

**UNIVERSITY OF KWAZULU-NATAL (UKZN)**

**The Impact of Information Systems on Internal Processes and Service  
Delivery in eThekweni Municipality**

**By**

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degree of Master of Business Administration**

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## **ABSTRACT**

In view of the growing importance of information systems and technology in the public service delivery and the massive expenditure of government on information technology, it is essential to comprehend how to evaluate the benefits and impacts of information systems in public administration, as well as the municipalities in South Africa. Information systems are enabling organisations to leverage on new opportunities and to build more robust technology capacity. The application of information systems for service delivery demonstrates that there is a direct correlation between information systems and the degree of economic development in the state or country. The study assessed the impact of information systems on internal processes and service delivery in eThekweni Municipality. The study utilised a qualitative approach and applied a process of structured interviews for data collection. The study reviewed six (6) selected business units in municipality. Using a purposive sampling method, a total of 12 interviewees were selected to participate in the study out of which (11) responded, giving a response rate of 92%. The interview questions were designed to align with the four (4) objectives of this study. Feedback from the study showed that the eThekweni municipality is already using some information systems and the absence of such systems would lead to a complete disaster. Respondent's feedback showed that the participants were aware of the fourth revolution but believes that eThekweni municipality is still behind. In some aspects, it was uncovered that the existing information systems were effectively utilised, and that information systems played a vital role in the internal processes and efficient service delivery. The study also showed that the political leadership had some input in the existing municipality structure and that sometimes, there was interference in the administration in the municipality. Employees were also resistant towards the introduction of new information systems implementation, as they were getting tired of adding new systems without addressing the shortfalls in the existing systems. The study reveals that effective leadership is required in all business units. The study further revealed that working in silos is a major hindrance in moving forward for the municipality. The study recommended that silos should be addressed through creation of discussion forums for interaction. It was also important to assess new systems before implementation as it is vital that all the systems are integrated to enable the employees improve internal processes for effective service delivery.

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### **LIST OF ACRONYMS**

CMS	Complains Management Systems
DBMS	Database Management Systems
DSS	Decision Support System
EHR	Electronic Health Records
EMR	Electronic Medical Records
ERP	Enterprise Resource Planning
GIS	Geographic Information System
IS	Information Systems
IT	Information Technology
LAN	Local Area Networks

PHR	Personal Health Records
SA	South Africa
SCM	Supply Chain Management System
VPN	Virtual Private Networks

## **CHAPTER ONE**

### **INTRODUCTION AND BACKGROUND TO THE STUDY**

#### **1.1 Introduction**

A core aspect of public administration is public service. In many countries, improving the productivity of service delivery in public service is the ultimate objective of governments and political leadership at all levels (Yang, 2015). In view of the growing importance of information systems and technology in the public service delivery and the massive expenditure of government on information technology, it is essential to comprehend how to evaluate the benefits and impacts of information systems in public administration (Alrashid, 2016). This will also enable better internal process, enhanced service delivery and efficient relations with citizens and other local businesses. This study evaluates the impacts of information systems on internal

processes and service delivery, with focus on Durban eThekweni Municipality in KwaZulu-Natal province of South Africa. This chapter discusses the background, significance and focus of the study. It will also outline the problem statement and the objectives of the study. The methodology that was applied in the research will be explained and the conclusion of this chapter will expound the structure of the dissertation.

## **1.2 Background**

Information systems are enabling organisations to leverage on new opportunities that will build more robust technology capacity. The application of information systems for service delivery demonstrates that there is a direct correlation between information systems and the degree of economic development in the state or in a country (Yang, 2015). One of the most efficient approaches of the public institution is to minimize costs at varying levels of organisational processes. The public sector has encountered increased pressure to improve their productivity and demonstrate progress with effective productivity measures. The measurement and understanding of the productivity influence of information technology is substantial and it is a difficult issue facing researchers (Bourgeois, 2014). Previous views of public and business process management have showed that information technology does not directly result in increased public service productivity, however they influence it via intermediate organisational processes (Yang, 2015). Another study reviewed the relevance of management information system to public management. This study was used to determine if it assisted in expediting decision making or management. This was expected to ascertain the degree to which it has assisted in planning, control and operational function of the organisation (Ijeoma, 2018). An effective information system typically utilises computer and other sophisticated technology to process information that shows the day to day operations of the company (Yang, 2015). A study on the impact of information systems on the performance of business organisations in a West African country, showed that it transformed the decision support systems and became foundational for the new business environment (Yang, 2015). The study by Yang (2015) further recommended that business organisations should introduce flexibility in their application of information systems. This they can

do by upgrading existing hardware's in other to enhance efficient internal process and service delivery to customers.

The idea of this study was prompted by researcher's experience while joining the employment of the council and interactions with the various units within the municipality, where it was identified that each unit is using a different Information system as some were dysfunctional. Some of the systems that were in full operation lacked integration and were autonomous, thereby procrastinating internal processes which affected efficiency and service delivery. In reviewing the evolution of Electronic Government (e-Government) among municipalities, it was highlighted that information technology has unlocked countless possibilities for internal managerial efficiency and the importance of service delivery to citizens. (GCIS, 2016). As a result, information technology is a core element for managerial reform in the public service and e-Government towards the future of public governance (Alrashid, 2016).

There is a possibility to argue that eThekweni Municipality which is located in South Africa, being a developing country is likely to advance in various aspects of information systems. However, studies have been conducted on the state of the national government in South Africa (Zietsman, 2018). The findings from the study was that municipalities forms an integral part of public administration and are expected to excel in public service delivery. In the service delivery report, her worship the Mayor of eThekweni municipality was quoted saying "we have a futuristic vision for our city, which involves using modern technology to fast track service delivery (Sisilana, 2016). This study therefore aims at assessing the impact of information systems on internal process and service delivery in eThekweni Municipality. The study will help in understanding the current systems, optimisation, integration, ease of access, and reliability.

### **1.3 Significance of the Study**

This study will add to scholarly research and literature in the field of Information Systems in Local Government, for example in eThekweni Metropolitan Municipality by investigating the impact of Information systems on internal processes and service delivery. This study will also enable an enhanced information systems practice by addressing key problems like high information technology cost, lack of synergy and

integration of the systems in the eThekweni Municipality. This study will then stimulate the sustainability of economic development goals, thereby addressing ways to achieve higher levels of economic productivity through diversification, technological upgrade and innovation if embraced by the political leadership of Durban. In terms of access to information and communication technology, this study will stimulate the need for initiatives that can provide affordable access to the internet. This study will also identify key challenges that lead to the lack of systems integration, as well as room for optimisation in the existing systems. The study will further show impact on internal process and service delivery by information systems.

The study will therefore use collected data to design solutions on how synergy may be created with the present IT systems. The researcher believes that there is room for improvement with regards to the efficiency of information system that will cover the gaps that exists in the municipality as some of the systems are operating in silos. Furthermore, the recommendations from this project are expected to guide the local municipalities who are yet to invest in information systems.

#### **1.4 Study Focus and Limitation of the Study**

The key focus of this study is to evaluate the impact of information systems on internal processes and service delivery, with key focus on eThekweni Municipality. The study mainly cantered on six business units that play more role in service delivery. These business units are information and technology, water and sanitation unit, electricity unit, city fleet unit, security management, and city treasury. The outcomes from this study are only applicable to Durban eThekweni Municipality, hence the study cannot be generalized.

#### **1.5 Problem Statement**

The public sector has several promises of improving governmental processes and service delivery through improved information systems (like e-government), even though the implementation has remained slow over the years. Although many countries have now successfully implemented e-governance, there are some delays in implementing efficient information systems in the South African public sector. One of the challenges faced by the SA public sector is that a good number of them operate

in a complex environment with different difficulties in implementing efficient information systems that will improve internal processes and service delivery. EThekwini municipality currently operates a number of systems, even though they are still facing internal process difficulties which results in inefficient service deliveries. Examples of these difficulties are that some residents do not receive feedback to complaints on time, inefficient use of existing systems by municipality employees, systems being offline when demand for service is high from residents, etc. This shows that an urgent intervention by the decision makers in the municipality is required to ensure that this service institution receives the benefit of the investments made on information systems and technology. An overview of the existing system suggests that the challenges faced could be due to lack of synergy and lack of optimisation of the existing internal systems. The failure of these systems if not properly optimised and utilised will result in inefficient internal process that will lead to poor service delivery when poorly utilised. The study is aimed at assessing the impact of information systems on internal processes and service delivery in the eThekwini municipality.

## **1.6 Research Objectives**

The research objectives that guided the research are as follows:

- a) To explore what Information Systems are currently in place in eThekwini Municipality.
- b) To examine if the Information systems are effectually utilised.
- c) To investigate the relationship between Information systems, internal processes and service delivery.
- d) To analyse the role of political leadership and officials in implementing new systems.

## **1.7 Research Questions**

The outcomes from this study are expected to provide responses to the following questions:

- 1. What Information systems are in place in eThekwini Municipality?
- 2. Are the information systems being effectively utilised?

3. What is the relationship between information systems, internal processes and service delivery?
4. What is the role of political leadership and employees in implementing new systems?

### **1.8 Assumptions of the Study**

This study will focus on establishing the causes for not optimising IT and the effects it has on internal processes and service delivery in the eThekweni Municipality, with an aim to establish solutions to the challenges. The focus of the study will embrace analysing existing systems and internal processes, studying the relationship between internal process, IT and service delivery.

### **1.9 Methodology**

The research methodology is very crucial in establishing the research structure like for example strategy, approach, and other aspects of the study. This research utilised the qualitative approach and also a non-probability sample in selecting the sample population. The study used purposeful sampling for selecting the sample. In purposive sample, the participants are selected depending on pre-selected criteria, as the sample size is already set. The population business unit was 46 while only about 12 participants were sampled for interview. These 12 participants were selected because they work with business units that utilise more information systems and aligned towards service delivery. Out of 12, only 11 were available to be interviewed. The feedback from the participants were analysed using both thematic and content analysis to establish patterns from their interview's comments.

Ethical consideration was made during the research. Substantial efforts were made by the researcher to ensure that the wordings in the interview schedules were suitable. Ethical clearance was received by the research from the Ethics Committee. The research also ensured that the participants responded willingly with no coercion as they had options to keep their identities confidential.

### **1.10 Chapter Outline**

This section outlines the chapters of the study and provide as follows:



**Chapter One:** This chapter provides the introduction of the study. It also covers the background to the study, study motivation, focus and limitations of the study, study objectives, research questions and the research methodology.

**Chapter Two:** Chapter Two covers the literature of the study. It reviews the theoretical content covering the objectives of the study, as well as the theoretical framework guiding the study.

**Chapter Three:** Chapter Three deals with the research methodology. This Chapter shows the research paradigms, research design method, study location, sample population, sampling, and data collection strategy.

**Chapter Four:** Chapter Four presents the results presentation, data analysis, findings and discussion of the presented results. This Chapter also indicates how the research results agree or disagrees with existing literatures.

**Chapter Five:** Chapter Five presents the study conclusions and recommendations for future study.

### **1.11 Summary**

This chapter reviewed the study introduction, related background, study significance and the focus of the study. The problem statement was outlined, in addition to the research objectives, research questions, scope of study and research methodology for the study. Information systems are an important driver for business excellence and is very essential in improving internal processes. The appropriate utilisation of business internal processes through information systems will enhance the service delivery to the public and citizens. The next chapter presents the literature review.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Information systems and technology are unique as they are increasing in impact. This enables the decision making and knowledge management system in an organisation (Bourgeois, 2014). Their utilisation has resulted in significant improvements in the efficiency of business internal processes and service delivery. The foregoing chapter covered the introduction of the study on the impact of information systems on internal processes and service delivery. This chapter outlines the literature related to the study.

#### **2.2 Exploring Information Systems in Place in eThekweni Municipality**

##### **2.2.1 Information System Overview**

The present day solutions to global challenges are supported by an array of information and data systems that were not accessible in the previous decades. Access to such information were limited because of early stage developments on information systems (GEHA, 2014). According to Gomez, Serna and Badenes (2010), information systems for the management of many organizations and companies have been a key driver for enterprise development. The development of information systems has progressed from being seen as just work, to a strategic

element and new models of business that is founded on its development (Gomez, et al., 2010).

Information system is essential to the daily operations of many global governments ranging from federal, state and even local governments. It is difficult to imagine the degree of manpower that is needed to monitor and track any citizens social security numbers (otherwise known as Identity Number in South African context), without using the speed and power of present day technology (GEHA, 2014). The importance of information systems in many governments cannot be over emphasized as many services that are provided by such governments would be impossible without information systems (GEHA, 2014). This is because, the drive of daily operations on all spheres of government parastatal hinges on information systems to run efficiently. Information systems. According to Forza (2013), the efficacy of quality management systems through information systems in any organization is so vital that it deserves greater recognition in the practice of quality management. Many public reforms have been introduced in the government sector and they cannot be maintained without accurate and precise measurement of policy outputs using information systems (Forza, 2013).

