitative research design

Neuman (2011:175) avers that "…the meaning of a social event or statement greatly depends on the context in which it appears". He further advises researchers to consider the situation in order to better understand the context. Therefore, qualitative researchers seek to understand what the interpretations are at a particular point in time and in a particular context. This involved not only managing multiple and even contrasting perspectives but also the use of words to describe and explain the interpreted findings. By using interviews as the main data collection tool, different perspectives were expected as different individuals sometimes have different views. Qualitative research design is informative and can be conducted on a small sample using data collection methods such as interviews (Leedy, 2001). This also facilitated the choice of a qualitative research design for this research, which anticipated a small sample due to the nature of the data that was sought and that could only be collected from the managers.

Hoepfl (1997) summarises the reasons for adopting a qualitative research design as portrayed in Table 3.2 below.

Table 3.2: Features of Qualitative Research (Hoepfl, 1997) mapped against this study
(Adapted from: Hoepfl, 1997)

	HOEPFL'S FEATURE	USE IN THIS STUDY
1	It uses the natural setting as the source of data, the researcher attempts to observe, describe and interpret settings as they are.	The empirical study took place at the Municipality of Cape Town on the premises discussing a live functional system.
2	The researcher acts as the human instrument of data collection.	I carried out the interview to collect primary data myself as the researcher.
3	Inductive analysis is predominantly used in data analysis.	Themes and codes were mainly informed by the researcher's interpretation, taking into account key concepts identified in the literature.
4	Reports are descriptive.	The findings are provided as a narrative, which serves as the foundation of the findings.
5	Has an interpretive nature where the researcher is the interpreter.	The contextual meaning was elicited through my interpretation of the primary data.
6	Researchers pay attention to the idiosyncratic as well as the pervasive, seeking the uniqueness of each case.	Non-salient issues were also considered in the interpretations from the several respondents to harness rich data.
7	It has emergent design and researchers focus on this emerging process as well as the outcomes of the research.	The interviews were not fixed, and the choice of interviewees was incrementally built upon to enable emerging issues to be pursued together with the research outcomes.
8	It is judged using special criteria for trustworthiness.	A collection of documents and artefacts was attached as appendices to aid the evaluation through Validity, Reliability and Confirmability.

Qualitative research assumes that knowledge of reality is gained through social constructions such as language, consciousness, shared meanings, documents, tools and artefacts (Klein & Myers, 1999). There was a need to share meaning through the interviews that were carried out in support of the qualitative research design. Qualitative methods seek to better understand the situation at hand by detailed exploration (Eysenck, 2004). There was a need to explore one organisation in detail to understand the research problem. The kind of data obtained from participants was difficult to express in numerical terms and was limited, thus could not be collected using standard instruments. Leedy (2001) advises that such data needs to be analysed and expressed qualitatively. The use of a hypothesis was not

applicable in this research as new facts were expected. Finally, Myers (1997) illustrates the relationship between qualitative research design and the possible research philosophies (see Figure 3.2).

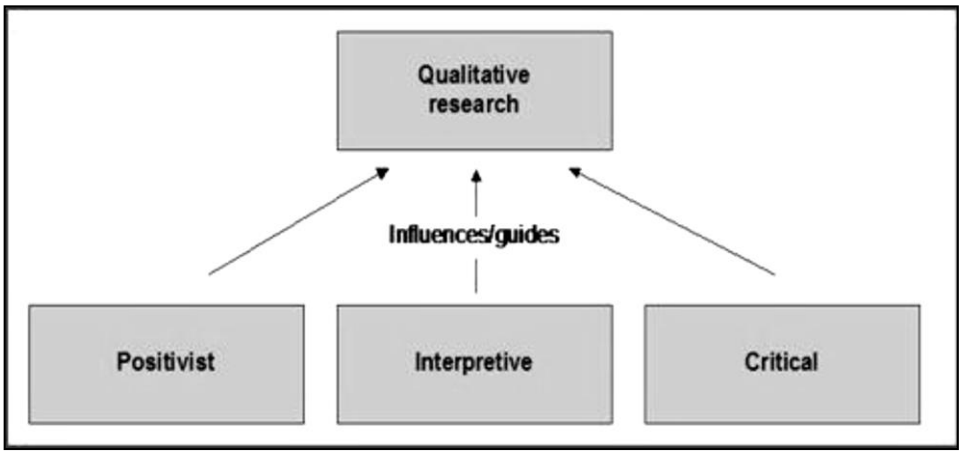

Figure 3.2: The underlying philosophical functions of qualitative research
(Source: Myers, 1997)

Although careful consideration was given to the choice of the qualitative paradigm, it was not a blind research design choice. I also examined the applicability of a quantitative research design. Quantitative research refers to the investigation of social phenomena through statistical or mathematical techniques. Quantitative research cannot be used where the data cannot be quantified. Quantitative designs lack the ability to fully describe the situation to provide a clear meaning to the stakeholders. Based on a detailed literature analysis, there was not sufficient clarity on the constructs relating to citizen facing benefits management. This was a necessity to be able to design and operationalize an instrument for quantitative data collection. Therefore, I opted not to use a quantitative research design. This research also aimed to collect qualitative data from a relatively small number of respondents rather than to collect limited information from a much larger cohort of participants.

3.2.2 Research philosophy

One of the initial design issues that were considered concerned the positing of the study within an appropriate philosophical frame. According to (Chua, 1986; Myers, 1997; Pather & Remenyi, 2005; Neuman, 2011) there are three dominant philosophical approaches in IS research, namely, Positivism, Interpretivism and Critical research (see Figure 3.1 above).

This research adopted an interpretivist approach as the underlying epistemology (Walsham, 1993; Myers, 1994). Epistemology concerns what constitutes acceptable knowledge in a field of study. Interpretivism is an approach that assumes that *"reality and our knowledge thereof are social constructions"* (Khazanchi & Munkvold, 2000:34), and its outputs are the *"subjective constructions"* of the researcher (Wyssusek et al., 2002). My ontological stance of subjectivity was supported by Saunders et al. (2007) who aver that the social phenomena are created from the perceptions and consequent actions of social actors. The way humans attempt to make sense of the world around them is referred to as the interpretive paradigm (Saunders et al., 2007). Burrell and Morgan (1979) noted that the interpretivist stance in research considers that intentional actions construct social reality. It was necessary to explore and interpret the intentional actions that were undertaken by the Municipality management in implementing the ERP system. It also assumes an ontological belief that access to reality can only be achieved through social constructions such as language, consciousness and shared meanings (Myers, 1997). This research adopts an interpretivist approach for the following reasons:

- The achievement of the research aims would be better supported by an interpretive position because the research aims to conceptualise and describe, rather than subjectively analyse the research information in order to answer the research questions.
- Other similar studies in the ICT literature (for example, Walsham, 1993; Myers, 1994; Walsham & Waema, 1994) which either developed or tested frameworks or models or instruments have mainly been interpretive.

Walsham (1993) argues that the process whereby IS influences and is influenced by the context can be understood through the interpretive approach. The emphasis on subjectivity of an interpretive approach gave credence to recommendations made to the relevant stakeholders (Saunders et al., 2007). The research also followed the principles of interpretive research (see Table 3.3) as portrayed by Klein and Myers (1999). These principles are interdependent in the sense that principle four directly affects principles six and seven, which finally affect principle two, while six also directly affects seven.

Table 3.3: Application of principles of interpretive research to this study
(Adapted from Klein & Myers, 1999:72)

Principle	Explanation	Application in this study
1. The fundamental principle of the hermeneutic circle	This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.	Iteration between the individual interview transcripts, some with few departmentally aligned benefits as the parts of the global context enabled understanding of the benefits available to citizens as a whole.
2. The principle of contextualisation	Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.	The first interview with the CIO, as well as a study of relevant documentation related to the ERP project, provided a clear picture of the pre-implementation era. This was necessary as it highlighted the significant changes that the new system brought about. This then enhanced the overall interpretation of the data and case at large.
3. The principle of interaction between the researchers and the subjects	Requires critical reflection on how the research materials (or data) were socially constructed through the interaction between the researchers and participants.	The interviews with the respondents provided room for follow-up questions from both the interviewer and the interviewee. This setup helped support correct assumptions and dismiss wrong ones that would affect my interpretations.
4. The principle of abstraction and generalisation	Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.	Application of principles of interpretive research provided an adequate platform that linked the theoretical underpinning philosophy to the reality of the findings of the empirical work. The analysis was made on the current data as well as the historical background to get the correct interpretation.
5. The principle of dialogical reasoning	Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (the story that the data tell) with subsequent cycles of revision.	Conclusions were only reached after reflection and further reflection that provided not only the expected possibility but also an analysis of what was never expected. The actual findings were compared with the theoretical preconceptions informed by the literature but could not be taken as final truth but contextually bound.

Continued…		
Principle	**Explanation**	**Application in this study**
6. The principle of multiple interpretations	Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.	I did not use frequencies as the basis for my findings but rather the value of each idea in the evidence from the various respondents. Nevertheless, follow-up questions and even evidence was requested where contradictions arose in order to help inform the final interpretation.
7. The principle of suspicion	Requires sensitivity to possible biases and systematic distortions in the narratives collected from the participants.	The respondents as interested stakeholders in the ERP system provided an account of perfect fit but deep analysis brought about other shortfalls. A number of respondents were interviewed to try to get the true account.

This research could have used “Positivism” as a research philosophy that tends towards an objective viewpoint. This research did not employ positivism because the exponents of positivist research utilise mainly quantitative techniques, according to Pather and Remenyi (2005). On the contrary, this research was interested in analysing the content and ideas raised by the respondents.

Another option was to adopt a critical approach. Myers (1997:4) defines the critical approach to research as one that assumes "that social reality is historically constituted and that it is produced and reproduced by people". A critical researcher recognises that change to social and economic circumstances is constrained by various forms of social, cultural and political domination (Myers, 1997). Since this research purposed to seek meaning in context to understand how the current context emerged (Klein and Myers, 1999), it could not adopt the critical approach. Having chosen an appropriate philosophical approach, I then needed to choose a corresponding research strategy, as elaborated below.

3.2.3 Research strategy

A number of research designs such as Surveys, Case Studies, Literature Analysis, Content Analysis and Conceptual Analysis were identified. Babbie and Mouton (2004) aver that case study approaches can now be used in any discipline even though they were traditionally used in disciplines such as business studies and social work. Welman and Kruger (2000) define case study research as a research method that requires the researcher to conduct

fieldwork when investigating a group or an organisation. Saunders et al. (2007) define a case study as a strategy that involves an empirical investigation within real life context.

The research design, which was adopted, was a case study. The choice of this design was informed by the above-mentioned writers. The decision was also reinforced by drawing on Walsham (1995) whose research addressed the nature of interpretive IS case studies and further prescribed the right methods for adoption in such studies. The chosen case was the Municipality of Cape Town in South Africa.[7] The case study was specifically chosen not only because of the need to uncover rich detail, but also to identify how the different findings relate and interact with each other. Another reason for choosing the Case Study approach was the need to conduct an in-depth investigation of an accessible organisation which implemented an ERP system as a public organisation, and which would provide a context to investigate the research problem.

The choice of studying a single case was advised by a number of academic writers such as Walsham, 1995; Leedy & Ormrod, 2010 and Neuman, 2011. Leedy and Ormrod (2010) advise that in order to get a deeper understanding of a situation there is need to focus on a few cases, if not a single case. Neuman (2011) also supports the choice of a case study by arguing that an indepth study is only possible with a single or a handful of cases rather than numerous cases. This research had identified and accessed a single case where an accessible public institution had implemented an ERP system. Neuman (2011) further argues that a case study can make "visible the details of social processes" by having a detail that can tell a "larger story". By exploring the numerous and different processes undergone by the Cape Town Municipality, this research was provided with a foundation to discover the intricacies behind the ERP implementation as it related to the primary research question, viz. citizen benefits.

Lee and Baskerville (2003) noted a case study generalisability framework with four components: "from data to description; from description to theory; from theory to description; and from concepts to theory." This study intended to find meaning in the data by detailed analysis and interpretations to add to academic theory. Walsham (1995) advises that all of these components are feasible from a single case study. The reasons elaborated above motivated the adoption of a case study approach. Furthermore, writers such as Myers (1994), who researched a public institution and a government department, and Walsham and Waema (1994), who studied information systems strategy, also made use of interpretive

[7] Refer to Chapter Four, for the background and overview of the case.

case studies. Given that this study had similar research goals in relation to a public institution, the choice of a case study approach was further reinforced.

The research studied the SAP ERP System to determine how residents benefit from implementation of such systems in public institutions. In addition, a case study design suited an investigation of the research problem, as it is a design which promotes the use of multiple sources of data to build or validate theories (Yin, 2009). Other factors considered were the limited resources to investigate more than one organisation. Again, a case study was used to conduct the field study because it allowed discovery of new and potential innovative practices, according to writers such as (Yin, 2009; Hussey & Hussey, 1997). The study aimed to explore the benefits for the citizen when ERPs are implemented by municipalities with reference to the current level of ERP system implementation and utilisation at the Municipality of Cape Town. Thus, the selection of a case study method was informed by its advantages in focussing on examining social and cultural influences within the ICT adoption context supported by the above literature. According to Walsham (1993:14), "case studies provide the main vehicle for research in the interpretive tradition." This was also a key factor, given that the study was aligned to the tenets of interpretivism.

3.3 Research Methodology

The data for the research was collected from various sources in order to get more information on the subject in question. To yield the best data for the study, both primary and secondary sources of data were consulted.

3.3.1 Delineation of the research study

This research investigated *how* the implementation and utilisation of an ERP system by a municipality extends benefits to the citizens beyond the internal organisation. I did not focus on the residents themselves as most citizens are generally focussed on the services they receive without consideration of how Information Systems contribute to the delivery of such services. Thus, an average citizen would not have an idea of what an ERP system is. In accordance with the research objectives, the research focussed on the Municipality's top management and specialists in the IT department. Respondents were found at City's Head Office (Central Cape Town), Plumstead Municipal Offices (Southern Suburbs), and Bellville Municipal Offices (Northern Suburbs) to represent the knowledgeable respondents in the Municipality (see interview schedule Appendix A, for finer details). The research considered how the managers of the Municipality utilise the ERP system to collect, store and

disseminate information throughout the Municipality within and across departmental and physical boundaries.

3.3.2 Primary data

The principal means of data collection was the interview. An interview is generally defined as a two-way conversation in which the interviewer asks the respondents questions to collect data and to learn about the ideas, beliefs, views, opinions and behaviours of the respondents (Nieuwenhuis, 2007). Through a formal introduction process, a link was established with the Municipality's Information Systems and Technology (IST) Department, where key respondents were identified. This was based on the "key informant approach" (Leedy & Ormrod, 2010:139). IST executive managers were in the best position to provide information in relation to the benefits extended to citizens by the ERP systems.

3.3.3 Selection of key respondents

Qualitative research demands that excellent respondents be sought out. Thus, this study used purposive sampling[8], as advised by Yin (2009) and Neuman (2011). There was a need to select knowledgeable respondents who were involved in the ERP systems implementation and utilisation. This study used purposive sampling, which was followed by snowball sampling (Yin, 2009) whereby the key respondents who were initially selected recommended the other respondents. This made it possible for me to access and interview experts I had not known and who could also have been difficult to access. Table 3.4 provides an overview of the selected respondents. A detailed description of these informants is given in the appendix as the interview schedule record (see Appendix A).

Table 3.4: Areas of expertise of the selected respondents

Expertise Category	Number of Informants
IT: top management	2
Business: top management	2
IT managers	8
Business & IT combined	3
Total	**15**

[8] Purposive or judgemental sampling involves "a non-random sample in which the researcher uses a wide range of methods to locate all possible cases of a highly specific and difficult-to-reach population", according to Neuman (2011:267)

According to Babbie and Mouton (2004), a social researcher has a whole world of potential observations as the population. A critical part of social research is the decision of what to observe and what is not necessary. Thus, given the research problem, the population for this study was the management and IT specialists at the Municipality of Cape Town. The following key respondents were identified: the Chief Information Officer (CIO) and the Head of the Change Management team. The latter referred me to the other key respondents: Head of Customer Relations and Administrative Services, the Chief Enterprise Architect, the Head of ERP Support Centre and the Head of the IT Projects Portfolio. All of the latter constituted the First Phase of the empirical work. This phase targeted senior managers in IT, Business and those with a combined IT-Business expertise (refer to Table 3.4). A full list of the respondents with their designation and the date and duration of their interviews is available as Appendix A.

Further purposive and snowball sampling supported by the first phase interviewees was employed to collect more data from the IT managers in the Second Phase. Each respondent was cordially asked to recommend further suitable respondents. The selection was based on experience and availability among the managers. Interviews were done at the Head Office as well as at a number of sites of delivery of the Municipality. IST specialists who interact with the systems to provide services to the residents were purposefully sampled and interviewed. All the respondents were selected based on their current involvement, their expertise and their availability.

Diverse opinions were expected from different respondents, as in any research area. Therefore, the sample was large enough to cover most or all of the perceptions that might be important, but at the same time trying to ensure that the data does not become repetitive and, eventually, superfluous. The research sample was not fixed and I continued interviewing until the phenomena being investigated were understood (Goulding, 1999; Creswell, 2007). As such, fifteen respondents were interviewed for this study. This included six top management members and nine middle managers. Perry (1998:793) also advises that around ten “cases are sufficient before a study becomes too costly and unwieldy”. In this instance, although resources of time and money were limited, it was also important that the data that was collected was sufficient. Thus after fifteen interviews, I reached a point of “theoretical saturation”[9] where I could not find any new data (Strauss & Corbin, 1998; Goulding, 1999). After interview nine, the responses of interviewees did not yield any new

[9] Theoretical Saturation is a point when collection of additional data becomes counterproductive, i.e. no more new ideas emerge from the new data (Strauss & Corbin, 1998).

insights. However, six more interviews were conducted to ensure that there were indeed no further new insights to be obtained.

Crouch and McKenzie (2006) also support the use of a small sample, arguing that qualitative research is concerned with meaning and not making generalised hypothesis statements. Snowballing helped to obtain a critical mass of data as the key respondents referred me to their knowledgeable colleagues and subordinates. The heterogeneity of my population and the intensity that was required by my study also influenced my selection criteria. The need to re-sample for the second phase within the study also affected the sample size.

3.3.4 The interview

An interview is “a purposeful discussion between two or more people”, according to Kahn and Cannell (1957) in Saunders et al. (2007). Interviews were used in order to gather data in the most appropriate, effective and efficient way. Interviews are one of the most common qualitative methods of data collection (Ezzy, 2002). Interviews involve asking questions, listening, showing enthusiasm and genuine interest, and at the same time recording the verbal responses and taking notes (see Appendix I for the sample interview notes). A detailed interview guide (Appendix B) consisting of open-ended questions was formulated. Questions to management addressed issues of the status quo and the strategic plans of the City regarding the application of Information Systems within the Cape Town Municipality. In addition, the questions also inquired what benefits and what benefits management programmes are in place for the residents. Lastly, the questions inquired what the Municipality management is doing to ensure maximum benefits delivery to the residents. A friendly gatekeeper, viz. the CIO of the Municipality, was identified to guide and assist the researcher to navigate through the bureaucracy and thus secure the time of managers for interviews (see Appendix H for the introductory letter to the case study organisation). The interviewer also dressed formally and avoided jargon to accommodate all the respondents and create an appropriate rapport.

The rationale for the use of personal interviews to collect evidence comprised the following:

- Interviews gave me room to elaborate on ambiguous questions as well as responses received (Brink, 1996).
- Interviews allowed me to probe on any interesting aspect and get in-depth information. By face-to-face interaction in an environment that was conducive, the interviewees were free to share intrinsic opinions, profound thoughts, and tacit knowledge. Face-to-face interaction built rapport and higher levels of motivation amongst participants (Cavana et al., 2001).

- Interviews involved close contact between the research participants, resulting in an interactive and developmental relationship, which facilitated the exploration of emergent issues.
- Interviews also allowed flexibility with interviewees: some had a high level of literacy while others felt uncomfortable with questionnaires (Neuman, 2011).
- I wanted a relatively high response from the sample; therefore, I followed Neuman (2011), who advised that interviews result in a high response rate.

The interviews were semi-structured where the interviewer put certain themes, i.e. objectives, indicators, and metrics for ERP benefits and benefit management, forward. An introductory letter was sent to each interviewee before the interview to give a glimpse of the questions. This enabled research and preparation and enhanced the richness of the responses (see Appendix J for the introductory letter to each interviewee). The interview guide was used to ensure that the interviewees were kept focussed on the key questions.

3.3.4.1 Designing the interview Schedule

Open-response questions were designed to obtain data that could not be acquired by any other instrument. Charmaz (2006) suggests four principles that can be followed when designing an interview.

According to the principles of Charmaz (2006), the first level question should be general and comfortable to answer. For example, “In your view, why should any municipality consider an Enterprise Resource Planning (ERP) system?” The level that followed probed further, with special attention now given to the case study. For example, “Taking the City of Cape Town’s ERP system, what were the key motivational factors for its implementation?”

I then sought to understand the experiences from the view of the participant as well as relating and validating the views that may have been important to the participant. For example,

> *“Generally, an ERP system is focussed on streamlining internal business processes. You have mentioned one or two of them. However, my research’s objective is to understand ERPs in relation to the benefits that are derived either directly or indirectly by the organisation’s customers or - in this case the citizens. In your view, what are the ways in which the ERP will benefit residents of the City?”*

In accordance with Charmaz (2006), the final level must solicit positive responses to end the interview on a positive note. For example:

> *“Keeping in mind the objective of the study, viz. to investigate how the citizen benefits from ERP implementations – is there anything else you would like to share with me?”*

The above recommendations formed the basis of my interview guide, with very little adjustment for the middle managers who were interviewed in the second phase.

The interview guide (see Appendix B) shows that questions were tailored to fit the interviewee's degree of involvement and level of management. At the same time, follow-up questions were carefully constructed based on the respondent's response. The follow-up questions in the second phase with middle managers were necessary to shed more light on the operational realities rather than the ideal, which is planned by the top management. The underlying objective in taking this approach was to ascertain if there is any difference between what was planned and the outcome that was finally realised in terms of ERP system implementation and benefit realisation. The interview guide is attached (see Appendix B) and elaborates the objectives of the designed questions.

3.3.4.2 Conducting the Interviews

The first two interviews with the CIO were exploratory. These interviews verified my research problem and changed some of my research questions. The next step was to schedule the interviews with the selected individuals. Even though many difficulties were faced in scheduling the interviews with the respondents, I managed to gather a sufficient body of evidence. Only one interviewee was not available despite many attempts to secure an appointment, viz. the former CIO of the Municipality who actually managed the ERP system implementation. Since the interviews were with top managers who are always busy with the running of their respective offices, a very high level of patience was needed to accommodate meeting cancellations and re-schedules. A number of e-mails were written as correspondence. The research supervisor of the project played a crucial role in ensuring the necessary introductions with the gatekeeper and in being present for the first two interviews.

All the respondents were initially contacted through e-mails, with a brief background of the research accompanying the request for the meeting. Some of the respondents received these from those who had recommended them as potential respondents. After the respondents had accepted, a list of general interview questions that acted as the interview guide was sent to enable them to prepare in line with the objectives of the study. This made it easier as follow-ups were made to confirm availability as a rapport had already been established. The interview guide was used to guide the conversation with very little intervention where the respondents were found to be moving off the topic. The interviews were approximately an hour in duration. Field notes were also taken intensively, both as a backup to the tape recordings and to record the non-verbal cues in keeping with the qualitative paradigm research (Babbie & Mouton, 2001). The interviews took place from May to August of 2012.

In line with these principles informed by Charmaz (2006), the issues of anonymity and confidentiality were initially emphasised, especially given that the conversations had to be recorded. This created a relaxed atmosphere in which the respondents expressed themselves freely. The respondents were also advised that they were free to choose to answer only questions they were comfortable with (refer to Appendix B). Therefore, only pseudonyms are used in reporting the findings. A list of the actual positions of the respondents is given in Appendix A.

3.3.5 Secondary data

Newspaper articles, legislation and subordinate legislation, policy documents, official memos and reports, the City's website and unpublished research formed the body of secondary data. These sources helped build up the much needed supporting secondary data. This was crucial to supplement the empirical data, as advised by Walsham (1993). The CPUT library provided access to national and international academic databases. I also searched for documentary evidence to support verbal evidence to reduce bias (Yin, 2009). The supplementary evidence from some of the interviewees came in the form of presentations, memos and charts exchanged in the top management meetings in relation to the ERP system implementation.

3.4 Ethical issues

Permission to conduct this study was gained upon approval of the research proposal by the Faculty of Informatics and Design (FID) Research Committee at the Cape Peninsula University of Technology and ethical clearance to conduct this study by the FID Research Ethics Committee (see Appendix C, paragraph three as confirmation from the supervisor). I interviewed one of the senior managers, the Chief Information Officer (CIO) of Municipality of Cape Town, who ratified the objective of the study and agreed to be the gatekeeper. The office of the CIO granted permission in the first instance to conduct the research after a commitment of confidentiality that the data were for academic purposes only (see the letter in which a declaration was made by the researcher and the supervisor in commitment of confidentiality, Appendix C).

Neuman (2011:429) describes a gatekeeper as "an official or unofficial role who controls access to a setting". The CIO became the gatekeeper for this study. Following Neuman, (2011), non-negotiable limits were set to ensure the research integrity, as gatekeepers are known to shape the direction of the study if not taken care of. I personally gained informed consent from all the respondents and submitted a letter to each respondent in which the confidentiality of each interview was assured. The respondents were also reminded that no

reference was going to be made to their positions or their personal capacity and they could respond only to the questions they were comfortable with (see Appendix B). The official letter that introduced me as an official student who would use the data for study purposes only from the faculty also played an important role. It clarified the ethical issues since the research touched on highly sensitive strategies of the organisation.

Following Bell (1992), I kept the following ethical considerations in mind and adhered to the following principles:

- The interviews were voluntary. Respondents were assured of this in writing. At the beginning of the interview, interviewees were also informed that they could withdraw at any stage of the research (See Appendix B).
- The identification of interviewees would remain confidential. The transcripts were labelled with pseudo names and interviewee numbers (see Appendix E for an Atlas.ti report of the transcripts that were loaded). Thus no direct link was possible, ensuring that no findings could be referenced to the participants either in person or to their specific position. However, a detailed schedule was kept separately for follow-up and confirmability purposes.
- All the acquired data was treated with the strictest confidentiality and I made sure that only the summarised information was used all the time. Nevertheless, I kept a schedule of the interviewees and their designations (see Appendix A).

All respondents were informed about the interview as explained on the cover sheet of the interview guide (see Appendix B). Each interviewee was provided with a letter that confirmed issues of confidentiality (see Appendix C). Interviewees were furthermore requested to provide verbal consent, on record, to confirm their voluntary and anonymous participation. All the interviews were recorded and extensive notes were taken to cater for the different voice tones as I was also looking for emphasis besides the normal facts. The notes also served as back-up in case the electronic recordings should fail.

3.5 Data analysis methods

The overall data analysis approach followed the principles of qualitative data analysis because the data were in textual format as advised by writers such as Yin (2009) and Neuman (2011). Myers (1997) advises that hermeneutics can be treated in its own right as an intellectual stance. Therefore, this study used hermeneutics as a mode of data analysis. Hermeneutics involves “conducting a very close, detailed reading of text to acquire a profound, deep understanding” (Neuman, 2011:101). Hermeneutics is, therefore, the science and understanding of interpreting text-analogue. The interpretation attempted to make sense of the object of study, which was the text-analogue.

Following the above, the collected data that included the field notes, the supporting business documentation and the transcriptions of the fifteen interviews formed the body of evidence[10]. Figure 3.3 below details the evidence sources used in this study and their relationships.

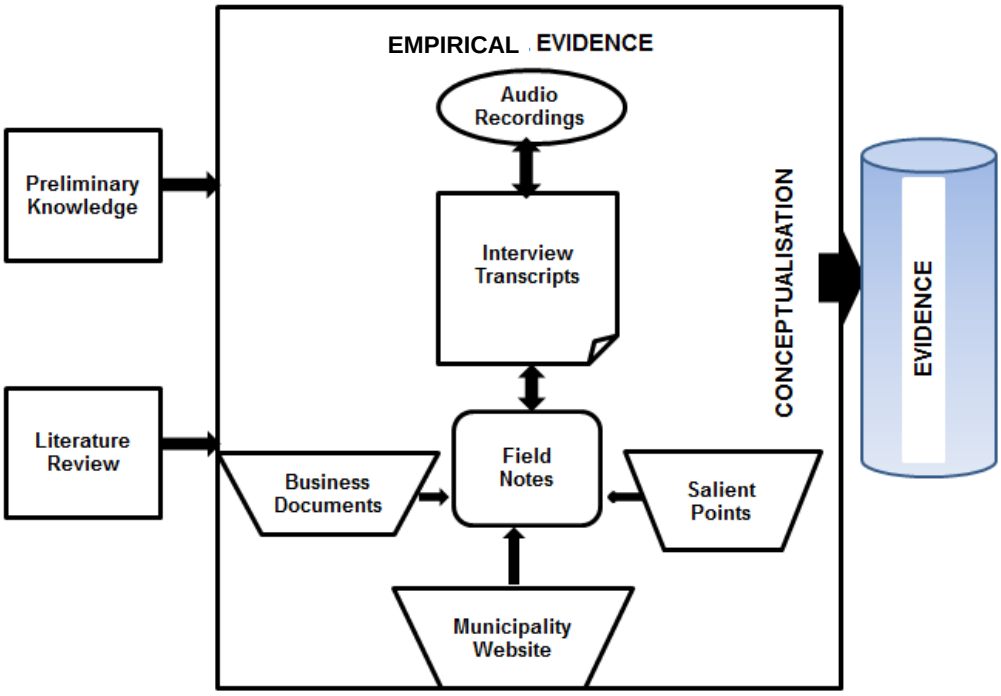

Figure 3.3: The sources of my evidence

As outlined above, the evidence analysis was informed by both the literature review and the preliminary knowledge. The two also informed the initial identification of concepts in the field notes and interview transcripts. The audio recordings were transcribed into interview transcripts. All the business documentation, the facts and figures acquired from the Municipality website as well as the salient points that emanated from informal discussions were converted into field notes. The field notes and the interview scripts eventually became the evidence in the form of concepts for this research. Coding of the evidence involved identification of relevant evidence and further conceptualisation and assigning of labels.

The identified concepts were further analysed to group them according to relationships that emerged. This process resulted in categories of related concepts. Through further reflection and analysis themes emerged from the categories. These themes eventually became the

[10] Some writers refer to the evidence as data but this research refers to the collection of both the empirical evidence with the associated literature and prior knowledge as indicated by Figure 3.4.

findings after rigorous reflection. The strategies that were undertaken as stated above were carefully designed to ensure that the research findings would be sound and would adhere to the requirements of research rigour. The sub-sections below elaborate how the actual analysis was conducted in terms of the micro-analysis and the use of a software program.

3.5.1 Micro-analysis

The audio interview records were repeatedly listened to and transcribed (see Appendix D for an example of an interview transcript) while extensive notes were being taken down. A colleague was also given the transcription and the audio to ascertain accuracy of the transcription. Conceptualisation of the contents of the transcripts then followed to identify preliminary ideas. Cleaning of the collected evidence by removing incomplete and irrelevant data resulted in organised data that confirmed the identified preliminary ideas. Notable indicaters such as the voice pitch, low tone and other exclamation marks were important pointers as to where different respondents attached importance. Therefore, particular attention was paid to them.

Further reflection of the empirical evidence facilitated conceptualisation, which led into analysis of the evidence ”at microscopic level”, as informed by Strauss and Cobin (1998). Strauss and Cobin (1998) advise an interplay between the evidence and the researcher to analyse the evidence. This involved an analysis of the evidence statement by statement and even word by word to identify the ideas behind the words and the wording. The procedure was found to be cumbersome and, if followed to the letter, would have set back my time-frame by months because of the time it takes to analyse a single paragraph. Thus this method was only partly applied for certain sub-research questions, viz. questions four, five and part of six. A decision was then made to interpret the rest of the evidence through hermeneutical techniques[11] (Klein & Myers, 1999; Neuman, 2011).

The use of hermeneutics was facilitated by the concepts that were found through micro-analysis. This involved the interaction of both the background and current situation to understand the context and the responses. As mentioned earlier in Section 3.2.2, the hermeneutic principles were used to facilitate evidence interpretation. The initially identified concepts were annotated and labelled to facilitate coding into the Computer-assisted

[11] “Hermeneutics is defined as a method associated with interpretive social science that originated in religious and literary studies of textual material in which in-depth inquiry into text and relating its parts to the whole can reveal deeper meaning.” (Neuman, 2011:101).

Qualitative Data Analysis (CAQDAS) software use. The use of this software is further elaborated in the section that follows.

3.5.2 Using Atlas.ti to conduct data analysis

Creswell (2007) advises the use of computer software to code, annotate and compare data segments in qualitative data analysis. The qualitative aligned works of a number of other researchers such as Yin (2009) and Neuman (2003) were consulted to ensure a manageable and reliable approach was followed. CAQDAS is a tool that can be used to manage a large pool of evidence. It does not analyse data but rather facilitates the data analysis (Yin, 2009). It ensured a manageable approach to a large body of textual evidence. The transcriptions were loaded onto a CAQDAS, Atlas.ti (see Appendix E for the list of transcripts report). The evidence was then coded through the labels (see Appendix F for the list of the labels) of the identified key concepts that were aligned to my research questions as informed by Allan (2003) and Creswell (2007). The software facilitated the linking of concepts to the matching quotations (see Figure 3.4 for the demonstration of the concept coding in Atlas.ti and Appendix L for the Atlas.ti report of concepts labels linked to their quotation).

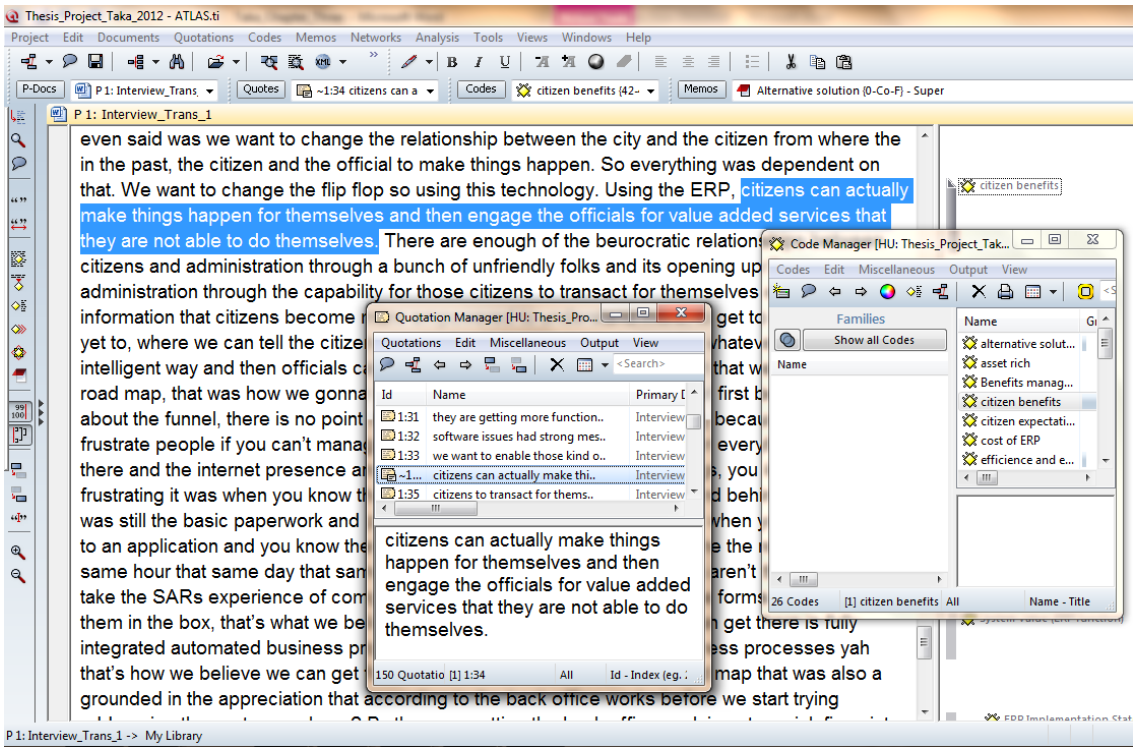

Figure 3.4: Concept coding with Atlas.ti (screenshot from Atlas.ti)

Informed by Creswell (2007) the concepts represented:

- the facts that I had expected to find;
- information I had not expected; and
- any other conceptually interesting facts.

The software facilitated the management and splitting of the text into smaller chunks, seeking evidence from the different transcripts. A number of labels were derived from the underlying meanings of the concepts (see Appendix F for a report of the list from the Atlas.ti). Even though frequencies prompted further analysis of concepts, they did not form the basis from which the findings of this study were derived (see Appendix K for a statistical report detailing the relevant frequencies of each concept). Each concept is depicted as per each interview transcript, showing the number of times not only as the transcript but also the total number of references.

Further reflection on the codes enabled the discovery of not only major but also related concepts. For example, concepts labelled as the “Resultant ERP benefits”, “System Value”, “ERP Implementation Status”, “Status quo” and “ERP Implementation” were identified. Related concepts were then grouped into categories of those that pertained to related phenomena. Axial coding was used to re-assemble the coded quotations by linking the user-defined set of labels representing concepts from the data that shared a common meaning. The categories were then subjected to further analysis and reflection with the advanced handling and manipulating features of Atlas.ti to get thematic patterns. User defined parameters were used to annotate, edit and hyperlink the categories to quotations in the transcripts.

More than thirty concepts were grouped into ten categories (see Table 3.5 for the related concepts that were grouped). Related concepts such as system benefits, single customer record, merged municipalities, etc., were grouped into the core citizen benefits category (see Appendix G for the list of categories that emerged with their descriptions). Appendix G1 has the Atlas.ti report depicting the grouping of the categories. The related categories were streamlined by grouping them, for example the “integration of legacy systems” is based on the “process standardisation” and is related to the “core citizen benefits”. These categories resulted into a theme “indirect ERP system benefits”. The categories contributed to more than one theme, as potrayed in Figure 3.7 below.

Most of the links were facilitated by Atlas.ti to group those categories as they were linked by the same quotations (see Figure 3.4). These are the themes that were inductively derived from the evidence and came out as a brief summary of the expectations from the theoretical framework that was adopted. Thematic links also emerged through the use of the advanced features of the software. At this stage these themes were not regarded as findings as they only facilitated the analysis and interpretation of the evidence and hence shaped the findings. The use of Atlas.ti enabled faster and easier access, retrieval and viewing of evidence as I manipulated the themes into the findings.

Table 3.5: Categories mapped against themes

CATEGORIES	GROUPED CONCEPTS	EMERGED THEMES			
		Indirect ERP-System Benefits	Direct Public ERP-System Benefits	Efficient Public taxes use	Effective Benefits Management
Citizen benefits	citizen benefits, legacy system, merged municipalities, single customer record	✓	✓	✓	✓
Future of ERP	Municipality objectives, future of ERP, System Value, citizen expectation			✓	
Improved service delivery	motivation for ERP System Efficiency, efficiency and effectiveness, citizen expectation		✓		✓
Integration of legacy systems	Integration, citizen benefits, legacy system, merged municipalities, single customer record, value chain, streamlined processes, System Value	✓			✓
Mobile access to services	mobile access, citizen benefits, efficiency and effectiveness, citizen expectation		✓		
Public sector ERP system functions	public sector ERP, value chain, merged municipalities, single customer record, Trusting the City, system efficiency			✓	✓
Reliable Services	Strictness, standardisation, Trusting the City, citizen benefits, asset rich, ERP costs		✓		
Single customer record	citizen benefits, integration, status quo, alternative solutions		✓		✓
Process standardi-sation	Transparency, integration, merged municipalities, streamlined processes	✓		✓	
Functional ERP system value	citizen benefits, ERP Implementation Status, value chain, Integration, legacy system, System Value			✓	✓

As indicated in Figure 3.5, the CAQDAS helped me identify links among the categories (see Figure 3.5 below). Those relationships assisted in themes identification and finally in answering the sub-research question which inquired whether there were any relationships among the various citizen benefits. CAQDAS defined relationships were used to describe the links that emerged. For example, a description of “is associated with”, denoted by double arrows, meant that the themes are dependent on each other, giving them the same level of importance; while “is cause of”, with single directional arrows, resembled dependency and form meant that the latter cannot exist without the former. Figure 3.5 demonstarte most of the relationships that emerged from the CAQDAS evidence manipulation (see also Appendix M for the Atlas.ti full report of the categories). A comprehensive report with all the categories and their related codes and part of their quotations is found in Table 3.5 above.

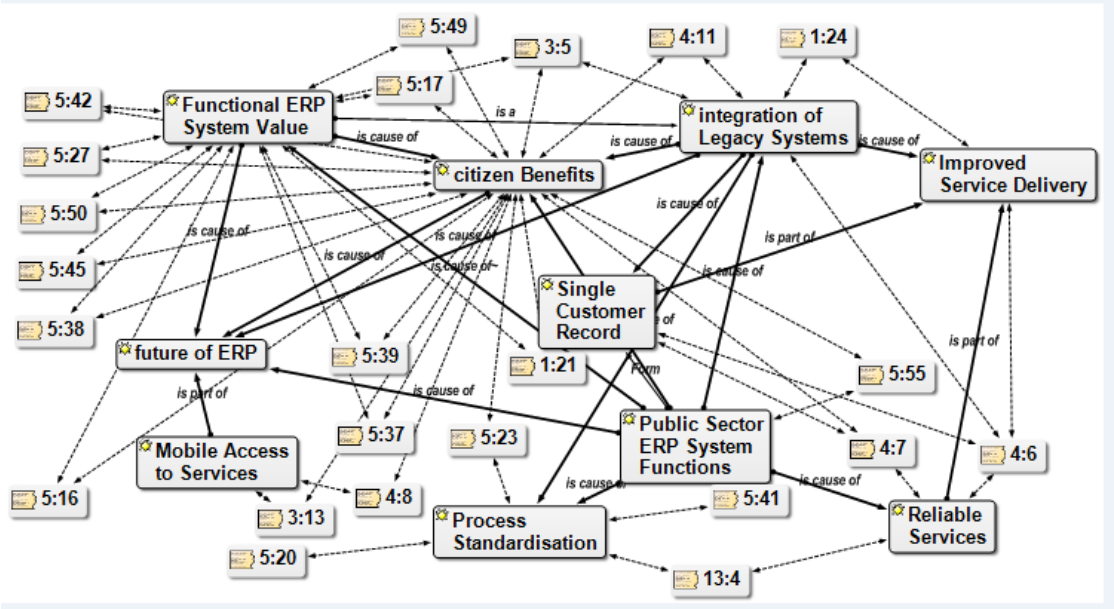

Figure 3.5: Categories’ links as portrayed by the CAQDAS

Finally, qualitative content analysis data analysis techniques as proposed Yin (2009) were used because the nature of the evidence that was collected was complementary and could not be divided into “cases” as interviewees contributed to the research from different perspectives. I organised and analysed the evidence to produce an informed interpretation and explanations, as advised by Vital and Jansen (2003). An overview of the evidence analysis process is given below and in Figure 3.6.

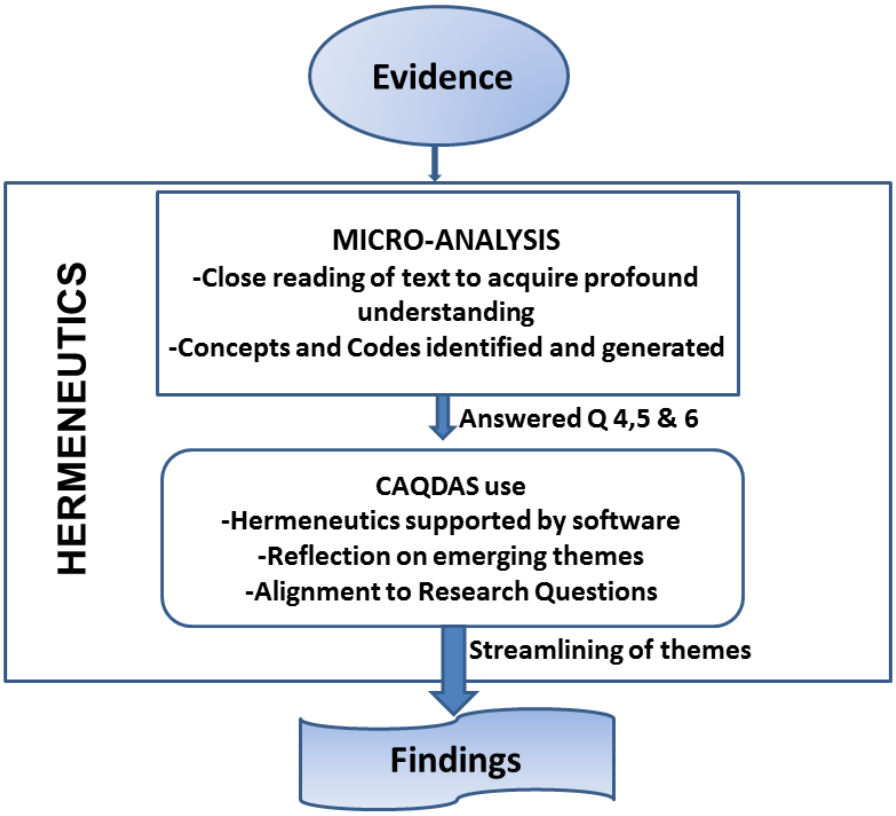

Figure 3.6: An overview of the evidence analysis process (From Figure 3.4)

3.6 Summary of the data analysis procedure

The overall qualitative data analysis can be summarised as:

- The transcripts and field notes were read through several times to obtain an innate understanding of the data as it pertains to the main research question. During this process important concepts which were deemed relevant were identified.
- Every identified concept was labelled. The label was chosen so that the name of the concept was explanatory. The labels served as a basis of coding the data. The coding process was facilitated by the use of Atlas.ti (see Appendix F for the complete list of concepts).
- During cycles of examining the textual evidence and introspection of the data, relationships between concepts were identified. Related concepts were then grouped into categories (see Table 3.5 for the complete list of categories with related concepts). One concept could be linked to more than one category.
- Further reflection and analysis of links and relationships amongst the categories resulted in further synthesis, and higher order themes were formulated.

- The themes that emerged formed the basis of the findings (see Figure 4.5 for the various issues discussed within findings).

A diagrammatic representation of the data analysis process is shown in Figure 3.7. From this figure it is important to note that the qualitative analysis process was not linear. There was constant interplay among the stages, and the arrows above and below show that there was movement forwards and backwards during all these phases of data analysis.

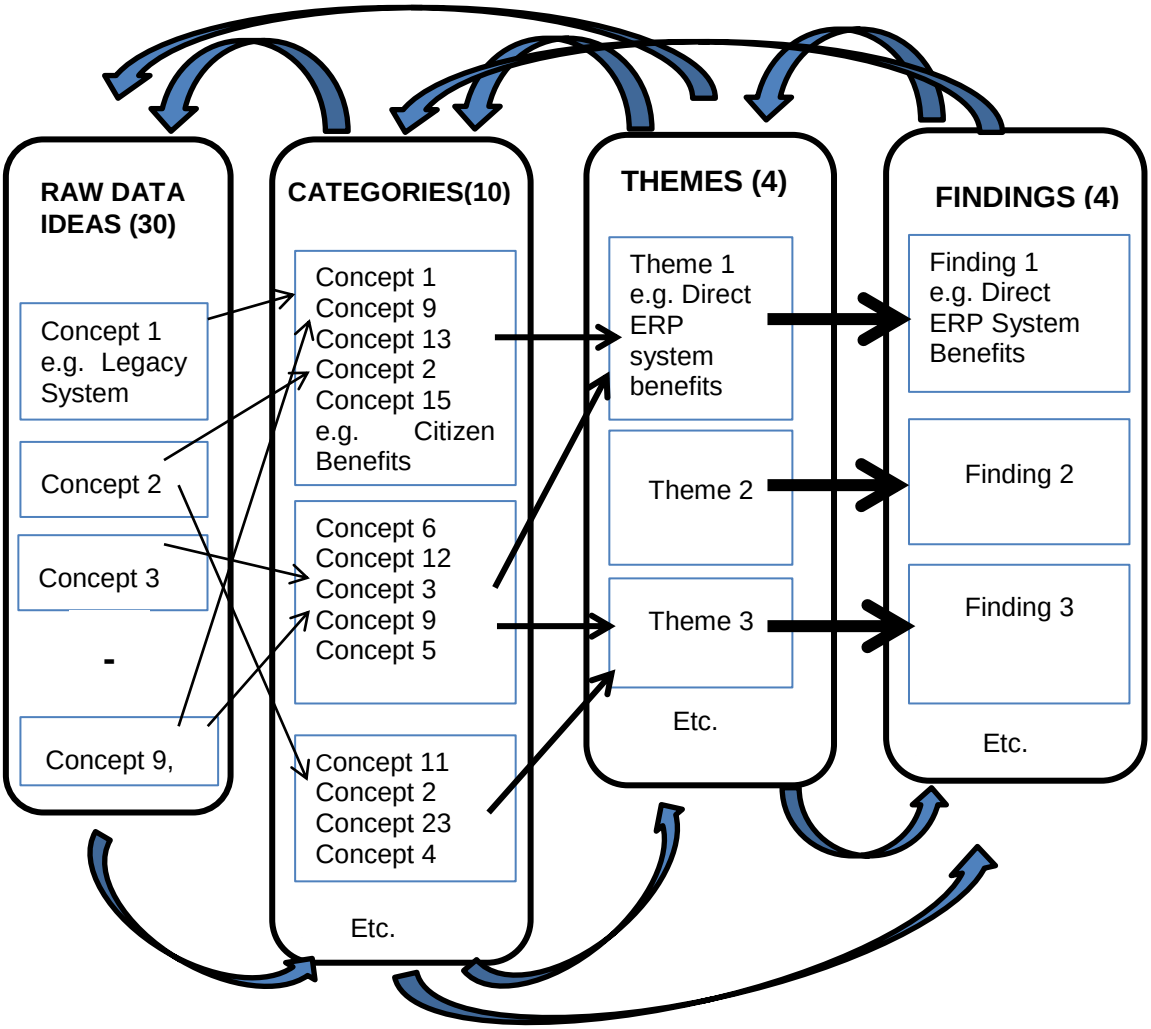

Figure 3.7: Data Analysis Process

3.7 Conclusion

In this chapter, the difference between the research design and the research methodology is explained. The chapter then went on to contrast the dominant philosophical underpinnings and justified the choice of interpretivism as the underlying epistemology. Section 3.3.4 explained how the interview guide was designed, giving examples of the actual questions that were asked. The main source of information, that is the case study, is introduced. The chapter also detailed why a qualitative content analysis approach was chosen in conjunction with the use of semi-structured interviews. The relationships among the various terms that were used throughout the data analysis was summarised in Figure 3.7.

A high-level overview of the phases of the study up to the point of research findings is summarised by Table 3.6 below.

Table 3.6: An overview of the phases of the study

a.	Preliminary literature review and exploration of the topic within the information management.
b.	Interaction with the selected organisation to solicit access and confirm validity of the research area.
c.	The empirical work involved fifteen (15) interviews that led to theoretical saturation.
d.	Research findings refined and analysed through close interaction with the supervisor.

The chosen research approach was justified as being able to gather enough information to render the results scientifically acceptable. The research strategy included a description of how data was gathered and analysed, making use of the case study and a qualitative data analysis approach. The above-mentioned details formed the research methodology for this study that I followed in executing the empirical work that resulted in the findings that are presented in Chapter 4.

CHAPTER FOUR
THE CASE STUDY, RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents a detailed reporting of the research findings. The findings presented in this chapter are in response to the research sub-questions four to eight that read:

Research sub-question four - What are the typical benefits that are derived by external customers of organisations, which have implemented ERP systems?

Research sub-question five - What is the status quo of ERP system implementation at the Municipality of Cape Town?

Research sub-question six - How does an operational ERP system contribute to citizen value?

Research sub-question seven - How could the Municipality management ensure maximum delivery of citizen benefits?

Research sub-question eight - How are the identified benefits related to each other?

By responding to the research, sub-questions above the details in this chapter answered the research question that read: "*What are the benefits for the citizen when ERP systems are implemented by municipalities?*" Thus, findings which were synthesised into high level themes eventually emerged to answer this question. These are:

- indirect ERP system benefits;
- direct citizen benefits;
- efficient use of public taxes; and
- effective ERP system benefits management.

This chapter first presents an overview of the Municipality and the Municipality's ERP system as the selected case study. The case study overview is presented to highlight the setting under which the study was conducted. It further highlights the status quo of the ERP system implementation at the Municipality. The findings are presented according to the framework for analysis presented in Chapter 3. The findings were inductively determined along thematic links; thus the final labels that were given are directly related to the thematic labels with very few changes. This was mainly because the labels of the findings were also explanatory. The findings are presented in the form of a discussion elaborating each one after the other individually. These findings are narrated not necessarily in order of their importance but in the order in which I saw fit to make sense of them. The use of the Computer-assisted

Qualitative Data Analysis (CAQDAS) tool enabled the identification of the relationships among the findings. The overall structure of this chapter is depicted in Figure 4.1 below.

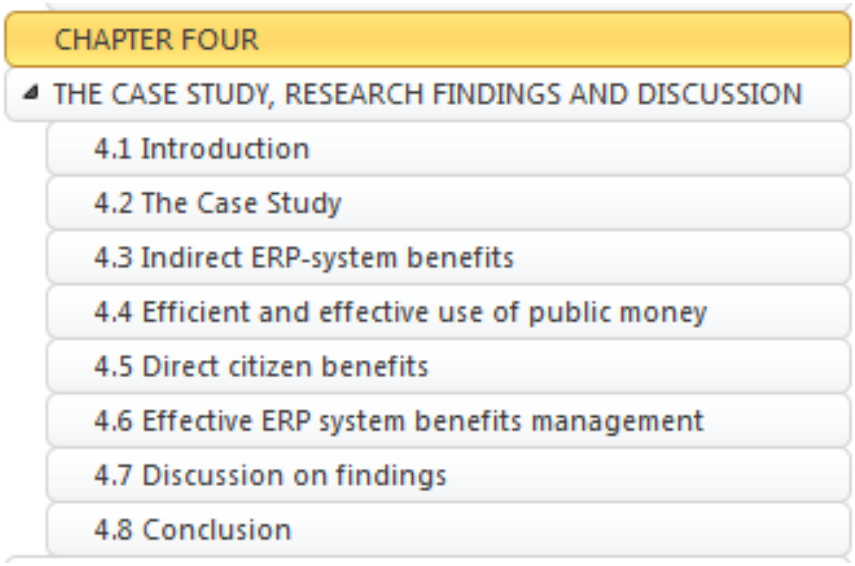

Figure 4.1: The Structure of Chapter Four

The sub-topics listed in Figure 4.1 above are expanded and elaborated along the issues that emerged from the data analysis. The issues emerged as sub-themes but are not necessarily linked to the sub-categories because of the analysis and reflection that was undergone. The interpretation and further reflection of these themes and sub-themes resulted in the findings that are elaborated in this chapter. Before detailing the findings, an overview of the case study is given to set the context of the study.

4.2 The Case Study

The City of Cape Town, which falls under the Metropolitan Province of Western Cape, served as the case study for the research. The Metropolitan Municipality of Cape Town in the Western Cape Province of South Africa is a local government managing a population of three and a half (3.5m) million residents (South African National Census, 2011). The City of Cape Town is a metropolitan municipality that employs more than 25 000 staff, who serve 3.7 million residents across a 2 400 km^2 area (Community Survey, 2007). Cape Town is the second capital city in South Africa and the primate city of the Western Cape Province. The national parliament and many Government offices are situated in this city. It is a major destination for immigrants and expatriates coming to South Africa, making it one of the most multicultural cities in the world. It has an area of 2 461 square kilometres, giving it a relatively

lower population density compared to other South African Cities (City of Cape Town, 2013: Online).

The overview of the Municipality of Cape Town is detailed under the following sub-headings:

- Legislative background
- Services offered to the citizens
- The business case: background and rationale
- Promised benefits
- Status of the ERP system

4.2.1 Legislative background

The City of Cape Town as a legislative structure is categorised as a municipality and it is among South Africa's five metropolitan municipalities. The others are City of Tswane, City of Johannesburg, eThekwini, Ekurhuleni (East Rand) and Nelson Mandela Bay Metro. Municipalities are constitutionally mandated. The legislative foundation of municipalities is outlined in Sections 151 to 153 of the Constitution of the Republic of South Africa, 1996b (Act 108 of 1996). Other relevant legislations that govern municipalities are the Municipal Structures Act (Act 117 of 1998) that defines the structure and purpose of a municipality. Section 73 and Chapter 6 of the Municipal Systems (Act 32 of 2000) outline duties of municipalities with special reference to service delivery and performance management procedures and systems respectively. This Act also requires the Municipality to use an "Integrated Development Plan" which is a five-year plan that focusses on transformational needs, developmental and operational strategies as well as key performance indicators and municipal targets.

The Public Finance Management Act (PFMA) (1999) at local and national level and the Municipal Finance Management Act (MFMA) (2003) stipulate procedures for all revenue, expenditure, assets and liabilities management. The acts outlined above give the Municipalities the right to govern, on their own initiative, the affairs of their communities (Constitution, 151[3]). Government legislation outlined above and policies such as the "Batho Pele Principles" can encourage ERP system implementation and utilisation not only by direct prescription but also by removing barriers to adoption. According to South Africa National Census (2011), Cape Town Municipality has 1 068 574 households, housing about 3 740 025 residents. Of these residents, 87.3% have access to piped water inside their yard, 91.4% have a flush or chemical toilet and 94.3% have solid waste refuse removed by the

Municipality at least once a week. Ninety-four per cent of households use electricity as the main source of energy (South Africa National Census, 2011).

4.2.2 Services offered to the citizens

More than three and half million residents currently access the Municipality at district level and on departmental level for services to homes and offices (Small, 2008). As one of its objectives the City expects ICT to lay the foundation for the building of a new flexible and responsive organisation. This is in response to Section 195 of Chapter 10 of the Constitution which demands that public services must be provided impartially, fairly, equitably and without bias. This enables it to continually improve in its efficiency and effectiveness in delivering its "programmes and services" (City of Cape Town, 2002:3). The Municipality aims to use technology to enable a better administration that supports social and economic development in a sustainable manner.

The Municipality of Cape Town has to deliver services such as health services delivery, housing and rates bill handling, water, electricity, sewage collection and disposal, refuse removal and traffic services to these residents efficiently and in the most cost effective manner. The ERP system accepts inputs such as customer requests for services, payments and process these inputs to deliver output services such as invoices, resource allocation, feedback, etc. to the citizens.

Management of the ERP system is essential to ensure that these elements and functions that are driven by the ERP system are sustainably coordinated. Some of the services that are supported and coordinated by the ERP system are portrayed in Figure 4.2 below.

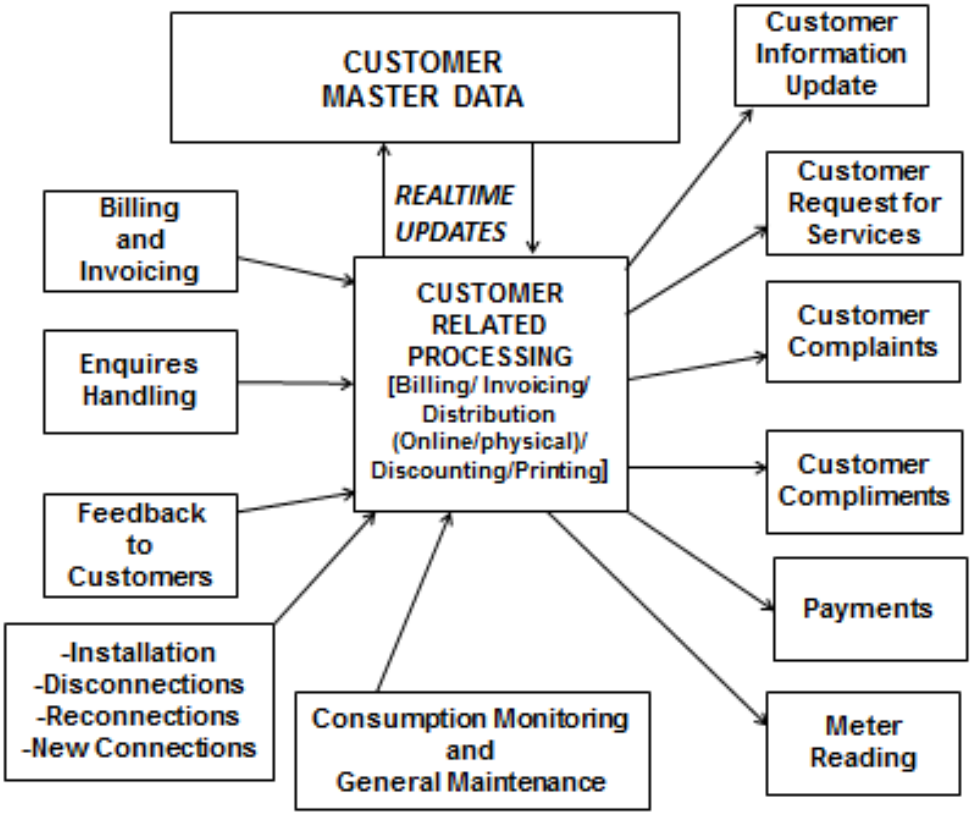

Figure 4.2: Some of the services supported and coordinated by the ERP system

This is also done in fulfilment of the Municipal Systems Act (2000) which prescribes that the Municipality must provide universal access to essential services. Access to these services is expected to improve, as the City scraps usage of redundant applications and diversified technologies to use an ERP system. The Municipality has several departments, such as Property Management, Housing, Treasury, Safety and Security, Information Systems and Technology, Utility Services, etc. It is funded by the rates and taxes paid by the residents. It has a steadily growing Gross Geographic Product (GGP), now at an average of ninety billion Rands as illustrated by the graph below. The growth of the GGP in 2004, as illustrated by the graph (see figure 4.3 on the next page 83), is attributed to the ERP system implementation by the Municipality management.

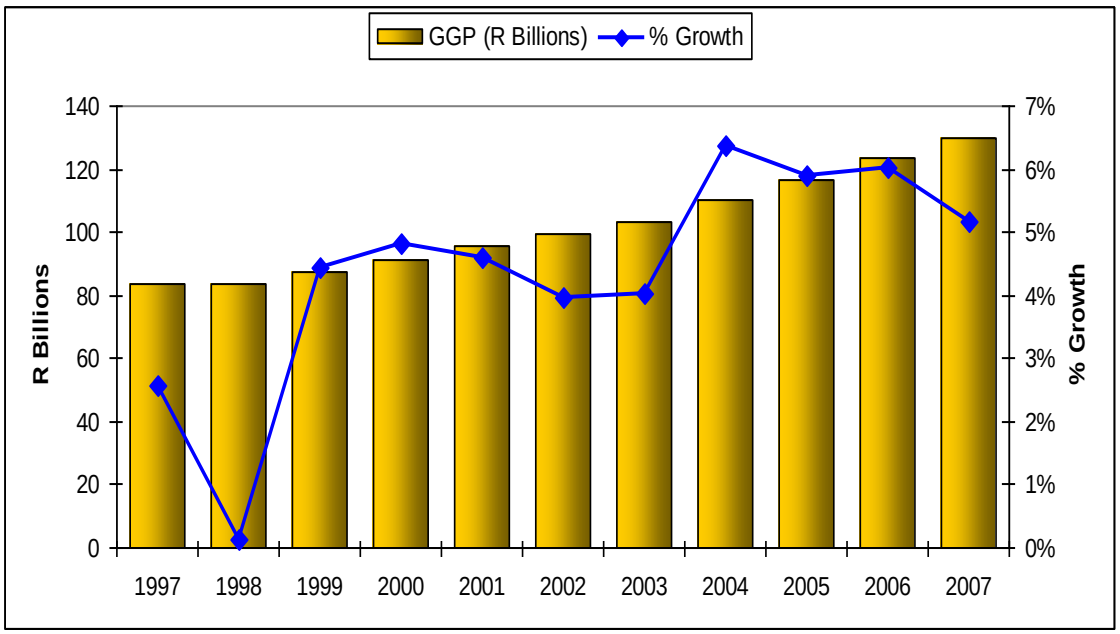

Figure 4.3: Gross Geographic Product (GGP)
(Compiled by: Strategic Information, Strategic Development Information and GIS Department, Source: Cape Town, 2010)

4.2.3 The business case: background and rationale

The City of Cape Town management had an ERP system business case. This section details this business case and the scenario under which the ERP system was proposed and implemented. It also elaborates the rationale for the ERP system implementation. The Municipality of Cape Town has implemented one of the most successful ERP systems recognised not only in South Africa but worldwide (City of Cape Town, 2013). It is also referenced as Project Ukuntinga in the business case proposal and implementation duration. The business case for implementing an ERP at the Municipality was based on three issues. Firstly, the Cape Town Municipality ERP aimed to merge seven previously independent municipal councils into the unified City of Cape Town. The figure also summarises the size and population of the "mother city". This meant integration and standardisation of the Municipality systems as each council had its own different system. Secondly, the ERP was implemented to transform the Municipality to international standards as tried and tested international software was introduced. Finally, the implementation was meant to unlock financial value for the City of Cape Town by replacing the legacy systems that lacked transparency because of duplication and redundancy of business processes (City of Cape Town, 2013: Online; CIO, 2011).

The motives of the City of Cape Town for implementing an ERP system, as gleaned from a presentation by the City of Cape Town (2002) that was used to motivate the business case, can be summarised as follows:

- Technically – to integrate disparate departments and systems and transform the obsolete legacy systems.
- Operationally – to enable current and reliable information sharing among stakeholders.
- Strategic – to ensure sustainability through envisaged growth.
- Performance – to improve service delivery through improved effectiveness and efficiency.

The ERP system implementation project accelerated organisational transformation, taking into consideration business principles, processes and a solid economic platform. Though not documented in any study, the success is evident. For example, the Municipality won internationally recognised awards such as the African Achiever's and the E-government Award of 2002, The Bill and Melinda Gates Foundation Access to Learning Award, The 21st-Century Achievement Award from the Computerworld Honours programme (Cape Town, 2011: Online).

According to the Cape Town Municipality authorities, the ERP (SAP) implementation project started in 2002 and went live in December 2002 (Phase One) and September 2003 (Phase Two) (CIO, 2011). Phase One was the enterprise transactional system that enabled the back office day-to-day business processes as the ERP's main component. The actual systems involved were the financial systems, the asset accounting systems, the revenue systems, the Human Resources systems and the logistical systems. The second phase included additional modules and included dealing with the legacy systems to achieve a complete transformation to the new ERP system. The implementation period and the cashflow associated with the ERP system is demonstrated by the following Figure 4.4.