Many businesses and organizations depend on information systems to process and manage their business operations, communicate with their stakeholders and effectively compete in the marketplace (Zwass, 2014). This is because, they are utilised in running interorganizational supply chains and markets electronically. For example, many firms use information systems to put together financial statements, to manage their human capital, and to assess their potential customers with many online advert promotions (Zwass, 2014). Some of such organizations include eBay; which depend on information systems for auctioning in the marketplace and Amazon; a growing electronic mall and supplier of diverse cloud computing services. Many diverse human activities are enabled by information systems which impact a huge influence on the society. These systems improve the pace of daily activities, assist people in developing and sustaining new and more rewarding relationships thereby influencing the nature of their work (Forza, 2013).

### 2.2.2 Definition of Information Systems

Information systems can be defined as a collection of interrelated elements that gather, control, store and distribute data as well as information with an adequate feedback mechanism (Ndlovu, 2015). Information systems (IS) is a unique term that is used for systems, people and processes designed to store and enable effective distribution of information (Forza, 2013). The nature of information systems is as easy as using a pencil on a piece of paper. Hence, it is used to create a system for capturing information. According to Zwass (2017), information systems can be defined as an integrated set of components for collecting, storing, and processing data and for providing information, knowledge and digital products. The vital parts of information systems are computer hardware and software telecommunications, databases, data warehouses, human resources and procedures (Zwass, 2014). Many companies work with huge number of data. The figure 2-1 below depicts the definition and examples of information systems.

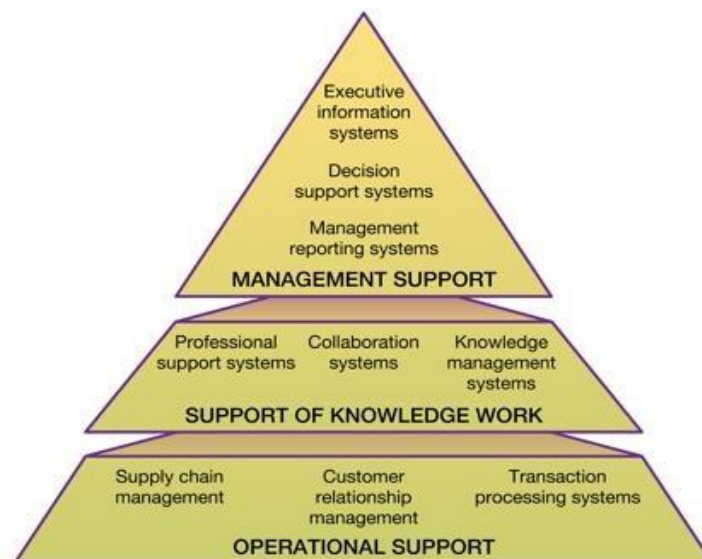


Figure 2-1: Definition of Information System (Source: Zwass, 2014)

The figure above shows that an aspect of information system deals with operational support which can range from; supply chain management, customer relationship management and transactional process systems (Forza, 2013). Another aspect of information system deals with the support for the employees. It usually covers aspects like professional support systems, collaboration and knowledge management (Zwass, 2014). The last phase from the figure deals with management

support. This is intended to enable management reporting systems, decision support and executive information systems (Zwass, 2014).

### 2.2.3 Types of Information Systems

According to Zandbergen (2016), there are some general types of information systems. They include;

- a. Database Management Systems (DBMS): This is a combination of software and data. It also makes it feasible to arrange and evaluate data.
- b. Electronic Spreadsheet: A tool for the basic evaluation of data which is dependent on formulas that explain the relationships among the data

Conversely, there are also other types of specialized information systems that have been designed to assist a specific process in the organization or to perform a designated task (Zandbergen, 2016). These include;

- a. Enterprise Resource Planning (ERP): This is a type of information systems used to coordinate the proper management of all external and internal information in the organization. The figure 2-2 below shows an example of an ERP system.



Figure 2- 2: ERP System (Source: Zendbergen, 2016)

The ERP system operates as an adhesive that binds together the various computer systems for big organisations. In the absence of an ERP application, each department will need to have its own system optimised for their specific task (Labarre, 2019). However, all the systems can be accessed via one application. This is done by using one interface for utilising an ERP system. For instance, the ERP system can enable the system utilised by the supply chain management department assess one application through the manufacturing interface (Labarre, 2019). As a result, the ERP applications assist big establishment to be more self-aware by connecting information about production, supply chain, finance, marketing and human resources together (Zandbergen, 2016). It is important to note that ERP system will not always eradicate inefficiencies in the business. This means that the business needs to reconsider the way it is set up so that it will not end up with mismatched technology (Labarre, 2019).

- b. Geographic Information System (GIS): This is used to coordinate and study all types of physical data. The figure 2-3 below depicts a GIS system.



Figure 2- 3: Geographic Information System (Source: Zendbergen, 2016)

The system above is a computer based tool that uses a map to analyse, store, manipulate and visualise geographic information. This system captures and stores information about the real world as thematic layers. These layers are all connected via the help of the geographic coordinates (Payet, 2018). Through this system, a cost saving can be realised due to the greater efficiency in record-keeping and can make powerful three-dimensional analysis without difficulty (Zandbergen, 2016). Applications of the GIS system includes consumer profiling and supply chain management. It can also be used in the media environment to communicate stories with maps which aims for advertising campaigns (Zandbergen, 2016).

- c. **Expert Systems:** This is set up to provide solutions to complex problems by utilizing the reasoning of the professional.

#### 2.2.4 Components of Information Systems

Even though there could be variations information systems (IS) and how they are utilised in an organisation, there are various components of information systems (Zandbergen, 2016). These components include;

- a. **Hardware:** The IS hardware is a component of the IS that one can touch. For example, iPads, flash drives, computer key boards, etc. are all part of IS system hardware's (Bourgeois, 2014). In the present day world, the smallest firm have some kind of computer which could range from desktop, smartphones and even tablets.
- b. **Software:** The software is a combination of instructions that determine the task which is expected to be performed. This is an intangible component of IS as it cannot be felt. The two key categories of software are operating system (otherwise known as system software) and application software (Bourgeois, 2014).
- c. **Telecommunications:** These are utilised in connecting to networks, computer systems, portable and other moveable devices that transmit

information (Zandbergen, 2016). This is a core component of many information systems and has become an individual category because of its uniqueness (Bourgeois, 2014). There are many network configurations that are possible and relies on the necessity of the company (Zandbergen, 2016). For instance, local area networks (LANs) link computers at a specific site such as office building or academic campus. To ensure that business activities are private and secure, organisations utilise telecommunication platforms like the virtual private networks (VPNs) for encrypting the messages.

- d. **Databases and Data Warehouses:** Information systems are basically utilised as delivery vehicles for organizational data that are stored in the database (Zandbergen, 2016). The collection of interrelated data is put together such that individual records or groups can be recalled to meet various benchmarks. Employee records and the catalogues of products are examples of databases. According to Bourgeois (2014), these data also serve as archival data that are gathered over time, which can be mined for information so as to develop and market new product offerings. These data are used to service existing customers more efficiently and also used to reach out to new customers.
- e. **Human Resources and Procedures:** Employees who are qualified are a core component of any information system (Zandbergen, 2016). These could range from administrators, business analysts, system analysts, engineer, specialist, operational managers, etc. The procedures for utilising and operating IS are a major part of the documentation. For example, procedure must be put in place to run a payroll programme. This can include the ideal time to run it, the person to authorize it and who actually has access to the output.

### 2.2.5 Role of Information Systems

Information systems play a role in any economy and in the government institutions.

Some of these roles include;

- a. **Sharing and Data Interpretation:**

Information systems facilitate the compilation and dissemination of data that are essential for the smooth running of government department (Dubow,



2017). It assists in building knowledge and help in making timely decisions that will benefit the citizen and policymakers (Dubow, 2017). For example, it can assist the municipal governments in sharing information as to what is happening in the municipality or community, such that the views of the citizens can be received in real time. EThekwini municipality is creating information awareness on their website, but efficient information systems can enable them to improve their agility in sharing information.

b. Facilitating Social Cohesion and Support:

Citizen to citizen online communication and connection that is facilitated by efficient information system can assist in mobilising and strengthening existing communities (Cordella & Iannacci, 2010). Information systems enable communities and municipalities to be better networked, thereby creating supportive and participating citizens (Cordella & Iannacci, 2010).

c. Improved Operations Management:

Information systems assists in providing information that enables an organisation to improve their entire operations in a more effective manner (Markgraf, 2019). In the public government services, information systems can improve how the government manages services to the citizens in their service units like electricity and water supplies, thereby creating an efficient operation.

In addition to the above roles of information systems, information systems according to Woodruff (2018) can also assist the municipality and government in;

- Improving employee productivity
- Achieve higher level of efficiency
- Promote better communications between departments in the workplace
- Provide workable platforms to explore different scenarios for diverse options and economic environments

#### **2.2.6 Comparison of Information System and Information Technology**

The integration of computer using telecommunication gadgets for storing, recovering, controlling and storing data is known as information technology (Zandbergen, 2016). It is also defined as the development, utilisation, application, support and management of computer based information systems (Zandbergen, 2016). Although

information systems and information technology are deemed to be similar in a number of ways, they are still different (Zandbergen, 2016). The following are some of the areas where they differ from each other.

- **Origin:** Information systems existed from the pre-mechanical period which was captured in form of books, drawings, etc. In contrast, the origin of information technology is mainly related with the invention of computer systems (Zwass, 2014)
- **Development:** Information systems have encountered many transformations; ranging from physical record keeping to the present cloud storage system (Zandbergen, 2016)
- **Business Application:** Information systems have been applied in many businesses. For example, the shift from bookkeeping of accounts to the present day TALLY. In contrast, information technology has improved the efficiency across many companies and have demonstrated productivity and accuracy in business applications (Ndlovu, 2015)

### 2.3 Existing Processes in eThekweni Municipality and Current Information Systems

The eThekweni municipality has a number of existing information systems that support a number of departments. They are summarised by Table 2-1.

Table 2-1: Existing Information Systems in eThekweni Municipality

System	Custodian/Department	Application/Uses
RMS (Risk Management Support)	Treasury	Records all collected revenues
eCareers	Human Resources	Human Resources Management – job applications and database for applicants
Ellipse/Coins	Electricity	Database management system for all rate payers and electricity charges (customer accounts information and transactions)

Complaints Management System (CSM)	City Fleet	Records all reported complaints from City Fleet clients/drivers and NDC employees
District Health Information System	Health	Records patients information (otherwise considered Patients Database)
e-Natis (Electronic National Traffic Information System)	Metro Police	Records all traffic offence information per driver and vehicle registration details. It is also used for fine generations
EMARAS (eThekwini Municipality Audit and Risk Assessment System)	Internal Audit	System used for risk analysis for the council and audit finding records
Enterprise 1 (E1)	Treasury	Used for orders, requisition, processing, approval, procurements, budget and finance management records
EPMA	Performance Monitoring	Records all employees/business units performance related matters. It is used for scores, rating and also for monitoring and evaluating performance.
Emergency Services System (ESS)	Emergency Services	Used for database and records of all emergency issues, vehicle bookings, dispatch. Records for fire, security and metro police

These systems from Table 2-1 above are used by different units in the municipality and for various purposes. According to eThekwini municipality (2018), the e-careers is used by the human resource department, which allows both internal and external job seekers to apply for vacancies online. The rate payer's system is used by the residents to access their utility bills and statements (eThekwini Municipality, 2018). There are also the employee self-service, coin, ESS, EPMA, EMARAS, e-Natis, and CSM (eThekwini Municipality, 2018).

Even though some of these systems are outdated, some exhibit modern designs and reliability. For example, the eThekwini Municipality website is not updated, hence presenting unreliable information for a citizen who may want to access it for any research or decision making purposes. These are some of the challenges faced by the municipality with regards to IS and this study aims at assessing the impact of IS

on internal process and service delivery. The research will explore only the systems utilised by the IT, water, electricity, security management, city fleet, and treasury units as the users of systems that directly affects service delivery.

### **2.3.1 Reliability and Interoperability of Information Systems**

#### **2.3.1.1 Reliability**

In the present day, a good number of organisations, makes use of information systems of some kind. However, reliability is one of the key drivers that is affecting organisational competitive advantage from using information systems (Tworek & Liu, 2018). In view of many global challenges and threats in the business environment, it is essential for organisations to maintain reliability, security and accuracy of their information system. This makes parameters like reliability a vital aspect of any company's information system network. According to Buccafurri, Holzinger, Kieseberg, Tjoa and Weippl (2016), when a system is not reliable, it results in immediate significant and vital business impact that could affect the reputation of the business, which in turn affects the bottom line progress of the organisation.