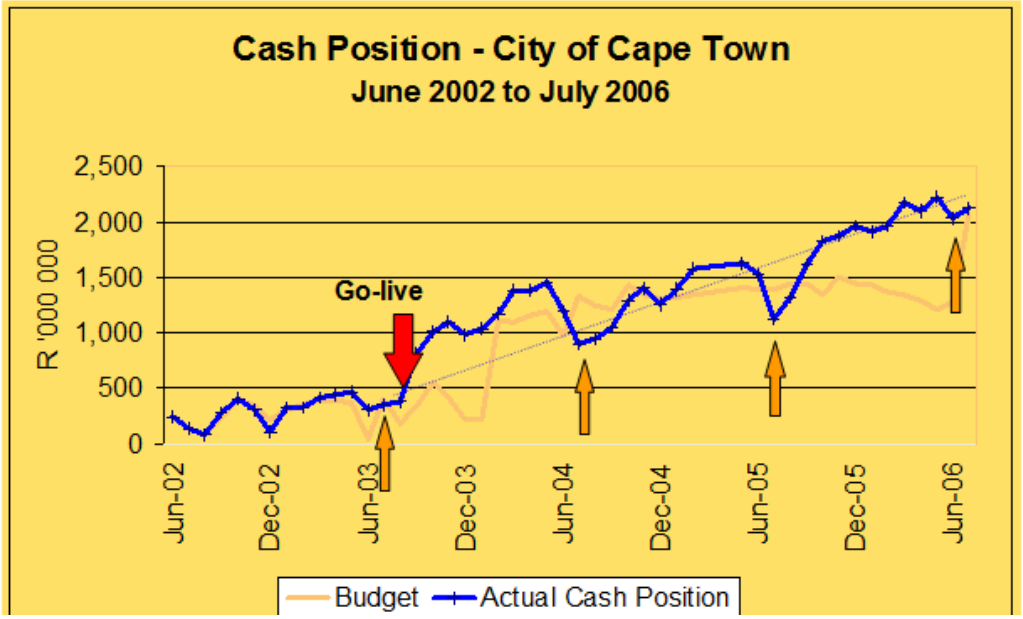

Figure 4.4: ERP implementation dates at Cape Town municipality
(Source: Stelzner, 2008)

It is evident that the actual cash position of the Municipality has been continuously improving since it started utilising the system. The Municipality management attribute this improvement to the ERP system utilisation and further hinted that, prior to the implementation, the Municipality's cash flow was unpredictable and always unfavourable (Stelzner, 2008). This means that the return on investment is already benefitting the Municipality.

The Municipality's ERP system spans across departmental boundaries enabling residents to access departmental services from any point within or outside the resident's district or point of registration. This further enables sharing of common repositories and other resources within the whole Municipality. Local Government is about service delivery with special emphasis on bringing services to the people in the most cost effective way and as efficiently as possible. Often ERP systems are implemented to provide benefits to organisational management and internal processes. The ERP system in public institutions makes a difference as it extends direct benefits to the main stakeholders, the citizens who fund it.

With the ERP system implemented, the Municipality of Cape Town launched a "Smart City Initiative", which is based on a policy framework from planning to co-ordinated implementation to transform the way in which its administration runs its "internal processes, conducts business and interacts with its customers" (City of Cape Town, 2002). This is done

in line with the Municipal Systems Act of 2000. The framework proposes the use of a “smart card” system that will be an integral part of the City’s new Integrated Rapid Transit (IRT) network. This system will be required to capture information about all individuals who intend to use the public transport and all their transactions. It is clear that the Municipality is aware of the benefits of investing in an ERP system to increase the efficiency of its information management (Van der Walt & Du Toit, 2006) and to improve its service delivery. Thirty-eight independent municipal systems were amalgamated into a single super system. This system encompassed all the different departments that are found in an operational municipality making it very complex, given the way public institutions operate.

4.2.4 Not yet accrued benefits

This section details the citizen benefits that have not yet accrued since the ERP system implementation. This section was also drawn from the interview evidence. This is important to note because the value to the citizen cannot be defined by the potential benefits but must be defined by the value the ERP system actually delivers. Several citizen benefits can be traced to the business case that was used to justify the ERP system implementation by the City management. These benefits of the ERP system were motivated for in the business case. The objectives of the Municipality as a public institution are to deliver services to its citizens in an efficient, reliable and cost effective manner in the short term, and to ensure sustainability of the above-mentioned benefits in the long term. The evidence affirms that senior management are aware that even though some of the planned benefits are not visible or not yet visible, it is a matter of time before the residents can access them. There is need to apply a benefit management framework that will not only keep searching and identifying but also creating benefits by taking advantage of the ERP system capabilities. The framework should both inform citizens of the availability of the benefits and also ensure accessibility of the benefits so that they become visible even if they are intangible. These benefits will define the future of the ERP systems in public institutions. The citizens become accustomed to the ERP system through the use and benefits that differentiate it from ordinary usage of computers.

During the inception phase of the ERP system, the business case also documented a number of benefits that include the direct and indirect benefits. At this stage all the benefits were still “potential and expected” benefits. In this study, the term “potential benefits” refers to benefits which may (potentially) be realised in the future. These benefits range from the very simple to the most sophisticated. These are now in varying stages of implementation and hopefully the citizens will be enjoying these benefits soon. This section details the ERP

system benefits that were promised in the business case but are still not yet realised. These are elaborated in the sections that follow.

Enhanced communications between the City and citizens

One of these benefits relates to the way in which the ERP is able to harness the use of mobile cell-phones. This is referred to as "*mobile access*" by the Municipality management, with the communication through the cell phone linked to the business processes such as those of service request or request tracking automatically. Citizens could, for example, receive timeous updates on traffic flows, warnings of intermittent problems such as faulty traffic lights. On-line communication channels such as really simple syndicates (RSS) feeds can be used in this respect. The active majority of the Cape Town residents owns a cellphone. Mobile phone access is thus one of the primary channels which citizens are able to use to access services or to commuicate with the Municipality. Text-based mobile communication is relatively cheap and accessible, hence, it will benefit the citizens.

Although a number of private blog sites are already providing this kind of service the City has access to primary data in respect of benefits provided. The ERP system will be able to support such benefits by recording the primary data in real time and also enable real time access to any interested party. Therefore, mobile access becomes a crucially anticipated ERP-enabled channel that most managers promised to bring to the residents in the near future. The following interview extract elaborates examples of the Municipality plans to ensure that the ERP system supports maximum benefits accrual to the citizens:

> *"We would want to incorporate event management technology enabled by the ERP system where residents can also access the City's information automatically, through alerts, such as electricity cuts, accidents on freeways, etc" (Interviewee 8, 2012).*

In this "information age", sharing of information becomes the determinant of success in any organisation, public organisations especially. Effective communication as portrayed above is proposed to consider an event management approach.

Event management[12]

Event management would mean that residents would be able to trigger the events that result in receipt of services, for example entering their meter reading to get a bill calculated and

[12] Event management is a term that was used by several informants to refer to a scenario where the citizens can manage their own services without human intervention. This would be enabled through the ERP system configuration process.

delivered the same minute. Event management technologies would ensure that every event happening within the Municipality is managed by the ERP system. This makes the progress and status of every event available in real time to any interested citizen. Once an issue, be it a court case, police report or even buying a house, is recorded onto the ERP system, then only the authorised and documented personnel will be able to alter or resolve in a standard, fair, transparent and documented manner. This is sometimes referred to as "*case management"*. It was described by one manager as follows:

> *"When I talk to you about value for the citizen, CRM, business management, and case management, the next wave of innovation. Every single interaction that you will have with this city, will find its way in a case, and if you track that case" (Interviewee 5, 2012).*

The benefit will be tangible when all transactions and correspondence with the City are accurately recorded and thus traceable. In addition, the following quote from one respondent explains by expanding the possible cases such as court cases, ARV drug dispensing, etc., that are expected to be facilitated when case management is involved:

> *"… through case management, the court cases, the municipal courts get to benefit. Documentation gets lost and evidence keeps on disappearing thus only traceable accurate documentation through the ERP system will solve this problem. I am sharing this with you because not only this has value for the citizen, but it's going to help with the social ills of the society, shorten the time to dispense an ARV drug, and that is underpinned by the ERP system" (Interviewee 2, 2012).*

However, it is worth noting that the ERP system will be limited as to what it will be configured to offer, thus there is a need to manage the ERP system to ensure availability of these benefits.

Supply Chain Management (SCM)

If configured well, the SCM module is the basis on which a diversity of benefits to the citizen may be realised either directly or indirectly. A variety of potential services, not yet implemented, was identified in the interview evidence. These include the supply chain management whereby vendors will manage the Municipality inventory to ensure that replenishment is undertaken at the most suitable timing. This will ensure that residents are catered for in terms of supply of their needs for repairs and maintenance. High service level standards are possible when the ERP system manages the supply chain. The following quotation noted some of these benefits:

> "*Examples include: creating an on-line communication channel to reach new customers; introducing vendor managed inventory for key suppliers; allowing customers to undertake self-billing; deploying a data warehouse and analytics to automate operational decision*

making; and introducing mobile technologies for professionals to work on-line during client engagements" (Interviewee 1, 2012).

Mobile technologies such as tablets and smart phones mentioned above will be linked to the ERP system through dedicated channels to provide accurate and updated information to benefit the citizen.

Integrated bill to the residents

The ERP system also was the basis on which the City promised to provide an integrated bill to the residents. This will see residents being able to pay all their rates, electricity, library services, traffic services etc., on a single invoice. Currently, citizens can access these services separately even though they can go and pay in the same office. They were also promised the ability to update their meter readings, what is called "self-billing", from the comfort of their homes.

Health and the Safety and the Security modules

The other benefits, which are being planned for, include the Health module and the Safety and Security module. These will affect all citizens who interact with health services. Hospitals and clinics are currently running their own system. This existence of disparate systems is contrary to the expectation that the ERP system must integrate all vital departments and systems. The health module is of paramount importance because everyone needs to access health services at some time irrespective of their financial status. This means the earlier these modules are activated the better for all the citizens. The following quote from the head of change management substantiates and further elaborates the plans to introduce the Safety and Security module as well as the Health System module:

"Then the other modules that are important to our organisation, that we have to activate, are the safety and security module, to get the metro police into SAP, the other one will be the Health System. How do we take clinics and bring them to SAP? At the moment they are on their own network and they have their home grown open source application. Obviously there is value in integrating them. So there are certain key business processes that we haven't managed to introduce" (Interviewee 2, 2012).

With the Safety and Security module, citizens will directly benefit when all the citizens are recorded on the system with accurate details. If fingerprints are accurately recorded for every citizen, then forensic scientists will be relieved in criminal investigations, as identification of individuals will be made easier. With the Health System module, access to citizens records will be made easier whereby less time will be needed to follow-up the medical condition and the accurate medical history of an individual before medication can be given. Currently,

citizens need proof of residence to access services, meaning that one should get medication where one resides. The ERP system must enable versatility and a stop to that restriction.

Fast internet connection

The implementation of the ERP system is also creating benefits for citizens, who are not directly linked to it. The City has built the fibre network to service its own internal needs, i.e. prompted by the ERP. These faster connections are specifically designed and configured to support faster internet connectivity by providing a higher bandwidth. This will provide a robust, reliable and affordable network for citizens to communicate with the City. Consequently, the City is now investigating ways in which it will make the space capacity of the fibre network available to citizens. Once enabled, access to the fibre network will provide a multitude of benefits to the citizens.

This is an example of an **indirect benefit,** i.e. the Municipality is going beyond its internal systems. It is also ensuring that the infrastructure is provided for citizens to access services via the internet. Currently, all the Municipality libraries provide free limited access to the internet to the residents. With the plans to extend the fibre network to all citizens, the benefits from the ERP system will be universally accessible in the future. The following quotation explains that the Municipality is improving the public infrastructure and why it is doing so:

> *"The problem is access to internet and the speed of the internet facility, improvement on the public infrastructure. We are linking schools, hospitals and police stations using a fibre to connect the citizens with a better speed connectivity to enable citizens to have better access especially to our services through the portal" (Interviewee 5, 2012).*

Once extended, the benefits elaborated above will open up more other benefits and enable the citizens to enjoy more ERP system benefits.

The value of the ERP system is measured by both available and potential citizen benefits. The IT specialists and the Municipality managers are aware of the potential benefits such as mobile access capability even though they are not yet explored. Currently, citizens can only call the City on mobile phones but more functionality can be included to enable citizens to interact with the City, as one respondent put this across:

> *"The ERP system, as it currently exists, contributes to value for the citizen both directly and indirectly. This will be extended into the future with the planned benefits that contribute to the value for the citizen directly becoming more and more visible" (Interviewee 3, 2012).*

4.2.5 Current status of the ERP system

In addition to the foregoing, a number of other pertinent facts concerning the status of the ERP system implementation were gleaned from the data that was empirically collected but mainly from the interview transcripts. The implementation status is directly related to the benefits that can possibly be extended to the citizen. More so, because in any ERP system implementation, it is the indirect benefits that initially accrue. These intangible benefits are as a result of the back office integration. Private sector organisations are also utilising the ERP system to strategically build long-term commitment to their customers. The Municipality has integrated its previously separate systems from thirty-eight municipalities. This is the basic ERP system infrastructure with basic modules such as finance, human resources, supply chain, etc. The following excerpts give an overview of this status extracted from the theme "ERP System Implementation Status":

> *"Once this organisation was being amalgamated, it was 38 previous municipalities down to seven municipalities then we amalgamated seven municipalities into one super metro. Already you can see the complexity of 38 municipalities, each with its disparate payroll system, procurement system, supply chain network, emails, and just about any conceivable business system. You already see 38 views of the world. That is 38 views of the City to take the 7 into one required what I call one strand throughout the organisation" Interviewee 1*[13]*, 2012).*

The foregoing demonstrates objectives of the Municipality and how far it has gone in implementing the ERP system. The back office infrastructure supports the internal processes that facilitate the smooth day-to-day operational activities. The following quotation from an interview with a senior IT manager at the Municipality head office further demonstrates that the modules implemented are spanning across departmental boundaries to cover the whole city:

> *"We have got SAP wall to wall, we have implemented modules such as the Finance, within the Finance module we have got accounting, management accounting, treasury and insurance, so 'manacc and finacc'*[14]*, internal guys that do the budgeting and that do financial services for the whole city. We have the Utilities module, which divided into billing, device management and customer care, which is CIC/CRM then we have FICA engagement and we have rates. These are the modules that are implemented that I call business modules" (Interviewee 5, 2012).*

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[13] Note that I replaced the actual names and positions of the informants in line with the confidentiality agreement with informants that "the evidence will not be referenced to you either in person or your position" (see Appendix B for the full confidentiality clause). However, a confidential schedule of the interviewees and their designations is maintained (see Appendix C).

[14] 'Finacc and Manacc' is a term common within the Municipality management that refers to Financial Accounting and Management Accounting.

Besides the Finance module mentioned in the excerpt above, there are several other modules that cover from the internal processes such as recording, tracking and reporting complaints and requests from residents and ratepayers. In short, the ERP system now applies to all functions of work in the City, from potholes, water leaks, to employee pay queries or internal maintenance requests, etc. This is specifically the back-end processes.

4.2.6 The findings framework

Following Miles and Huberman (1994) who advise the use of a conceptual framework that is a graphical form of key factors under study and their presumed relationships, Figure 4.5 was designed to summarise the findings and the related issues through a findings framework. The findings that are presented in the following sub-section are narrated according to the links depicted in the diagram that originally emanated from the thematic links denoted by the CAQDAS tool. A list of the final findings and their related issues that eventually emerged from the themes is given as a “tree chart” in Figure 4.5. This Chapter finally analyses the relationships among findings to answer the fourth research sub-question.

The role of the ERP system in contributing to citizen value can never be under-estimated. In investigating its importance, numerous benefits were identified. Figure 4.5 below presents a summary list of the findings which are further expounded in the sections that follow thereafter.

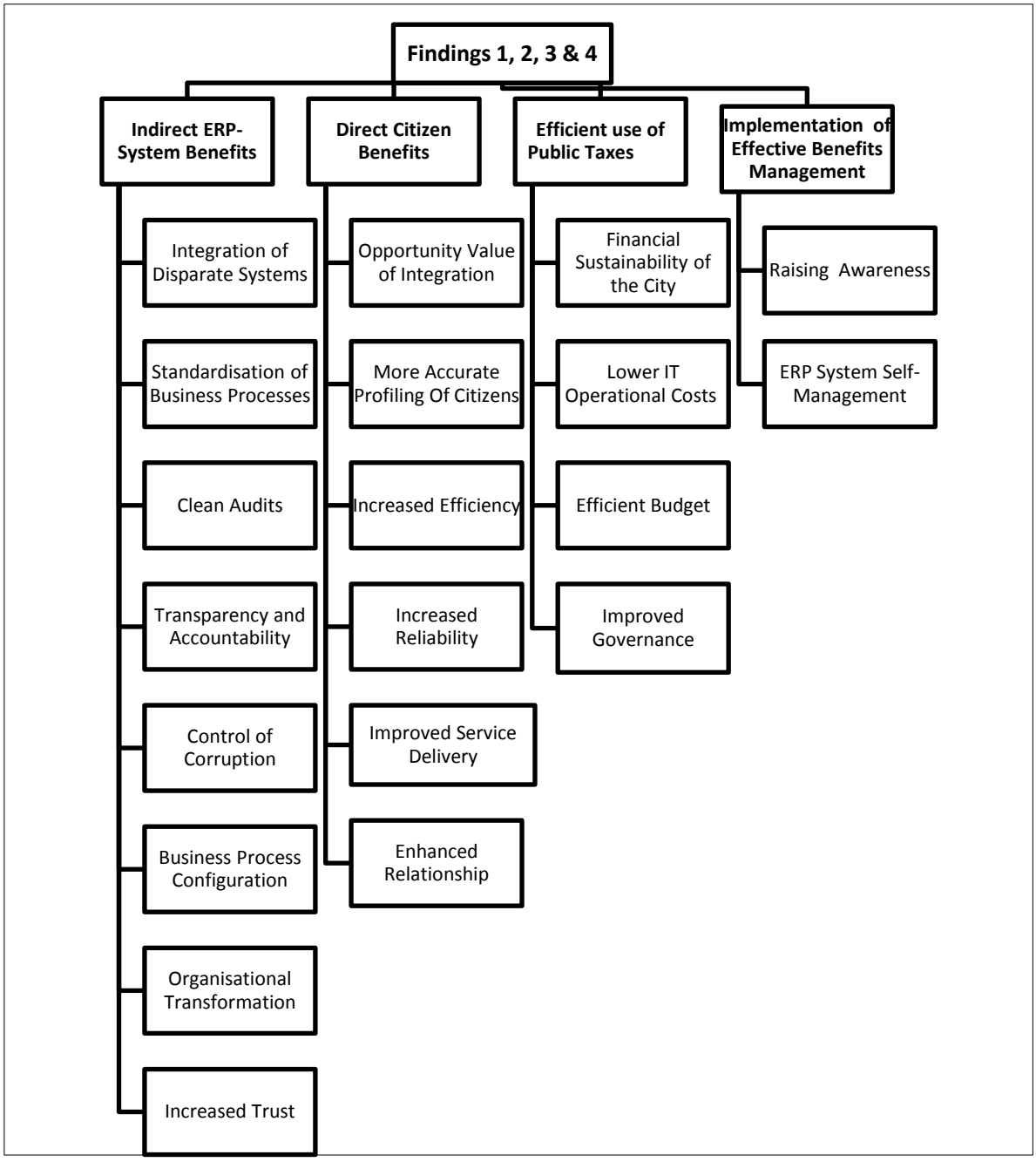


Figure 4.5: The Findings emerging from the research

4.2.7 Conclusion of the section

This section detailed the findings on the general status of the ERP system implementation. The background of the case study elaborated above provides a foundation for the main research findings. This section detailed the legislative background, the Municipality and the

ERP system (SAP) in terms of the business case motivation and the promised benefits. Having identified the potential benefits that are not yet available to the citizen, details of the actual available benefits follow in the next sections. The reason for noting the two categories of benefits is to compare the ERP system capability not only with the documented literature review but also with the empirical evidence of the study. Other findings that are directly related to the research questions are given in line with the findings framework that emerged from the evidence analysis. The framework illustrated in Figure 4.5 expresses the findings that emerged from the themes. The first main finding is aligned to the indirect benefits of the Municipality ERP system. Other findings are defined along with the benefits that are directly attributed to the ERP system implementation, those benefits that affirm efficient use of public funds and the effective benefits management. The last finding gives details of what management of the City can do to extend maximum benefits to the citizen.

4.3 Indirect ERP-system benefits

This section provides an elaboration of the generic ERP system benefits findings as portrayed in Figure 4.5 above. The importance of the different findings ascertained by this study was further supported by the content analysis part of the CADQAS. This gave me a perspective of the frequencies of the specific concepts that emerged (see Appendix K for Concepts with statistics), as illustrated by a Report from Atlas.ti.

Since all the themes and finally the findings and their issues were labelled with an explanatory name, some of the relationships can be traceable from the codes to the findings. However, it should be noted that the findings emerged from the analysis and hermeneutical interpretation of the evidence that involved interlinking of these concepts and reflection that altered the meanings of the original concepts. In an organisation, a benefit is “an advantage on behalf of a stakeholder or a group of stakeholders” (Ward & Daniel, 2006). Therefore, an ERP system benefit is an advantage provided to specific groups or individuals as a result of meeting the overall ICT utilisation objectives.

This section details the “generic”[15] benefits attributed to the ERP system, with the emphasis on the benefits to the citizen in a public positioning. The common benefits which were gleaned in the literature (see Chapter 2.3), such as smooth flow of information, enabled interoperability, accurate data and common user interface, etc., enabled the research to establish whether there is a gap between the expected benefits and the currently extended benefits. The study noted five more benefits that were perceived to be common within the public enterprise implemented ERP system, the case study. However, some of the benefits

[15] Generic benefits relates to benefits which may also be realised in a non-public sector organization.

overlap each other making it difficult to separate and appropriately categorise. The details of those benefits that emerged in the findings as contributing to value for the citizen and how they are perceived by the respondents to be contributing are given in this sub-section.
These are:

- Integration of disparate systems
- Standardisation of business processes
- Transparency and accountability
- Business process configuration
- Organisational transformation.

Their order does not reflect their importance even though it was informed by the emphasis that was induced by the responses from the interviews. Research sub-question four (which reads: “What are the typical benefits that are derived by external customers of organisations which have implemented ERP systems?”) is mainly answered in this section. The findings are given through referencing the benefits as follows:

4.3.1 Integration of disparate systems

The term ”integration”, as used by respondents emerged to be a broad term that can refer to integration of services or systems that are available to support the business processes of any organisation. Integration is not only cross-sectional, i.e. across departments, but also longitudinal, along the supply chain to incorporate the back-end to the outside world. The citizens join the supply chain as the final consumer of goods and services within the Municipality environment. There are various departments such as the Finance; Human Settlements; Safety and Security; Transport, Roads and Stormwater; Community Services and Utility Services, etc. The ERP system integrates these entities in a coherent and consistent manner. The residents interact with these and with others not mentioned on a regular basis. These departments thus hold information about residents, making it simpler for the citizens to access the City for different services.

The ERP system implementation integrated these departments by not only providing a single repository for the above-mentioned information about the citizens, but also an integrated point of access to the services from any point of service delivery within the mega-city. The ERP system integrated both front office and all the back-office processes. Front-office processes include those processes that are visible when the residents visit the points of service delivery and the back-office processes are the supporting activities that are not visible in everyday interactions. This supported the findings in the literature review that “*An*

ERP system offers organisations a comprehensive and integrated solution for managing services such as financial; revenue; human resources; maintenance; procurement; leasing; customer care; amongst others, on a single integrated software system".

The following excerpt from the interview transcripts shows that the municipal manager confirm that the different departments are now fully integrated as explained above:

> *"Integration enabled a 'one stop shop' for a number of services such as all 'Revenue Related Enquiries' as a single toll-free number is used to contact the whole city from the same call centre. This is critically important, given that disparate systems would require citizens[16] to stick to their own point of service delivery." (Interviewee 2, 2012).*

As noted above, integration of the disparate legacy systems removed the complexity that comes with independent systems resulting in a uni-city both from administrative and the residents' side. It is clear that amalgamating the Municipality administratively without merging the systems could only spell disaster for the City managers and the residents at large. Integration brought about other hidden benefits that included the incorporation of "Legacy data" that was imported automatically for smooth continuity purposes.

The ERP system enabled the importation of legacy data without compromising its integrity. This indirectly benefitted the residents by enabling them access to their profiles from any part of the City as their details were already on the new system. This makes integration the core function of the ERP system, enabling most of the other benefits. Integration of all business processes is the foundation upon which benefits to citizens are realised. Integration of the business processes supports the benefits in a number of ways. Numerous components were integrated.

4.3.2 Standardisation of business processes

The ERP system provides the basis for uniform, consistent, standardised and visible business processes coupled with multi-channel access for enhanced accessibility (Interviewee 1, 2012). Standardisation of key business processes was a result of utilisation of a set of "best practices" prescribed by the ERP system. Only a single updated version of the information about a specific citizen is available throughout the Municipality. The citizens can now access the Municipality for services through other standard multi-channels such as cell phones and e-mails. The findings attested to this argument, as portrayed by the following interview excerpt:

[16] Some informants referred to residents as citizens; thus, the two terms were used interchangeably.

> *"The following lines of communication with the citizens are available. Free call line from both landlines and cell phones, with or without airtime in a cell phone. Citizens can now write emails or log on to our websites and log a complaint or request for a service. They can still come to our offices and request for services" (Interviewee 6, 2012).*

Levelling the digital divide

The multi-channels that link to the same business process through different technologies are of particular importance, given that not all citizens can access a single channel such as the web-portal. This means that poor citizens can still access the City through traditional and ordinary channels, such as telephones and cash halls.

This improved communication between the citizens and the City. However, the promotion of multi-channels further perpetuates the digital divide instead of incorporating all citizens into the ERP system utilisation benefits. For example, the poor will mostly use the telephonic communication while the rich will access the services through the portal, which is more user-friendly. Nevertheless, all these channels will link to the same business process as per the configuration of the business processes concerned. Another manager who emphasised the reduction of costs by reducing duplication, not only of data storage but also of service requests, said:

> *"Anything that a customer requests is recorded and with no duplication. It saves a lot of money and helps determine where to spend money by providing accurate updated and integrated reports of needy areas. Shorter turn-around time is enabled in most business processes because all customer details are on the system especially when the customer is online, you no longer need not ask too many questions. We are also able to avoid requests duplication" (Interviewee 4, 2012).*

Multiple accesses to services and service requests

Regardless of the way you access the City whether by phone, electronic mail, short message service or even online access, the same standardised service request process, that is traceable, follows. This functionality is not important to private organisations that contrarily emphasise differentiation of customers. Most of the channels such as the call access provide a 'self-help'[17] option. The functionality of 'self-help' ensures efficiency by reducing queues and enabling those citizens who can access some services through other channels. Figure

[17] "Self-help" function refers to the service that allows the citizen to interact with the system to request or receive a service without human intervention. This occurs, for example, when citizens punch in the water meter to get a bill.

4.6 below portrays an example of a service request form available on the website as one of the channels of communication open to residents enabled by the ERP system:

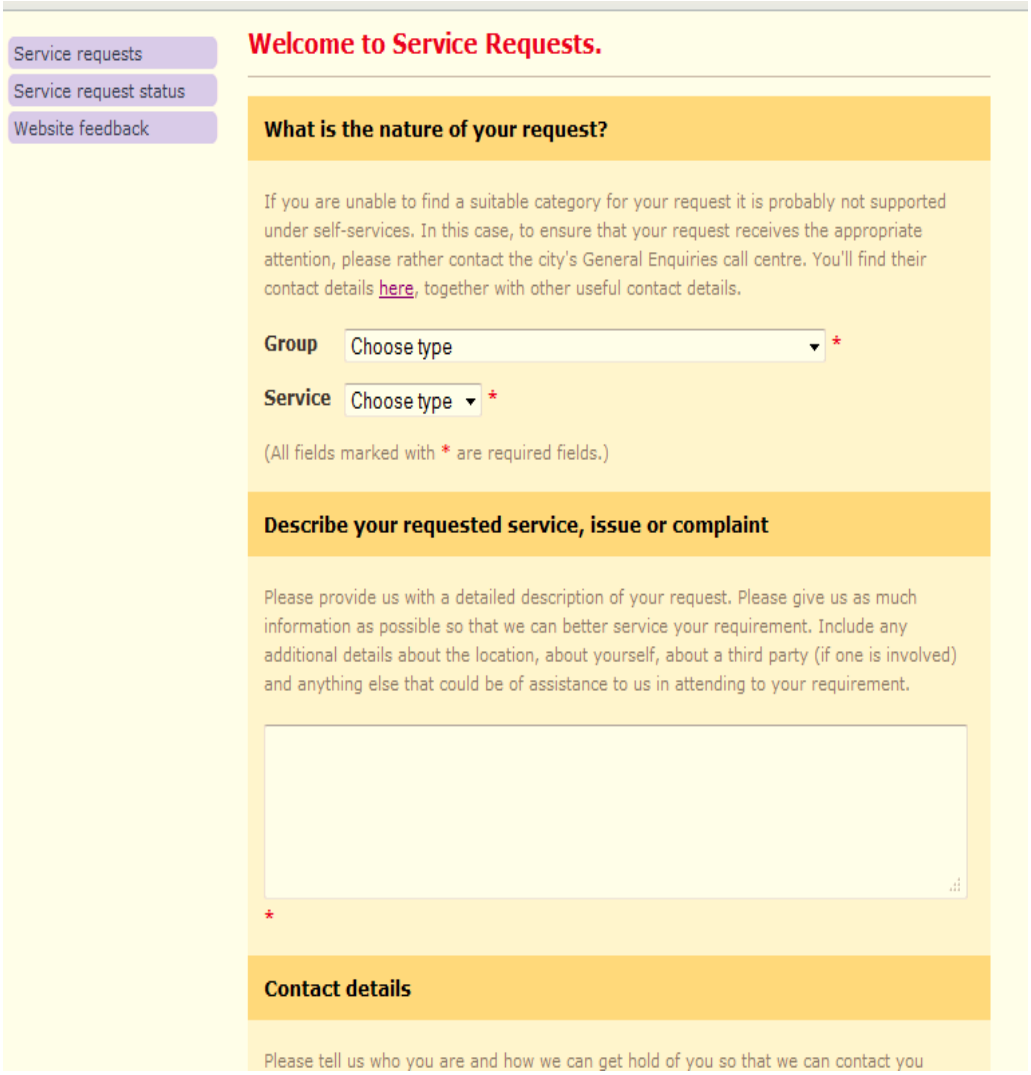


Figure 4.6: Service request form
(Source: City of Cape Town, 2013)

Standardised service request

The important aspect of these channels is that they link to the same process that is standardised as it connects through a standard configured system. All the channels are linked to the same system and lead to the same process after every request. However, it is not clear as to how the efficiency of service delivery is linked, especially considering that these requests may accumulate and lead to the same waiting time as in a service kiosk visit.

Traceability of request progress

A further important issue is that all the transactions that the citizens execute through the ERP systems can be tracked. Citizens are now assured that there is no longer confusion with the City arguing about whether they requested a specific service or not. Furthermore, the citizens can now trace the progress of their service requests. This is possible, irrespective of whether the service was digitally accessed, i.e. through the portal, e-mail, etc., or non-digitally, i.e. through old and ordinary channels such as the cash-hall. The following extract from the interview with the Head of Customer Relationship Management also shows that citizens can now trace the progress of their service request:

> *"The volume of calls that are enabled by the ERP system is awesome. Imagine! We are able to talk to five and half thousand customers per day. We have details of all the customers, employees who log complaints, e.g. drain cover stolen, or branches, and can be traced through the service request and its status at any time. We can now keep a track of which roads need more attention…" (Interviewee 3, 2012);*

The traceability of service requests and logs give the managers confidence in the system and hence in the whole organisation. This benefit is crucial to residents, especially when you take into consideration critical service requests such as urgent ambulance calling or water pipe bursts. These services always cause confusion and arguments when different stakeholders blame one another for delay or non-delivery of a service. The ERP system is able to pinpoint the exact bottleneck in any business process.

4.3.3 Clean audits

Standardised, programmed, configured and documented procedures result in clean audits where citizens can confirm how their monies are used. The system is strict in controlling behaviour and enforcing integrity. The standardised ERP system provides the backbone for the City's business processes. The Municipality is essentially running all the business processes based on the ERP system. This means that there is nowhere the Municipality can abandon the ERP system to roll back to the legacy systems. At this point failure of the new system is no longer an option, even though there are some individuals who were comfortable with loopholes that existed in legacy systems and would wish reversal of the implementation.

Key business processes supported

All key business processes of the Municipality are now supported by the ERP system. This is in line with its capabilities, as portrayed in the academic literature. However, the public aligned benefits that accrue go a bit further than the privately owned systems. This is because of the nature of public business processes. These processes range from the typical

rubbish collection to the sophisticated payroll and tender management. The following statement attests to that:

> *"…in your research you have come to terms that you will have one single version of the truth. Yes we have spreadsheet gurus today, individuals that still think that SAP will be switched off one day and then can go back out there to their legacy systems, its not going to happen. The reality today in the City of Cape Town is we collect rubbish bins using the SAP, we run the payroll using SAP, we dispatch emergency vehicles using SAP. SAP has become the backbone of this organisation. If SAP goes down, we cannot collect revenue, we cannot run these crucial services. SAP has become in my opinion the most strategic application in this organisation. The life blood of all" (Interviewee 2, 2012).*

Accuracy of the bills

In addition to the benefits described above, one other standardisation benefit extended by the ERP system implementation is the standard functionality that is used for validation of bills. The automatic check-up routes 'suspicious bills' for further processing without disturbing or stopping the entire process. This is done by separating the billing processes to individual levels. The Municipality bills are accumulative and span a number of years, unlike most private business where bills usually have a definite time span. This complicates their management; thus the ERP system supports the daily calculations in a manner that changes the lives of so many citizens in a positive way. This is expressed through accuracy and efficiency. The Head of Change Management attested that changing citizens' lives is why they implemented the ERP system. She said:

> *"All of a sudden you can see that there is one way of doing things, hard coded into the system. There is always one way to perform that function, that brings about all sorts of benefits, sorts of efficiencies and fast response time and that fundamentally produces benefits for the ratepayers. I serve my internal audiences, who are the directors, my staff, services like finance and HR, then I serve my staff members, who access the system, fundamentally why do we do this? To change the lives of individuals who are out there. I could change the people's lives with technology" (Interviewee 2, 2012).*

Pre-configured policies procedures

The ERP system removed any individual empowerment whatsoever by giving standardised pre-configured procedures to both municipality employees and the citizens at large. This means that no one may unilaterally decide on fundamental issues in relation to policies and procedures that are applied to daily routines.

One major citizen benefit is of standardised financial policies and procedures which benefit citizens when the City becomes creditworthy. Government entities are entrusted with the

public purse. Thus legislation such as the Public Finance Management Act (provincial and national departments) (PFMA), the Municipal Finance Management Act (MFMA), 2003 and the Municipal Systems Act, 2000 provide regulations for the strict control of expenditure. Thus the attainment of a clean audit is critically important to any government organisation. When citizens know that their monies are being spent prudently, they begin to have trust in their government. Trust in turn leads to a better relationship between citizens and government. Consequently, it becomes one of the factors which improve social cohesion in a society. Standardisation benefits directly lead to transparent benefits, as portrayed in the next section.

4.3.4 Transparency and accountability

Transparency is the candidness of the business processes. It is very important to any government department or public organisation because of all the complexities and the magnitude of the clients involved. For example, all the residents of the City need water to bath every morning and at the same time. All these clients need to access the services, some at the same time, and management of scarce resources becomes difficult, especially if you want to maintain a high value for the citizen[18]. Transparency can only be possible if there are adequate measures to ensure that the correct procedures are followed all the time. Rules are defined and monitored by the system, which cannot be manipulated by human beings. This calls for a very high level of accountability.This is where the ERP system that comes with standard proven procedures helps ensure transparency by reporting any deviation from the standard procedures. Anyone interested will be able to assess any business process to their satisfaction. This makes sense as everyone is bound by already agreed proceedures in doing everyday tasks that affect every citizen through the quality of service delivery. According to one of the senior IT managers:

> *"The bottom line is that transparency is enhanced when procedures are hardwired to be followed at all costs. When would we use? If you are an employee of the City and you are a vendor, our systems will send out alarm bells and shoot rocketing to the sky because that means there is a break down and there is a risk. You cannot be the employee of the City and the supplier of the City" (Interviewee 1, 2012).*

The issue of transparency in business processes gives pride and trust among citizens. However, the transparency issue is a special feature that is a priority in public organisations.

[18] Value for the citizen refers to a situation where the quality of life is high because of the services that are rendered in a manner that respects human dignity. A value for the citizen is created when the quality of service offered within the public sector setting exceeds citizen expectations created by the private sector setting (Stelzner, 2008).

This finding noted in this section made clear how an operational ERP system contributes to an improved value for the citizen. Furthermore, the ERP system enables citizen involvement and participation in the-day to-day business processes. One respondent said:

> *"we want to enable those kind of services so that the citizen can help themselves and have larger share and high level of involvement in the City administration because they get involved in the business processes within this ERP programme … so it brings good organisational governance into application, then it results in high value for the citizen" (Interviewee 1, 2012).*

Citizens' involvement

The involvement of citizens in the service provision process and the business processes at large is not only transparency but also gives the citizens the sense of ownership as they come to understand how it is done. Specifically, they tend to follow on how their services are provided. They can follow where there are delays and get correct projections and expectations as far as the delivery of their services is concerned. Even though this special feature is not peculiar to a public organisation, it becomes crucial, given the notion that service delivery is always poorer than in the private sector environment.

4.3.5 Control of corruption

The issue of corruption has been high on the agenda and one of the benefits of an ERP system that has been properly implemented is control of corruption. Information is made available by the click of the mouse in real time to support or dismiss assumptions. This avoids commitment to unnecessary as well as high-risk projects. The special feature that ensures standard views of citizens within the Municipality is needed to support transparency by defining and maintaining their relationships and associations. With a single record of an individual citizen, transparency is further extended when good practices and rules are enforced, such as ensuring that employees of the Municipality cannot be vendors at the same time. Some controversial associations, whereby nepotism and corruption can thrive, are thus controlled. The public ERP system controls corruption in the following manners:

- Every transaction is not only prescribed but also recorded in detail for easy monitoring and auditability.
- Even tenders, including the bidding process, are transparently managed and documented by the ERP system.
- Cooperation with other stakeholders in a transparent manner further supports credibility.
- Automation of processes such as tender systems removes the human element that is pro-corruption, resulting in reduced (if not eliminated) collusion and rigging among bidders.

One top manager explains this issue as follows:

> *"You often hear in the SAP world, we talk about the business partner, which is a single view of the customer. I have a view in one 'lens' but on multi-facets. I have a view of you as a ratepayer, of me as an employee, custodian of social grants; you have a view of me as a vendor. The ERP system will spot if I am both at one point in time, for example, an employee and a vendor. So we build ERP systems for transparency in governance which is very important because in such a high turn over you can easily lose yourself" (Interviewee 4, 2012).*

This results in a very high level of accountability since each stakeholder is aware that all transactions are transparently done. The following illustrates how the ERP system is supportive of the notion of transparency:

> *You can see who's carried out the transaction, and you can take corrective action to understand why it happened. So, the system allows that visibility, to see where things have gone wrong, who's made what transactions, who has done what purchasing (Interviewee 2, 2012).*

Remedial action prescription

A high degree of transparency does not only end with everyone becoming an auditor, but also prescribes the remedial action to be followed in the event that some processes are short-cut. This comes with direct benefits to the citizens as every process is guided by the system rather than by individuals. Therefore, transparency goes a long way towards fighting mal-administration and corruption. The transparency and accountability levels are supported by a high level of business process configuration, as elaborated in the next section.

4.3.6 Business process configuration

The interoperability that is brought about by the ERP system is crucial to standardise the flow of information among the different stakeholders in seamless intra- and inter-organisational levels. All financial transactions and other communication with the Municipality are supported by the ERP system through the Electronic Data Interchange. This is an integral component of the Supply Chain Management (SCM) which is equally important to the Customer Relationship Management (CRM) as they both involve the same stakeholder, the citizen. The ERP integrates all stakeholders in a logical manner that is free from variations and contradictions.

Self-service

The ERP system was configured to enable a seamless integration of all information flows in the Municipality. Management of the Municipality resources should benefit all citizens regardless of their personality or even financial status. The interactive benefits accumulate to the citizens as the same citizens are clients in different forms. The ERP was capable of removing the human element, thus facilitating prompt feedback to all the stakeholders mentioned above. Most systems such as those used in e-commerce allow people to feed data on to a form that will need another human being to interpret before response is given to the client. The ERP system, on the contrary, enables direct interaction with the computer system without human interaction. This is evidence that the business processes can be configured to respond to this special feature, for example, citizens will be able to feed in their meter readings and then the system calculates and disseminates the bill. This means that the billing process can be re-configured to take into consideration the self-service function. This is an essential benefit that goes a long way to address the inequalities that are always associated with human interventions in service delivery. This will eradicate queues and ensures that the quality of service you get in this respect is now dependent on the quality of your connection. Information visibility is now enhanced, unlike in disparate systems. One respondent had this to say:

> *"We had to change a lot of processes either by stopping specific functions altogether or introducing new functionalities. This resulted in enhanced and even completely new ways in which we are conducting ordinary business. Users have accelerated access to data with limited navigation when files and attachments are linked into the ERP on configured and accessible system" (Interviewee 11, 2012).*

This excerpt is an indication of the level of awareness the Municipality management has on the impact the ERP system had on their business processes. The ERP system is capable of responding to the citizen promptly, showing a high level of artificial intelligence. One other respondent also supported this view by noting that:

> *"…you know how frustrating it was when you knew that it was just a form you were filling in and behind that form there was still the basic paperwork and processes to be manually done. Nothing came out of it but when you actually log on to an application and you know there is intelligence that will give you the response that same hour that same day that same minute"(Interviewee 2, 2012).*

Automation of business processes

The ERP system was configured to respond to citizen needs. The new functionalities that were added to the business processes took into consideration what the citizens need most from the City. This means the configurations were made in line with the services that are

accessed most, such as bill transactions. All the business processes were designed by the City management to provide a better life to the citizens. Citizens can track progress on their service requests electronically through device and account management related processes. One other respondent explained that the residents benefit from the new business process configuration by emphasising the choices available for accessing the City:

> *"The free call line for complaints, compliments, requests, and feedback is the main strategy. Even if residents have no airtime, they can communicate with us via the different channels that are enabled by the ERP System implementation. Remember, you can now call, or log on to the portal and interact with the Municipality in which cases the ERP system plays a very important role of redirecting you to the same business process" (Interviewee 9, 2012).*

Not only does the system re-direct you to a single business process but it is also done in real time. This is an important function that brings in great benefits when everyone is considered the same with access to the fastest service available and when one considers that a lot of citizens cannot afford the cost of a call. The new business process configuration that was enabled by the ERP system manages the whole supply chain in an integrated manner. The ERP system implementation enabled an organisational transformation that changed several business processes to accommodate the standardised integration of services and processes. This was evidenced by the findings elaborated and interpreted above. All business processes such as bill payments and service requests are integrated and connect to the same back end process. The findings showed that there is a great need to configure the business processes in a public organisation due to the sizes and needs involved.

4.3.7 Organisational transformation

The ERP system brought about a significant organisational transformation, whereby legacy structures from the separate municipalities were merged to enhance process flows in the new uni-city. Integration brought about benefits to the residents by enhancing information availability, visibility and accessibility. This is an important aspect of service delivery. A complete overhaul of a number of business processes is noticeable as access to the City is enhanced. Citizens can now access services through multiple channels such as telephone, Short Message Service (SMS), the internet portal, etc., giving the residents choice each time they interact with the City. One respondent noted how the business processes are integrated to benefit the citizens as he said:

> *"We are now at a point where all that good work that we invested at the back-end, and to take that through portals, we can now support the citizens better because if the citizen*

logs on to our portal, we have the back office to support that. Whether, they walk in or phone in, walk into a cash office, or SMS or email, there is one same business process" (Interviewee 3, 2012).

As noted, residents can now avoid waiting in long queues or in one office or even one office after another by visiting one point of service delivery to access the different services, such as paying a water and an electricity bill. The information availability has increased the response to service requests, as compared to stand-alone systems that were used prior to the ERP system implementation. Integration is described by interviewees in the following excerpts:

"Integration of the City systems resulted in all departments working in unison on a single computer system. This enabled fast response, because of information availability. It actually made services accessible faster. Less staff can now deliver all different services, from one integrated huge system." (Interviewee 3, 2012); and

"The most recent application we have got live is one in which the citizen has the ability to to code a notification on our website. A citizen can log on to our website right now, report a pothole, report a broken pipe and this log is captured directly into the ERP system. So that's the manner in which we are trying to reach out to the people"(Interviewee 5 2012).

These quotations indicate the level of organisational transformation that the Municipality changed from a site bound service delivery to a free and self-service organisation. It is self-evident that the citizens will enjoy the web-services now and in the future as more and more people are joining the connected community. To support these transformational benefits, the Municipality made available free public limited internet access, for example, via all its libraries. This affords anyone, who wishes to enjoy the benefits, much needed access to the internet, levelling out the division between the rich who can access the services from home and the poor who will still access the web enabled services. The transformation of the City enabled the creation of a social value that closed the gaps between the socio-economic status of the citizens.

4.3.8 Increased trust

One difference that emerged from the interviews was the need to build a trustworthy relationship between the City and the citizens. Currently, this relationship is very poor with citizens protesting and complaining citing poor service delivery. With the transparent manner in which all business processes and transaction will be conducted with the support of the ERP system, there will be a perceived drastic change in the way the citizens perceive the way their monies are utilised. The only challenge is for the City to enlighten and educate the citizens of the ways in which they can take advantage of the available services to audit the

City. The ERP system will enable every citizen to check on the accountability issues as one respondent revealed when he said:

> *"We are building a trustworthy relationship with our citizens in which everything we do is open and transparent through the ERP system configured decisions" (Intervieewe 5, 2012).*

The trust between the City and the citizens is also increased through the new services that are enabled by the ERP system such as the free calls, online interactions and service requests follow-ups. These services were not available prior to the ERP system implementation. Enhanced communication is the key to trustworthy relationships.

4.3.9 Summary of this finding

Notwithstanding that generic benefits which are evident in any ERP system implementation, the benefits discussed in this section were noted with special reference to how these translate into value for citizens. Since the list detailed above is common, it should be taken as the starting point to check whether these benefits are available as they are not automatically available. It is, therefore, not enough to mention the public institution aligned benefits without making reference to these benefits. These benefits are not visible to the ordinary citizen. Having noted these, the following findings examine more closely, ERP system benefits which are unique to public sector needs and environment.

4.4 Efficient and effective use of public money

The ERP system provides unlimited opportunities for the City to explore and ensure the sustainability of the City for the benefit of all the citizens. The fact that the Municipality has a stable financial control will indirectly benefit the citizens as the City's plan for better services will be successfully implemented as well. The ERP system now effectively supports revenue collection, which results in financial stability. The system fiurther supports efficient financial management and reporting, which forms the success of any organisation, especially within the public domain. The extracts below support the notion that the strategic objectives of the Municipality are enabled by the ERP system's implementation objective that aims to sustain the City in the long term.

> *"The City's functions, service delivery and growth are not possible without effective revenue collection and expenditure, excellent financial management and reporting, and viable and sustainable budgeting. We are confident that with the way SAP supports these core functions…" (Interviewee 2, 2012).*

The citizens would want to pass on the City to their siblings and generations to come without compromising the quality of life. This highlights issues of continuity and sustainability. The ERP system upholds the sustainability of the Municipality, as portrayed by the following excerpts:

> *"Yes we have spread sheet jockeys today, individuals that still think that SAP will be switched off one day and then can go back out there to their legacy systems, it is not going to happen." (Interviewee 2, 2012).*

Given the foregoing, the reality at the Municipality today is that the majority of their key business processes are supported by the ERP system. These range from rubbish bin collection payroll and emergency vehicle dispatch. Thus, the ERP system usage has become the backbone of this organisation. If SAP goes down then not only will crucial functions such as revenue collection not take place, but also all other business processes, even pothole patching, because each process has to be informed by the system. Therefore, the ERP system has become the strategic application in this organisation. This is what an operational ERP system can enable, resulting in the sustainability of the benefits associated with its implementation. However, some individuals are comfortable with the legacy system and wish they could return to the disparate systems. Nevertheless, the ERP system is able to overshadow them by enabling more and more benefits.

Managers of the City are concerned with the quality of service delivery. It is becoming more complex as people have access to information especially with regard to what they should expect. The citizens' awareness levels are increased partly, by education and partly by high levels of interaction of citizens with the global village. Residents are better informed through the use of the internet, news agencies, researchers and so forth. The city managers took a pro-active approach and planned to extend functionalities in line with technological developments. They decided to join other organisations that are using ERP systems to support business processes.

The findings detailed in this section can further be expanded into issues such as the way the ERP system utilisation:

- promotes financial sustainability of the City;
- lowers overall ICT costs;
- enables an efficient budget for the City; and
- results in better governance.

4.4.1 Financial sustainability of the City

Given the mentioned solid platform of an intact back end, it is perceived that the benefits made available so far will continue to exist over the medium to longer term. The objective to improve the service delivery is being sustainably achieved because of the ERP system implementation. The citation that follows from the CIO of the Municipality attests to this:

> *"The purpose of local authorities or a municipality is primarily for service delivery to its citizens on one hand, on a short term sort of objective, then on the longer to put in place good solid asset management processes, good and solid accounting processes to good processes that ensure that you leave behind a city or town that the next generations can build on and prosper. An ERP system in its core talks to those kind of activities and enabling organisations to achieve those objectives" (Interviewee 1, 2012).*

The foregoing attests to the fact that sustainability of the City is at the centre of the ERP system implementation. The only way the City management can ensure that the legacy of the City is maintained is by putting in place solid asset management processes as well as good accounting processes. This is where the ERP system comes in to support these solid processes. Other issues that support the sustainability of the City are improved governance and efficient budgeting that are still supported by the system.

4.4.2 Lower IT operational costs

The ERP system ensures that business processes are executed in a disciplined manner. The economies of scale benefit the citizens when IT resources such as the repository database are shared. Instead of having a database server for each department, the integrational capacity enables the City to share a common database that will be manned by a single administartor, thereby ultimately reducing the costs. The Municipality as a public institution with a diversity of stakeholders is extremely sensitive to costs. The administrators of public funds are able to lower costs in transparent and consistent ways. As the following interview excerpt demonstrates, the ERP system reduced the IT costs through resource sharing capability:

> *"We have driven down the IT costs. ERP systems are expensive if you use them as stand alone system. With an ERP system you reduce or eliminate duplication altogether. Duplication of all resources from manpower to printers through what we call 'shared resources'. Citizens are getting a cheaper IT service, they are getting more functionality, and they are getting reliable process execution" (Interviewee1, 2012).*

The foregoing is supported by the fact that the networked societies specifically support resource sharing in organisations. The Municipality is no exception to this. Sharing of resources begins with very small gadgets like printers or scanners in offices. The reduction of the overall IT costs is higher if more functionality is enabled by the use of the ERP system in the key business processes.

Cheaper communication

One more important feature is enhanced availability and accessibility of information at a cheaper cost both to the citizen and the City. With the use of free calls, the City has a mandate to limit the duration of each service request call. This is made possible by the enhanced information accessibility when information can be accessed by the click of a mouse. The efficiency of accessing details recorded on the ERP system further lowers the overall costs as well. If all citizens can submit their meter readings through the portal, then a significant saving will be made on manpower. Increased productivity results in low operational costs. The following example further illustrates this:

> *"…so we don't have lots of employees collecting readings at your premises, so as a citizen you are saving money on collecting data." (Interviewee 8, 2012).*

By reducing the number of employees and replacing them with ERP system modules, the Municipality enhances sustainability not only of IT costs but the general operational costs. However, budget cutting is not clearly visible as the initial cost of the ERP system is generally very high. Nevertheless, in the long term the use of an ERP system eventually results in lower operational and maintenance costs. This is mainly because ERP system running costs are always reducing. The ERP system is more sustainable as it works 24/7 offering services without human interaction and making it the best asset the City can count on. The system also reduced running costs in numerous ways such as by eliminating data duplication that in turn led to lower costs on storage space and by sharing of resources. However, these cost reduction strategies that are supported by the ERP system must be achieved without lowering the quality of services.

4.4.3 Efficient budget

The ERP system enables not only revenue increase but also cost containment. Poor accounting methods are avoided that result in financial problems for organisations. Though the benefit of an efficient budget appears indirect, money matters are always of interest to all the stakeholders. Efficient collection of revenue translates to high service levels, as the

Municipality is perceived to have sufficient money to provide the required services. The Municipality is now using the ERP system to plan revenue collection and consequently successfully meet its revenue collection targets. Besides creation of financial value through strict and consistent policies, the ERP system is now able to charge individuals selectively without favour. The ERP system helps to identify those citizens who are privileged to be better positioned financially. Even though there is a complex formula used to determine rates, including the size of the property, amount of utilities consumed, size of the building, etc., the location of the property is the highest contributor. For example, those staying in the affluent suburbs such as the Southern Suburbs are targeted to pay higher rates than those residing in locations such as Khayelitsha for the same size of property or same consumption of utilities. The head of Customer Relationship Management offered a vital insight in this respect as cited below:

> *"…because we are operating within an ERP system, a system with strong integration, you can start what I call socially just tariffs; that is, charging people for services which addresses the reality of South African, Cape Town, of people who can pay versus people who can't pay and people who can pay and choose not to pay are the ones on target, but people who cannot pay" (Interviewee 3, 2012).*

The issue of efficiency also affects the spending by the Municipality. Having successfully collected the revenue, the ERP system goes on to support the best pattern of spending. Resource allocation is efficiently executed with the support of the ERP. If all the information is available, determination of the needy areas and resources allocation will then be easilly done. The following quote from an IT manager supports this finding:

> *"The ERP system must be used to its fullest capacity to assist the management of the City resources to provide a better and affordable service to all its residents. To be able to do this, change must be managed in such a way that people are motivated to fulfill the vision of the City to deliver efficient services. SAP must be used to a maximum as a tool to help people to be focussed" (Interviewee 5, 2012).*

The efficiency of the budget is a result of an efficient collection of payments that results from consistent decision-making and accurate transactional recordings. This is enabled by the ERP system that can provide up to date information in real time within the whole municipality.

4.4.4 Improved governance

The system by which organisations are directed and controlled in terms of management of a web of relationships among the stakeholders is referred to as "corporate governance"

(Solomon, 2007). Insofar as municipalities are concerned, a key stakeholder is the citizen. The governance structure of a public institution determines its efficiency. It directly increases operational efficiency of the whole organisation.

Unqualified audits

Most public organisations often fail to completely account for the expenditure as expected and stipulated in the national Constitution. With the use of the ERP system, the Municipality repeatedly received unqualified audits. This gives confidence not only to the residents who are paying rates every day, but also donors and sponsors when they are assured that their funds will be put to good use. This will benefit all citizens.

In this sub-section, the role of the ERP system in improving governance is examined. The ERP system has resulted in a perfect governance structure that makes almost all day-to-day decisions promptly and with a very high level of precision. An example is the level of interaction between the citizens and the City whereby the ERP system prescribes the course of action in terms of decision making without human intervention. This one area was emphasised by the respondents as having made a huge impact on the way the Municipality previously operated. It gives the Municipality the effectiveness that is lacking in most public institutions.

Most of the governance issues are related to the internal processes, which make them indirect benefits that are not directly visible to the stakeholders. The community involvement in service provision is greatly promoted. Therefore, the respondents did not elaborate much in this section. Nevertheless, it does not make the governance issue trivial as it contributes to the overall value for the citizen.

4.4.5 Summary of the finding

In summary, the benefits discussed in this section contribute to the sustainability of the City. Given that business continuity of the City is every stakeholder's expectation, it is therefore beneficial for the ERP system to support such an important feature. If the costs of running the day-to-day business activities use of ICTs, etc., is reduced and rendered consistent, then the City will budget efficiently. This will eventually result in good governance and improved business operations.

The sustainability of the City is particularly fundamental in public organisations as there is no expectation of closure to any municipality. The citizens as clients are always there and need the services as long as they live. This is different from private oriented objectives whereby one can establish an enterprise to capitalise on a fixed duration and abandon or even

prematurely close down by choice. For example, there were projects that ran in order to target and service the World Cup period but that closed immediately thereafter. On the contrary, once a municipality is established then it will stay forever.

4.5 Direct citizen benefits

The third finding is explained here. The interaction between the citizen and the City is on-going. Every day citizens visit the Municipality offices either to access services or to pay for the rendered services. Even though an average resident is not aware of or does not need to know about the existence of the ERP system, there are a number of benefits they are directly enjoying. These form a list of tangible benefits that every citizen can see as new features within their service delivery package. These are benefits that are directly linked to the ERP. These can be clearly traced by all the stakeholders. The issues under this finding are as follows:

- Opportunity value of integration.
- More accurate profiling of citizens.
- Increased efficiency.
- Increased reliability.
- Improved service delivery.

4.5.1 Opportunity value of integration

By integrating the thirty-seven municipalities into a single municipality, the Municipality of Cape Town took advantage of the ERP system to transform the organisation. This came through as new services, enhanced old services and stoppage to unnecessary services. As discussed in section 4.2.1, systems integration results in generic benefits which are prevalent in most ERP implementations, as well as benefits specific to public institutions. The key benefits identified centred on “one stop” benefit. It is clear that city managers have a perspective that the residents are enjoying the freedom of accessing integrated services. The fact that any office within the mega-city will render the same service at the same service level is quite remarkable, especially when one considers a social injustice such as segregation where some offices would offer better services than others. The integration of the Municipality provided an opportunity to reduce social injustice by giving equal access to the City and the City services, such as ARV dispensing, through the same channels. The following excerpt portrays the elimination of the social injustices:

> *“The whole purpose of integrating the City systems was to ensure that residents access services from any single point regardless of their race or location of residence. The SAP*

ensures that their information regarding any services is available at all points and at any time. A good example is with the call centre where a single call instance can be utilised to query a number of services even from all different departments" (Interviewee 4, 2012).

The foregoing demonstrates that the call centre provides a standard platform where citizens are afforded a similar service regardless of their race or financial status.

Billing and invoicing benefits

Another notable benefit is the citizens' ability to manage their own accounts in the comfort of their homes. This brings service convenience to the citizens. The billing and invoicing services form the basic interaction of residents with the City. The billing and invoicing benefits are realised at various levels, ranging from single bill to composite bills such as water and electricity. Citizens can now access some of the basic and common services, such as checking for water and electricity bills and making payments online. They can now apply for jobs and follow up on their applications online. The ERP system is able to bring to the Municipality the quality of service which citizens have begun to expect from the corporate world, such as the banks, where customers access services via various channels. This is a big step in creation of "E-citizens". The following extract confirms this finding:

"Citizens can interact with the City online. They can now read their own electricity and water bills, update the data on their accounts online at the comfort of their homes. They can now do job applications on the portal. Lots of people are already using the portal" (Interviewee 3, 2012).

Many times citizens have had to wait for the bill to be posted to find out how much they owe. This waiting time is removed as they can contact the City through any available channel and get the informational any time they wish. This goes a long way to supporting personal budgets to the benefit of the individual or organisation concerned. What is more interesting is the involvement of the citizen in the service delivery process. This is enabled by the ERP system as cited below:

"Using the ERP system, citizens can actually make things happen for themselves and then engage the officials for value added services that they are not able to do themselves." (Interviewee 7, 2012).

Removal of bureaucratic processes

A frequent critique of the public service has been the bureaucratic processes that citizens face. Thus, opening up the administration through the ERP system will enable the citizens to

easily transact and communicate with the Municipality. These specific features produce many benefits. Previously, citizens would need to wait for special services, for example when they needed to change or update their details. This would call for lots of bureaucratic processes that are now replaced by the use of the ERP system.

Some respondents revealed that with the implementation and utilisation of the ERP system, residents can clearly notice and enjoy the benefits of efficiency. This is seen when they manage to access services anywhere at any time without waiting in long queues. This benefit can be directly associated with the ERP system or its utilisation. The emphasis is put on the tremendous reduction in turnaround time in most of the day-to-day procedures undertaken by the citizens as they request services from the City. The efficiency is made possible by the ERP system, which streamlines the processes. A good example is the time taken to get approval of a building plan that was reduced from a month to three (3) days. The following citations attest to this as follows:

> *"…send an email with whatever format, and you take it to the large format printer then you print out, you jump onto the portal and you submit your business plan application, and your 30 day turnaround time is reduced to 2 to 3 days turnaround time" (Interviewee 5, 2012), and*

> *"Equitable service delivery, the ERP system can prioritise maintenance, quicker response to the needs as there is one view of the City on one window" (Interviewee 13, 2012).*

Reduction in the turnaround time

The dramatic reduction in the turnaround time can be attributed to the support of the ERP system. Citizens no longer need to physically visit the Municipality, but just electronically exchange the necessary documentation from the comfort of their homes or offices. The change of the business process is driven by the ERP system that integrated the different sub-processes that take place. In addition, the ERP system will go a long way towards controlling every stakeholder's behaviour by defining policies and procedures that should be followed by officials. This includes the day-to-day activities such as the procedure undertaken to employ an individual, i.e. from job application to payroll management. The time that was needed for the employment process is reduced as well.

Public participation processes

The complexity associated with *public participation processes* is simplified by the utilisation of the ERP system. Citizens benefit not only if they are participating but also when they are assured that their rates are used in a transparent and honest way. There is always mistrust

between the Municipality management and the citizens; this at times results in demonstrations. If the citizens see transparency in the whole organisation then there will be overall satisfaction among the citizens. This will also contribute to a higher value for the citizen. The CIO explained this by saying:

> *"Once a process is agreed upon and 'hard coded' no-one can change or shortcut it unless the right procedure is followed to update it no matter who you are. People undermining processes or undermining policy are actually taken out of the way or eliminated through this ERP system intervention" Interviewee 1, 2012).*

The main benefit of utilising standard ways is the availability of information where all the stakeholders make informed decisions. The ERP system gives the citizens an opportunity to access not only the relevant information but also the required services. The citizens are enjoying benefits such as quick access to their integrated information and services that help them make informed decisions.

4.5.2 More accurate profiling of citizens

The single view of the resident is a benefit that citizen are perceived to be enjoying at the moment. The ERP system enables a single profile of each citizen which is supported by a single customer record. This ensures that all the interactions with the Municipality can now possibly be done through any channel of access. The Municipality has a the potential to have a correct and updated record of each citizen as all the information can be a click away. Updating your profile through one channel or one department ensures that all departments will access the updated profile at once. Citizens can now view their own profiles and correct any deviations, creating an error-free profile. However, there are certain problems that come with the freedom to update profiles which the ERP system and the Municipality have to manage. Opening up the system to a multiple stakeholder always needs a high level of monitoring. The ERP system provides the capability to monitor records and report activities as they transpire. This is a great benefit to the entire community as assurance is given that the accuracy and integrity of the information is guaranteed. The following is an example of responses from respondents who believe that the single record of a customer will enable a single view as the ERP system maintains a single updated version of each citizen's details:

> *"The whole notion of a single view of the customer, SAP calls it the business partner. As a single record of a business partner, you could log into the system once, as a core record, but you can have multiple roles, so if you are a supplier of the City, you have the role of being the vendor and if you are an employee of the City, you have the role employee, so and if you are a property owner you have the role of being the property owner and if you are just a recipient of social grants…" (Interviewee 4, 2012).*

As noted above, the ERP system will further profile a citizen into categories with special relationships that link them to its existence, such as employees, ratepayers, suppliers, etc. This is important in defining rules and regulations that prevent and check on corruption. For example, it is not fair for an employee of the City to be a supplier at the same moment as he might take advantage and use his other relationship with the City to gain competitive advantage. Of importance, is the need to have an accurate profile of each individual. This is not a priority in private organisations where sometimes the real name of the customer is not called for.

4.5.3 Increased efficiency

Efficient services are clearly noticeable especially in the departments that deal directly with the citizens through standardised operations and procedures. The ERP system enabled efficiency through a number of ways such as streamlining some of the business processes, by stopping some unnecessary activities and by introducing other user-friendly activities such as blogging, which aids communication with the Municipality. Residents were afforded new ways of doing business with the City such as requesting services online or even making a free call to the City via the call centre. A number of respondents were quick to point out benefits that are aligned to this notion. In line with the findings in the literature review (see Section 2.2.8), “They actually equip organisations with the tools they need to cut costs, improve operational efficiency, and to make smarter decisions faster and competitively.” Citizens are perceived to be enjoying operational efficiency, that is accurate, quality and timely information that is made available by the ERP system.The following quotes show confirmation of the above findings:

> *“I think it benefits citizens in the area of improving the efficiency of the administration and we probably talk a lot about that but there is a different financial and service delivery benefits to citizens as organisations operates efficiently. The next area I think it provides benefits to citizens is to creates more opportunities for more services the City can offer…” (Interviewee 2, 2012).*

The ERP system implementation made services available on a web portal for the citizen to easily access from the comfort of their homes. The citizen can report potholes or, while online, the exact location of the pothole can be picked. The improvement on the internal processes resulted in improved general service delivery. The following is a quote that highlights the notion of increased efficiency as citizens have a high level of information availability:

> *"Users have accelerated access to data with limited navigation when files and attachments are linked into the ERP system on configured and accessible system. Information visibility is enhanced unlike in disparate systems. In web enabled environments..." (Interviewee 7, 2012).*

The citizens actually witness the intelligence applied by the system as it gives them responses promptly without human interference. Besides promptly receiving a response such as a bill from the Municipality, increased efficiency will also indirectly benefit the citizens as access to resources such as ARV dispensing can now be controlled by the ERP system. This is supported by the accurate profiling of individuals. These individuals can now access the Municipality from any point within or outside the Municipality's physical boundaries. Therefore, increased efficiency is a direct benefit that everyone interested can compare either with what used to happen before the implementation of the ERP system or with other cities' current quality of service delivery.

4.5.4 Increased reliability

The municipality increased its reliability in several ways. The impact is directly felt by the citizens, especially in areas such as:

Provision of accurate and timely information

The ERP system supports provision of accurate and timely information to the residents, which they can actually expect as they compare these services with those provided by the private sector, which is always presumed to be utilising advanced technology. The resultant benefits are evidenced by the millions of ratepayers around the Municipality who continue to regularly receive an accurate billing service. Some residents now access the portal and promptly receive their bills, resulting in a dependable and reliable business interaction. Respondents highlighted this benefit of reliability with statements such as:

> *"This is about the mother city, and this is about your relationship with the citizen, and your relationship with the citizen starts at one basic level. That basic level of reliability is the integrity of the bill. Citizens get the services at a pre-programmed interval without fail, be it a bill or a payment reminder. In short, the promised turnaround time is met without fail" (Interviewee 5, 2012).*

As depicted by the quote above, reliability is a result of accuracy and transparency in the processes and procedures undertaken to execute business processes. Particularly, the accuracy of the billing system is very important.

Readily availability of services

If the citizens can trace their service requests through the ERP system, then the management and the employees will always live up to their promises to provide reliable services. The citizens now access several essential services directly from the system without human intervention. Automated workflows are more reliable as scheduled tasks are definitely undertaken, for example, bill postage can be scheduled for the first day of the month. These services are available 24/7 without fail once incorporated and commissioned through the ERP system.

4.5.5 Improved service delivery

The improvement in service delivery is mainly measured by improvement in response, amongst other key indicators. That is, from the time the service is requested to the time it is delivered. This response time is always relative but a significant improvement is also visible with the use of the ERP system. If your personal details are already on the system and readily accessible, then there will be an improved response every time you need a service.

The value of any system is in its use. This means that the value of the ERP system is in what it can do, how it can improve service delivery standards. The ERP system implementation is definitely a service improvement strategy. The ERP system provides effective tools for measuring and optimising performance within business processes, resulting in improved service delivery to the citizen.