The systems identified for investigation for this study should possess a degree of reliability. The reliability of information system in companies is seen as a measurable aspect of information system that deals with control and management, identifying the quality level of the systems and highlighting possible issues in the system (Buccafurri, et al., 2016). The reliability of the information system is also connected to the efficiency of the information system areas, particularly those that are vital for the daily or continuous business operation (Buccafurri, et al., 2016). A good information system should be very effective when it comes to system reliability, information reliability and service quality (Berryman, et al., 2013). According to Tworek and Liu (2018), the following questions can categorize the reliability in an organisation;

- Does the systems have short response time and high availability?
- Is there ease to the accessibility of the system?
- Does the system provide responsive and availability support services?

### **2.3.1.2 Interoperability**

According to Berryman, Yost, Dunn and Edwards (2013), the ability of information systems to exchange information and to successfully utilise the exchanged information is known as interoperability. It can also be seen as the ability for systems to connect and communicate with others easily even in a case where the system was manufactured by different manufactures (O'Connor, 2017). A good information system is able to share information among various applications, databases, and other computer systems (O'Connor, 2017). It denotes the fact that information can be shared in a timely manner. For instance, changes made on the security management system of eThekwini municipality should be picked up on the city fleet side of information system.

### **2.3.2 Value Add and Competitive Advantage of Information Systems**

According to Altamony, Masa'deh, Alshurideh and Obeidat (2012), good business strategy in the global business environment is considered one that assists the organization to achieve competitive advantage. An understanding of the degree of competition and forces in the market can help develop the appropriate business strategy. This is in order to gain longstanding competitive advantage in the business environment (Altamony, et al., 2012). Ramey (2012) argues that IS and IT supports the firms' business design strategy as this helps to meet business focused demand, which helps in providing new products and offerings to the customers.

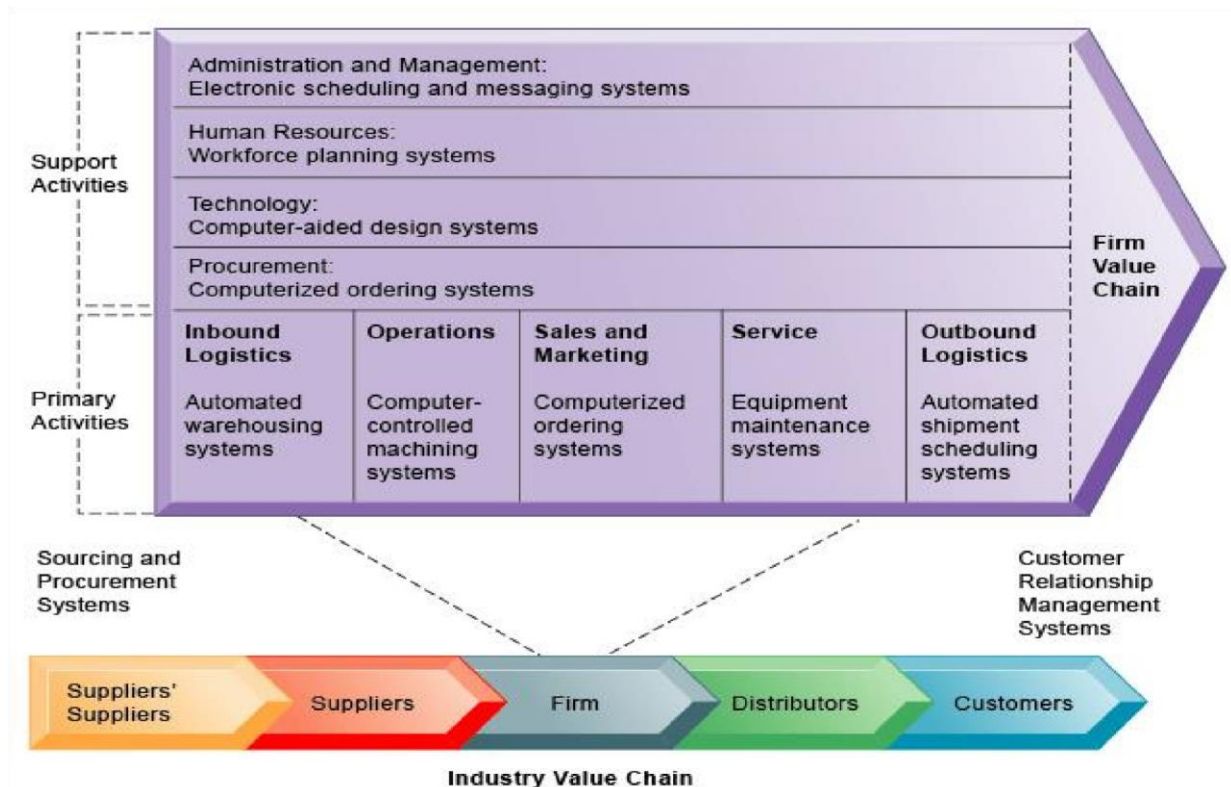


Figure 2- 4: The Value Chain Model (Source: Porter & Millar, 2015)

The value chain model in figure 2-4 above displays areas of activities in the business operations where competitive strategies can be applied and where IS are most likely to have strategic impact (Porter & Millar, 2015). Information system is applicable in all the support activities and primary activities from figure 2-4 above. The figure 2-4 above further shows that any organisation can utilise the business value chain model to identify areas where IS will improve business processes. These organisations can also benchmark their processes against any industry as this helps to identify and implement best practices. In applying IS for competitive advantage, businesses and government parastatal (like eThekweni Municipality) can leverage on doing the following;

- a. **Using IS to gain new perspective:** It is very essential to review the issues in any organisation or business as the stakeholders and customers are the most important people in a business. For the municipality, the citizens (i.e. customers) which the municipalities service are paramount to the sustenance of the municipality. IS can help in gaining competitive advantage by taking

the view of the customers and asking how IS can be re-designed to enhance customer experience, thereby making the customers happier with their products and services.

- b. **Appropriate Automation of Internal Processes:** A common example is that the municipality realizes that there is need to use technology to improve their operations (Alrashid, 2016). They put out a tender (to select a vendor), approve the vendor, and implement the process only to find out that the process failed. The underlying issue in this example could be that the process that was intended to be automated was not properly reviewed. Hence, IS assists in helping organisations understand the process before implementing an automated system.
- c. **Cost Reduction:** IS can be used in minimizing cost in organizations. Promoting IS can assist government institutions in reducing their costs of operation. For example, capturing an order is and can be a complex process for an organization, due to the degree of information needed to ensure that they are able to deliver the order to the customer (Alrashid, 2016). IS makes such transitions as smooth as possible which in turn enables the business to be more efficient for the government.
- d. **Improved Customer Satisfaction:** The experience of customers is a vital aspect of all businesses and organisations. A major determinant to customer satisfaction is a stronger customer support and the ability of the organisation to meet customer requirement (Scheck, 2016). IS provides efficient tools for good communication with customers and for resolving their issues optimally. As a driver of competitive advantage, IS help maintain a happy customer base through efficient technology.

It is important to note that it is not just IT that gives a company the required competitive advantage but the one who applies IS appropriately and timely (Ramey, 2012).

### **2.3.3 Government Information Systems**

There has been a number of significant growths in electronic Government (otherwise known as e-Government) at local, national and international levels (Averweg, 2015). Through the introduction of e-government and globalisations, all global governments had to migrate from paperless into online systems. According to Adaku, Amoako-Gyampah, Lomotey, Amoatey and Famiyoh (2018), government information systems are systems used to store, manage, manipulate and process all the government information. For instance, in Canada and USA, information systems are used as information provisions mechanism. In a case where information is put on a website, the internet provides greater opportunity for greater transparency to a greater public audience and thus increase public sector accountability (Alrashid, 2016). The US government also launched or uses IS for grant applications and e-voting systems. Although some of these systems cannot make decisions, they are merely for counting voters and producing audit trails (Alrashid, 2016). Through information systems success, Chile launched an e – tax systems for the citizens to file their tax online (Adaku, et al., 2018). This has been a success and recent studies shows that more than seventy percent of Chile taxpayers file online. South Africa has followed the same trends with the SARS efilling, and online tax filling system.

In SA, it has always been a key challenge for local governments, when it concerns its ability to include IS into its everyday performance. A former Minister of Public Service and Administration highlighted that e-Government is an integral component of improving service delivery for all citizens, which is done by building an efficient society that integrates IS into the government in other to improve service delivery (Averweg, 2015).

## **2.4 Utilisation of Information Systems in eThekweni Municipality**

### **2.4.1 Utilisation and Optimisation of Information Systems in Government Institution**

Some of the examples and aspects where information systems can be utilised and optimised in improving internal processes and service delivery are;



**a. Flow of Information:**

The key to the success of many organisations is information. The nature of information assistance might be internal, external, objective or subjective (Ramey, 2014). The external reviews the environment around the organization, objective information helps in clarifying what is already known, while subjective information provides clarity on something that is presently unknown. IS assists organisations in understanding and ensuring the free flow of these types of information. This is done by utilising centralised data centres where these data can be accessed (Ramey, 2014). It is also vital to note that the flow of information in an organisation can be upward, downward, outward and horizontal (Ramey, 2014). For example, upward information flow in the public service institution is a situation where the information is flowing from lower levels of a hierarchy to the upper levels.

**b. Processing of Transactions:**

IS brings simplicity on the transaction process of any public service institution. The transaction process is a system in the public service that processes transactions which occur within an organisation (Ramey, 2014). The centre of every organisation has information technology (IT) systems, with a vital responsibility of capturing transaction information and formulating new information that is dependent on the transaction information (Ramey, 2014). The role of this transaction process system is used to update any transaction process and then store any information retrieved in a database. This is done as it will assist any department or unit that require such information to access them through a centralised network storage (Onobrakpeya, et al., 2018). In the manufacturing industry, such transaction process systems help to create, disseminate, store, manage information effectively for production processes (Onobrakpeya, et al., 2018).

**c. Decision Support:**

IS provides assistance and helps in decision support system (DSS). The DSS is a very elastic and collaborating IT system that is formulated to back up decision making when the problem is not rightly structured (Ramey, 2014). The DSS works collaboratively with an artificial intelligence network, which assists workers in creating information. This is usually done via the online analytical process, in order to expedite decision making responsibilities which need substantial effort and analysis (Ramey, 2014).

**d. Cost Reduction in Communication and Transmitting of Information:** IS has considerably minimized the expenditures involved in transmitting and communicating organisational information ranging from short and long distances (Onobrakpeya, et al., 2018). According to Ewuim, Igbokwe-Ibetoe, and Nkomah (2016), the impact of this IS benefit in improving internal processes and service delivery to customers and citizens is that location will no longer matter, as this will enable efficient economic activity in any organisation. For example, the email, telephone, video conferencing, and remote approval systems are all reducing these costs of transmitting and communicating ideas from a distance (Ewuim, et al., 2016). Communication and transmission of information is highly essential in the running of any organisation, as they assist managers and employees in making beneficial decisions in the organisation (Ramey, 2014).

**e. Automated Improvement in Administrative Efficiency:**

IS initiatives assists in the enhancement of administrative efficiency as it ensures better delivery of services to the customer in real time (Ewuim, et al., 2016). The use of improved electronic platforms by the public service institutions increases the ease at which the local residents and citizens receive efficient service delivery (Ewuim, et al., 2016). For example, public services can utilise the option to chat online using the Chatbots. The Chatbots uses a set of automated instructions and matching of words to recognise questions and respond with answers (Stokbroekx, 2017). In practice, a chatbot can handle limitless number of simultaneous conversations, providing the responses quicker than any human could, and deal more tolerantly with tough customers (Stokbroekx, 2017). This is currently used in improving public services in developed countries like the United States, China, Japan, etc.

**f. Efficient Data Management:**

IS helps public institutions in using database software to store all their relevant data on a database (Ramey, 2014). This type of infrastructure can be designed to assist public services internally and externally. The internal system allows data to be only accessed within the organisation while external system enables access of data outside the organisation using interphases like remote internet protocol (Ramey, 2014). As a result, employees and line managers in public services can utilise government website to access necessary data (Ramey, 2014).

According to Stokbroekx (2017), the rise in consumer and residents data is also one of the challenges facing efficient data management in any institution. Some critics have indicated that service deliveries over time will become less personal. Another study argues that public services and institutions can sustain personal services, as modern IS enhances data management through more automation and improved ability to provide services at a lower cost (Ramey, 2014).

**g. Transportation and Urban Management:**

Transportation and urban management have become progressively automobiledominated and less sustainable. Some major cities in developing countries have encountered accelerated growth in transport-related issues (Pojani & Stead, 2015). According to Grabara, Kolcun and Kot (2014), the importance of IS and the roles it plays in an organisation makes it to be a type of company's nervous system, as it entwines the network of all departments and other business units. To operate transportation and urban management effectively, many public service systems across the globe are currently using modern tools of IS. For instance, a number of cities in Indonesia are actively utilising IS to enhance services. An investigation revealed that Jakarta Transport Authority cooperated with other application providers like Tafi, Google Maps to assess alternate traffic schemes (Grabara, et al., 2014). This approach ultimately reduced travel times of the Jakarta Transport buses by twenty percent.

In SA, the department of Roads and Transport recently launched a new app that integrates the province's transport system known as "Gauteng on the Move" (Zietsman, 2018). This is a handy tool as it provides commuters with essential information to estimate the cheapest, shortest and optimal routes while travelling in the Gauteng Province (Zietsman, 2018). This demonstrates the strength of technology in reshaping public transport services as this clearly shows the impact of IS on transportation and urban management.

**h. Improved Health Care Services:**

In order to make critical health services and management decisions, application of efficient information systems is essential. There are many challenges faced by the

public healthcare sector such as; weak healthcare systems and under developed facilities that deliver weak outcomes relative to local residents (Cline & Luiz, 2013). There are many global situations that reveal that information systems have the ability to improve public healthcare systems via internal processes automation, therefore minimizing the inefficiencies of manually driven system processes and reduction of overall transaction cost (Cline & Luiz, 2013). In emerging economies such as South Africa, many government local clinics are located in the rural environment with under developed road networks and interrupted services like water and electricity (Cline & Luiz, 2013). These local healthcare systems depend on manual paper driven processes, as patient information is paper based and the health data are captured in log books (Cline & Luiz, 2013). Most times the need for automation is usually not considered in relation to the need for improving infrastructure, like more equipment and health workers.

In recent years, some of the new changes in the health sector that affect patients, providers, and organisations are noticeable by the public, which is as a result of the innovations that are based on health information systems improvements (Kumar, 2011). Some of such systems include; personal health records (PHRs), electronic health records (EHRs), and electronic medical records (EMRs). Thailand public service system are working on integrating the PHRs, such that both health professionals and patients can access information to track progress, seek necessary assistance and make doctor's appointments through an online platform (Abiad & Khatiwada, 2018).

#### **i. Risk and Security Management:**

The growth and evolvement of technology demands continued security through risk management, as this ensures that information technology does not expose public institutions and organisations to cyber-attacks (Izuakor, 2016). If cyber-attacks against an organisation are successful, they can negatively impact the economies security and safety (Izuakor, 2016). A vital stage in risk management process is comprehending the impact, and the impact of cyber threats especially in business environment is commonly evaluated in terms of economic loss (Izuakor, 2016). The impact of cyber-attacks on government public services can be classified into physical, economic, psychological, reputational, and social (Worth, 2018). It is

important for public services to utilise efficient information systems in improving security and risk management.

#### **2.4.2 Barriers and Challenges Towards Full Utilisation of Information Systems in the Government**

Some of the barriers and challenges towards the utilisation of information systems in public organisations and government institutions includes;

- a. **Cost and Financial Barrier:** According to Garrett, Brown, Hart-Hester, Hamadain, Dixon, Pierce and Rudman (2006), one of the topmost barriers to utilisation of information system in the public or government institution is cost, which ranges from implementation and maintenance costs. The government institution need to do a proper cost-benefit analysis to understand the implications, approve the budget and will also need to understand maintenance cost for effective information system (Garrett, et al., 2006). A good number of government project is usually stalled due to cost, hence cost is a very important barrier to utilisation of information systems (Khalifa, 2013).
- b. **Leadership and Management Barriers:** According to Ghobakhloo, Hong, Sabouri and Zulkifli (2012), the leadership and management barrier can vary from perception and attitude of management towards adoption of the new system, the support and commitment of management, management, familiarity with administration etc. (Ghobakhloo, et al., 2012). Management team towards information system can become a positive driver or a barrier towards information systems utilisation (Khalifa, 2013). A positive perception from leadership and management towards a particular type of information system that is desired or required, will favour the utilisation of such system (Izuakor, 2016). This will assist in improving the utilisation of the existing systems within the municipality.
- c. **System and Technical Barriers:** Utilisation of the information systems can be affected by present technical facilities and systems in place in the organisation (Ghobakhloo, et al., 2012). It will be difficult to utilise a system that is not compatible with the desired system. This could be as a result that the present system is outdated (Khalifa, 2013). Technical barriers could also stem from

the inability of the organisation to actively support the technical requirements of the system (Izuakor, 2016). For systems already existing within the municipality with technical barriers, this barrier will also limit the employees' access, as continuous system issues will turn off a user from the excitement of utilising such system. This may eventually result in a system barrier.

- d. Adoption Barriers: The adoption barrier deals with issues that affect the utilisation of the systems in the government. Some aspect of adoption barriers can be data integration, organisational IT policy and perception of the users (Ismail & Rahim, 2014). It is essential for a system to have proper integration capability so that it can easily be set up for effective utilisation. There is also a need for the organisation policy to be of high standard, as this will ensure privacy and confidentiality (Ismail & Rahim, 2014).

#### **2.4.3 Leadership Paper Based versus Online Based Systems/Processes**

One of the issues that systems are faced with, in regard to systems and processes is moving over from paper based systems to online based systems (Scheck, 2016). Before the advent of computer systems and technology, many of the tasks were carried out using paper based systems (Scheck, 2016). The introduction of computer and other innovative management system improved the utilisation of information at the workplace by moving away from paper based approach to online based systems (Dunbar, 2017) . Some of the reasons for this migration is that issues like typing errors can be amended without the stress of removing the essence of materials like correction fluid. Also, a whole block of text can be copied without having to retype the entire document (Dunbar, 2017). Online system also provides the ease of sharing files in the work place, filing and several other functionalities that cannot be implemented using the paper based systems (Demirci, 2010). This online approach also assists the utilisation of information systems in the public services or government institutions.

### **2.5 Relationship between Information Systems, Internal Processes and Service Delivery**

### 2.5.1 eThekweni Municipality Internal Processes Under Investigation

The internal processes under investigation in this study that are impacted by the information systems that also affects service delivery, are represented by the Table 2-2 below;

Table 2- 2: eThekweni Municipality Internal Processes Under Investigation

Ellipse/Coins	Electricity	Database management system for all rate payers and electricity charges (customer accounts information and transactions)
Complaints Management System (CSM)	City Fleet	Records all reported complaints from City Fleet clients/drivers and NDC employees
e-Natis (Electronic National Traffic Information System)	Metro Police	Records all traffic offence information per driver and vehicle registration details. It is also used for fine generations
Enterprise 1 (E1)	Treasury	Used for orders, requisition, processing, approval, procurements, budget and finance management records
Emergency Services System (ESS)	Emergency Services (Security Management)	Used for database and records of all emergency issues, vehicle bookings, dispatch. Records for fire, security and metro police

### 2.5.2 Service Delivery

The usual challenge faced by many organizations, is the improvement of customer service, of which public service is not exempted (Standard Bank, 2018). Service delivery is seen as an approach of applying social policy approved by the country's legislation in servicing her citizens (Standard Bank, 2018). Globally, the biggest service provider is considered to be the public sector and the improvement of public services affect millions of citizens. In any country, the citizens expect their needs to be responded to rapidly and flawlessly. This can only be done through an efficient service delivery framework and good strategy. A service delivery framework is a set of principles, standards, policies and constraints to be used to guide the designs, development, deployment, operation and retirement of services delivered by a service provider, with a view to offering a consistent service experience to a specific

user community in a specific business context. In SA, service delivery is a common phrase used to describe the distribution of basic resources like water, electricity, sanitation infrastructure, land, and housing that citizens depend on (Standard Bank, 2018).

According to Onobrakpeya, Nana & Odu (2018), service delivery should be predominantly all about effectiveness and customer service. Effectiveness deals with ensuring that things are done in the right way as this helps to monitor parameters like the satisfaction of customer, quality of service, right timing and human interaction (Onobrakpeya, et al., 2018). The customer is also satisfied when the services provided by the service provider exceeds the expectation of the customer. Improving public service delivery is one of the biggest challenges confronting local administration in Africa. Studies have linked citizen's satisfaction with public services delivery that involved participation in street protests in Africa (Akinboade, et al., 2014).

### **2.5.3 Challenges in Improving Service Delivery in the Public Sector**

Public sector organisations require continuous improvement in the aspect of service delivery in order to meet the growing responsibilities of the country's citizens (Johnson, 2018). In SA, the researcher acknowledges that the public sector is functioning quite well in relation to other countries. However, there is the need to improve the system because of the growing service delivery demands and gaps that are increasingly trying to collapse the existing system (Schultz, 2018). Hence, service delivery in the public sector is not without its challenges. According to Schultz (2018), some of the challenges include;

- a. **Staffing Capacity:** The concern that social service employees are sometimes overworked and underpaid for the degree of work they provide. As the social service environment becomes increasingly complex and interdependent, the duties and roles of social service employees' are continuously expanding.



- b. Organisation: Although most organisations provide services that are excellent, they do not have all the resources needed to shift efforts towards capacity building. An efficient organisational structure can be a cornerstone that determines if any organisation remains constant and sustainable.
- c. Internal Process: This deals with the sequence of tasks or interrelated activities that are executed in order to achieve a goal. Inefficient internal process will drag the efficiency of any department or unit in the public sector. Proper understanding, monitoring and optimisation of internal processes is vital to improving service delivery in the public sector.
- d. Information System: Inefficient IS can pose a serious challenge on the efficiency and effectiveness of service delivery in the public sector. IS helps to set up system and processes in the public sector which are designed to store and assist in effective distribution of information. Lack of efficient IS in the public sector will result in distorted internal processes, which will ultimately lead to poor service delivery.

#### **2.5.4 Public Perceptions of Service Delivery**

Even though the opinions of Africans with regards to democracy is vital, it is also essential that perceptions of how the local governments and municipalities function, are extremely more important than the tangibility of the services they provide (Nkomo, 2017). As a result, the response of the key players in the public services system, such as local councillors are pivotal to how the citizens view any government and its service delivery performance (Nkomo, 2017). A survey done by Afrobarometer asked South Africans how well or badly they believe their local government was managing five service delivery tasks. The figure 2-5 below shows, their response.

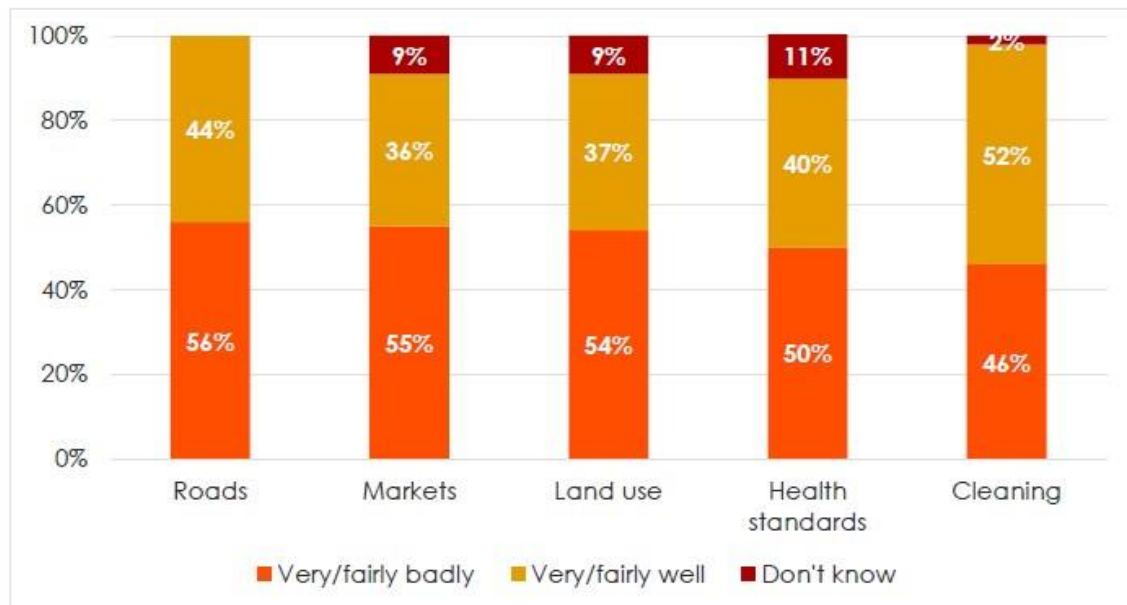


Figure 2-5: Popular assessments of local government service delivery (Source: Nkomo 2017)

From the figure 2-5 above, about half of the respondents indicated that their municipalities were performing “very/fairly badly” at maintaining roads (56%), marketplaces (55%), managing the use of land (54%), and maintaining health standards (50%). The only task where majority (52%) assessed their local government’s performance as “very/fairly well” was on keeping the community clean. Some of the perceptions on things that affect service delivery includes;

- a. Ability to reach the local councillors increases the degree of satisfaction with service delivery
- b. High levels of trust in local government councillors lead to views that local government are delivering their services
- c. The involvement of citizens in protest activities is linked to dissatisfaction with service delivery
- d. Good service delivery is often associated with positive assessment of councillor performance

### 2.5.5 Business and Internal Process

A process is a sequence of tasks or interrelated activities, carried out in response to an event that are concluded in order to realise a goal (Ramey, 2012). Processes are

phases of events that firms go through daily in order to fulfil a mission. According to Gelinas, Sutton & Federowicz (2008), the more effective a process is, the more efficient the business is. Internal processes may also be linked with various standard operating procedures and unique ways that organizations or public institutions do things whether it be decision making and operations (Gelinas, et al., 2008). According to Olugbode, Elbeltagi, Simmons & Biss (2015), a business process is a series of events that is centred on realizing a goal for a business. They are also wellcharacterised series of work that generate workflow products (e.g. data, documents, etc.) that define the priority of activity (Olugbode, et al., 2015).