One stop shop

An example is the one stop shop whereby a citizen can access a variety of services from one service delivery shop. It is the responsibility of the Municipality management to ensure that the true value of the ERP system is upheld by putting in place mechanisms that ensure maximum benefits to the citizens. The ERP system brought about new ways of doing things and new things that were never thought of before. The capability of the ERP system is described by one of the research respondents as follows:

> *"The ERP system implementation creates opportunities or new organisational capabilities by enabling Municipalities to do something new, involving using the ERP system, doing something in a new way using the ERP system and using new ERP system to do something it could not do before" (Interviewee 6, 2012).*

The foregoing demonstrate that the Municipality is now at a point where all the investment into the back-end processes is now maturing as that can now be taken to the front front-end. This can now be accessed through portals to support the citizens better because as the citizen logs on to the portal, he or she is actually accessing the back-end. This back-end can

now support any communication channel, whether the citizen walks in or phones in, walks into a cash office, or sends an SMS or emails; there is always one similar business process that is supported by the back-end. The configuration that comes with the ERP system gives it the value that can never be compared with the ordinary computer's usage. A senior manager who recognised the value of the ERP system in operation suggested that:

> *"The citizens are benefitting because the resources of the City have now been able to be released to actually offer value-added service to citizens that business processes and computers couldn't do in the past" (Interviewee 4, 2012).*

Apart from the above-mentioned scenario, the ERP system implementation and utilisation enabled a number of capabilities that consequently benefitted the citizens.

The free call line

The call centre can be accessed through free calls. This becomes the basic point of interaction with modern businesses and the Municipality is no exception. The ERP system supports a truly functional call centre by providing accurate information timeously. Citizens utilise the call centre to access a variety of services such as service requests, personal information update, complaints, or even tracing service requests. According to one of the interviewees:

> *"The volume of calls that is enabled by the ERP system is awesome. Imagine! We are able to talk to five and half thousand customers per day. We have details of all the customers, employees who log complaints, for example, drain cover stolen, or branches, and can be traced through the service request and its status at any time. We can now keep track of which roads need more attention…" (Interviewee 3, 2012).*

The quotation above highlights the fact that the ERP system did not just support the ordinary business processes but also brought about new processes and services. These new services are thus contributing to value for the citizen. For those citizens who have been interacting with the City from the pre-ERP system utilisation up to now, the post implementation period, the value of this system is clearer. These citizens can see the difference in all the business processes of the Municipality. For example, previously you would not expect to successfully call any department of the Municipality to complain, let alone to request a service. The ERP system has now enabled anyone to call the City. The majority of citizens in the towns own or have access to a cell phone or a telephone. This makes it the easiest channel that anyone can access, especially given that the calls are free of charge.

Overcome the legacy of apartheid

The evidence indicates that the integration of business processes, as discussed in Section 4.3.1 above, is of paramount importance. The residents of Cape Town now have equal access to services, irrespective of their physical location or socio-economic background. The ERP system thus has a central role in removing the disparities which were created through apartheid planning. It brought about the eradication of preferential services. The ERP system has transformed the service delivery differences where some suburbs were preferentially treated. Citizens can now access the City through multiple channels, regardless of their economic status. Those citizens who were previously disadvantaged tend to benefit most, even though every citizen is perceived to be enjoying this improvement in service delivery. This is endorsed by one of the interviewees, who indicated that:

> *"Our citizens now have equal treatment. The ERP serves them at equal level with the same respect, regardless of their wealth or status" (Interviewee 7, 2012).*

This benefit of equal treatment is enabled mainly through "self-service" features of the ERP system where services are rendered without human interference. The levelling of the playing field also extends to those services that involve human interaction. For example, anyone with internet access will be able to contact the City and anyone with a cellphone, even without airtime, can access the call centre and engage with the Municipality. The following excerpt demonstrates that the Municipality management is aware of how the ERP system impacts on service delivery through the establishment of a solid "back-end platform":

> *"The ERP system brought a new life to the whole municipality. Accessing the City free is the best thing ever to happen to the citizens. The call centre is a busy hub …" (Interviewee 3, 2012)*

It is worth noting that the reality at the grassroots community level as constantly reported in the public media indicates that residents are still protesting about poor service delivery. Nevertheless, in terms of the evidence in this study, there is confirmation that the ERP system does play a role in improving service delivery. However whilst the efficiencies of the ERP are evident, there are still outstanding issues that require the attention of the City's planners and management, as service delivery is dependent on other factors as well, e.g. political issues, budget allocation, etc. Given all the benefits enabled by the ERP system, it is clear that the residents have other services that cannot be catered for by the ERP. An

example is the free houses politically promised but economically not viable. It is also possible that the residents are abusing the term “service delivery” to refer to anything they expect to receive from the local government or even the state. The head of change management confirmed this argument when she said:

> *“…deliverables in the first phase were primarily aimed at addressing the core back office business processes associated with any large enterprise, such as the accounting, financial processes, the human resources and payroll type processes, logistical processes like supply chain and procurement, and inventory management, revenue processes, all that was put in place. People always complain that the rate is too slow…” (Interviewee 5, 2012).*

The strategy that was applied to implement all the modules that constitute the core back office ensured that all the services would improve as they are linked to the ERP system. All the ERP system benefits are supported by the back office modules because of the way they support services. Therefore, complete back office ensured that all the related services would improve. It is perceived by the City management that no key services will be left lagging behind, as all the key services will be driven by the ERP system. A special note about the improved service is that citizens can now access the City for service requests or complaints at any time of the day as the ERP system can handle the interactions without human intervention. All routine requests are now accessible from the ERP system, giving every citizen an equal opportunity. One respondent said:

> *“If you call for a pothole, the system records it and initiates the same process all the time, regardless of who called and from where…” (Interviewee 11, 2012)*

The concept of accessing the Municipality from multiple channels and affording a standard response to anyone who interacts with the City is provided by the ERP system. The efficiency of the interaction is felt by those who can compare with the previous quality of service delivery they experienced before the ERP system was implemented. The perception of citizens of improvement in quality of service enhances the overall efficiency of the Municipality.

The foregoing is an overview of ERP system benefits as envisaged in the original business case when the ERP system was introduced. However, an analysis of the evidence indicates that there are other benefits which may be (are being) realised. It was also prudent to find out if there are any benefits that are not yet realised but also contribute to a higher value for the

citizen if included in the current list of benefits. These were analysed and interpreted as illustrated in the section below.

4.5.6 Summary of the finding

Tangible citizen benefits are the benefits that any resident can witness even though most of the residents have no idea what has enabled them. A high value for the citizen results when the citizens are afforded the benefits discussed above. For example, when a meter reading is entered, the process that follows will clearly indicated the waiting period until the personal bill is received. The involvement of citizens is strictly monitored by the ERP system, enabling an accurate audit of all transactions.

The fact that all the interested parties are assured that all procedures are pre-configured gives a peace of mind, which results in social upliftment where the citizens live in harmony with the Municipality management. This can possibly reduce if not eliminate public demonstrations that are so prevalent in our modern society among the populace of the Municipality now.

In summary, Section 4 has examined the ways in which the municipal ERP system contributes to a higher value for the citizen. It expanded on the findings of the Municipality's status quo, the generic citizen benefits, the financial sustainability and lastly the tangible citizen benefits that result from ERP system implementation and utilisation. These findings were in direct response to the research question which reads: "How does an operational ERP system contribute value for the citizen?" Specifically, it is all about how those benefits are changing the value for the citizen.

4.6 Effective ERP system benefits management

This section answers the research sub-question number seven (7) that reads: "How could the Municipality management ensure delivery of maximum benefits?" The Municipality has the responsibility to put in all the effort to raise awareness among the residents of the available benefits. The Municipality is working on two fronts. The first and easiest is to advertise the benefits that are enabled by the ERP system. It is really important since there are new business processes now available and old business processes are re-configured through vigorous customisation to take beneficial dimensions. The second is to manage those benefits in a sustainable manner.

Following the Benefits Management Cycle (Ward & Daniel, 2006:119), the Municipality having identified and structured the benefits as per its planning, is now busy executing these benefits. This stage should be followed by the review stage, which checks to see whether the planned benefits are actually accrued and sustained

Improving the public infrastructure as far as connectivity is concerned is part of what the Municipality is doing to ensure that the citizens glean maximum benefits from the ERP system implementation. However, the Municipality does not have any formal benefit management scheme; even though they have principles and procedures, they are undertaking to extend benefits to the citizens. During the interviews managers did allude to benefits, but without any discussion of a benefit management approach. One senior manager indicated that:

> *"I would also want to see our organisation adopting a Benefits Management Approach. Any approach to realising benefits from IT investments must be able to address the principles identified as problem-based and innovation-based implementations" (Interviewee 4, 2012).*

The absence of a benefits management scheme results in some benefits being overlooked or overshadowed as the different stakeholders in the City will always emphasise their own priorities. If the Municipality utilises a benefits management framework, it will ensure that all the benefits are managed according to the value they are defined to contribute.

Two crucial issues that are detailed under this finding are as follows:

- Public awareness campaign;
- ERP system self-management; and
- ERP systems success benefits as follows:

4.6.1 Public awareness campaign

A number of media channels are being used to raise awareness as to the existence of benefits as the citizens take advantage of the new services' accessibility enabled by the ERP system. Advertising is a traditional way of alerting clients to products and services and, as such, the Municipality is no exception. Given the diversity of the benefits and ways to access them, it is only prudent for the Municipality to encompass as many ways and channels as possible. These channels include billboards, local radios and newspapers, posters in sites of service delivery, the internet, etc. If this availability of services online or through cell phones is not communicated to the citizens, then queues will still flourish in the offices. The following citations confirm that all media channels are used to raise awareness of the availability of services to ensure maximum benefit delivery to the citizens:

> *"We are currently running lots of campaigns to the communities. Mainly communication is through local newspapers, local councillors, local libraries and the internet. Those who do not have internet access and need internet can now access the ERP system through our*

libraries. Residents can now find vacancies, apply for jobs, on their own without any official delaying them. Ninety per cent of our recruitment is now done online through the portal, with the support of the ERP system. All these measures are there to raise awareness among the residents of the capabilities brought about by the ERP" (Interviewee 8, 2012).

Management has put mechanisms in place to arouse awareness among the residents of the availability of some benefits. They are doing this through a variety of media such as radio stations, print media such as newspapers, campaigns, and even the local political leadership to try to reach even the poorest resident. The Municipality website has enough information for the privileged citizens who are already aware of the existence of such facilities via the internet.

The foregoing is a demonstration of the actions that are to improve access to the benefits extended by the ERP system. Thus, this becomes the first step towards benefit management, the aim being to manage the benefits in a sustainable manner that is fair and transparent to the diversity of citizens that forms the population of the City of Cape Town. Having managed the soft side of the ERP system, i.e. the benefits access, there is always a need to manage the technical side. This is done as detailed in the section below.

4.6.2 ERP system self-management

Effective management of the ERP system results in improved customer services. The ERP system is self-managed, making it the integral part of the Municipality assets. The other rather difficult and indirect benefit-enabling endeavour is that the Municipality is configuring and customising the ERP system to ensure that the intended recipients, the citizens, glean maximum benefits. The Municipality has completed the back-end office configuration first, so that all the other possible front-end processes will start flowing from there. These front-end processes will support and extend direct citizen benefits. The following quote supports the above-mentioned finding:

"The system we are running is now self-managed. There is a particular reason why we spent ten years investing in a back-end. You can only help someone adequately in the front desk, if your back office is sound; and if your back office is broken, then you are just a pretty face"(Interviewee 7, 2012).

In line with the fourth step of the benefit management model by Ward and Daniel (2006:119) and given the ever-evolving technologies, the Municipality management should keep on assessing the potential untapped capabilities of the ERP systems. The city is expecting what they call transformative collaboration where the residents are involved rather than transitional

change as this is the foundation of the E-citizen, according to numerous respondents. E-citizen results from a very high level of benefits management and should involve all stakeholders. The following is a citation that shows that the managers of the Municipality are aware of the need to manage the benefits, thus they are striving to put in place measures to ensure benefits management:

> *"These changes must be identified and managed successfully if maximum benefits are to be realised. Benefits realisation and change management are therefore inextricably linked. This is obviously the case when the project is explicitly an IT-enabled or 'techno-change program" (Interviewee 4, 2012).*

The issues raised above are not exhaustive but substantiate the fact that the Municipality is aware that implementing a benefits-rich ERP system is not enough. In order to successfully close the digital divide, the Municipality management must apply measures that raise awareness of the ERP system benefits that are available. Thus, inviting the residents to utilise the available services forms the basis of ensuring maximum benefit delivery and sustainability. However, a gap still exists between the available benefits and the uptake, which is a cause for concern. This section thus leans towards what actions are required to improve benefits. The next section analyses the relationships among the various citizen benefits elaborated in the sections above.

4.7 Discussion on findings

This section provides a discussion that harmonises the findings in the different sections of this chapter to respond to the last research sub-question, which states *"How are the identified benefits related to each other?*" Initial findings revealed that the ERP system is successful, as elaborated in the case study section. However, a further analysis of the factors that were considered showed that the assessment was based on a standard ERP system. The factors found here included the actual integration of the systems, the general standardisation of business processes throughout the City to international comparison and the transparency of the new system that is brought about by the organisational transformation. This called for a further reflection and synthesis of the findings to ascertain whether the requirements of the ERP system within the public institution standards were met.

ERP systems critical success factors in private organisations are well documented (Lyytinen & Hirschheim, 1987). However, a closer look at these factors divulges that the emphasis is on the internal systems benefits. A further analysis of the findings above reveals that management of public institutions needs to know and identify the critical success factors

more than those in the private sector. This is mainly due to the diversity and the number of citizens involved. These citizens come with a diversity of expectations. With high levels of information sharing in this "information age" this problem is exacerbated as citizens share and exaggerate any problem they might have encountered.

The research reveals that the Municipality management is focussing on the citizens. At least having finished the back-end processes, what is left is the front-end. A public ERP system should provide benefits to the public and not only to management from the internal processes only. Nevertheless, it must be noted that the success of the front-end functions such as self-service billing is directly dependent on the back-end operations that do the calculations and the manipulation behind the scenes.

If the Municipality management is aware of the critical success factors, then they will be in a position to defend their expenditure on certain decisions that target citizen benefits. Priorities will then be accurately and confidently defined. The benefits that were detailed from Section 4.2 are in line with the critical success factors found in the literature review. For example, the standardisation and integration of the Municipality systems resolved the problem of legacy systems and legacy data. Since the citizens moved from disparate administration to an integrated administration, the legacy data in terms of the citizens' information needed special consideration. From the evidence, it could not be concluded that management was focussed on evaluation of system benefits even though all of the effort so far has resulted in benefits for the citizens. Nevertheless, the findings revealed that even though there is a high perception that all the stakeholders are satisfied with the progress so far, the citizens are not yet getting a number of potential benefits.

The critical success factor of communication among stakeholders was revealed by the finding that multiple channels are being used by the Technical and Customer Support processes. However it was not clear what kind of response the citizens were giving as to whether they liked the developments or whether they were just forced to use these new enabled channels. The top management indicated that there was a concerted effort to arouse awareness to the existence of services to the citizens. However, the findings were not clear as to why the Municipality management had to worry about the communication lines with the citizens showing that communication within the organisation is lacking on the business case. Alternatively, this might mean that the Municipality did not have the citizen benefits as its primary strategic objective as it is supposed to have.

The issue of security was not idenitfied even though evidence is available that citizens now trust that the transparency levels enabled by the ERP system give them confidence in the level of security. The benefit of a single integrated repository supports this as citizens will

have only one record to check and update each time they have a change in their information, be it an address or even financial status. Maybe the security issue was considered as a basic benefit that is given by the respondents. However, public institutions must emphasise security since they deal with high profile individuals and ordinary people who have no option but to rely on the City for services and protection.

The research could not disclose how the municipal ERP system benefits the visitors who are always thronging into the City, as revealed by the case study findings that it has so many local and foreign visitors such as the tourists. Considering these was important because these visitors also access the services and somehow contribute to the public funds that are eventually used to support the ERP system. Nevertheless, the City must safeguard the integrity and reputation of the city by accommodating visitors in the same manner as it does the citizens.

Most of the benefits can arguably be dismissed as obvious but it should be noted that all ERP systems citizen benefits have to be managed somehow to ensure that the City is sustainably more effective and efficient. This is why there are still long queues in the Municipality cash halls and pay-points even though most of the services are now accessible through other means and channels. With the main objective to transform the disparate municipalities into a single unit, the mega-city, citizen benefits will not obviously accrue to the public without a concerted effort to manage not only their identification but also their delivery and sustainability. The business case thus lacked the emphasis on the main stakeholder, which can be a problem if there is no proper evaluation taking place at regular intervals.

4.8 Conclusion

This chapter presents the findings and the discussions in response to the research questions (refer to Table 1.1). The findings are given in the form of a narration that details them along thematic lines. These findings brought to the fore the following:

4.8.1 Summary of findings

The key findings can be summarised as follows:

- The Municipality has successfully implemented the back office part of the ERP system and residents are already enjoying the related benefits, such as a single customer record. The foregoing is a demonstration of the capabilities and functionality of an ERP system in a municipality.
- Citizens now have a one-stop shop when it comes to interaction with the City. This was enabled by the interdepartmental and disparate systems' integration. This is currently very crucial when citizens pay their different bills such as water, electricity, etc.

- The Municipality now has increased efficiency and effectiveness as it has timeous information availability for decision makers. Reaction to service requests and turn-around time on business processes is now sustainably improved.
- The citizens can now access some of the City services through “multi-channels” that are consistent and standardised. They can now e-mail, send SMS, log on to the website, or even call for free to communicate to the same service request business process.
- The high level of transparency and accountability enabled by the ERP system usage eliminates corrupt activities. This is done through consistency and standardisation of accounting policies and procedures. Unqualified audits are evidence of this notion.
- The City has an improved governance structure. This is supported by an efficient budget and lower IT operational costs, resulting in long-term financial sustainability.
- Business process configuration facilitated migration from the legacy systems that were already outdated and functionally inadequate. This means that besides solving problems for the City, the ERP system brought about functionalities.
- The City is busy with raising awareness among the public of the existing benefits through local radio stations, awareness campaigns, road shows, newspapers, etc.
- Residents can now find vacancies and apply for jobs, on their own without any official intervention. Ninety per cent of the City’s recruitment is now being done online through the portal, with the support of the ERP s
- Citizens now have quick, reliable and equal access to the City services, especially the previously disadvantaged citizens. This is extended by multi-channel access to a single customer record within the City services database.

4.8.2 Integrated view of benefits

After reflecting on the findings, several important issues emerged concerning benefits and the management thereof. These are:

- The financial sustainability, effectiveness and efficiency of the Municipality are at the core of the ERP system implementation.
- The sustainability benefit is within a pool of tangible benefits (e.g. accurate profiling of citizens, improved service delivery, etc.). There are dependent on intangible ones (e.g. business process configuration, organisational transformation, etc.). In other words, front-end depends on back-end operations.
- The intangible benefits are an integral component of the ERP system benefits (e.g., the integration of disparate systems, control of corruption, etc.) which propelled the Municipality into implementing the ERP system to glean the benefits of financial sustainability for the City as well as other tangible benefits.
- All these benefits findings are directly associated and interwoven within the benefits management findings, which determine the accessibility of all these benefits. No benefits can be extended without proper planning and management, either directly or indirectly.

This summary of these relationships is illustrated in Figure 4.7, which illustrates how the different benefits are conjointly related.

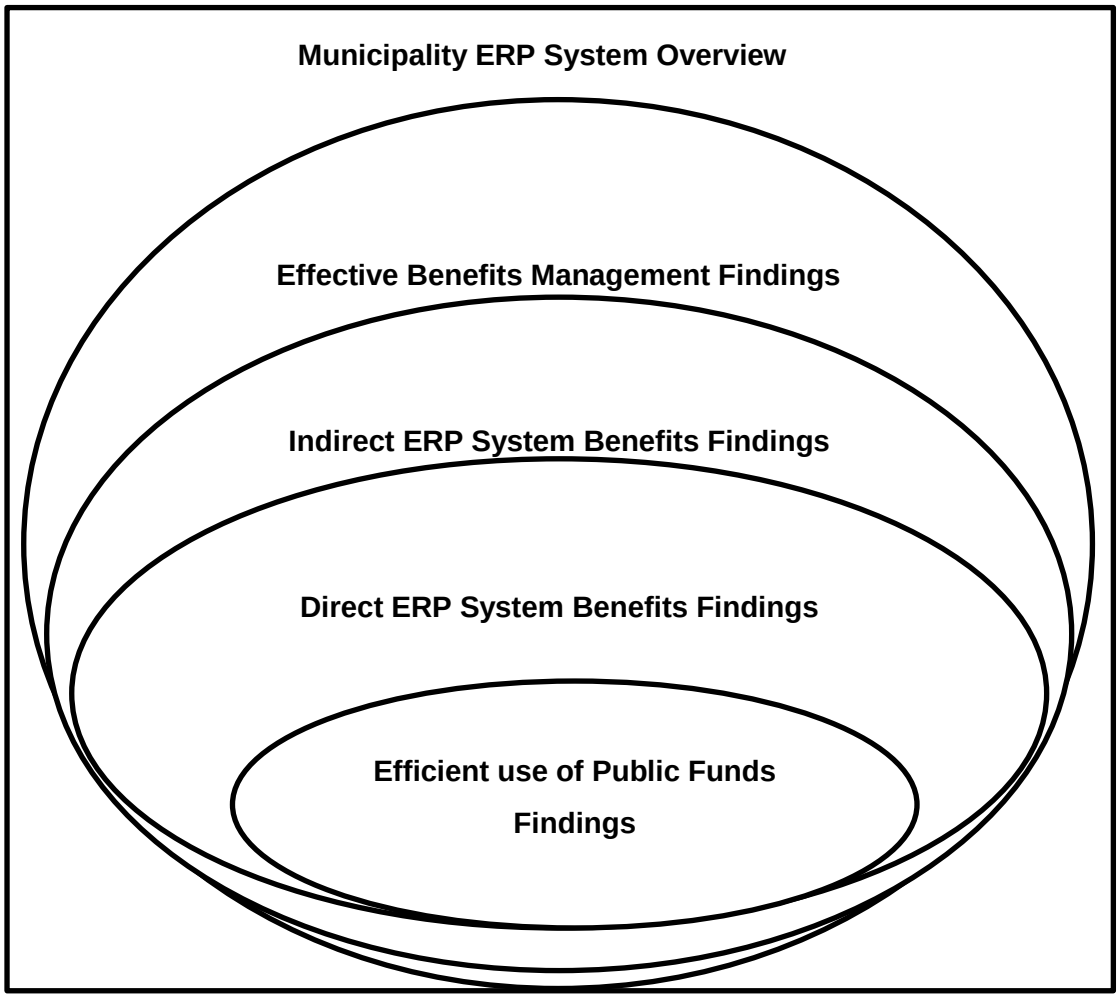


Figure 4.7: The relationships among the four findings

The Municipality then is required to effectively manage indirect benefits in a way that will enable their transformation to direct benefits, which can be easily associated with the citizens. This section above summarises the key findings, and indicates how they relate to each other. This is the foundation for the Benefits Management Checklist that will be presented in the next chapter.

An analysis of these findings above in comparison with the capabilities of the ERP systems documented in the literature shows that there is a gap between the current and the intended system. The ERP system has currently enabled far fewer citizen benefits than the potential benefits that can be extended by the ERP system, even if we compare them to the benefits

planned by the Municipality. The gap emanates from the fact that the overall potential benefits are not yet realised. Whether the residents are aware of the benefits extended to them or not or whether they know that they are being enabled by the ERP system is not important. What is important is the resultant citizen benefit. Most importantly, citizens benefit when there is a successful municipal administration in place but they do not care what will be driving the success.

The Municipality has the back office working, efficiencies are there, and duplication has been minimised through integration. This sets a solid foundation for ensuring that the other ERP system functionalities can now be implemented, and that this is being planned. This implies that the Municipality should now start to enable the front-end benefits, as they are the ones that bring more of the direct and tangible benefits that ordinary citizens will easily associate with. Benefits such as RSS feeds, an integrated bill, benefits enabled by mobile technologies, etc., will directly influence the lives of citizens. The ERP system will help not only to extend routine services, but also to solve problems that may arise. This is a point when all the promised benefits will materialise. The next chapter details the conclusions and the recommendations that emanated from these findings.

CHAPTER FIVE
CONCLUSIONS, EVALUATION AND RECOMMENDATIONS

5.1 Introduction

The previous chapter focussed on the results of the empirical study. This chapter integrates the findings of the literature study with the results of the empirical study to respond to the research questions. This capstone chapter assesses the results of the study against the primary research problem and the research questions. The chapter commences with a discussion of the main objective of the study; that is followed by a discussion on the importance of the findings. Following on this the conclusions drawn from the study are elaborated. The importance of evaluating the research also receives due attention, and thus widely accepted criteria for evaluating qualitative research that were employed follow in this regard. The research limitations are also acknowledged before final recommendations are made. Figure 5.1 that follows presents the structure of the chapter:

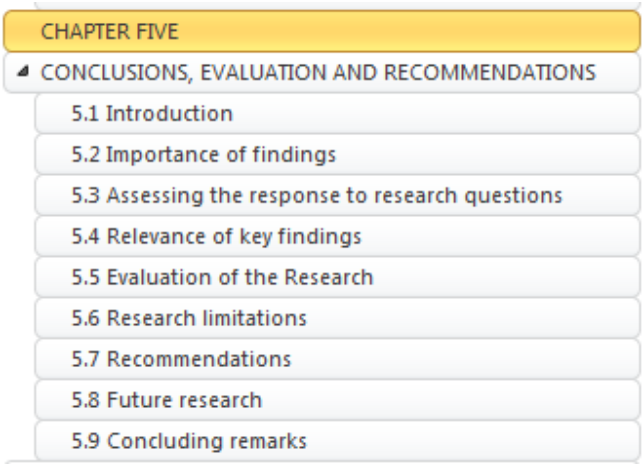


Figure 5.1: Structure of Chapter Five

The main objective of the study was to investigate how the citizen could benefit from ERP system implementations in public institutions such as a municipality. It is not enough to note that citizens benefit when ERP systems are used without elaborating how the citizens actually benefit. This notion is further complicated by the fact that there is no clear distinction between private and public systems implementation objectives. The former aims at maximising profits while the later tries to improve service delivery. This study provides

clarification in this respect by detailing how the citizens actually benefit from an operational ERP system within a public organisational arena.

5.2 Importance of findings

Given that the Office of the Presidency through the Department of National Treasury is implementing a Government-wide Monitoring and Evaluation System for assessing the impact of public funds expenditure, the findings of this study are relevant. Firstly, the findings augment the effort of the Presidency in ascertaining the value of the ERP systems that are so expensive but becoming a popular tool, especially with municipalities. While some of the benefits noted in this study seem to be obvious, it is important to consider that implementation of Government policies deals mainly with documented evidence such as this study. Therefore, the findings of this research propose a basis to develop a framework to assess the availability of citizen benefits not only in municipalities but also in other public institutions implementing ERP systems.

Secondly, besides stipulating strict procedures for all revenue, expenditure, assets and liabilities management, the PFMA (1999) at provincial and national level and the MFMA (2003) prescribe serious consequences for those public managers who fail to adhere to the set standards. Therefore, this study augments the effort by the Government in the implementation and adoption of ERP systems. This study will equip more individuals with the information as to how exactly the ERP systems contribute to elevating lives of general citizens. This is against the background of how expensive the ERP systems are.

In addition, the academic literature divulges that the academic researchers have not ventured precisely in the area of citizen benefits. Instead, there have been assumptions based on studies done on private sector enterprises. Although the literature does consist of material related to ERP systems, much of the documented literature consists of white papers that are written mostly by vendors. In this regard, many of these white papers are questionable in terms of objectivity, given that vendors are driven by profit motives to increase sales. The vendors' motivational literature further shifts the attention to the benefits for managers and system owners, whom vendors try to motivate to buy ERP systems. Their objective is to entice the managers to implement these systems at the expense of the citizen, in the case of municipalities.

Furthermore, the value of this study is that it refocusses attention on the importance of the citizen benefits. This study, therefore, will help arouse further interest within the academic arena to investigate how the ordinary citizen can benefit from the significant resources from

the public purse, which are increasingly being directed to ERP systems. It is my belief that the more the academics inquire on phenomena, the better all stakeholders understand each other's role in the overall improvement of citizens' lives. Therefore, this study provides recommendations to the municipalities and other public institutions as to how important citizen benefits are so that they do not only document them at the business case stage, but will also be able to manage and sustain them throughout the ERP system utilisation. Management of these benefits becomes crucial because of the long-term relationship that exists between the citizen and the Municipality. Each benefit that is extended must be sustained for the entire life. Public ERP system implementers will get guidance from this study.

Lastly, ordinary citizens will be enlightened as to the benefits they should expect and demand from the Municipality after an expensive ERP system implementation. This will motivate the public institution managers to ensure that they incorporate as many modules as possible and configure the ERP system as much as possible to extend as many benefits as they can possibly harness. If the citizens are knowledgeable about the benefits then there will be gratification among this special group of stakeholders in the public ERP system utilisation at large.

5.3 Assessing the response to research questions

This section summarises the assessment of the response to different research sub-questions. Each research sub-question was responded to within the thesis to give an overall response to the main research question as follows:

Table 5.1: Relationship between research sub-questions and their response

		SECTION RESPONDING TO RESEARCH SUB-QUESTION
RESEARCH SUB-QUESTION	One	Section 2.2: Defining Enterprise Resource Planning systems Section 2.3: ERP systems background and capabilities
	Two	Section 2.4: ERP systems successes and challenges
	Three	Section 2.6: Management of ICT benefits
	Four	Section 4.2: Indirect ERP-system benefits Section 4.3: Efficient and effective use of public money
	Five	Section 4.1: The Case Study
	Six	Section 4.5: Direct citizen benefits
	Seven	Section 4.4: Effective benefits management
	Eight	Section 4.6: Discussion on findings Section 4.7: Conclusion

5.4 Relevance of key findings

This section details the relevance of the findings to the real situation on the ground. It takes into consideration the difference between the public organisational environment and the much-documented private setup. The key findings are given headings as they pertain to the area of relevance:

5.4.1 Capabilities and functionality of an ERP system in a municipality

The research had an objective to establish and highlight the relevance of ERP system implementation to public organisations such as the Municipality. The research concluded that the ERP system implementation by the Municipality as a public enterprise is valid and relevant. Given all the capabilities and functionalities that support and extend citizen benefits, the implementation of ERP systems is deemed to contribute towards worthy outcomes for local government.

The ERP system has a transformative effect on the way the Municipality interacts with the citizens. However, while acknowledging that there is still further implementation to take place, it is worth noting that the Municipality is trying to take advantage of the potential citizen benefits. These include an accurate profiling of citizens, integration of departmental systems, improved service delivery by enabling efficient, effective, and reliable services, etc., and the

Municipality only has to extend additional benefits such as full self-service and e-services, etc. to further improve the value for the citizen. The best level of ERP system utilisation will be reached when these potential benefits are extended to the citizens.

5.4.2 ERP systems successes and failures

In investigating the critical success issues affecting ERP system implementation, the academic literature available lacks relevant research on ERP system benefits in the public sector. This prompted the research to derive the critical success factors that resemble public interests from those that are academically documented and which predominantly concern the private sector. A number of issues identified in the literature fitted into the case study scenario when a comparison was finally done with the findings from the empirical study. This might mean that the ERP system implementation is being implemented successfully even though it is not yet complete. Nevertheless, the Municipality also admits that it is still working towards extending more citizen benefits that are potentially possible in line with the e-citizen expectations. Time will judge as to whether these benefits will be delivered in time and at sustainable costs. The reasons for exclusion of some departments is a major concern as the concept of “integration” is not satisfactorily accomplished if other departments are still stand alone within the Municipality. Of course, the reasons are incompatibility of systems but that is what the ERP system is capable of solving.

5.4.3 Benefits management

This research also aimed at analysing available models and frameworks for understanding the benefits of ERP system implementation. It also covered two categories of citizen benefits, i.e. tangible and intangible. The Municipality does not have a formal citizen benefits management strategy besides the Policy Framework for the Government-wide Monitoring and Evaluation System that still needs a lot of alignment to fit into a municipality scenario. The Municipality is only managing the ERP system, thus treating the citizen benefits as consequential benefits without proper frameworks to plan, nurture, assess and sustain them. Proper benefits management should be targeted at sustainably maximising citizen benefits and their accessibility.

The issue of benefits management is further complicated by the fact that in a public organisation it is important to convert the indirect benefits, such as improved internal processes, to become tangible, such as improved service delivery. This happens over time as indirect benefits accrue as soon as the ERP system is implemented. Tangible or direct benefits will only emerge as a result of proper benefit management. An illustration of the above scenario is depicted in Figure 5.2 on the next page.

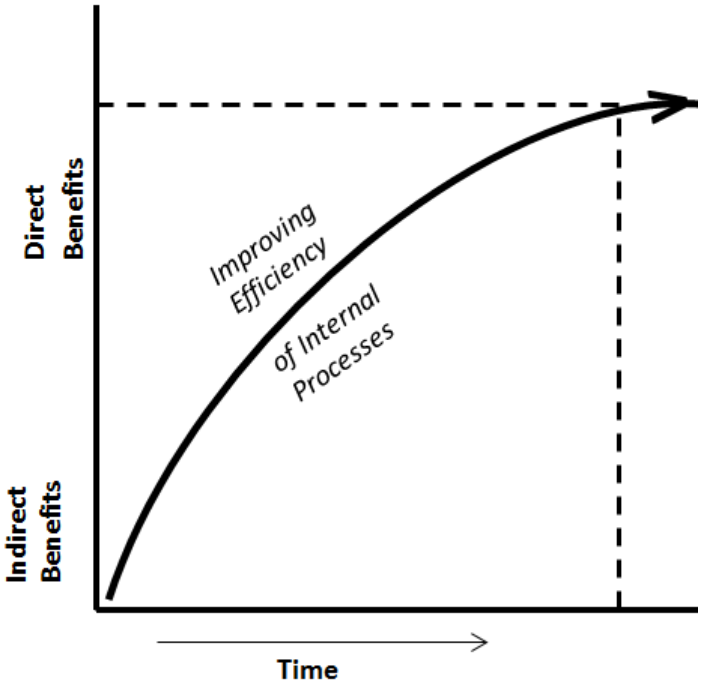


Figure 5.2: Benefits Tangibility with Time

The much needed benefits management framework must convert the indirect benefits into direct and tangible benefits that the citizens can relate to and ultimately realise. Based on Figure 5.2 above, the Municipality has accrued the indirect benefits, such as the improvement of internal processes, and is now at the stage of enabling the direct benefits. As soon as the direct benefits are extended, proper management will be needed to sustain all the benefits. More so, if consideration is given to the fact that the tangible benefits will not replace the intangible ones but augment them and result in a better overall position of both the organisation and the citizens at large. Finally, municipalities must seriously consider the issue of performance planning, i.e. government departments now have to measure their performance against expenditure as a treasury requirement. Thus having a framework of benefits will enable them to hone in on benefits, to justify initial capital outlay and on-going expenditure for ERP systems.