### **2.5.5.1 Impact of IS on Business Internal process – Case Study**

#### **Background:**

The impact of IS on business internal process was reviewed as a case study on Beale and Cole Building Services (BCBS), which was formed in 1967 (Olugbode, et al., 2015). The firm began as a small family business but later became one of the leading companies of building services engineers in England. The company experienced substantial level of expansion over the years. Nevertheless, the existing IS operations system was not adequately sustaining the degree of growth in the company. As a result, BCBS employed the services of an IS consulting firm to assess and improve the internal processes, in other to enhance business performance and profitability (Olugbode, et al., 2015). The figure 2-6 below shows the proposed framework that was reviewed, in order to improve the effect of IS on performance and profitability

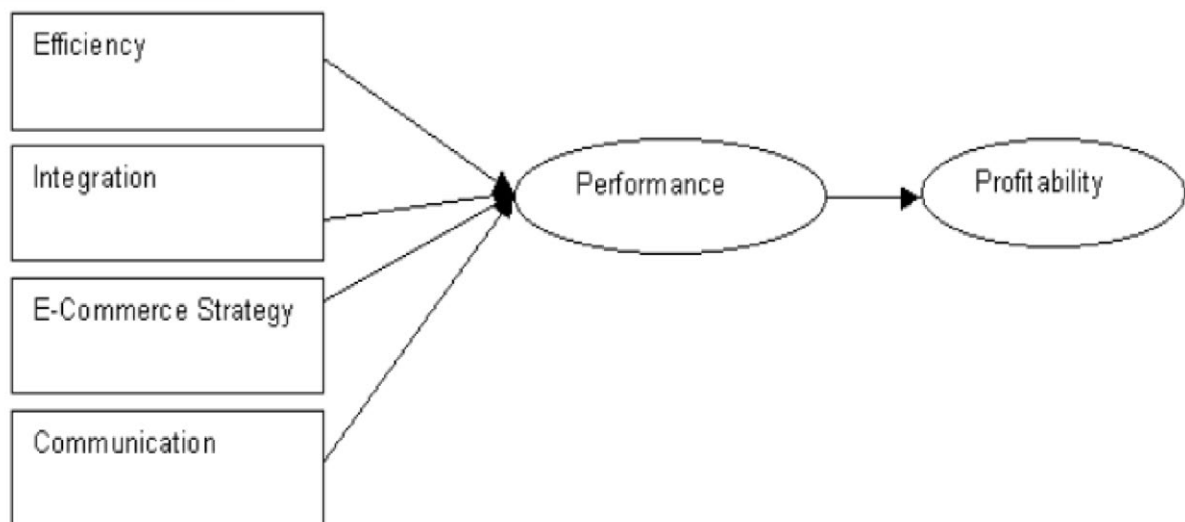


Figure 2-6: Proposed Framework to Improve BCBS

The framework represented by Figure 2-6 above shows that internal processes that were efficient, with sound system integration, e-commerce strategy and communication are drivers that will improve the performance of the BCBS, thereby improve the profitability of the business.

#### **Implementation of Improved System:**

A number of changes were made in the area of efficiency, integration, e-commerce and communication, which was done in other to eliminate these inadequacies

(Olugbode, et al., 2015). These IS improvements led to the following;

- a. Introduction of new time sheets eliminated duplication and reduced errors n payment which resulted in saving staff half a day per week.
- b. Telephonic system improvements saved the BCBS about 312 hours per year and minimized expenses significantly.
- c. The information system eliminated duplication of activities and improved internal system communications.
- d. Improved data management and security via integrating the information technology and communication system.
- e. Implementation of an appropriate system of filing that minimizes the time required to locate files and enhanced archiving abilities.

### **2.5.6 Relationship between Information Systems, Internal Processes and Service Delivery**

The role of information systems in the current work environment, business, and government is a positive driver of change that should be embraced to remain relevant in the global scene (Berryman, et al., 2013). The digital landscape has changed. Information systems are enablers of service delivery for public services and municipalities. The service delivery framework is set up to assist in the development, deployment and spread of services to the citizens of the municipality or area (Akinboade, et al., 2014). Information systems on the other side uses formalised procedures in making services rendered by an organisation more efficient and easier.

A study was conducted couple of years back on the public sector management information systems in England, UK (Ijeoma, 2018). This study was set up to provide a breakdown analysis of the public sector information systems management. The feedback from the study showed that information system assists a wider management and monitoring of control systems that enable efficient service delivery to the public. Another study assessed the role of information system in measuring the performance in the Department of Arts and Culture in KwaZulu-Natal province (Ijeoma, 2018). The study revealed that information systems drive the collection and processing of information. This makes it easier to process huge levels of information, harmonise and share them (Ijeoma, 2018). Information systems also provides platforms for citizens to provide their views in certain areas where the municipality is falling behind, as this will help to improve the service delivery to the citizens.

Information systems makes internal processes easier to manage. For example, utilising the Ellipse system within eThekweni municipality makes the internal and external processes of managing all rate payers and electricity users, easier for the municipality. Through agile information systems, the municipality is able to have inter department interactions, which increases the overall efficiency of the municipality. The complaints management systems (CSM) within the city fleet management enables the workers, clients and employees to record all complaints. Information systems through the platform of eLearning Management systems can increase the internal processes of training employees from a physical class room session, into an online platform, which will minimise time and cost for the municipality. According to

Botchway, YeboahBoateng and Kwofie (2015), Supply Chain Management System (SCM) as a tool can be used as an information systems platform to meet the internal needs of the municipal workers. This can help to streamline the internal supply chain processes within the municipality and also help to improve the ordering and control system (Botchway, et al., 2015). In addition, information systems like the Project Follow-Up (PFU) systems can assist the municipality management in supplying organisational data and valuable information for easy decision making (Botchway, et al., 2015).

#### **2.5.7 Using Information Systems to Improve Service Delivery**

In other to improve service delivery, it is paramount to embrace the benefits of IS and innovation (Payet, 2018). The importance of IS in improving service delivery in eThekweni municipality was repeated by series of speakers in a conference that was held at Moses Mabhida Stadium on the Technology and Innovation in Service Delivery (Payet, 2018). The assistant head of the Information Management Unit at eThekweni Municipality reiterated that citizens desire good services that are swift and less expensive. Another speaker at the conference encouraged the attendees not to be afraid of IS innovation as it is a game changer. They further highlighted that this will help open minded public sector and municipalities to become pacesetters in service delivery (Payet, 2018).

In 2016, the Department of Home Affairs received a prestigious ICT Service Delivery Transformation Award for the automated booking system for the Refugee Reception Offices (GCIS, 2016). This was a positive news for the government in utilising IS in improving service delivery. Government Mobile application is presently used to access several functions to inform and empower them, as the application provides easy access to government information (GCIS, 2016).

#### **2.5.8 Theoretical Framework (DeLon and McLean IS Success Model)**

The understanding of the success as it applies to information system is an ongoing aspect of interest by researchers (Ojo, 2017). This growing interest is also being explored by practitioners and management stakeholders of many organisations and public institutions (Ojo, 2017). The value of such understanding is that it amplifies the benefit of the system and can provide organisations with valuable information



McLean (2016) and highlights the individual success variables. According to DeLone and McLean (2016), they include; service quality, system quality, information quality, use, user satisfaction, and net benefits (otherwise known as net impacts). These variables are explained below;

- **Service Quality:** This is the quality of the support which the system users get from IS and IT support personnel (DeLone & McLean, 2016). For instance, this is made up of accuracy, responsiveness, reliability and technical competence. This shows that for the municipality system, this variable need to receive quality support from the IS and IT personnel like assistance from helpdesk and helpline.
- **Information Quality:** This is the required features of the system outputs; i.e., web pages and management reports. For instance, this comprises of accuracy, completeness, clarity, usability, conciseness and wholeness (DeLone & McLean, 2016). For example, the system should provide quality feedback such as the cost per Kilowatts of electricity used.
- **Systems Quality:** This is the expected quality of an information system. This comprises of parameters like; user friendliness, flexibility and reliability of the system, ease of learning, good response time and sophistication (DeLone & McLean, 2016). This variable shows that information systems in the municipality should be user friendly and flexible. It should also be easy for employees to perfect how to use it in delivering excellent services to citizens.
- **Use:** This deals with the extent and approach in which the employees and customers utilise the functionalities or capabilities of the information system. For instance, the frequency of use, type of use, suitability of use, degree of use and aim of use (DeLone & McLean, 2016). D&M suggests user “intention or intention of use” as an alternative to “use” for some scenarios.
- **User Satisfaction:** This deals with the user’s degree of satisfaction when using the information system and is deemed one of the key measures of information system success (DeLone & McLean, 2016). An example of this are platforms like websites and other essential support services. This can also



be utilised by eThekweni municipality employees in assessing their user satisfaction on existing and newly introduced information systems.

- **Net Benefits:** This comprises of the value or results that the information system is yielding for different stakeholders (DeLone & McLean, 2016). Even though “use” and “user satisfaction” can be associated with benefits, there is importance in measuring net benefits directly. A good number of studies applying the DeLone and McLean IS success model evaluate the benefits of utilising information systems on the individual and organisational levels.

#### **2.5.9 Information System Failures**

Information system comprises of many skills to gather, present, and evaluate data. The information that emanate from information systems helps in the making of effective decisions for organisations. However, a lack of understanding of information system is a major driver to the potential level of problems and failures that can bring to a halt information system development projects (Gunawardhana & Perera, 2015). Increased failure rates are becoming a normal issue for any organisation or industry and does not depend on any rank or status (Gunawardhana & Perera, 2015).

Failure is observed to be derived from a lack of fitness. According to Dwivedi, Wastell, Laumer, Heriksen, Myers, Bunker, Elbanna, Ravishankar and Srivastava (2014), three typical types of failures includes; Project failure, System failure and User failure. Project failure occurs when the set standard have not been met, which also includes not meeting budgets, deadlines and system expected functionalities (Dwivedi, et al., 2014). System failure results in when a system does not perform as intended or planned and does not also operate the way it is intended to (Gunawardhana & Perera, 2015). This leads the project not to produce the expected gains. The failure of information systems could also be as a result of user failure, which could occur due to inadequate training or even confrontation over such systems (Dwivedi, et al., 2014). In any case, information system failures in the government or the municipality environment can lead to a drag on the business internal processes instead of acting as a catalyst of operation and internal process efficiency. Failure of information systems can also result in total stalling of service delivery in the municipalities. In addition, failures on information system could be as

a result of background factors (e.g., user participation, participant behaviour, user satisfaction, infrastructure facilities) or conceptual factors (e.g., software failure, management failures, quality, and project or system failure).

## **2.6 Role of Political Leadership in Information Systems Implementation**

Information system comprises of sub-systems which are linked with many other aspects that work in harmony to realise one goal of processing data needed by management in decision making. The application and utilisation of information systems have been used in administering the services of the government from a social, economic and political standpoint (Alfian, 2016). Some increasing beliefs among the policy makers is that they should exploit the full benefit of information systems in order to transform the relationship with the citizens and businesses (Alfian, 2016). A major reason for the failure of information system and e-government is due to poor political leadership that affects governmental and municipal leadership, thereby influencing the outcome of the information systems (Kifle & Cheng, 2009).

### **2.6.1 Role of Political Leadership: the Case of Sragen**

The e-government can be seen as the utilisation of information and communication systems in the public sector, which is aimed at improving their internal processes, operations and service delivery (Bjorn & Fathul, 2015). The study revealed e-government challenges and the impact of political leadership in the district of Sragen. The study concentrated on the input side of e-government and reviewed the challenges in the three key areas like management, infrastructure and human factors in implementing e-government (Bjorn & Fathul, 2015). The study revealed that political leadership with a clear vision is necessary for the holistic implementation of information systems and effective management of change (Bjorn & Fathul, 2015). It was also revealed that political leadership drove positive results, which was seen at all levels of the governmental and municipal offices.