5.4.4 The typical benefits of public ERP systems

The relevance of this finding was to highlight the difference between the benefits extended to private organisations ERP systems and public by ones implementing. Given the scarcity of academic literature on this area, it was important to note the benefits expected within

municipalities. This finding noted benefits related to ERP system implementation, based on previous studies (see Section 2.6) and the empirical evidence. This research examined the foundation that was laid by the ERP system to provide a continuous efficient and effective improvement in service delivery to the citizens.The findings define the basic benefits. Any organisation implementing an ERP system must not only ensure realisation but also sustainability through the lifetime of the ERP system. The benefits are categorised in accordance with the themes that emerged from the data analysis to make them more understandable, even to the ordinary citizen.

5.4.5 The ERP system at the Municipality

The study intended to establish the status of ERP system application at the Municipality of Cape Town (the Case Study). Thus, this section gives the setup in which the study was undertaken without which many findings become meaningless. It details the phases undergone so far in the implementation of the ERP system. This gives a better understanding of whether citizens are gleaning the maximum benefits in accordance with the extent to which the implementation has progressed. The Municipality ERP system is still under implementation with further modules still pending. The back office is now complete to support the system. Several projects that are already supported by the ERP system are directly benefitting the citizens. For example, the smart city initiatives will see citizens accessing multiple services from the City, such as transport, recreation, etc., using smart cards. This means that even the configuration and integration-aligned benefits are not yet fully gleaned in comparison with the full potential of the ERP system.

However, an analysis of the benefits extended so far and the business case shows that most of the benefits that were used to convince the stakeholders to support the ERP system implementation are now achieved. Therefore, the citizen benefits that are extended by the ERP system so far support the concept of a successful implementation. The pace of adoption and utilisation depends on the circumstances within which the ERP system is implemented. This ERP system implementation is one of the few in South Africa; thus every development on it is effected without confidence and certainty. Most of the stakeholders are not sure what to expect now. Currently, the Municipality ERP system is slowly extending e-citizen benefits to residents as they form the operational and tangible benefits that citizens directly enjoy now and expect tomorrow. Therefore, an assessment of the status quo that details achievements so far becomes crucial in giving the implementers the confidence they deserve. It goes on to boost the transparency that the ERP system is bound to support when the citizens are aware of the benefits that are available for their consumption.

5.4.6 ERP system contribution to maximum citizen value

This study aimed at finding out if citizens are afforded maximum value from these technology investments such as ERP systems in municipalities. This was done through identification of the planned and realised benefits, whether tangible or intangible. Greater business performance and efficiency resulted from integration of all critical business functions. This finding proved that the value of the system is in its use and not necessarily in its existence. It explained that the way the ERP system is used could result in citizens failing to benefit even though their funds would have been used. It highlighted the indirect benefits that are invisible and very difficult to measure in fiscal terms.

The indirect ERP system benefits such as transparency, organisational transformation, business process configuration or even the control of corruption are difficult to account for in the business case. These are, however, directly linked to the other direct ERP system benefits. For example, effective benefits management results not only in efficient use of public funds, but also both direct and indirect benefits. An accumulation of these benefits results in increased value for the citizen. What determine a high citizen value are the availability, accessibility and sustainability of all the possible benefits. This means that any public organisation that only accrues indirect benefits cannot be categorised as a failure. Even though the citizens may not be concerned about the specifics of how the Municipality officials are fighting corruption, they just want to see it eliminated. The Municipality should not be influenced by the citizens, who are only aware of the direct benefits. This means the onus is on the implementers to identify and structure the benefits for the citizens without the influence of the nature of the benefits. Again, instead of explaining and justifying how the legacy systems were integrated, it is necessary just to ensure that citizens access their information anytime and anywhere (one stop shop). Therefore, this study highlighted that all benefits are crucial as they contribute to a better life for the citizens.

Finally, this finding highlighted the difference between the public aligned organisation and the privately aligned ones; citizens are more sensitive to benefits while customers of private organisations are interested in products. Noting this difference is crucial especially when taking into consideration the business case that needs to identify and differentiate the main stakeholders to the ERP system.

5.4.7 Relationships among the findings

The findings of this study were also instrumental in revealing how the different categories of benefits are related. The contribution of these findings bridges the gap between the theory

and the operational ERP system right down to finer implementation details. The following key issues emerged from the findings:

- Once implemented by a municipality, an ERP system enables both direct and indirect benefits to the citizen.
- Contrary to what most writers claim, both direct and indirect benefits are difficult to quantify in monetary terms. This becomes even more difficult in a public setup where there is no competition. If you reside in Cape Town then you can only get services from its municipality.
- A public organisation operates in a public environment where it is exposed to public scrutiny and so is its system.
- The general ERP system implementation, in a public organisational environment, automatically realises indirect benefits.
- Having realised indirect benefits, municipal organisations are further mandated to sustainably enable the realisation of direct benefits.
- More direct ERP system benefits for the citizen result from management of the ERP system and additional functionalities.

Alignment can be drawn with the Framework for Strategic Plans and annual performance Plans (see Section 2.7.9 for the adapted structure of this framework). In this case, the *outcomes* become the indirect benefits; the *outputs* are the direct benefits while the *impacts* are the final value for the citizen when the public funds are efficiently and transparently used.

The explanations above harmonised the research findings with the research question. This was done by analysing how each finding contributed to the response to the main research question. It is, however, important to note that the findings will only make sense if they are treated in totality. If treated partially, then the main research question will not be satisfactorily answered. A summary of the findings is illustrated in Figure 4.5 on page 92 as the findings framework that emerged from the research.

5.5 Evaluation of the Research

In line with the qualitative research traditions, various strategies were adopted to enhance the credibility, transferability, dependability and confirmability of this study (Guba, 1978; Lincoln & Guba, 1985; Hoepf, 1997). These strategies are used in qualitative research as evaluation mechanisms, as compared to quantitative research, which depends on mechanisms such as validity, reliability, and objectivity (Lincoln & Guba, 1985). These strategies will not only help fellow researchers to understand my study procedures, but also helped me by providing checks in the journey of my study that enabled me to maximise the trustworthiness of this qualitative study.

5.5.1 Credibility

Hoepfl (1997) argues that in qualitative research credibility depends on the richness of the findings and not necessarily on the sample size. Lincoln and Guba (1985) advise that the use of raw segments of data and "member checks" enable corroboration of findings.. Several quotations were thus cited to support the findings and research experts and the respondents were given an opportunity to check the findings in response to this advice. The respondents verified and confirmed the transcripts after each interview. This helped in improving the quality of the evidence and the interpretation. Credibility is mostly defined by the dependability of the study, according to Lincoln and Guba (1985).

5.5.2 Transferability

This refers to the extent to which a similar study would result in similar findings. This is irrespective of whether the research is conducted on the same organisation with the same respondents, or in any other organisation or setting. Lincoln and Guba (1985) advise the provision of sufficient information that enables the reader to determine applicability of the findings in a similar situation is needed

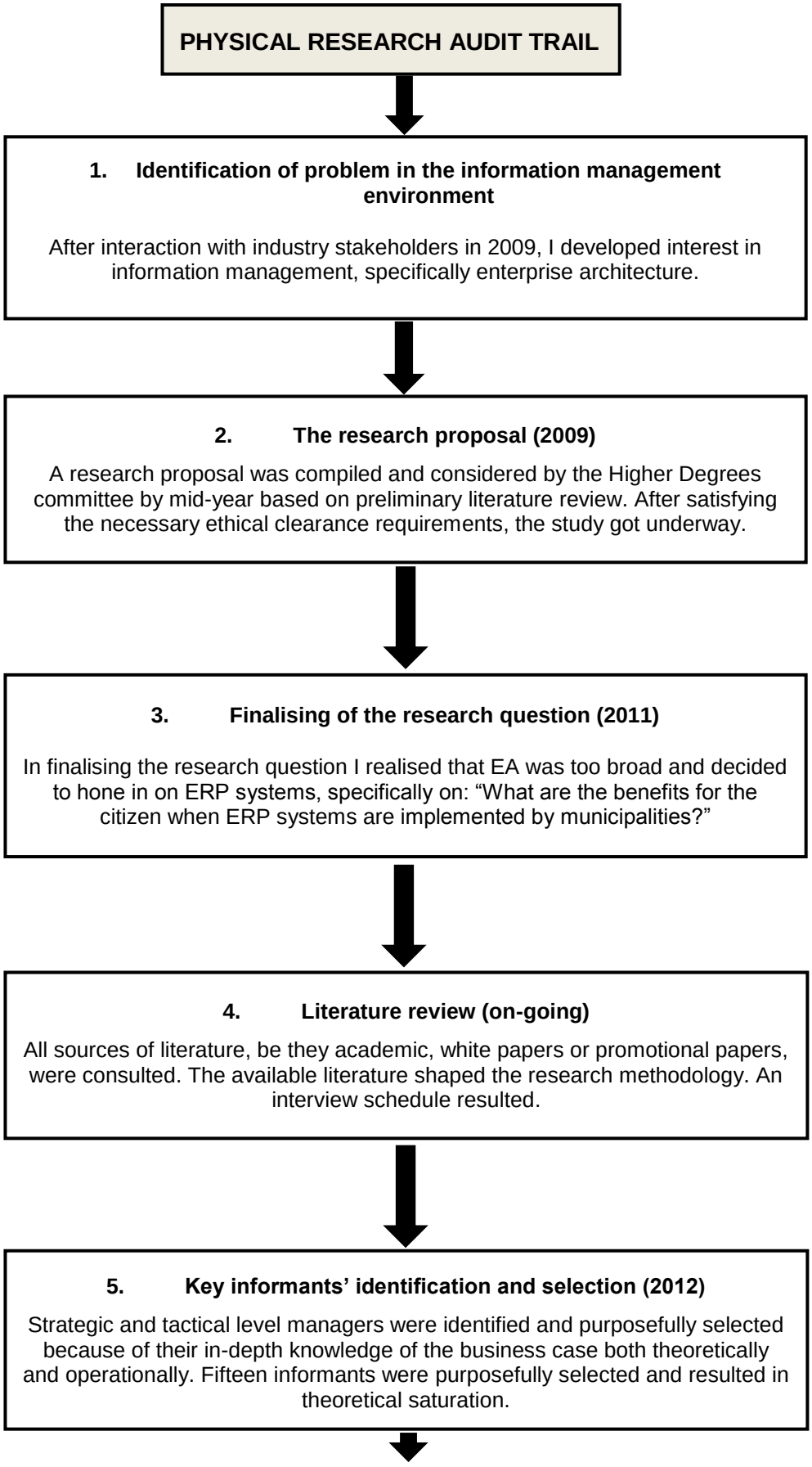
The results of this study are transferable to other municipalities in South Africa for the following reasons.

- ERP systems and their functionality are generally the same regardless of the municipality they are implemented at.
- The basic functions of municipalities are governed by legislation, therefore will be the same in all municipalities.

In light of the above, the results of this study which provide a perspective of how a computer system can facilitate benefits with appropriate management strategies should be applicable to other municipalities in South Africa.

5.5.3 Dependability

Furthermore, Lincoln and Guba (1985:317) advise the use of an "inquiry audit". An audit trail that shows the key stages of the study is given below (see next two pages, Figure 5.3). This demonstrates the logical and coherent framework that was adopted to enhance dependability of the findings. The process and the products can then be examined for consistency.


PHYSICAL RESEARCH AUDIT TRAIL
1. Identification of problem in the information management environment
After interaction with industry stakeholders in 2009, I developed interest in information management, specifically enterprise architecture.
2. The research proposal (2009)
A research proposal was compiled and considered by the Higher Degrees committee by mid-year based on preliminary literature review. After satisfying the necessary ethical clearance requirements, the study got underway.
3. Finalising of the research question (2011)
In finalising the research question I realised that EA was too broad and decided to hone in on ERP systems, specifically on: “What are the benefits for the citizen when ERP systems are implemented by municipalities?”
4. Literature review (on-going)
All sources of literature, be they academic, white papers or promotional papers, were consulted. The available literature shaped the research methodology. An interview schedule resulted.
5. Key informants’ identification and selection (2012)
Strategic and tactical level managers were identified and purposefully selected because of their in-depth knowledge of the business case both theoretically and operationally. Fifteen informants were purposefully selected and resulted in theoretical saturation.

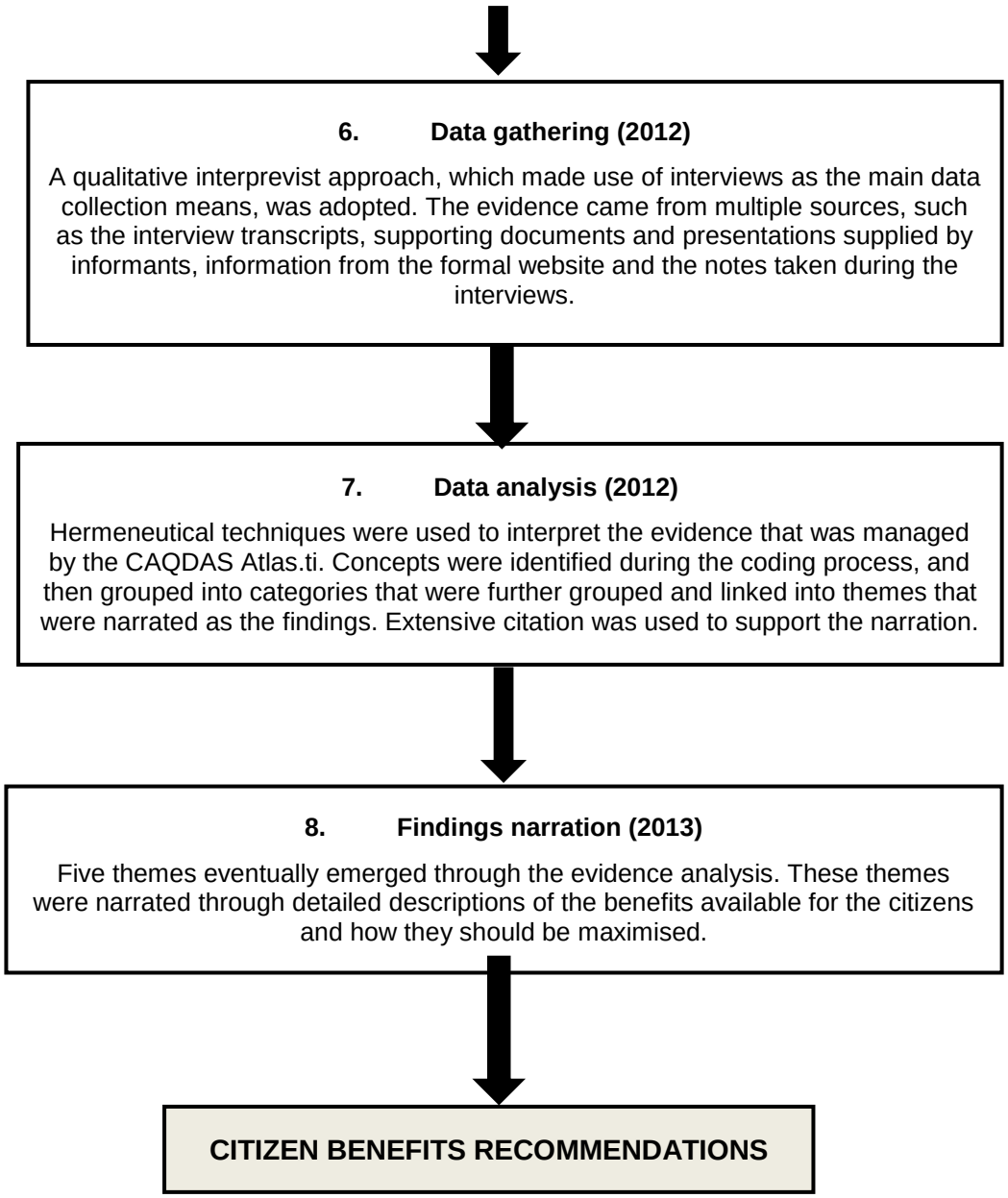


Figure 5.3: An inquiry audit of the study

5.5.4 Confirmability

Confirmability sums up the issues of reliability and validity of the research as this enables observers to confirm authenticity of the procedure that was followed in executing the research. Miles and Huberman (1994) advise the use of triangulation to minimise bias. This ensures that the findings emerge from the data and not through predispositions. This research made use of multiple sources of data, viz, academic literature documentation, white

papers All the above strategies and measures ensured the trustworthiness of this study. In-depth methodological description, including the audit trail, was given in response to this note.

A structured research method was necessary to ensure that the research had integrity (Remenyi & Williams, 1995). This was affected by the purpose and circumstance of the research. The assumption is that if the same procedure were to be followed, similar findings would be expected. Besides intensive direct quotations, the interview data is kept intact, just in case there is a need to verify the findings. Notwithstanding all the requirements that confirm the authenticity of the study, the results emanating from the study also play a crucial role in making sense out of the whole research process, given the subjectivity of the qualitative paradigm. The findings can therefore be considered reliable as they were reviewed, validated, and verified.

In summary, a number of measures were taken. These include:

- the use of well-established research methods;
- the use of triangulation;
- the use of suitable and willing respondents; and
- debriefing sessions with fellow researchers and the supervisor (member checks).

Guba's four criteria for trustworthiness in qualitative research were satisfied as elaborated above. Therefore, the results of this study can be taken as credible, confirmable, transferable and dependable, in line with the qualitative traditionally aligned evaluation approach.

5.6 Research limitations

The research focussed on adoption and utilisation of ICT (the ERP system) within the Municipality. The research focussed on the interaction of the Municipality and the residents in terms of services accessibility. While I was aware of some constraints such as time, I discovered that they always differ in the way they affect the whole study. I identified the following three distinct categories of limitations:

5.6.1 Lessons learnt from the research process

The research did not focus on the opinions of residents because the study required in-depth knowledge of ERP systems as they relate to the Municipality's business case. This left me with the top management who are always busy. Some managers tried to refer me to junior managers. Unfortunately, the nature of my research questions needed the senior managers themselves. I believe I could have reached my point of saturation with fewer interviews had my appointments followed the hierarchy of seniority with the respondents. Therefore, the availability of respondents, especially the top management, posed a serious constraint on the

research. The other constraint was the restriction to secondary data. One example is a certain presentation that I deemed informative; one respondent promised to liaise with senior management before he released it. I was still waiting for it up to the time of completion of this study.

5.6.2 Evolving technology

While I researched this domain of information management and the benefits thereof, I acknowledge the fact that technological advancement is at a bubble stage. New technologies are invented and modified each day. This renders several case studies out-dated, thus making it more difficult to easily access relevant academic literature.

5.7 Recommendations

This section presents a discussion on recommendations regarding ERP system implementations in municipalities within a context of ensuring maximum citizen benefits. Based on the conclusions noted above, a number of recommendations were inductively determined. These are detailed with a brief motivation. The research problem, researched within the ambit of this dissertation, reads as follows: "*What are the benefits for the citizen when ERP systems are implemented by municipalities?*" This is taken with specific reference to public-oriented enterprises, the municipalities in particular. Although case specific recommendations were directed to the relevant authorities, generic recommendations that will give insight and guidance as to the public ERP system implementation and utilisation are detailed. This was done to safeguard the integrity of the case study organisation. Similarities and differences drawn from the literature review (Chapter 2) and the findings from the evidence (Chapter 4) culminate in the following research recommendations:

- Link to the population database.
- Distinguishing between implementation and benefits management objectives.
- The benefit management framework need.
- Robust awareness campaign needed.
- Augmenting modules needed.
- Appropriate profilling of citizens for sustainability.

5.7.1 Appropriate profiling of citizens for sustainability

The municipality should not only segment citizens according to the suburb they inhabit, but also take advantage of the citizen's profile to segment at individual level according to their income level, wealth and cash flow in general. Currently, we have rich people in townships

such as Khayelitsha enjoying low rates at the expense of even poorer individuals in other perceived to be “posh suburbs”. An effective and efficient collection of rates will not only sustain the benefits to the citizen, but also the Municipality at large. The ERP system is capable of identifying individual citizens with all characteristics that can give adequate details that can be used by decision makers to plan accurately.

The Municipality should take advantage of the capability of the ERP system to store, process, retrieve, and share large amounts of information throughout the Municipality stakeholders. I further recommend that the Municipality should use the above-mentioned capabilities to support the government’s anti-poverty strategies by appropriately profiling individual citizens, thereby ensuring that only the deserving citizens benefit. If each citizen is accurately profiled, then the authorities will easily identify the needy. These strategies include provision of free education, water, electricity, etc. in line with the millennium goals. Therefore, it can be concluded that the ERP system can be used in these ways to improve the citizens’ lives further.

5.7.2 The Benefit Management Framework Need

As advised by academic researchers such as Farbey et al., 1999; Ward and Daniel, 2006; Glynne, 2007; Spitzer, 2007, the Municipality should implement a citizen benefits management framework that will help standardise extension of benefits to the citizens, especially taking into consideration that the main stakeholder to the Municipality ERP system is the citizen. The framework should define, specify, and formalise the objectives in a transparent, detailed, and measurable manner. Currently, no common vision is defined by the Municipality on both short-term and long-term objectives, resulting in over-expectation of services and service levels by the citizens. If there is lack of a common vision, then the impact will be on the decision-making, which in turn affects the service delivery function. For example, if it is not clear how the issues of compatibility and costs associated with integration affect the ERP system implementation, then even the employees will lose confidence in this system.

The benefits management framework should not only identify benefits, but also highlight milestones and phases where specific benefits should be expected. Assessment of the benefits becomes crucial if one considers that ERP system implementation is a process and not an event that can be completed at once. A special reference should be made to the different categories of benefits, which are realised at different phases of ERP system implementation. Specifically, indirect benefits are realised earlier and direct benefits as the ERP system matures.

At the moment there are benefits that are taken for granted, especially given the scenario that no follow-up is done to check on whether the expected benefits are gleaned by the intended recipients, the residents. The model should take into consideration the current digital divide and the previously disadvantaged citizens of Cape Town in line with the current government's objectives and the constitution of the country at large. This will definitely eliminate both underestimation of the cost and exaggeration of the benefits extended by the ERP system. Eventually, it will help management to manage the ERP system sustainably.

5.7.3 Augmenting modules needed

Acknowledging that ERP systems have limitless capabilities and functionalities, an analysis of a specific public institution such as a municipality informs an expectation of certain modules. These should be obvious if ever a citizen benefit perspective is taken into consideration. The Municipality should implement the other crucial modules that must be included: Safety and Security and the Health module. If the Municipality embarks on an impact assessment, then areas of need will easily be identified. This should be done on a department-by-department basis to relate the benefits accrued by each benefit to the objectives of the whole ERP system implementation. This will go a long way towards assisting medical practitioners, especially in times of emergency when they can easily identify patients, thanks to the timeous availability and accessibility of information. This would save many lives.

The more functionality the ERP system has, the cheaper its overall cost becomes because of shared costs. ERP systems are expensive if they are used as stand-alone systems. This means the more functionality the ERP system has, the cheaper it becomes to run and maintain. The more benefits extended, the higher the value of the ERP system. If the ERP system is used on all key business processes, then it will be clear that it can be used as a strategic planning tool and implementation. The convenience of itemised billing must be coupled with consolidated invoicing. This is possible with the ERP system.

5.7.4 Robust awareness campaign needed

Having the ERP system supporting multiple accesses to the City in terms of payments and other service requests, it is sad to note that queues are still prevalent in the Municipality offices of service. This can be attributed to the ignorance of the existence of either these services or related services, such as free limited internet access in the Municipality libraries to support such transactions. The ERP system is able to support payments via electronic funds transfers from all banks, which should be easier than direct payment at the municipal cash office. The Municipality should do more to arouse awareness of the benefits, which

come through the services that are now available as a result of the ERP system implementation. The strategy should include banners and television advertisements where the majority of the citizens are currently accessing. They should be prepared to spend more on awareness programmes and other indirect costs like upgrading IT infrastructure. At the moment, some citizens who can access services through other channels still clog the offices at the expense of those who have no other alternative because of lack of knowledge. This will also help other municipalities to compile sound business cases when the enabled benefits are clear and accessible. A defined framework, e.g. between citizens and ERP system decision makers, should support better communication among the stakeholders. The fact that these stakeholders have not established a benefits management framework shows that there is no formal communication among them about the citizen benefits.

5.7.5 Distinguishing between implementation and benefits management objectives

With the back office fully implemented, the Municipality should now put their focus on benefits management rather than the ERP system implementation that has been on the fore since early 2000. The Municipality should take advantage of the flexibility enabled by the ERP system to constantly configure and customise it in accordance with the evolving customer needs and availability of new technologies, whichever comes first. Examples of these are access through smartphones and tablets (mobile accesses) and e-services. As these new technologies are invented and become accessible to the general citizens, they must be incorporated into the day-to-day interactions to facilitate more benefits extension. Even though citizens can now access some services through the portal and web services, the access is limited to job applications and bill viewing. The Municipality thus needs to aim to manage and enhance the available functionalities to enable services such as those that allow citizens to make things happen themselves, for example entering their meter readings to immediately get their bill.

The decision makers should recognise the distinction between the objectives of ERP system implementation and the objectives of ERP system benefits management. Respondents focussed much on the former, giving evidence that the latter is not yet considered a priority. This was in spite of the kind of questions that aimed to differentiate the two. Focussing on the objectives of implementing an ERP system gives the impression that there is no difference between ERP systems in private organisations and those implemented in public organisations in terms of the kind of benefits they enable. During the interviews it became clear that many respondents were not sure about what should be done; they simply expected to carry on with the implementation as best they could to support internal processes. Proper

benefits management should ensure that all citizens benefit from the ERP system implementation and utilisation.

5.7.6 Link to the population database

The municipality should ensure that every citizen is accurately profiled in the ERP system. Currently, the ERP system is populated by those citizens who have direct interaction with the Municipality. This means that no one who does not have direct contact with the City can be recognised until such time as they contact the City in a manner that calls for registration. This results in very few citizens being found on the ERP repository. For whatever reason, this shows that the capability of the ERP system is under-utilised in this respect. It is clear that some residents are not on the ERP system because of the approach the Municipality is using to register; it targets only those who are directly transacting with the City. Examples are if you are a ratepayer or if you have a complaint or a service request. Only those with direct interaction with the City will be recognised as citizens by the ERP system for now. This will make it very difficult to trace individuals, especially those with issues such as criminal offences. Therefore, the research recommends that the ERP system be linked to the country's population database to ensure that all municipal citizens are given an accurate profiling. All SA citizens residing in Cape Town have profiles traceable within the South African population database.

If the Municipality takes into consideration the recommendations outlined above, then the citizens will be able to enjoy the maximum benefits that can be enabled by the ERP system not only now but into the future in a sustainable manner. This will make the ERP system investment worthwhile, especially considering how expensive it is to the citizen, the main stakeholder in a public institution such as a municipality.

5.7.7 Summary of recommendations

Figure 5.4 is the diagrammatic representation of the key findings. It highlights citizens benefits and emphasises the importance of conceptualising the benefit management framework during the system planning stage. This result in "Direct benefits" that are visible to the public and "Indirect Benefits" that can only emanate through the "Efficient use of Public Funds" or only if they are converted through direct benefits.

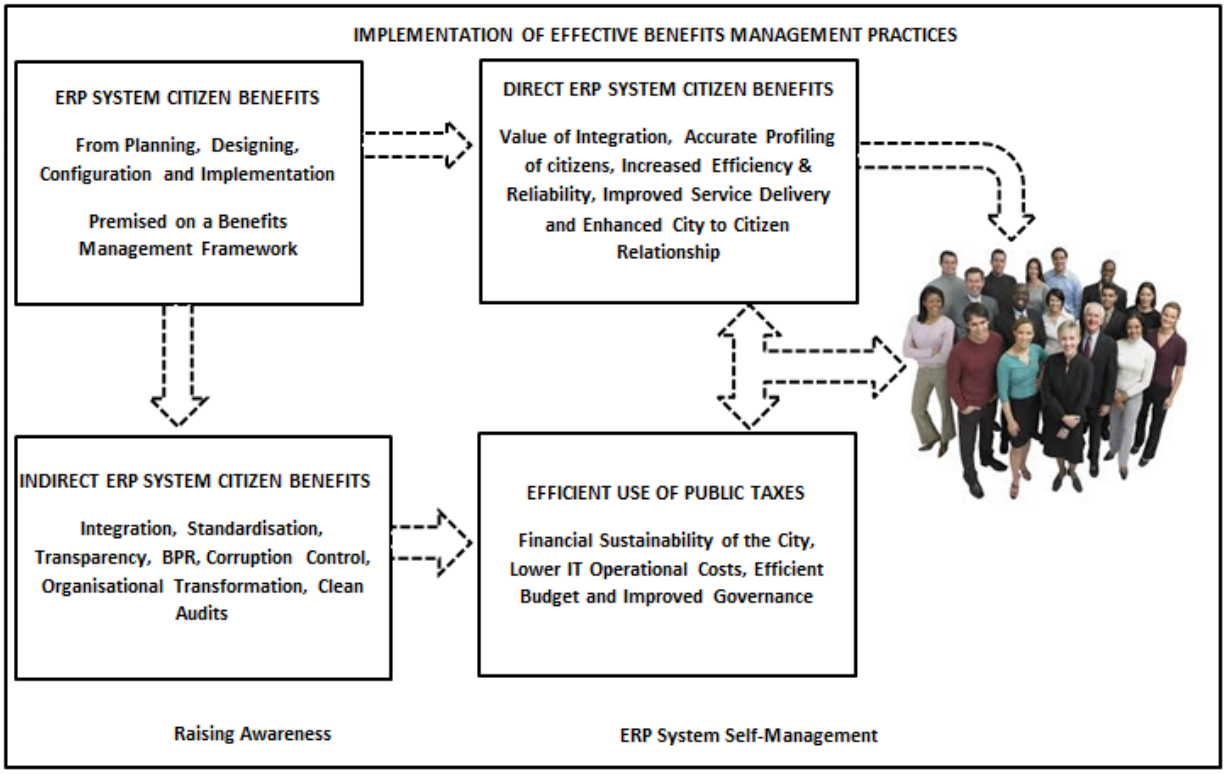


Figure 5.4: The Conceptual framework for ERP systems citizen benefit

Given that citizens have limited choice when it comes to municipal services, the City should not take advantage but should realise the necessity to implement a sustainable environment in which everyone wishes to live and also cherishes to leave for their children and grandchildren. From this research, it is evident that confusion often exists in both the minds of the people and the literature due to the small difference that exists between public organisations and private organisations. This difference widens as the comparison is made of direct benefits, which are not necessarily the focus in private organisations while they are in public organisations such as the Municipality. However, this study highlighted both similarities and differences that are prevalent from the inception date to the ERP system retirement in terms of the benefits that should be expected by the citizens.

In short, the Municipality should:

- Re-configure the ERP system to accurately profile citizens at individual level according to their income level, wealth and cash flow, etc.
- Implement a benefit management framework that will help identify, create and assess the benefits available to citizens.
- Incorporate more modules that are vital to the benefit of the general citizens.

- Undertake awareness campaigns to ensure that every citizen is aware of the available benefits.
- Distinguish between ERP system implementation objectives and benefits management objectives and then focus on the latter for sustainable improvement of citizens' lives.
- Ensure that every citizen is accurately profiled in the ERP system. A suggestion could be linking it to the South African population database.

This study ratified the planning part of the ERP system and noted that it is the implementation and management phases that are found wanting, as expounded above. If these phases are handled in a manner that recognises the citizen as the main stakeholder then more value could be gleaned from the ERP system. This should be the intention.

5.8 Future research

In acknowledgement of the fact that IT is ever evolving, it is recommended that similar research be undertaken on a regular basis, not only on the same municipality but also on other cities that are implementing ERP systems. Secondly, other studies should formulate an appropriate questionnaire to survey the citizens themselves to assess whether their expected benefits are in line with those being planned by the municipalities. These other researchers could take advantage of the theoretical insights presented here as a useful launching pad for continued study and research. The scarcity of academic literature on public enterprise oriented ERP systems in general and the benefits expected in particular are an indication that more academic studies should be done.

5.9 Concluding remarks

I interacted with industry practitioners and academics. The study contributes to the on-going debate regarding ERP system benefits. Even though the topic of ERP system benefits has not been receiving the attention that it deserves within the public domain, this study brought the ERP systems benefits under the spotlight. The purpose of this study has been to investigate if public ERP systems are being fully utilised to extend maximum benefits to the citizens. A number of benefits are already extended to the citizens. However, there is a gap between the potential benefits and the actually enabled benefits. More so, if the ERP system is taken as a strategic tool that enhances service delivery by enabling a vast array of benefits that result in enhanced value for the citizen, who ultimately pays for the implementation. The findings show a vast array of citizen benefits that are potentially extended by a public ERP system. Nevertheless, it should be noted that the public ERP system must extend all the

public ERP system aligned benefits on top of all the benefits that are extended by those implemented by private organisations.

Furthermore, this difference between the benefits extended by ERP system implementation in public institutions and in private organisations emanates from the difference in the level of interaction. If one buys a pair of shoes from the manufacturer, one can only go back to complain, that is if they have a problem. There is no critical and constant two-way communication channel between the customer and the service provider. On the contrary, with public enterprises such as the Municipality, the communication is on-going, where citizens access services on a daily basis and pay for those accessed services accordingly. This study detailed a number of available and potential benefits as well as the management practices that are being employed by the municipal management to ensure maximum ERP system benefits delivery to the citizens. This calls for the need to emphasise on the difference, especially to the municipal management, which is in control of such special and expensive projects.