The e-government initiative in Sragen received full support from all the local parliamentary members (Bjorn & Fathul, 2015). For instance, the head of one of the commissions stated that *"We provided full support to relevant initiatives from the government, as we have seen a lot of benefits. This initiative was beneficial as it*

*improved communications at all levels from district to villages*". In the aspect of the human factor, the implementation enabled a shift in the mind-set orientation of the civil servants to being more service-focused. One of the leaders said the following, *"It took me six months when I was in the system to do a brain washing of the civil servants, as the objective was to enhance awareness in public service quality"*. In terms of the infrastructure factor, e-government was supported by the political leaders such that they were able to work with their limited budget (Bjorn & Fathul, 2015). They indicted that their infrastructure was limited, but they were able to optimise the resources available to them in accomplishing the set goals (Bjorn & Fathul, 2015). The study showed that e-government through the support of political leadership and government officials can be successful.

### **2.6.2 Role of Political Leadership: the Case of Bucharest**

This next study reviewed the role of local public administration in the implementation of e-government practices. In this case, the political leadership of the government of Bucharest introduced a Chief Information Officer (CIO) position whose role was to steer information systems in the government towards the right direction. The focus of the CIO was to make technology innovation real in government internal processes and improve the return on investment of information systems projects in the government of Bucharest (Nicolescu & Berceanu, 2014). The third focus of the CIO was also to expand the business impact by working collaboratively with governmental leaders in order to drive new business initiatives and cultural shifts (Nicolescu & Berceanu, 2014).

After a period of three years, the benefit of this decision by the political leadership uplifted the status of the government with regards to information systems and technology (Nicolescu & Berceanu, 2014). The government of Bucharest was able to set up improved internal process systems that enabled government workers to be better positioned in their services to the general public. This approach also minimised the interference of political leaders, as the public administration was shielded from the impact of changing political leaders with different information technology understanding and intentions (Nicolescu & Berceanu, 2014).

### **2.6.3 E-Government Trends and Political Leadership in Sub-Saharan Africa and South Africa**

According to Mawela, Ochara and Twinomurinzi (2017), it is often reported that in the African context, the implementation of e-Government is usually delayed and focused more on urban metropolitan cities, which exempts those in the rural areas. A major difficulty for the e-government development in Africa is the large infrastructure and functional literacy issues (Mawela, et al., 2017). In South Africa, there are certainly challenges in the implementation of e-government in the metropolitan municipalities and other local municipalities. The present political leadership are encouraging the implementation of information systems through egovernment as it encourages citizens and businesses to interact with government through the use of full range of electronic media (Mawela, et al., 2017).

It has also been observed that there are silos in the South Africa government municipalities, as there are increased concerns from Information Technology Communication (ICT) managers that it will even delay service delivery to the citizens (Mutula & Mostert, 2010). It is essential to note that e-government is expected to remove the silos and help governments in being more integrated and citizen centric (Mawela, et al., 2017).

Another study in South Africa revealed the feedback of representatives from different municipalities. They reiterated in an overwhelming manner that they do not have the essential support of their political leadership or executive management with respect to utilising information systems and technology in order to support service delivery (Mawela, et al., 2017). It was revealed that many politicians do not talk to ICT issues and many of them do not drive ICT governance and implementations. (Mawela, et al., 2017). However, some representatives from another study indicated that they have good municipal manager and that they receive very good support from their Premier. In other words, their Premier drives it and ICT matters are always on his agenda (Adaku, et al., 2018).

### **2.6.4 Smart Cities**

A smart city is a framework that comprises of ICT technologies that is aimed at evolving, positioning and promoting sustainable development practices to address development challenges (Adaku, et al., 2018). They are cities that make use of technology in order to make the life of citizens more sustainable, efficient, transparent

and intelligent (Lee, 2017). Smart cities rely on smart technologies, the internet of things and the use of geographical information systems, which is used to contextualize huge amounts of collected big data (Lee, 2017). Smart cities are built around information systems and usually assist in data-driven decision making, enhanced citizen and government engagement (Rujan & Simpkinson, 2018). Many countries are exploring the idea of smart cities and South Africa is one of them. President Cyril Ramaphosa recently in his SONA address cited that *“he dreams of a South Africa where the first completely new city built in the democratic rises, with skyscrapers, schools, universities, hospitals and factories”* (Makhafola, 2019). His views were further complemented by Nkosazana Dlamini-Zuma, who highlighted that smart city is a possibility in South Africa and should be built on the values of democratic government (Sain, 2019).

#### **2.6.5 Fourth Industrial Revolution**

According to Xu, David and Kim (2018), the fourth industrial revolution describes a world or a global environment where people move between digital domains and offline reality through efficient technology that enable people in managing their lives. It relates to the radical changes to the way people live, work and relate to each other, catalysed by the adoption of cyber systems, internet of things and systems (Marr, 2018). The fourth revolution is growing at the rate that is considered exponential instead of linear, thereby interrupting every industry and previous global way of doing things (Xu, et al., 2018). The fourth revolution will leverage on information systems maximally, as people and cities will have no control over technology and interruptions that emanate with it (Xu, et al., 2018). It is expected to affect everything as it is expected to enable machines to cooperate, visualize production chains and make decisions independently (Marr, 2018). It is also anticipated that the fourth industrial revolution will initiate changes through the use of robotics that can take over many human responsibilities in the workplace, cities and even in our homes (Marr, 2018). It is therefore further expected that the fourth revolution, through internet of things will offer advanced connectivity to devices and systems.

Even though there are merits to the fourth industrial revolution, there are also some challenges that are ahead. There is a high potential for this revolution to disrupt the labour market. For instance, having robots that is intended to improve service

delivery in the municipal government will also replace lots of the people and could result in loss of jobs (Xu, et al., 2018). This means that it will likely eradicate many ordinary labour in the workforce, except for roles and positions where new ideas and innovation is required (Marr, 2018). The fourth revolution also has a potential of increasing cyber security issues and other hacking risks, leading to a higher raising of security concerns (Marr, 2018).

## **2.7 Conclusion**

The chapter reviewed existing literature on information system. It started by reviewing the definitions and general overview on information systems. The benefits of information systems on internal process and service were also reviewed. This chapter further highlighted some of the existing information systems that are currently utilised in eThekweni Municipality. The literature review ended by assessing some of the impacts of information systems in improving service delivery. It is clear from the literature review that information systems impact internal processes and service delivery in any organisation. The next chapter presents the research methodology.

# **CHAPTER THREE**

## **RESEARCH METHODOLOGY**

### **3.1 Introduction**

A vital aspect of any research study is the research methodology. As a result, determining the research methodology is a crucial element of the study. The need for research methodology cannot be overemphasised, as it is essential in

establishing the research structure; like, strategy, approach, philosophy of research, and other aspects of the methodology (Kilani & Kobziev, 2016). This chapter presents the research methodology which covers the research philosophy, design, and protocols used for the data collection. This chapter also outlines the population and selection of the sample, design of the questionnaire and expounds on the literature review. Ethical considerations guiding the study, in addition to reliability and validity of data were also reviewed.

### **3.2 Research Objectives**

The research objectives are as follows:

- a) To explore what Information Systems are currently in place in eThekweni Municipality.
- b) To examine if the Information systems are effectually utilised.
- c) To investigate the relationship between Information systems, internal processes and service delivery.
- d) To analyse the role of political leadership and officials in implementing new systems.

### **3.3 Research Approach/Method**

Research approach can be defined as the methodical and logical tactic taken regarding the gathering and analysis of data, such that valuable information can be extracted from the data (Kilani & Kobziev, 2016). It is essential to comprehend the research aims vividly in order to establish and select the most convenient technique, in other to realise the aim of the research or study (Kilani & Kobziev, 2016). According to Cooper and Schindler (2011), research approach (otherwise known as research philosophy) is the general style applied by the research in exploring new knowledge. The research approach can either be qualitative, quantitative or mixedmethod approach (Cooper and Schindler, 2011).

#### **3.3.1 Quantitative Approach**

The quantitative approach in research can be described as an extreme of observation, as it relies on the control and clarification of the phenomenon (Kilani & Kobziev, 2016).

The quantitative research approach is more concerned with “how many”, how often” and “to what degree”. This goes ahead to show that quantitative study is centred on getting to the truth.

The paramount style of the positivist researcher is the experiment, which delivers to them the capability to assess a cause and the outcome of the cause connections which is mainly done through observation (Sekaran & Bougie, 2013). Majority of the quantitative research approach utilises deductive approach, in that the data is collected to test a theory. The quantitative approach can use either descriptive or inferential statistic to analyse data in order to enable the researcher extract essential conclusions (Sekaran & Bougie, 2013). In quantitative research approach, the data collection strategy can be expensive and response rates can be low (Kilani & Kobziev, 2016).

### **3.3.2 Qualitative Approach**

The qualitative approach advocates the opinion that the world is multidimensional and not streamlined through theories (Saunders, Lewis, & Thornhill 2012). The qualitative research approach maintains that social sciences vary from natural sciences, which actively requires the understanding of human behaviour as opposed to scientific explanation (Saunders, et al., 2012). This approach demonstrates that data collection is dependent on a field or on a real life situation such as experiences and actions to other people (Kilani & Kobziev, 2016). The qualitative approach employs a subjective sampling method which does not generalise and is usually quicker in comparison to quantitative approach (Kilani & Kobziev, 2016). The nature of data and information from qualitative research approach are usually presented in words, expressions, sentences, interviews and narrations instead of numbers (Kilani & Kobziev, 2016). The weakness of the qualitative approach is the high probability of bias and the reality that it can be difficult to extract short summaries from qualitative data (Kilani & Kobziev, 2016). Qualitative data also has a low level of accuracy and it faces challenges with regards to comparison (Kilani & Kobziev, 2016). The researcher utilised the qualitative approach for this study.



### **3.4 Research Design**

The overall plan or structure of the research work is known as research design. It can be defined as a strategy for the collecting, assessing and scrutinizing of the collected data, relative to the research questions for the study (Sekaran & Bougie, 2013). Research design also focuses on the final outcome of the research and ensures that the information collected via the research answers (Hasa, 2017). The aspects of the research design comprises of exploratory, descriptive, comparative, and correlational study (Saunders, et al., 2012).

The study utilised an exploratory design and the nature of the problem suggests that exploratory design is the best approach to follow. This was because there are not much established views on the impact of information systems in internal processes and services in eThekweni municipality. Thus, the purpose of the study was to solicit the views of the key role players in decision making in a number of business units. These key role players are regarded as key informant parties that assist in finding solutions. The study was done using the exploratory approach as these key role players are regarded as subject matter experts (SMEs). In other words, they are very knowledgeable and have influence on the implementation of information system policy and decision making. Face to face and one on one in-depth interviews were conducted with the study participants, which followed semi structured approach and interpretive philosophy. This ensured that all the participants are comfortable and that they share their ideas more openly, which will make meaningful contribution.

### **3.5 Study Location**

The study was conducted at the Durban eThekweni Municipality offices in the KwaZulu-Natal province of South Africa. The investigation focused on information systems on business units like Information Technology, Water, Electricity, Security

Management, City Fleet, and Treasury (Finance). These units were selected for the study because they are directly and indirectly involved in the study. Some of them play direct roles in service delivery while some play support roles towards efficient service delivery.

### **3.6 Population and Sample Selection**

### 3.6.1 Population

A set of comparable items which are of significance for a particular test or review is known as population (Creswell & Creswell, 2018). A population is also considered as the total population from which samples for a study are collected. These samples usually relates to people, or events (Kenton, 2018). The figure below is a picture representation of total population and the sample.

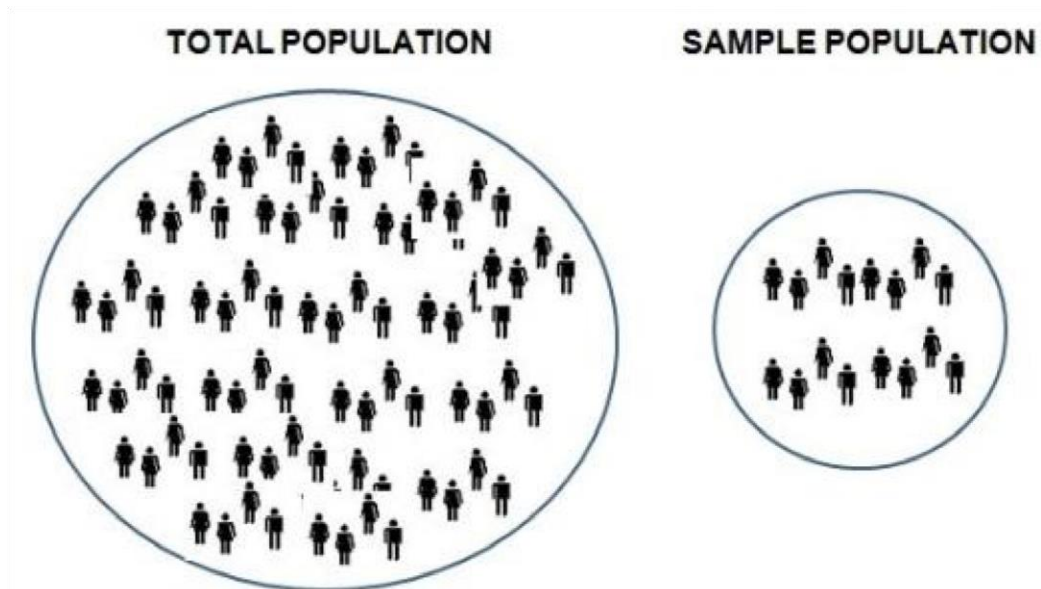


Figure 3-1: An example of total population and sample population

(Source: Kenton, 2018)

The target population from the municipality context was a total of 46 unit (some are full business units while others are sub-units). Due to the time and financial constraints, the researcher was not be able to reach the entire target population in the study investigation. As a result, only six (6) business units that play more role in basic service delivery and those supporting units that utilise information system intimately were selected for the study. These include;

- Information and Technology Unit
- Water and Sanitation Unit
- Electricity Unit
- City Fleet Unit
- Security Management
- City Treasury (finance)

### **3.6.2 Sample and Size**

The sample size is usually a sub-category of a population of the study. Sampling is a means of selecting the appropriate number of elements from the population, which ensures that proper estimations of the qualities of the selected sample can be applied to the population (Sekaran & Bougie, 2013). Probability and non-probability sampling are usually the two (2) kinds of sampling. In probability sampling, every member in the population has a fair opportunity of being selected, while nonprobability sampling does not provide the same opportunity (Surbhi, 2016). The study utilised non-probability sampling in selecting the sample population, as this type of sampling is usually peculiar in qualitative research. Non-probability sampling sub-types includes; purposive, quota, snowball, self-selection and convenience (Saunders, et al., 2012). The sample size for the study was 12 participants that were interviewed two (2) from each of the six (6) selected business unit).

The study used purposeful sampling. In this purposive type of sampling, the participants are chosen based on pre-selected qualification and the sample size is pre-set or dependent on theoretical saturation (Surbhi, 2016). The purposive sampling was also adopted to ensure that dissimilar aspects of the population are presented and to ensure that decision makers are selected based on characteristics E.G management level with authorities and influence in systems related projects and are able to answer certain research questions. For this study, these were mainly the executive, operation head, support staff and rate payers. In qualitative research, the sampling typically is sustained until a saturation point with regards to information is reached. This theoretical saturation is the point at which the newly collected data does not provide further insight. This saturation point is also a stage where no new information is emerging in the data. As a result, it was critical for the gathering of data and analysis to occur simultaneously as this helped in informing the researcher when the saturation point was reached. The types of data collected and evaluated in qualitative study approach include in-depth interviews, direct observation, and written documents. The main objective of the qualitative research is to supply deep understanding; hence it targets a particular group, event or process (Saunders, et al., 2012).

### **3.7 Research Instruments, Interviews and Data Collection Procedures**

According to Marczyk, Dematteo and Festinger (2005), the simple collection of data usually comprise of observations and critical questions that are essential in qualitative or quantitative research. Research instruments are materials or tools that are developed to gather data on the research topic or subject (Marczyk, et al., 2005). The research instrument was also guided by the DeLone and McLean model which is the theoretical framework that guided the study. The instruments can be used to collect primary or secondary type of data. In a quantitative study, a questionnaire is usually the research instrument used for the collection of data while the interview schedule is also used for a qualitative research (Cooper & Schindler, 2011)

#### **3.7.1 Research Instrument (Interview Guide or Schedule)**

The interview guide can be defined as an instrument for the scholar to make sure that vital issues are discussed during the interview (Cooper & Schindler, 2011). According to De Clerck, Willems, Timmerman and Carling (2011), the interview guide for semi-structured interview is primarily dissimilar from a questionnaire. The structure of the interview guide was designed such that it was not a list of questions, but a guide to engaging discussion that will uncover valuable information that are beneficial to the study (De Clerck, et al., 2011). According to Hoppen, Klein, Rigoni, and Ritter (2016), the interview guide allows the scholar to focus their attention on the informants and on what was said. The guide also assists in avoiding a scenario where the informant provides short answers and waiting for the “next question”. The semi-structured interviews demands that the researchers are well prepared and have a clear understanding of the expected outcome expected from the interview sessions (Hoppen, et al., 2016).

#### **3.7.2 Interviews (Face to Face In-depth Interview)**

The interview was conducted with 12 Senior Managers and Managers who are decision makers in various service delivery in the eThekweni Municipality business units as indicated in the population section (section 3.6.1 above). Face to face interviews with semi-structured questions were used for the interview. The interviews were made up of open-ended questions linked to the research objectives. The researcher used interview notes and a recorder for recording with the permission of the participant. The feedback from the interview was later transcribed from codes

and then analysed using thematic data analysis method. The interviews took place in the participant's office and lasted about 30 to 60 minutes. The aim of the study was to determine a sustainable and strategic approach to information systems optimisation in order to enhance internal processes, flows and service delivery.

### **3.7.3 Data Analysis**

Qualitative data analyses consist of words, observations, and even symbols (Creswell & Creswell, 2018). It is usually difficult to derive meaning from qualitative data as they are nearly impossible; hence it is used greatly for exploratory research (Creswell & Creswell, 2018). The researcher used thematic analysis for data analysis. Thematic analysis is the process of identifying patterns or themes within qualitative data. In analysing qualitative data, the researcher first transcribed all data, which means they were converted into textual form (Cooper & Schindler, 2011). Then, the data was then organised in line with the study objectives. The data was then coded which involves categorising them into concepts and patterns. At the end of the data analysis the researcher took necessary steps to check for accuracy and credibility of the results. The steps include qualitative validity by employing certain procedures, and reliability of procedures to check for mistakes.

### **3.8 Pilot Study**

It is necessary to conduct a pilot study beforehand as it enables the researcher to design and execute a large-scale project more methodologically and efficiently (Crossman, 2019). A pilot study is an initial small-scale study that the researcher carries out in order to assist them as they decide on how best to conduct bigger projects (Crossman, 2019). It is a trial run carried out in readiness of a full scale study and is usually conducted to test the research instrument (Dikko, 2016). They are useful for a number of reasons. They enable the scholar to refine a research question, identify and resolve potential problems or issues. In a qualitative research, they enable the researcher in identifying and refining questions after selecting a focus group (Dikko, 2016). A pilot study was carried out on two (2) of the managers from another business unit that was not selected for investigation. The pilot study assisted the researcher to highlight ambiguities, hard and irrelevant questions which later helped to modify them. It also helped to determine whether a question that was asked attracted a response that assessed if the researcher had included questions

that addresses the research objectives. The pilot study also assisted the researcher in monitoring the time taken to complete the interview in order to determine if the set time was reasonable.

### **3.9 Validity and Reliability**

The reliability of a measure of data demonstrates the extent that the data is void of error, hence it ensures consistency with regards to measurement (Sekaran & Bougie, 2013). It is seen as the consistency and firmness of a set of data independent of the experiment's repetition (Leung, 2015). Validity checks how worthy the instrument fits the exact concept that it was set up to measure (Sekaran & Bougie, 2013). In qualitative research, validity also implies the appropriateness of the data, while reliability deals with the precise replicability of the procedures and the outcomes (Leung, 2015). The participants confidentiality is protected by identifying them in numbers rather than real names, E.G. instead of using Ms Nonto Mnguni, I used Respondent 04 according to a numbering only known to the researcher for classification purposes only.

### **3.10 Ethical Clearance**

It is important whilst conducting research to carry it out ethically as they uphold the research objectives with truth and evasion of inaccuracies (Resnik, 2015). It is crucial for the scholar to execute the research ethically in course of the research process. The importance of ethics in research is important as it demonstrates that the researcher abides by certain rules or norms (Sekaran & Bougie, 2013). Ethical approach in research affects each phase of the research which includes data collection during interview, review of data and distribution of conclusions (Arifin, 2018). In qualitative research according to Sanjari, Bahramnezhad, Fomani, Shoghi, and Cheraghi (2014), the nature of the relationship and closeness that exist between the scholar and the participants can result in a variety of diverse ethical concerns. Some of the aspects include; privacy, establishment of truthful and open communications, avoidance of misrepresentation etc. (Sanjari, et al., 2014). The researcher ensured that proper protocol was followed in organising the interview and that none of the participants were coerced to be interviewed nor were they forced to provide their confidential personal information. Proper explanations regarding the objectives of the study was provided to the participants regarding the study. The data

collected from the research is saved on Google Drive for the next five (5) years as prescribed by research ethical standards and requirements.

### **3.11 Conclusion**

The chapter outlined the research methodology that was used in this chapter. The researcher chose to use the qualitative approach. The whole population for the study was selected and the sample was chosen using purposive sampling. The sample population only covered six (6) business units and two (2) managers from each of those that were interviewed. The researcher carried out a pilot study to authenticate the questions in the interview schedule and made appropriate amendments. The next chapter presents the results and discussion.

## **CHAPTER FOUR**

### **RESULTS, INTERPRETATION AND DISCUSSION OF FINDINGS**

#### **4.0 Introduction**

The previous chapter highlighted the various aspects of research method for the study. This chapter presents the results from the interview sessions, findings and discussion of findings. It describes the analysis and theme development of the qualitative data and also shows how the results align with the aim of the study.

#### **4.1 Outline of Data Collection**

The study utilised an explorative study and the nature of the problem suggests that exploratory study was the best approach to follow. Face to face and one on one indepth interviews was conducted with the study participants, which followed semi structured approach and interpretive philosophy. The approach of data collection ensured that all the participants were comfortable and shared their ideas more openly, such that they will make meaningful contribution.

## **4.2 Overview of the Business Units**

Data Collection was done in the six (6) units of EThekwini Municipality, These units were chosen for interviews;

- City Fleet
- Security management
- eThekwini Water & sanitations
- Electricity
- Treasury(Finance)

Each business units falls within the eight (8) administration clusters which are service delivery sectors of the city of eThekwini, formally known as eThekwini Municipality. Each cluster and unit has a focused clear role and responsibility. Each unit provides organizational support, services and infrastructure to residents across eThekwini according to the City delivery plan (eThekwini Municipality, 2018).

All these units have a mandate for service delivery in EThekwini Municipality, they have staff members who are key role players in decision making in the respective units. The remaining intended department unit from the Finance cluster was supply chain but were inundated with other urgent work commitments and could not be able to participate in this study. It was hoped that the views of the Supply Chain officials would be valuable by providing updates on the developments and the role e-procurement and smart procurement have on service delivery, as well as internal processes through information systems. However, the priority of this study was to establish the Impact of Information Systems on Internal Processes and service delivery. Therefore, this study was not affected materially by the absence of this information.



### **4.3 Participant's Profile**

The 11 interviewed participants were employees of eThekweni Municipality and their contact list was requested from the Information Systems department and also the Heads of unit were requested to nominate managers, senior managers, deputy Heads, in the absence of the listed titles, any person whose role directly linked to information systems and has decision making authorities in relation to information systems project. The selection of the participants was made because they have a direct influence or are delegated authorities on planning, decision making and policy making in relation to but not limited to information systems projects in eThekweni Municipality. Their business units also directly affected or supports major service delivery in the city, whom also any delays or lags in internal processes will have a direct impact on service delivery. The sample for qualitative design targeted 12 participants from eThekweni Municipality and 11 participated in this study, resulting in a 92% response rate.

The interviewees were from different designation levels which included Deputy Head, Senior Managers, Business Analyst and Project Manager, Manager Support and Security Officer. The interviewees are responsible for decision making, support to municipality and offering guidance. Their roles ranges from project planning, budget, developing standard operating procedures, approving of business processes and business requirements documents for system designs. Some of these managers work directly with service delivery and systems that feed in walk in centres, known as Sizakala Customer Service Units or Trading Services Centres.