An inquiry into this resulted in the findings; hence the recommendations that the Municipality should not only extend and manage both direct and indirect benefits but also raise awareness as part of the “citizen benefits” strategic management plan. Awareness becomes crucial, especially considering that availability of benefits on the part of the organisation is one thing while knowledge and ability to access them by the citizens is another. The benefits of the ERP system need to be highlighted and the citizens should be given guidance on how to access and enjoy the services in a sustainable manner. Only when all potential benefits are not only are extended but are being accessed by the entire citizens can the Municipality claim to be utilising the ERP system to extend maximum benefits to the citizens. Therefore, while we appreciate that the Municipality is doing its best to ensure availability and accessibility of benefits, we still recommend that a proper citizen benefits management framework be instituted. This is especially important if we consider that the citizen is the main stakeholder of any public ERP system and funds all the projects that are implemented. Extending more and more benefits to the citizen should therefore be prioritised.

It should be understood that these findings comprise a response to my research. As such they provide a foundation as to the direction that further research should take. This could be either longitudinal, whereby more studies would follow on the organisation studied, or even cross-sectional, where other public institutions are studied for the development of proper metrics concerning public ERP system benefits. Notwithstanding possible answers that could be found different, it is my belief that no contradictions would be possible, given the realities of the facts accumulated.

I finally realised that the acceptance of certain points of view by the scientific community is dependent on the evidence that is made available at a given point in time (Babbie & Mouton, 2004). Notwithstanding the advice by Balkwell (1991), who argued that the fact that some notion is widely believed does not make it correct, I embarked on this journey of intellectual pursuit to find competent and useful answers to the research questions. This study should therefore be taken as an on-going search for understanding of ERP systems in public enterprises in line with the above-mentioned statement. Nevertheless, it can be concluded that ERP systems are essential to our modern municipalities, and their value can be greatly enhanced through more effective planning for and management of benefits.

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APPENDICES

Appendix A: The Interviews schedule Record

Interviewee Number	Interview Date 2012	Position	Interview Location	Interview Duration	Remarks
1	12 June	CIO	Municipality Head Office	1 hr. 20 min	Joint Face to face Interview
2	13 June	Head: Change Management	Municipality Head Office	1 hr.	Joint Face to face Interview
3	15 June	Head: Customer Relations & Administrative Services	Municipality Head Office	55 min	Face-to-face interview with demonstration of system
4	15 June	IST Management (Chief Enterprise Architect)	Municipality Head Office	50 min	Face to face Interview
5	20 June	ERP Support Centre Manager	Municipality Head Office	54 min	Face to face Interview
6	22 June	Head of the IT Projects Portfolio	Municipality Head Office	35 min	Joint Face to face Interview
7	25 June	Business Projects Manager	Municipality Head Office	55 min	Joint Face to face Interview
8	4 July	Personnel Services	Municipality Head Office	30 min	Face to face Interview
9	11 July	Specialised Technical Services	Municipality Head Office	45 min	Face to face Interview
10	12 July	Information Systems & Technology	Municipality Head Office	50 min	Joint Face to face Interview
15	20 July	Information Systems & Technology	Plumstead	45 min	Face to face Interview
11	20 July	Information Systems & Technology	Bellville	35 min	Face to face Interview
12	25 July	Information Systems & Technology	Khayelitsha	48 min	Joint Face to face Interview
13	25 July	Information Systems & Technology	Fishoek	50 min	Face to face Interview
14	27 July	Human Resources	Municipality Head Office	25 min	Face to face Interview
	Total Number of Interviews: 14 *Number of Interviewed Persons: 14* *Total Interviews Duration: 12 Hours*				

Appendix B: The Interview guide

My name is Takauya Chandiwana (post-graduate researcher from CPUT). Firstly, I would like to thank you for affording me the chance to meet and discuss. Your contribution to this study and to the development of new knowledge is most appreciated. Secondly, may I remind you that the information from this interview will be used for academic purposes only and no reference shall be given to you individually or your position. Thus please feel free to be candid in your responses. If there is any question which makes you uncomfortable, you may elect not to answer.

This is a letter in which my supervisor and I undertake to maintain and respect the confidentiality of this interview.

My primary aim, as described in my mail communication is that am interested in the Enterprise Resource Planning project of the City of Cape Town. With your permission, can I please record this interview?

Aim: The purpose of the research is to investigate how the citizen benefits from ERP implementations in Municipalities.

Research Question	**Objectives**
1. In your view, why should any municipality consider an Enterprise Resource Planning (ERP) system?	*To establish and highlight the relevancy of ERP implementation to the Municipality.*
2. Taking the City of Cape Town's ERP what do you think were the key motivational factors for its implementation?	*To get the background or **motivation** to have the ERP project for the Municipality? (General benefits are expected here)*
3. What is the status quo of the ERP project as at May 2012, in terms of completed, on-going and completed modules?	*To find out how far the ERP implementation has rolled (Whether it is completed or still being implemented).*
4. In most ERP implementations, the project targets internal business processes. My research's objective is to understand ERPs in relation to the benefits which are derived by the organisation's customers -in this case the citizens. In your view, what are the ways in which the ERP will benefit residents of the City?	*To find out if the residents are benefitting from the ERP implementation project now and in the future.*
5. Given the high number of recorded failures and problems with ERP implementations, some critics have questioned whether sufficient value is derived from such costly projects. What are some of the strategies which may be used to ensure that maximum benefits are derived from the ERP implementation and utilisation?	*To find out what the Municipality management is doing to ensure maximum benefits delivery.*
5.2. In these strategies that you have mentioned, has there been any conscious thinking or planning as to how the residents will derive maximum benefits from the ERP implementation? .	*To find out if residents benefits derivation was part from the Business Case.*

Thanks and bye.

Targeted individuals: To schedule (at least an hour) interviews with the following:

1. The CIO
   (Andrė Stelzner, andre.stelzner@capetown.gov.za);
2. The Head of Change Management
   (Lee-anne Philander, lee-anne.philander@capetown.gov.za);
3. The Chief Enterprise Architecture
   (Meyboob Foflonker Meyboob.foflonker@capetown.gov.za); and
4. The Chief Programmer;

Reason for targeting these: To extract critical information from these top management members who are the custodians of the long term and future oriented focus strategic plans of the organisation in line with vision and mission thus can relate to the objectives of ERP system implementation. By the virtue of their positions, they are expected to be a lot knowledgeable about ERP system project at a broader perspective. They are the ones who are responsible for the planning organising and leading all other employees in extending the benefits to the residents.

Appendix C: Confidentiality Agreement

Cape Peninsula University of Technology

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05 May 2012

Dear Sir / Madam

CONFIDENTIALITY AGREEMENT

TITLE OF RESEARCH PROJECT: ASSESSING ERP BENEITS IN MUNCIPILATIES

I would like to thank you for the interest shown in this research project which is being conducted towards a Master's Degree in Information Technology at the Cape Peninsula University of Technology (CPUT).

This letter also serves to confirm that Mr Takauya Chandiwana is currently a registered student (Student Number 209218029) under my supervision. I understand that you have limited time, and therefore would like to express my sincere appreciation of your willingness to share your expertise and contribute to the advancement of research and knowledge creation.

This project has received the necessary ethical clearance at the University. It also has been cleared by the City's Director: Information Systems and Technology, Mr Andre Stelzner. As such Mr Chandiwana undertakes that the information shared by you and/or your organisation will be kept confidential, and that this will not be used for commercial gain or purpose in any way whatsoever. In terms of the reporting of the research, only summarized information will be used, and this will not be attributed to you in your personal or professional capacity nor your organisation, unless you have expressly given your permission.

I hope that we can continue to build a good relationship between yourself and the CPUT.

Yours faithfully

Prof Shaun Pather
Supervisor

Appendix D: An interview transcript

Interviewer: As described in my mail communication, the scope of my study concerns Enterprise Resource Planning project at municipalities.
Aim: The purpose of the research is to investigate how the citizen benefits from ERP implementations in Municipalities

1. In your view, why should any municipality consider an Enterprise Resource Planning (ERP) system?

Interviewee : The national government is very good at policy setting and I think very poor in execution, there is a disconnect between national provincial and local governments then of course local governments is what we call the face that the local people see, people demand services from. Once this organisation was being amalgamated 38 previous municipalities down to seven municipalities then we amalgamated seven municipalities into one super metro. Already you can see the complexity of 38 municipalities, each with its disparate payroll system, procurement system, supply chain network, emails, and just about any conceivable business system. You already see 38 views of the world. That is 38 views of the City to take the 7 into one required what I call one strand throughout the organisation. You can add beads on to make a necklace that you like and the only way in which you drive transformation projects like is if there is political war. Mentioned was we have embarked into a process in the year 2000 when the merger was about to happen and in order to a merger seven municipalities into one, the one thing that we did honestly and we owned up to was you need one system and the fact that there were seven systems was hindering the actual amalgamation to take place. So the political pressure was there to make sure that we had one system and why that was important was because all of us for the first time on our strategy as political leaders irrespective of our political parties, so all political parties had a common goal of implementing the ERP, then we need to select and recruit the best application for this merger. We went to the analyst called Gartner, and through their diligent processes, we shortlisted Oracle and SAP. We thought these were the leading technology software applications that could drive the organisational transformation. We then spent another year with Gartner we then saying that we going to choose our technology and SAP proved to be a more successful, and we said ok we are going to choose SAP in a very open competitive process, then we said we have a the best software on the planet, we want the best software implementer, but there was nowhere we could be able to implement SAP system on our own. The organisation came with legacy systems, 7, 38 very competing ideas of what the system should be, so you understand needed a certain level of impartiality. You can understand the fight that was going on, 7 IT directors, running seven IT shops, 7 municipal managers, each of them in their own empire. We then went into an open ended process and we ended up selecting Eserntia as our systems implementer. Why did it win the race? Because Accerntia won because many individuals claimed that they are implementers and they have implemented SAP but what we liked about Accerntia was that in Accerntia true style they take one or two or three seasoned consultants and then they take these new masters students, guys that are at university doing computer science and throw them in the deep end, and these guy mess with the organisation, so we didn't need someone who would come and disrupt this organisation. Someone who would say it's either this or nowhere. And through that the process was rammed in the ERP. We had lots of more discussions with process owners. This was done with these individuals within their hands of the discipline. I painted the background particularly, because the importance of having an ERP system in the Municipality or local governments in that there is needed to have one business process, one way of doing things. There is many variations, taping is like a mechanical set, they give you enough component box, you can build a boat, you can build a plane , or a car with these parts, with more additional parts you can build a different kinds of cars, kinds of planes and that what we did how we configured SAP to serve the organisation. Of course if you have got one system, in your research you have come to terms that you will have one single version of the truth. Yes we have spread sheet gurus today, individuals that still think that SAP will be switched off one day and then can go back out there to their legacy systems; it's not going to happen. The reality today is the City of Cape Town is we collect rubbish bins using the SAP, we run the payroll using SAP we dispatch emergency vehicles using SAP. SAP has become the backbone of this organisation. If SAP goes down, we cannot collect revenue, we cannot run these crucial services. SAP has become in my opinion the

most strategic application in this organisation. The life blood of all. That is very important to any government department or organisation because all of a sudden you have got federated offices, federated labour force; you have got diverse services you need to access master data, all touching one fundamental issue, Business partner. You often hear in the SAP world, we talk about the business partner, one single view of the customer. I have got a view in one lens but on multi-facets. I can have got a view of you as a ratepayer, of me as an employee, custodian of social grants, you have got a view of me as a vendor, hopefully am not both at one point in time an employee and a vendor. That's what SAP brings. So we build ERP systems for transparency inside of government which is very important because in such a high turnover you can easily lose yourself, and all of a sudden it will start coming at you, and you wouldn't have catch that, so it brings organisational governance into, then it is about the citizen value, why do we make the administration more slick, because the more slick that we become the less dependent that we should be on the labour force and a lot of those business processes allow us to become and am sure and will show up on departmental inadequacy, through reporting, through say hey someone logged a report on a pothole to be repaired. And those in the department who would take forty days because of what I call management by perception, they used to tell the director, no we have dispatched the truck, being there but no one was there, now the politician or the director can say, no you have never dispatched that truck, you never even log that call. You are not responding to the citizen. So it made this organisation act more responsibly in terms of demand placed on us from the outside of the City. Now government is not oil and gas, is not insurance, is not FMCG, and is not retail, government is all of the above. So we are an eco-system, we are an economy and half. The only thing we don't do probably is to print out our own money but we probably do, our utilities bill, you pay us with that, so we are an eco- system. That's why an ERP system is critical and vital. And then the integration, like an utility we generate, like retail we sell water and electricity, like insurance we insure our own land and buildings, we also property owners and property sellers, so very feature rich multi-faceted business and for that basis this organisation is working in on uniform manner, that's the important of an ERP. Look at SETA and what they are trying to do with the IFMS; it has taken them ten years to get all the government departments on it at provincial level. Now at the City of Cape Town if I want to buy a pencil, it's the same requisition procedure as buying a stadium, one transaction. It's the same one the guy in Tygerberg, Belleville, south peninsular, Blourberg, has to undergo. That's very important. All of a sudden you can see that there is one way of doing things, hard coded into the system. There is no off system manner to perform that function, that bring about all sorts of Kaizen benefits, sorts of efficiencies and fast response time and that fundamentally produces benefits for the rate payers. I serve my internal audiences, who are the directors, my staff, services like finance and HR, then I serve my staff members, who access the system, fundamentally why do we do this? To change the lives of individuals who are out there. I could change the people's lives with technology.

Interviewer: Taking the City of Cape Town's ERP what were the key motivational factors for its implementation

2. What is the status quo of the ERP project as at May 2012, in terms of completed modules, and modules which are still in progress of implementation?

Interviewee: We have got SAP wall to wall, we have implemented the FI module finance, within Finance we have got accounting, management accounting, treasury and insurance, so manacc and finacc, internal guys that do the budgeting and that do financial services. We have implemented the HR module, time management, payroll, personnel cost planning, recruitment and selection and organisational management. We have got the human capital management suite, which is planning and development, environmental health and safety institution. Then we have got the logistics that deals with projects systems which is the module entitled to manage or projects. Then we have got plant and maintenance, we got material management, we have got public sector records management. Then the real estate management implemented, where we have got rental accounting, business partner master data and training, problem and business support, and projects, then we have got the Utilities module, which divided into billing, device management and customer care, which is CIC/CRM then we have got FICA engagement and we have got rates. These are the modules that are implemented that I call business modules. Then we have technological service that underpin which is the basis. Its technical architecture, processing our entire batch and then the portal. We have the software factory, that delivers cuts codes and those codes are within ERP system they and the business intelligence. Then the User support lap, i.e., Authorisation, profiling and admin, those are the streams that we have. Within those streams we

have got the system land scape of very integrated complex instances of SAP modules. What is out and where are we going? We have now in the ten years back with ERP implementation, we have invested in the backend to make the organisation more robust. We are now at a point where all that good work that we invested at the backend, and to take that through portals, we can now support the citizens better because if the citizen logs on to our portal, we have the back office to support that. Whether, they walk in or phone s in, walk into a cash office, or smses or email, there is one same business process. That's the implementation of CRM self-services becomes very important to customers that are out. Press one, for you rent account, press two, your account balance, we have now integrated this information at the back office of the ERP. Then the other modules that am thinking are important to our organisation, are that we have to bring on board are the safety and security module, to get the metro police into SAP, the other one will be the Health System. How do we take clinics and bring them to SAP. At the moment they are on their own network and they have their home grown open source application. Obviously there is value in integrating them. So there are certain key business processes that we haven't managed to introduce. So I think from administrative point of view we have invested a lot of money to make that work. You can only do that if you have a solid and robust back office.

Interviewer: Generally, an ERP system, is focussed on streamlining internal business processes.

3. ***My research's objective is to understand ERPs in relation to the benefits which are derived either directly or indirectly by the organisation's customers or -in this case the citizens.***

In your view, what are the ways in which the ERP will benefit residents of the City?

Interviewee: Ok, ah, again from my engineering background I need to break the problem into pieces and one area I think it benefits citizens is in the area of improving the efficiency of the administration and we probably talk a lot about that but there is a different financial and service delivery benefits to citizens as organisations operates efficiently. The next area I think it provides benefits to citizens is to creates more opportunities for more services the City can offer, because we are operating within an ERP systems, a system with strong integration, you can start what I call socially just tariffs that is charging people for services which addresses the reality of South African Cape Town, of people who can pay versus people who can't pay and people who can pay and choose not to pay are the ones on target, but people who can't pay, it's pointless in actually you know put in a lot of effort trying to squeeze blood out of the stone, and you need to have good intelligent systems to distinguish between the two, and if you have the posh parked in your garage, it does sound a bit of a far-fetched story to say you can't pay your license disc, while ERP system can tell me you parked a posh in the garage and you have this and that. I can obviously still address that um a very strong construct within the ERP system, the citizen might feel threatened by this there is the whole notion of a single view of the customer SAP calls it the business partner, ah as a single record of a business partner, you could log into the system once ah, as a core record, but you can have multiple roles, so if you are a supplier of the City, you have the role of being the vendor and if you are an employee of the City, you have the role employee, so and if you are a property owner you have the role of being the property owner and if you are just a recipient of social grants (that's the area we still want to take with the ERP system), you would have the role of citizen grant recipient. And with that information, the City can start tailoring and start managing and start addressing the citizen needs a lot more effectively as well as drive out some of the bad practises, that is evident in a lot of local government and the public sector, say for instances, when would we use, if you are an employee of the City and you are a vendor, our systems will send out alarm bells and shoot rocketing to the sky because that means there is a break down and there is a risk. You cannot be the employee of the City and the supplier of the City, because you now playing both sides of the fence. And there are many other examples, there are people for instance, who have debt in one area but own property in another area and they just don't service the debt whereas in the other area they are earning income as they having tenants where they have earning streams. So all this helps improve the single view of the citizen not to be big brother watching, but to be actually being a big brother that can help and adjust strategies and ensure that a city like Cape Town is sustainable and adjust to all the future and successfully.

Interviewer: Some studies raise questions as to whether the high costs of ERPs result in added-value.

4. ***What are some of the strategies which may be used to ensure that maximum benefits are derived from the ERP implementation and utilisation?***

Interviewee: This is about, the mother city, and this is about your relationship with the citizen, and your relationship with the citizen starts at one basic level. That basic level is the integrity of the bill, if I sent you the bill to Taka's house say 45 000 rands for water and you live on your own, and you say how can I possibly run up an account like this, automatically I create a rift between you and me as service provider and service consumer. The benefits to individuals are there, the integrity of the utility bill, we can use the utilities bill, that is without a doubt spot, because we understand your device, we understand you as a business partner, we measure that device, we can give you the ability to punch in your own readings, so we don't have tonnes of guys collecting readings at your premises, so as a citizen you are saving money on collecting data. The second issue is ROI, how can I start intelligently assisting you? If I know that, based on the data that I access through the ERP system. We probably going to have lots of rains in the Cape Flats area, it helps me with my maintenance and my proactive maintenance of repairing the infrastructure. So when the rains do come, the issues are not as severe as we would have been proactive. So through the intelligence of an ERP system we integrate various intelligent sources we are able to make better management, better decisions for the citizen. And when it enriches our budget deficit. We have a very firm grip on our tariff modelling and our financial modelling on what is going to happen. So as a citizen you are sure that your money is being appropriated in a certain manner and channelled and directed into areas of most needs. Lets talk about the have and the haves not, the haves stay in Constantia and Camps Bay, they can pay us through the portal, electronically they benefit immensely, open systems, but the guy on pre-paid who don't have computers for them as we have organisational savings through IT efficiencies, we can plough our resources back, we can now start drawing statistics on, we spending X amount in Constantia and only X amount in Langa, we can hold up and say we received 200 million rands worth of rates and services fees in Camps Bay, we have received 50 thousand in Langa but we can spend 100 million in services in Langa and only spend 100 thousand in Camps bay, all of a sudden we can now show value to the citizen. But we are not only spending money, yes it costs us much more because infrastructure in high to maintain, we have brighter lights, but on the social fabric perspective, you now have the ability to pull out and share resources. There are very huge benefits in that. The citizens only want, I don't mind paying tax, but where is the tax going to? Is it going to but cars for our politicians? Or is it going back to the citizens? If I grow up and out of my mum's home in the ghetto, I don't want you to invest in the suburban, I am not in need, but you can invest in my mum's area, so a as a citizen that becomes important. That is one of the strategies to deal with. There is one version of the truth, my budget my operations, in this one system.

Interviewer: Is there any other ways in which you can make the citizens aware of these possible ways of getting these services?

Interviewee: As I said, the ERP we are an internally placed department. I can never stand on roof tops to say how great we are. We are an IT department; we are invisible to the citizens. But departments like revenue, like customer care, the ones I call customer centric department, they need to take that value proposition to the customer, they need to say, we are running our campaign this month, we want to have our citizens ability to pay their bills via mobile, via the internet cafe, pick n pay, they need to consume our services in this manner. So business comes to us with their business requirements, we then send resources to the right channel and say let's make this a project. Then we undergo through the project life cycle, project initiation, charter, blue print, mould, execution, and maintain. That's our contribution to the value chain. Of course the technologies, as IT practitioners, we are also rate payers, we are also citizens so we think about citizens and ourselves when we built these solutions. And when the business department like revenue, struggle with a connection, when they come out with a business process that works for them. I just want to break down the system, we say to them hey hold on we just want to augment those business programs. Us as the business transformation unit, we are not just a bunch of technology shop, we are a transformational shop. Now we kill two birds with one stone. We augment the business to business problems, and we take services to the citizens. And businesses then communicate with

the citizens, and they do that in the major, they do email mug shorts, the do an advertisement on the radio, I don't think we have gone above the line to TV yet. And we do it through postages and campaigns, we run a campaign on; "Did you know that you can pay your utilities bill online? The most recent application we have got live is the citizen have the ability to code a notification on our website, you can log on to our website right now, report a pothole, report a broken and it can make a way directly into the ERP system. So that's the manner in which we are trying to reach out to the people.

Interviewer: In these strategies that you have mentioned, has there been any conscious thinking or planning as to how the residents will derive maximum benefits from the ERP implementation?

Interviwee: There are enough of the beurocratic relationships between citizens and administration through a bunch of unfriendly folks and its opening up the administration through the capability for those citizens to transact for themselves exposing information that citizens become more empowered to understand more, to get to a point we are yet to, where we can tell the citizens when electricity is going to be cut for whatever reason in an intelligent way and then officials can just underpin this to move forward. Ah that was part of the road map, that was how we going to drive, we are not going to try and do that first because we talk about the funnel, there is no point to open that funnel to illussional capacity because you actually frustrate people if you can't manage their frustration, when in the web when everybody went out there and the internet presence and you log on to the internet and do things, you know how frustrating it was when you know that it was just a form you were filling in and behind that form there was still the basic paperwork and processes and nothing came out of it to when you actually log on to an application and you know there is intelligence those who are giving me the response that same hour that same day that same minute. When I know that the officials aren't there in the office take the SARs experience of completing your tax versus completing of the forms and dropping them in the box, that's what we believe we can get, and the only way we can get there is fully integrated automated business processes sitting behind and ah and business processes yah that's how we believe we can get for the citizen. From the start, was a road map that was also a grounded in the appreciation that according to the back office works before we start trying addressing the customer phase? By the way, getting the back office work is not a quick fix point, its decade and I believe it's quite kooky that things are now working in certain areas. Some areas are not working at all, and still needs work, so it's like that.

Interviewer: Keeping in mind the objecitve of the study, viz. to investigate how the citizen benefits from ERP implementations – is there anything else you would like to share with me ?

Interviewee: yar I think there is a particular reason why we spent 10 years investing in a backend, you can only help someone adequately in the front desk, if your back office is sound, and if you back office is broken then you are just a pretty face. E.g., discovery, their business is managing files and paper, and probably just managing claims, and am in with discovery and I think it's a fantastic company, I can log online, I don't have to visit their offices, the close I get to them is when I through my documents to the discovery health drop out, and I drop my doctor's invoice in there, my doctor gets paid, within days with no worries. But what sits behind these processes, they have sound back office systems, so when I talk to you about citizen value, CRM, business management, and case management, the next wave of innovation. Every single interaction that you will have with this city, will find its way in a case, and if you track that case. And manage that case, it will have a life span, so when you apply for a building plan, you want to renovate a room in your house, no longer do you need to visit my plans section in 23rd floor and ask them to through a microfiche to print your plan, go back and come back, look at it, the entire business process takes took 30 days turn around, we now have the ability to send an email with whatever format, and you take it to the large format printer then you print out, you jump onto the portal and you submit your business plan application, and your 30 day turnaround is reduced to 2 to 3 days turnaround time, that's where it become. Then the queue management system, why should we have the vulnerable stands up in the queue for the social benefits? We can have that all that taken care of through case management, the court cases, the municipal courts, case management, why do cases don't get through, because documentation get lost, evidence keep on disappear, so when we must find a way these police officers didn't do his job properly, the file document he made did not reach the office. I am sharing this with you because not only this has citizen value, but it's going to help with

the social ills of the society, shorten the time to dispense an ARV drug, like in all the and that is underpinned by ERP. City of Johannesburg launched an E-services portal, the president launched a hotline. To set up an infrastructure, lots of change management is made telling the country that we need to go, when the first 100 calls came in, they couldn't handle it because there was no back office. We are now at the degree of certainty that we have the back office to support, and public space, we are not 100% we not like any other organisation but we are a lot further than the most government entities, in the country, probably in the continent, that's what I want you to get. I might sound arrogant, but there is a few very responsible individuals in the organisation department that think like that, and that is our contribution to government. Yah, we may want to join the other organisation and be shareholders, or NGO, but that's what we do, we take a lot of pride, we use very expensive application called SAP. If you look at the investment relative to the collection rate, relative to the customer satisfaction, absolutely the business case is something anyone can be proud of. Any politician would want to be associated with, it's not like a 500million rand that was rammed in by the way my project was taken in.

Appendix E: Transcripts loaded on the CAQDAS report

PD-Filter: All

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P 4: Interview_Trans_4 {11} [Managed in My Library -> C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Interview_Trans_4.docx] text/rtf

P 3: Interview_Trans_3 {17} [Managed in My Library -> C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Interview_Trans_3.docx] text/rtf

P 2: Interview_Trans_5 {7} [Managed in My Library -> C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Interview_Trans_5.doc] text/rtf

P 1: Interview_Trans_1 {47} [Managed in My Library -> C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Interview_Trans_1.docx] text/rtf

Appendix F: Concepts labels used to code the data (Report from Atlas.ti)

Code-Filter: All

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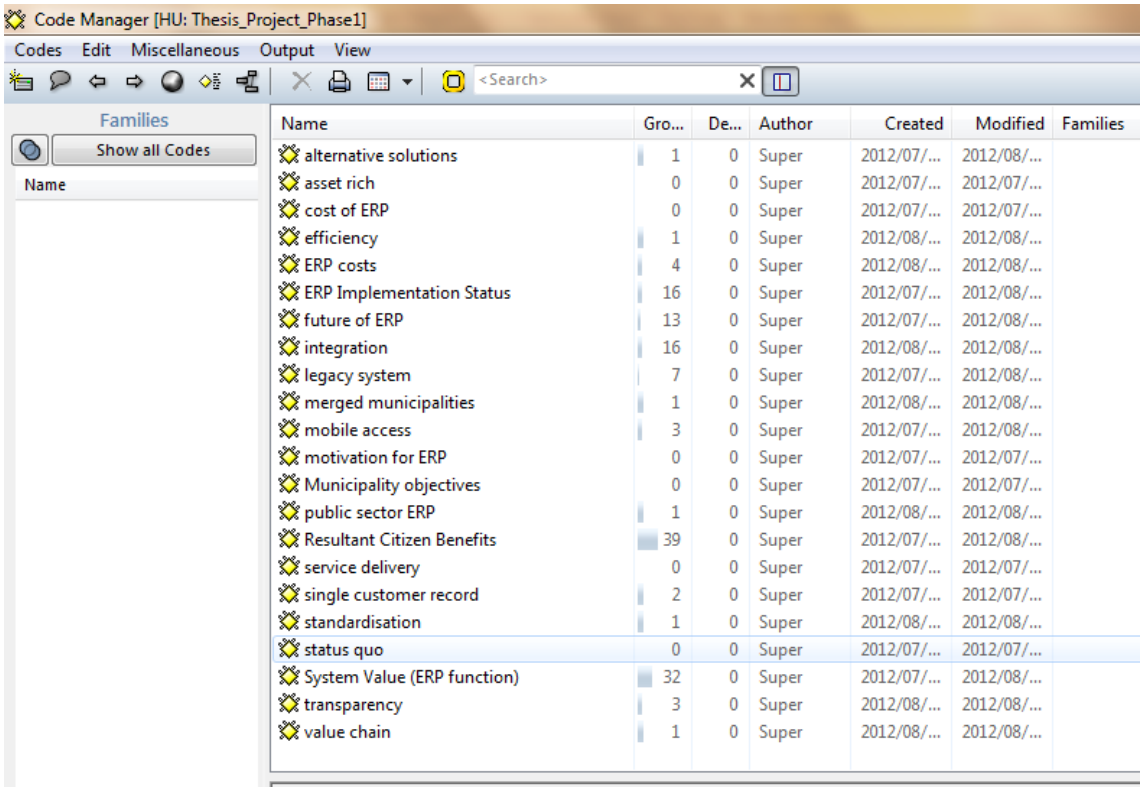
alternative solutions
asset rich
Benefits management
citizen benefits
citizen expectation
cost of ERP
efficiencies and effectiveness
ERP costs
ERP Implementation Status
future of ERP
Improved service delivery
integration
legacy system
merged municipalities
mobile access
motivation for ERP
Municipality objectives
problem solved by ERP
public sector ERP
Reliable Services
single customer record
standardisation
status quo
streamlined processes
Strictness
System Efficiency
System Value
transparency
Trusting the City
value chain

Appendix F1: Screenshot of the initial list of concepts before categorisation



Appendix G: Categories and description

CATEGORY	DESCRIPTION[19]
Core Citizen benefits	All typical benefits that are directly attributed to the ERP system.
Future of ERP	Potential benefits which are in planning but still in the pipeline.
Improved service delivery	Positive changes as related to the ERP system implementation and utilisation.
Integration of legacy systems	All statements comparing the old system with the new set up as related to the common system.
Mobile access to services	All benefits aligned to mobile access to the City services and general communication.
Public sector ERP system functions	The benefits that are perceived to be visible to the client in the public sector environment.
Reliable Services	Points related to the trust perception between the Municipality and the citizens attributed to the use of the ERP system.
Single customer record	All the advantages and benefits of having a single record for each citizen accessible from any department.
Process standardisation	Any advantage related to the adoption of standard practises supported by the use of the ERP system.
Functional ERP system value	General advantages that are visibly attributed to the existence of the system.

[19] **The description of each concept label serves more or less like a "definition" i.e. in this study's findings these are the key concepts which were identified.**

Appendix G1: Emerging Categories Report from ATLAS.ti (Grouped concepts with their quotations)

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alternative solutions {2-0} [1]

Trusting the City {5-0} [2]

14:3 We are currently running lots .. (20:20):
14:16 Mainly communication is throug.. (20:20):

Benefits management {6-0} [0]

---

citizen benefits {45-4} [8]

ERP Implementation Status {20-6} [1]

5:55 If you look at the investment .. (26:26):

integration {20-7} [7]

3:5 Made services on our portal fo.. (5:5):
3:12 Integration of the City system.. (19:19):
4:11 quicker response to the needs .. (21:21):
5:15 That is very important to any .. (5:5):
5:16 hopefully am not both at one p.. (5:5):
14:2 Integration of the City system.. (18:18):
14:6 Even if residents have no airt.. (18:18):

merged municipalities {2-0} [2]

14:6 Even if residents have no airt.. (18:18):
14:15 Even if residents have no airt.. (18:18):

mobile access {3-1} [2]

3:13 Communication in local newspap.. (21:21):
4:8 Local newspapers, free call li.. (18:18):

single customer record {2-3} [1]

4:7 Everything that a customer req.. (15:15):

System Value (ERP function) {33-4} [12]

1:21 people undermining processes, .. (20:20):
3:5 Made services on our portal fo.. (5:5):
5:16 hopefully am not both at one p.. (5:5):
5:17 So we build ERP systems for tr.. (5:5):
5:27 through portals, we can now su.. (9:9):
5:37 , so we don't have tonnes of g.. (17:17):
5:38 So through the intelligence of.. (17:17):
5:39 And when it enriches our budge.. (17:17):
5:42 we want to have our citizens a.. (19:19):
5:45 ability to code a notificat.. (19:19):
5:49 the entire business process ta.. (26:26):
5:50 the queue management system (26:26):

Transparency {4-2} [1]

5:23 All of a sudden you can see th.. (5:5):

Trusting the City {5-0} [2]

5:33 basic level is the integrity o.. (17:17):
5:34 your relationship with the cit.. (17:17):

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citizen expectation {2-0} [0]

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cost of ERP {4-6} [10]

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efficience and effectiveness {1-5} [0]

ERP costs {4-0} [0]

ERP Implementation Status {20-6} [3]

citizen benefits {45-4} [1]

5:55 If you look at the investment .. (26:26):

future of ERP {18-5} [2]

5:46 we spent 10 years investing in.. (26:26):

5:47 ther is a particular reason wh.. (26:26):

System Value (ERP function) {33-4} [2]

1:41 Some areas are not working at .. (25:25):

1:42 Some areas are not working at .. (25:25):

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future of ERP {18-5} [3]

ERP Implementation Status {20-6} [2]

5:46 we spent 10 years investing in.. (26:26):

5:47 ther is a particular reason wh.. (26:26):

mobile access {3-1} [1]

3:17 We will have access on the mob.. (25:25):

public sector ERP {2-0} [3]

14:5 In the meantime we will have a.. (24:24):

14:19 web enabled services to ensure.. (24:24):

14:20 web enabled services to ensure.. (24:24):

Improved service delivery {5-0} [0]

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integration {20-7} [7]

citizen benefits {45-4} [7]

3:5 Made services on our portal fo.. (5:5):

3:12 Integration of the City system.. (19:19):

4:11 quicker response to the needs .. (21:21):

5:15 That is very important to any .. (5:5):

5:16 hopefully am not both at one p.. (5:5):

14:2 Integration of the City system.. (18:18):

14:6 Even if residents have no airt.. (18:18):

legacy system {14-0} [2]

5:4 one strand throughout the orga.. (5:5):

5:5 That is 38 views of the City t.. (5:5):

merged municipalities {2-0} [2]

14:2 Integration of the City system.. (18:18):

14:15 Even if residents have no airt.. (18:18):

single customer record {2-3} [1]

4:6 We have details of all the cus.. (11:11):

System Value (ERP function) {33-4} [3]

3:5 Made services on our portal fo.. (5:5):

5:15 That is very important to any .. (5:5):

5:16 hopefully am not both at one p.. (5:5):

Trusting the City {5-0} [2]

14:2 Integration of the City system.. (18:18):
14:14 Integration of the City system.. (18:18):
value chain {1-2} [1]
1:24 accountants or people who driv.. (20:20):

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legacy system {14-0} [3]
integration {20-7} [2]
5:4 one strand throughout the orga.. (5:5):
5:5 That is 38 views of the City t.. (5:5):
streamlined processes {3-0} [1]
14:9 the need for a uni-system that.. (6:6):
System Value (ERP function) {33-4} [2]
5:1 organisation was being amalgam.. (5:5):
5:2 amalgamated 38 previous munici.. (5:5):

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merged municipalities {2-0} [2]
citizen benefits {45-4} [2]
14:6 Even if residents have no airt.. (18:18):
14:15 Even if residents have no airt.. (18:18):
integration {20-7} [2]
14:2 Integration of the City system.. (18:18):
14:15 Even if residents have no airt.. (18:18):

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mobile access {3-1} [2]
citizen benefits {45-4} [2]
3:13 Communication in local newspap.. (21:21):
4:8 Local news papers, freecall li.. (18:18):
future of ERP {18-5} [1]
3:17 We will have access on the mob.. (25:25):

---

motivation for ERP {2-0} [0]

Municipality objectives {2-0} [0]

---

problem solved by ERP {1-0} [0]

---

public sector ERP {2-0} [1]
future of ERP {18-5} [3]
14:5 In the meantime we will have a.. (24:24):
14:19 we hand web enabled services. (24:24):
14:20 web enabled services to ensure.. (24:24):

Reliable Services {1-0} [1]
Strictness {1-0} [2]
14:21 reliable services, (24:24):
14:22 very reliable services, where .. (24:24):

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single customer record {2-3} [2]
citizen benefits {45-4} [1]
4:7 Everything that a customer req.. (15:15):

integration {20-7} [1]
4:6 We have details of all the cus.. (11:11):

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standardisation {2-0} [1]
status quo {2-0} [1]
14:10 financial, the usual accountin.. (8:8):

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status quo {2-0} [1]
standardisation {2-0} [1]
14:10 financial, the usual accountin.. (8:8):

---

streamlined processes {3-0} [1]
legacy system {14-0} [1]
14:9 the need for a uni-system that.. (6:6):

Strictness {1-0} [1]
Reliable Services {1-0} [2]
14:21 reliable services, (24:24):
14:22 very reliable services, where .. (24:24):

System Efficiency {1-0} [0]

System Value (ERP function) {33-4} [4]
citizen benefits {45-4} [12]
1:21 people undermining processes, .. (20:20):
3:5 Made services on our portal fo.. (5:5):
5:16 hopefully am not both at one p.. (5:5):
5:17 So we build ERP systems for tr.. (5:5):
5:27 through portals, we can now su.. (9:9):
5:37 , so we don't have tonnes of g.. (17:17):
5:38 So through the intelligence of.. (17:17):
5:39 And when it enriches our budge.. (17:17):
5:42 we want to have our citizens a.. (19:19):
5:45 ability to to code a notificat.. (19:19):
5:49 the entire business process ta.. (26:26):
5:50 the queue management system (26:26):
ERP Implementation Status {20-6} [2]
1:41 Some areas are not working at .. (25:25):
1:42 Some areas are not working at .. (25:25):
integration {20-7} [3]
3:5 Made services on our portal fo.. (5:5):
5:15 That is very important to any .. (5:5):
5:16 hopefully am not both at one p.. (5:5):
legacy system {14-0} [2]
5:1 organisation was being amalgam.. (5:5):
5:2 amalgamated 38 previous munici.. (5:5):

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transparency {4-2} [1]
citizen benefits {45-4} [1]
5:23 All of a sudden you can see th.. (5:5):

Trusting the City {5-0} [3]

alternative solutions {2-0} [2]
14:3 We are currently running lots .. (20:20):
14:16 Mainly communication is throug.. (20:20):
citizen benefits {45-4} [2]
5:33 basic level is the integrity o.. (17:17):
5:34 your relationship with the cit.. (17:17):
integration {20-7} [2]
14:2 Integration of the City system.. (18:18):
14:14 Integration of the City system.. (18:18):

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value chain {1-2} [1]
integration {20-7} [1]
1:24 accountants or people who driv.. (20:20):

Appendix H: Introductory letter to the case study organisation

Cape Peninsula University of Technology

RESEARCH UNIT
FACULTY INFORMATICS & DESIGN
PO BOX 652
Cape Town, South Africa
8000

Tel – 27 21 469 1032
Fax – 27 21 469 1032

email: pathers@cput.ac.za

18 March 2011

ATT: CIO, CITY OF CAPE TOWN
Mr Andre Stelzner

Dear Mr Stelzner

TITLE OF RESEARCH PROJECT: ASSESSING ERP BENEFITS IN MUNICIPALITIES

Masters Candidate: **Mr Takauya Chandiwana**
Email takachandiwana@gmail.com
Tel 079 4101000

I would like to thank you for the interest shown in this research project which is being conducted towards a Masters Degree in Information Technology at the Cape Peninsula University of Technology (CPUT). The research problem focuses on the business case of ERP projects in Municipalities. The specific objective is to identify ERP project outcomes which contribute either direct and indirect value (or benefit) to the citizens in a municipality.

This letter also serves to confirm that Mr Takauya Chandiwana is currently a registered student (Student Number 209218029) under my supervision. I understand that you and your staff have limited time, and therefore would like to express my sincere appreciation of your willingness to share your expertise and contribute to the advancement of research and knowledge creation.

This project has received the necessary ethical clearance at the University. As such Mr Chandiwana undertakes that the information shared by you and/or your organization will be kept confidential, and that this will not be used for commercial gain or purpose in any way whatsoever. In terms of the reporting of the research, only summarized information will be used, and this will not be attributed to the City of Cape Town staff in their personal or professional capacity nor your organisation, unless you have expressly given your permission.

I hope that we can continue to build a good relationship between yourself and the CPUT.

Yours faithfully

Prof Shaun Pather
Research Supervisor

Appendix H1: Follow up to the introductory letter

Cape Peninsula University of Technology

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FACULTY INFORMATICS & DESIGN
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8000

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05 May 2012

FOR ATT: Mr Andre Stelzner
CIO, City of Cape Town

Dear Sir
TITLE OF RESEARCH PROJECT: ASSESSING ERP BENEFITS IN MUNCIPILATIES
Firstly, I would like to apologise for taking so much time to come back to you. But this was beyond my control. As a part-time student my literature study took longer than anticipated, due to interruptions by my full time work obligations.

The main reason for this communication is to inform you that I am now ready to commence with the empirical research phase. As agreed at our previous meeting, you would facilitate introductions on our behalf to the key informants identified below.

Furthermore, please note that the research project is structured into two phases. **PHASE 1:** In-depth interviews targeted at key informants at top ICT management, specifically, yourself, and at least three (3) more members such as The Head of Change Management, The Chief Enterprise Architecture, and the Chief Programmer or related posts.

PHASE 2: We will then use the findings of this phase to formulate a survey instrument. The survey will be used to gather further information from middle management and IT specialists in your department. In this phase we expect to cover a number of your sites of service delivery such as Plumstead, Bellevill, Fishoek, Khayelitsha and Green Point offices.

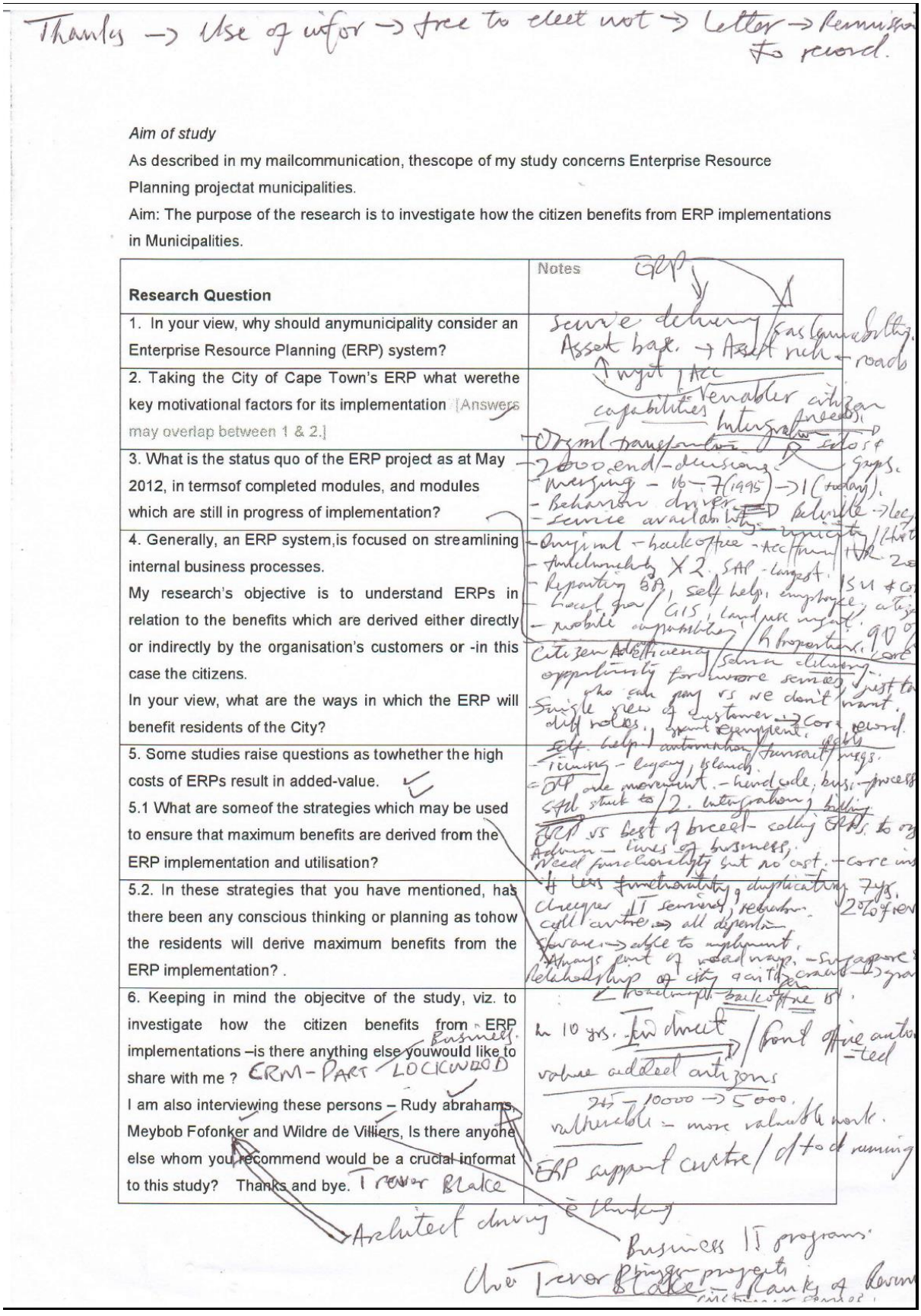
I would also like to assure of the following: In terms of the reporting of the research, only summarized information will be used, and this will not be attributed to anyone, in his/her personal or professional capacity nor your organisation, unless you have expressly given your permission. Furthermore, I undertake not to disseminate any of the raw data to anyone else other than my supervisor.

Your contribution to this study and to the development of new knowledge is most appreciated. I hope that we can continue to build a good relationship between yourself and the CPUT.

Yours faithfully

Prof Shaun Pather
Supervisor

Appendix I: Sample interview notes



Aim of study

As described in my mailcommunication, thescope of my study concerns Enterprise Resource Planning projectat municipalities.

Aim: The purpose of the research is to investigate how the citizen benefits from ERP implementations in Municipalities.

Research Question	Notes
1. In your view, why should anymunicipality consider an Enterprise Resource Planning (ERP) system?	
2. Taking the City of Cape Town's ERP what werethe key motivational factors for its implementation [Answers may overlap between 1 & 2.]	
3. What is the status quo of the ERP project as at May 2012, in termsof completed modules, and modules which are still in progress of implementation?	
4. Generally, an ERP system,is focused on streamlining internal business processes. My research's objective is to understand ERPs in relation to the benefits which are derived either directly or indirectly by the organisation's customers or -in this case the citizens. In your view, what are the ways in which the ERP will benefit residents of the City?	
5. Some studies raise questions as towhether the high costs of ERPs result in added-value. 5.1 What are someof the strategies which may be used to ensure that maximum benefits are derived from the ERP implementation and utilisation?	
5.2. In these strategies that you have mentioned, has there been any conscious thinking or planning as tohow the residents will derive maximum benefits from the ERP implementation? .	
6. Keeping in mind the objecitve of the study, viz. to investigate how the citizen benefits from ERP implementations –is there anything else youwould like to share with me ? ERM – PART LOCKWOOD I am also interviewing these persons – Rudy abrahams, Meybob Fofonker and Wildre de Villiers, Is there anyone else whom you recommend would be a crucial informat to this study? Thanks and bye. Trevor Blake	

Appendix J: An introductory letter to the interviewee before the interview

Takauya Chandiwana, a Postgrad Researcher at the cape Peninsular University of Technology (CPUT) is embarking on a research to investigate how the citizen benefits from ERP implementations in Municipalities. His research question is focussed on the business case for ERP systems in Municipalities - and specifically what is the value proposition (direct and indirect) for the customer (or citizen in this case). The scope of his study concerns ERP projects at municipalities. He thus, chose the Case Study of the Enterprise Resource Planning (ERP) of the Municipality of Cape Town.

The research is driven by the notion that in this 'information age', public institutions are joining the private sector in the networked information management while some studies raise questions as to whether the high costs of ERPs result in added-value. Specifically, whether public institutions cannot continue using the stand-alone systems to achieve the same result. Therefore, he needs to conduct the research interview with you, based on the question guideline below:

1. In your view, why should any municipality consider an Enterprise Resource Planning (ERP) system?

2. Taking the City of Cape Town's ERP what were the key motivational factors for its implementation?

3. What is the status quo of the ERP project as at May 2012, in terms of completed modules, and modules which are still in progress of implementation?

4. Generally, an ERP system is focussed on streamlining internal business processes. The objective of this research is to understand ERPs in relation to the benefits which are derived either directly or indirectly by the organisation's customers or -in this case the citizens. In your view, what are the ways in which the ERP will benefit residents of the City?

5. Some studies raise questions as to whether the high costs of ERPs result in added-value.

5.1 What are some of the strategies which may be used to ensure that maximum benefits are derived from the ERP implementation and utilisation?

5.2. In these strategies that you have mentioned, has there been any conscious thinking or planning as to how the residents will derive maximum benefits from the ERP implementation?

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Appendix K: Concepts with Statistics (Report from Atlas.ti)

CODES-PRIMARY-DOCUMENTS-TABLE																
Report created by Super - 2012/11/30 08:09:38 PM																
HU: [C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Thesis_Project_Taka_2012.hpr7]																
Code-Filter: All [30]																
PD-Filter: All [15]																
Quotation-Filter: All [396]																
	P 1: Interview_Trans_1.docx	*P 2: Interview_Trans_5.docx*	*P 3: Interview_Trans_3.docx*	*P 4: Interview_Trans_4.docx*	*P 5: Interview_Trans_2.docx*	*P 6: Interview_Trans_15.docx*	*P 7: Interview_Trans_14.docx*	*P 8: Interview_Trans_10.docx*	*P 9: Interview_Trans_11.docx*	*P10: Interview_Trans_12.docx*	*P12: Interview_Trans_6.docx*	*P11: Interview_Trans_13.docx*	*P13: Interview_trans_7.docx*	*P14: Interview_Trans_8.docx*	*P15: Interview_Trans_9.docx*	**TOTALS**:
alternative solutions	1	0	1	0	1	0	0	1	0	0	2	0	0	1	0	7
asset rich	2	0	0	0	1	1	1	0	2	0	1	1	0	1	1	11
Benefits management	2	2	1	0	1	0	0	0	1	0	0	0	1	0	2	10
citizen benefits	15	1	7	3	6	12	4	11	3	3	4	6	7	3	1	86
citizen expectation	1	3	0	0	0	0	0	1	0	0	0	2	0	0	0	7
cost of ERP	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	4
efficiency and effectiveness	1	2	2	0	3	2	0	1	3	1	1	1	2	1	0	20
ERP costs	4	0	0	0	1	0	0	1	0	0	2	0	0	1	0	9
ERP Implementation Status	6	1	1	1	2	0	0	1	1	0	0	1	0	1	2	17
future of ERP	4	0	4	0	5	0	0	1	0	1	0	2	0	2	0	19
Improved service delivery	2	2	0	3	4	1	2	0	4	2	2	1	1	3	1	28
integration	4	0	3	5	3	1	1	0	2	0	1	0	1	2	1	24
legacy system	1	3	0	1	4	0	1	0	1	0	0	2	1	1	2	17
merged municipalities	2	1	0	1	1	1	1	1	1	2	1	1	1	1	0	15
mobile access	3	2	2	1	1	1	3	0	1	0	3	0	1	0	1	19
motivation for ERP	2	0	0	0	1	0	0	1	0	1	0	0	0	1	0	6
Municipality objectives	2	0	1	0	1	0	1	0	2	0	0	1	0	1	2	11
problem solved by ERP	1	0	1	0	0	0	1	0	1	0	0	0	0	1	0	5
public sector ERP	1	0	1	0	1	0	1	0	2	1	0	2	0	1	0	10
Reliable Services	3	1	1	0	0	3	0	1	0	1	0	2	0	1	0	13
single customer record	2	4	1	2	1	2	1	2	0	3	1	1	2	1	4	27
standardisation	1	1	0	3	1	0	1	0	3	2	0	1	0	1	0	14
status quo	1	0	0	0	2	0	0	1	0	1	1	0	0	1	0	7
streamlined processes	1	0	1	0	0	0	1	0	0	1	0	0	0	2	0	6
Strictness	0	0	1	0	1	0	2	0	0	1	0	1	0	1	0	7
System Efficiency	1	0	1	0	1	0	1	1	1	1	1	3	0	1	0	12
System Value (ERP function)	9	1	5	2	16	0	0	0	0	0	0	0	0	0	0	33
transparency	2	1	1	0	3	0	2	2	1	4	1	1	1	1	1	21
Trusting the City	1	0	1	0	2	2	0	1	0	0	1	0	0	2	0	10
value chain	1	0	2	0	0	1	0	0	0	0	1	0	0	2	0	7
TOTALS:	77	25	38	23	63	28	24	27	29	25	23	30	18	34	18	

Appendix L: Quotations as they link to codes (Report from Atlas.ti)

Quotation Manager [HU: Thesis_Project_Taka_2012]

Id	Name	Codes	art	Created
14:3	We are currently running lots ..	alternative solutions	20	2012/08/26
5:11	Yes we have spread sheet gurus ..	alternative solutions	5	2012/08/04
5:51	why should we have the vulnera..	asset rich	26	2012/08/04
1:9	without the foundation, you ca..	Benefits management	18	2012/08/04
5:44	we run a campaign on; “Did you..	Benefits management	19	2012/08/04
1:7	when would we use, if you are ..	Benefits management	18	2012/07/31
13:5	the value of technology is not..	Benefits management	20	2012/08/26
3:6	E-citizen	citizen benefits	7	2012/08/05
5:36	give you the ability to punch ..	citizen benefits	17	2012/08/04
1:44	We have got the back office wo..	citizen benefits	28	2012/08/04
3:16	Fibre optic is a separate proj..	citizen benefits	24	2012/08/05
3:7	E-citizen, can now log in read..	citizen benefits	7	2012/08/05
1:33	we want to enable those kind o..	citizen benefits	25	2012/08/04
14:6	Even if residents have no airt..	citizen benefits	18	2012/10/18
1:31	they are getting more function..	citizen benefits	23	2012/08/04
1:3	to creates more opportunities ..	citizen benefits	18	2012/07/31
5:35	the integrity of the utility b..	citizen benefits	17	2012/08/04
1:43	the citizens have benefitted th..	citizen benefits	28	2012/08/04
5:28	self-services very important	citizen benefits	9	2012/08/04
1:47	I think it benefits citizens i..	citizen benefits	18	2012/10/13
13:2	Users have accelerated access.	citizen benefits	5	2012/08/26
1:5	of people who can pay versus ..	citizen benefits	18	2012/07/31
1:2	different financial and service..	citizen benefits	18	2012/07/31
5:33	basic level is the integrity o..	citizen benefits	17	2012/08/04
1:34	citizens can actually make thi..	citizen benefits	25	2012/08/04
1:30	Citizens are getting a cheaper..	citizen benefits	23	2012/08/04
1:22	best thinking at time and we h..	citizen benefits	20	2012/08/04
1:4	you can start what I call soci..	citizen benefits	18	2012/07/31
3:11	Citizens can interact with the..	citizen benefits	16	2012/08/05
1:35	citizens to transact for thems..	citizen benefits	25	2012/08/04
1:37	you actually log on to an appl..	citizen benefits	25	2012/08/04
2:7	and must be used to its fullest..	citizen benefits	823	2012/08/05
5:55	If you look at the investment..	citizen benefits, ERP Implementation Status	26	2012/08/04
4:11	quicker response to the needs ..	citizen benefits, integration	21	2012/08/05
3:12	Integration of the City system..	citizen benefits, integration	19	2012/08/05
3:5	Made services on our portal fo..	citizen benefits, integration, System Value (ERP function)	5	2012/08/05
4:8	Local newspapers, free call li..	citizen benefits, mobile access	18	2012/08/05
3:13	Communication in local newspapers	citizen benefits, mobile access	21	2012/08/05
4:7	Everything that a customer req..	citizen benefits, single customer record	15	2012/08/05
5:17	So we build ERP systems for tr..	citizen benefits, System Value (ERP function)	5	2012/08/04
1:21	people undermining processes,.	citizen benefits, System Value (ERP function)	20	2012/08/04
5:27	through portals, we can now su..	citizen benefits, System Value (ERP function)	9	2012/08/04

5:42	we want to have our citizens a..	citizen benefits, System Value (ERP function)	19	2012/08/04
5:49	the entire business process ta..	citizen benefits, System Value (ERP function)	26	2012/08/04
5:50	the queue management system	citizen benefits, System Value (ERP function)	26	2012/08/04
5:38	So through the intelligence of..	citizen benefits, System Value (ERP function)	17	2012/08/04
5:16	hopefully am not both at one p..	citizen benefits, System Value (ERP function)	5	2012/08/04
5:37	, so we don't have tonnes of g..	citizen benefits, System Value (ERP function)	17	2012/08/04
5:45	Ability to code a notifications..	citizen benefits, System Value (ERP function)	19	2012/08/04
5:39	And when it enriches our budge..	citizen benefits, System Value	17	2012/08/04
5:23	All of a sudden you can see the.	citizen benefits, transparency	5	2012/08/04
8:1	The citizen can report pothole..	citizen expectation	6	2012/08/26
1:10	you can be sure the sky is the..	citizen expectation	18	2012/08/04
~14:1	Generally ERPs bring efficiency..	efficiency and effectiveness	4	2012/08/24
1:28	we brought it down year on yea.	ERP costs	23	2012/08/04
1:29	When we started off it was jus..	ERP costs	23	2012/08/04
1:26	Within the administration peop..	ERP costs	23	2012/08/04
1:27	they are trying really hard to..	ERP costs	23	2012/08/04
5:25	We have the software factory, ..	ERP Implementation Status	9	2012/08/04
1:15	sit back and think how best to..	ERP Implementation Status	20	2012/08/04
3:8	SAP with modules, financial, t..	ERP Implementation Status	9	2012/08/05
1:19	we were able to thrush out and..	ERP Implementation Status	20	2012/08/04
5:46	we spent 10 years investing in..	ERP Implementation Status	26	2012/08/04
5:14	SAP has become in my opinion t..	ERP Implementation Status	5	2012/08/04
1:41	Some areas are not working at ..	ERP Implementation Status	25	2012/08/04
5:54	We are now at the degree of ce..	ERP Implementation Status	26	2012/08/04
5:6	was you need one system and th.	ERP Implementation Status	5	2012/08/04
5:26	we have invested in the backen..	ERP Implementation Status	9	2012/08/04
5:24	We have got SAP wall to wall, ..	ERP Implementation Status	9	2012/08/04
1:32	software issues had strong mes..	ERP Implementation Status	23	2012/08/04
1:16	And then we got through a proc..	ERP Implementation Status	20	2012/08/04
4:5	HR fully in place, scan in, pa..	ERP Implementation Status	11	2012/08/05
5:10	one single version of the trut..	ERP Implementation Status	5	2012/08/04
2:5	It was decided that the most a..	ERP Implementation Status	54	2012/08/05
1:40	getting the back office work i..	ERP Implementation Status	25	2012/08/04
5:52	We can have that all that take..	future of ERP	26	2012/08/04
3:14	The problem is access to inter..	future of ERP	24	2012/08/05
3:15	We are linking using a fibre t..	future of ERP	24	2012/08/05
5:31	there is value in integrating ..	future of ERP	9	2012/08/04
1:45	those processes are just fully..	future of ERP	28	2012/08/04
14:5	In the meantime we will have a..	future of ERP	24	2012/10/18
12:4	We are expecting'transformativ..	future of ERP	30	2012/08/26
5:47	ther is a particular reason wh..	future of ERP	26	2012/08/04
5:30	we have to bring on board are ..	future of ERP	9	2012/08/04
5:48	when I talk to you about citiz..	future of ERP	26	2012/08/04
8:2	We would want to incorporate e..	future of ERP	23	2012/10/18
1:36	where we can tell the citizens..	future of ERP	25	2012/08/04
1:8	can start pushing messages via..	future of ERP	18	2012/08/04
12:3	creating an on-line communicat..	future of ERP	30	2012/08/26
1:46	So we have taken down 25000 p..	future of ERP	28	2012/08/04

3:9	Now ready to bring E-citizen o..	future of ERP	10	2012/08/05
3:17	We will have access on the mob..	future of ERP, mobile access	25	2012/08/05
13:3	. Automatically generated emai..	Improved service delivery	7	2012/08/26
1:23	integration because we did it ..	integration	20	2012/08/04
5:9	is needed to have one business..	integration	5	2012/08/04
14:2	Integration of the City system..	integration	18	2012/08/26
5:32	have a solid and robust back o..	integration	9	2012/08/04
4:2	All departments have to wor in..	integration	5	2012/08/04
13:1	A common view and a single vie..	integration	5	2012/08/26
5:21	we are an eco-system	integration	5	2012/08/04
5:29	integrated this information at..	integration	9	2012/08/04
4:4	Integrated Planning on roads, ..	integration	7	2012/08/04
14:4	to incorporate event managemen..	integration	23	2012/08/26
3:3	One view of the financial data..	integration	5	2012/08/05
5:15	That is very important to any ..	integration	5	2012/08/04
5:4	one strand throughout the orga..	integration	5	2012/08/04
4:1	the need for one computer syst..	integration	5	2012/08/04
4:6	We have details of all the cus..	integration, single customer record	11	2012/08/05
1:24	accountants or people who driv..	integration, value chain	20	2012/08/04
5:8	organisation came with legasy ..	legacy system	5	2012/08/04
12:2	the citizens are benefitting be..	legacy system	30	
5:2	amalgamated 38 previous munici..	legacy system	5	2012/08/04
5:5	That is 38 views of the City t..	legacy system	5	2012/08/04
2:2	Each of these councils was onl..	legacy system	41	2012/08/05
12:1	The challenges facing Municipa..	legacy system	9	2012/08/26
4:3	Seven municipalities from 40 p..	legacy system	7	2012/08/04
2:4	Each administration runs its o..	legacy system	50	2012/08/05
5:3	the complexity of 38 municipal..	legacy system	5	2012/08/04
2:3	The independence of each counc..	legacy system	43	2012/08/05
1:14	t we tried to replace our lega..	legacy system	20	2012/08/04
2:1	Until October 2001, there were..	merged municipalities	39	2012/08/05
5:13	If SAP goes down, we cannot co..	motivation for ERP	5	2012/08/04
~1:17	the public sector is less disc..	public sector ERP	20	2012/08/04
5:22	Now at the City of Cape Town i..	standardisation	5	2012/08/04
1:1	last few years, is actually st..	status quo	10	2012/07/31
1:6	it’s pointless in actually you..	streamlined processes	18	2012/07/31
5:53	why do cases don’t get through..	System Efficiency	26	2012/08/04
5:7	software applications that cou..	System Value (ERP function)	5	2012/08/04
5:1	organisation was being amalgam..	System Value (ERP function)	5	2012/08/04
5:18	so it brings organisational go..	System Value (ERP function)	5	2012/08/04
2:6	SAP in the City of Cape Town i..	System Value (ERP function)	823	2012/08/05
1:11	about driving organisational t..	System Value (ERP function)	19	2012/08/04
1:20	you can’t change the procureme..	System Value (ERP function)	20	2012/08/04
5:19	show up on departmental inadeq..	System Value (ERP function)	5	2012/08/04
3:4	Improved the internal system	System Value (ERP function)	5	2012/08/05
1:12	vendors pre-empted the municip..	System Value (ERP function)	19	2012/08/04
3:2	Streamlined and combined into ..	System Value (ERP function)	5	2012/08/05
3:10	Like on HR module employees sc	System Value (ERP function)	10	2012/08/05
4:10	the ERP can prioritise mainten..	System Value (ERP function)	21	2012/08/05

5:12	The reality today is the City ..	System Value (ERP function)	5	2012/08/04
5:40	Lets talk about have and the h..	System Value (ERP function)	17	2012/08/04
1:13	this stage of amalgamating and..	System Value (ERP function)	20	2012/08/04
3:1	merged seven cities, and lots ..	System Value (ERP function)	5	2012/08/05
1:39	fully integrated automated bus..	System Value (ERP function)	25	2012/08/04
1:18	enable people to configure the..	System Value (ERP function)	20	2012/08/04
4:9	Equitable service delivery	System Value (ERP function)	21	2012/08/05
1:42	Some areas are not working at ..	System Value (ERP function)	25	2012/08/04
1:25	functionality is something we ..	System Value (ERP function)	23	2012/08/04
5:20	And those in the department wh..	transparency	5	2012/08/04
5:41	The citizens only want, I don'..	transparency	17	2012/08/04
13:4	Everything that a customer req..	transparency	14	2012/08/26
5:34	your relationship with the cit..	Trusting the City	17	2012/08/04
1:38	When I know that the officials..	Trusting the City	25	2012/08/04
5:43	we are not just a bunch of tec..	Trusting the City	19	2012/08/04

Appendix M: Grouping of related Codes to form categories (Report from Atlas.ti)

Code-Filter: All

HU: Thesis_Project_Taka_2012
File: [C:\Users\TAKA\Documents\Scientific Software\ATLASti\TextBank\Thesis_Project_Taka_2012.hpr7]
Edited by: Super
Date/Time: 2013-06-26 10:02:25

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alternative solutions <is> Root

Benefits management <is> Root

citizen benefits <is> Root
ERP Implementation Status <is cause of> citizen benefits
integration <is cause of> citizen benefits
ERP Implementation Status <is cause of> integration
System Value (ERP function) <is a> integration
ERP Implementation Status <is cause of> System Value (ERP function)
System Value (ERP function) <is cause of> citizen benefits

citizen expectation <is> Citizen Benefit
cost of ERP <is cause of> System Value
Efficiency and effectiveness <is> Root
ERP costs <is> Cost of ERP..<is cause of> asset rich
ERP Implementation Status <is> Root

future of ERP <is> Root
citizen benefits <is cause of> future of ERP
ERP Implementation Status <is cause of> citizen benefits
integration <is cause of> citizen benefits
ERP Implementation Status <is cause of> integration
System Value (ERP function) <is a> integration
ERP Implementation Status <is cause of> System Value (ERP function)
System Value (ERP function) <is cause of> citizen benefits
ERP Implementation Status <is cause of> future of ERP
integration <is cause of> future of ERP
mobile access <is part of> future of ERP
System Value (ERP function) <is cause of> future of ERP

Improved service delivery <is> Root

integration <is> Root
ERP Implementation Status <is cause of> integration
System Value (ERP function) <is a> integration..<is part of>..legacy system..<is part of> merged municipalities
ERP Implementation Status <is cause of> System Value (ERP function)

mobile access <is> Root

motivation for ERP <is> Root

Municipality objectives <is> Root

problem solved by ERP <is> Root

public sector ERP <is> Root

single customer record <is> Root
    ERP Implementation Status <Form> single customer record
    integration <is cause of> single customer record
        ERP Implementation Status <is cause of> integration
        System Value (ERP function) <is a> integration
            ERP Implementation Status <is cause of> System Value (ERP function)

standardisation <is> Root

status quo <is> Root

streamlined processes <is> Root

System Efficiency <is> Root

System Value (ERP function) <is> Root
    ERP Implementation Status <is cause of> System Value (ERP function)

transparency <is> Root
    ERP Implementation Status <is cause of> transparency
    integration <is cause of> transparency
        ERP Implementation Status <is cause of> integration
        System Value (ERP function) <is a> integration
            ERP Implementation Status <is cause of> System Value (ERP function)

Trusting the City <is> Root

value chain <is> Root
    integration <is cause of> value chain
        ERP Implementation Status <is cause of> integration
        System Value (ERP function) <is a> integration
            ERP Implementation Status <is cause of> System Value (ERP function)
    single customer record <is part of> value chain
        ERP Implementation Status <Form> single customer record
        integration <is cause of> single customer record