The breakdown of the participant's role in no particular order is shown by the Figure 4-1 below

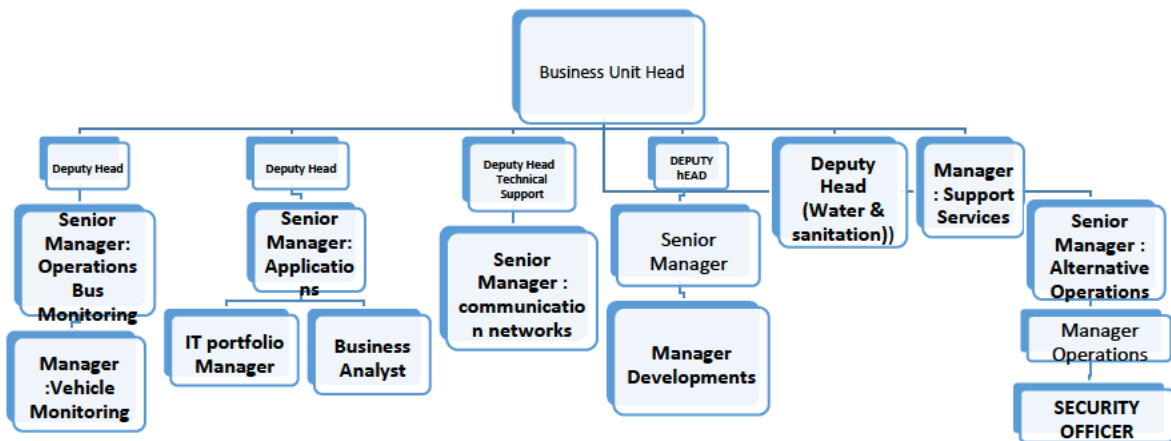


Figure 4-1: Breakdown of the Participant's Profile

#### 4.4 Gender and Business Units of Participants

The Interviewees are referred to as respondent 1 to 11 as a means of maintaining confidentiality. The Table 4-1 below shows the gender and business units of the participants.

Table 4-1: Gender and Business Units of Participants

Gender		Business Units	
<b>Female</b>	4	Information Management	2
<b>Male</b>	7	Security Management	3
		eThekweni Water & Sanitation	1
		Electricity	2
		City Fleet	2
		Finance	1
<b>Total</b>	<b>11</b>		<b>11</b>

The number of years the participants have worked for the municipality ranged from four (4) years to 20 years.

#### 4.5 Analysis and Presentation of Interview Results

Interview questions were divided into two sections. The first section had introductory questions the rest were made up of questions that determined if the respondents

were involved in any information system roles that would enable them to answer questions in section two. It also provided information about the current systems in place in eThekweni municipality and their functionality and capabilities. Another section deals with questions related to the importance of information systems and budgets. It also reviewed the role of other municipality stakeholders such as political leadership and the role they have on information systems. The last section also appraised the perceptions and attitudes towards information's systems and the impact it has on internal processes and service delivery. All the questions were derived from the research questions and themes were developed from the data collected.

#### **4.6 Objective 1: To explore what information systems are currently in place in eThekweni Municipality**

The following questions were asked to the interviewees under the first objective.

Interview questions were divided into two sections.

**a. The fourth revolution is already upon us, what is your take on the matter?**

Most of the respondents were well aware of what the fourth industrial revolution was, even though some were unaware. A good number of the respondents indicated that the eThekweni municipality is not ready for the fourth revolution. One of the respondents in answering the question had this to say:

*We did not catch the bus on time before it left, so we can only try and catch up. We are not yet ready for the fourth revolution. We need to sort out our basic problems in order to address the existing gaps.*

Respondent 7

*I am aware of the fourth revolution and it is a step in the right direction. The quicker we graduate from our current situation, the better we can be prepared for the fourth revolution. Respondent 9*

The fourth revolution is a follow up on the third revolution. The feedback of the respondents showed that the municipality is not ready for the fourth revolution. The fourth revolution is characterized by a fusion of technologies for economies that have well adapted on the third revolution (Xu, et al., 2018). It is clear that the municipality is not at the pace to meet up with the fourth revolution.

**b. Do you use systems for your daily operations? If yes, which systems and do list their uses?**

The response of the respondents showed that the municipality has a number of systems that are operational. EThekwini is one of the largest metro municipalities in SA and have huge operations with over 28000 employees, thereby requiring systems for effective operation. The respondents provided the following as systems in place for daily operation at the place of work. They include;

*JDE, Microsoft Office (e.g. Microsoft Outlook), ESS (HR employee services), Ellipse, RMS (revenue management services), E-Procurement, Contract Management Systems, Microsoft Project, CA (for IS request), Alarm Systems (MKSM), Reach Field, GroupWise (for emails), Scader, Geographical Information System (GIS), C-Track, Netstar, Fleet management system (FMS) Tectra. Over and above these systems, there are many other multiple systems used in eThekwini municipality. These systems are user specific for each Business Unit. However, there are common systems across all the city for all user departments, such JDE-E1, which is an Enterprise Resource Planning, Microsoft Outlook, GIS, ESS (Employee Self Service) and RMS. These are major systems, which are integrated for each unit.*

*Respondent 4*

**c. How many systems do you and your team use in total in order to perform your duties?**

The response of the respondents showed some used only two systems, another respondent used eight systems, some used four, another respondent used seven systems. The feedback from the respondents showed similarities in some of the systems while some were different.

**d. If more than one system is used, are the systems integrated?**

The feedback from one of the respondents showed that the systems are working well but require further upgrading. The respondents had these to say;

*Some of the systems like Ellipse and RMs are integrated while others are not. Integration is frustrating in the municipality because some of the systems cannot be integrated, and we end up integrating the database directly ourselves.*

*Respondent 4*

*We require a tool that will integrate the system so that we can have access to data from one platform to another. The lack of integration makes it difficult for my department to generate reports or even provide specifications for the result.*

*Respondent 4*

Some systems are integrated, for example; customer services for water, electricity, road, RMS and real estate.

System implementation works maximally and effectively when they are integrated, as this enables successful implementation (Eveland & Bikson, 2015). Lack of system integration creates frustration in the workplace, such that employees develop a care free attitude. Using multiple programs that do not integrate with other programs make it impossible for workers to execute their work effectively as this is supposed to enable the organisation to achieve their goals (Chignell, 2017). The system functionality is key for users. In line with DeLone and McLean principle that for IS model success to be true, systems are expected to bring net benefit by delivering its expected output (DeLone & McLean, 2016). Such systems also need to be user friendly and must meet user requirements.

**e. How would you describe your experience with the systems you are working with?**

Many of the respondents indicated that it will be impossible to function without the existing information systems because they have become an integral part of their

lives. However, working with systems that have a number of issues ranging from integration and systems update creates a frustrating and boring experience for the employees in utilizing these systems. Information systems are necessary for the public service and it requires focus and continuous monitoring to maintain systems that leave good impression with the staff. One of the participants had this to say;

*I can still perform my duties with the existing system. However, it takes the whole year to compile a single report.*

*Respondent 12*

*I enjoy working with the systems, however a good number stops during power interruption because there is no power back plan.*

*Respondent 9*

Poor systems make internal processes very difficult for the workers in any municipality. Service delivery is not only dependent on the behaviour of the municipal workers in executing their jobs (Cordella & Iannacci, 2010). However, information systems play a vital role in creating a stress free workplace (Berryman, et al., 2013).

#### **4.7 Objective 2: To examine if the information systems are effectively utilised?**

The following questions were asked to the interviewees under the second objective, which tried to examine if the information systems are very effective.

- a. What do you use information systems for mainly in your typical day?** Some of the respondents indicated that they use the information systems for procurement of services, placing orders and approvals. Some other indicated that it is used to support staff both in the office and in the field, and that they also use it to control project plans. Other respondents had this to say:

*I use information systems for communication in the workplace (both internally and externally) and also for designing process flows in the work place (like Microsoft Visio).*

*Respondent 6*

*I use information systems to manage my teams and deliverables. It also helps me in decision making, reporting and additional resources in the workplace.*

*Respondent 10*

**b. Does your job entail online approvals, if yes what online approvals do you do?**

Most of the respondents indicated that their job required online approvals. Some of the respondents had this to say;

*Yes, my job entails online approvals like JDE for orders, ESS for leave and contractors.*

*Respondent 7*

Online approvals enable employees to improve communication and also maintain scalability on jobs and tasks (Opuma, 2016). Online and automated approval enable organisations generate a real-time reports (Opuma, 2016). It also minimises the work a manager needs to do in the office, as it helps them to access the online platforms from anywhere.

**c. Are you able to access the systems remotely or out of office? If yes, are the data connectivity the same with the office sections?**

Agile information systems should be such that it allows the users to connect from anywhere with minimal connectivity issues (Scheck, 2016). Some of the respondents had this to say;

*I cannot access JDE out of the office and I think it is for security reasons.*

*Respondent 2*

*I can connect remotely if I use virtual private network (VPN) Respondent 9*

*I can access all remotely and on time*

### *Respondent 3*

Remote access services makes it easier for employees to work remotely and enhance their ability to connect every way using a secured and encrypted system (Scheck, 2016). Remote access also provide low maintenance cost, as it minimises initial cost at the main facility, which also enables employees to remain agile in providing feedback that is related to the work desktop, in real time (Sheehan, 2016). It is true that there is a potential to hack the system, but information systems applications that are enabled remotely can be managed such that the system are well protected (Sheehan, 2016).

#### **d. Is there anything that is done manually that you feel can be done on the systems, if yes please elaborate?**

The participants indicated that there are yet a lot to be done on the existing systems. Some of the respondents indicated that even though there were existing information systems, there are still some paper work going one. The respondents had this to say;

*We can go paperless where possible as it makes life easy and saves the municipality valuable costs. Respondent 2*

*There are online platforms for travelling approvals and the municipality should eliminate manual form approvals at all cost. Respondent 11*

The introduction of computer and other innovative management systems improve the utilisation of information at the workplace by moving away from paper-based approach to online based approval and filling systems (Dunbar, 2017). Online system also provide the ease of sharing files in the work place, filing and several other functionalities that cannot be implemented using the paper based systems (Demirci, 2010).

#### **e. Would you still be able to perform your daily duties without the current information systems?**



This question assessed whether the participants would still be able to perform their current roles without information systems. The truth is that the current workplace internal processes cannot be separated from information systems. It is like asking a person to type using the typewriter in the presence of computer aided systems. Many of the respondents does not see this as a possibility. In responding to this question, the participants had this to say;

*It is possible even though it will require a lot of time to be able to complete a simple task.*

*Respondent 8*

*Without information systems tool, the system is dead as many clients interact with the government through those systems. Respondent 5*

Information systems and technology is here to stay. The world is moving forward with regards to technology and has left the realm of moving backwards (Dubow, 2017). If the internet technology is shut down within the eThekweni Municipality, there will be chaos in the city management as lots of problems will arise ranging from the traffic systems to basic amenities by the public (Ghobakhloo, et al., 2012).

**f. What is the average cost that you spent on information systems annually?**

This question assessed whether the participants would still be able to perform their current roles without information systems. A smaller portion of the respondents could not provide the cost that is spent on information systems annually. A larger portion of the system spends millions of Rands on maintenance while most of the system also indicated that these millions of Rands is for licenses. One of the participants had this to say;

*About R39 million per annum is spent on maintenance cost and about 40 million Rands for new changes for RMS.*

*Respondent 3*

*About R50Million cost has been spent on tracking for the past ten years  
Respondent 7*

The feedback from the respondents showed that the municipality is spending lots of money on these systems, and earlier feedback shows that they do not receive the commensurate net benefit according to DeLone and McLean theory (Delone & McLean, 2003).

#### **4.7 Objective 3: To investigate the relationship between information systems, internal processes and service delivery**

The following questions were asked to the interviewees under the third objective, which tried to investigate the correlation between information systems, internal processes and service delivery.

##### **a. What is your understanding of internal processes and service delivery?**

Some of the respondents understood the processes that needs to be linked with deliverables that are aligned to a specific output. Some indicated that this implies departments should not work in silos as everything is a business process, which should produce a specific outcome. Some respondents had this to say;

*Internal processes are systems that interact with customers to produce an expected outcome. Respondent 6*

*Internal processes or chain of activities that need to be undertaken to provide the expected outcome for the public.*

*Respondent 11*

Efficient service delivery is a function of optimised internal processes (Onobrakpeya, et al., 2018). Service delivery should be all about effectiveness and customer services, which yields a particular net benefit. A clearer understanding of the relationship between both will enable business units in the municipal services to focus on optimised processes for efficient recovery (Johnson, 2018).

##### **b. How would you describe the impact of internal processes on service delivery?**

Poor internal processes will result in an affected service delivery. The response of the respondents showed that without internal processes, there is no direction of the municipal government in servicing the public. Two respondents had these to say;

*Standard operating system functions rely on internal processes, which means that without internal processes the business unit will not have direction.*

*Respondent 4*

*The internal processes impact service delivery, hence it is critical that they are managed correctly as they collect revenue. Hence, it is important to ensure that the internal processes are efficient so as to deliver the same value.*

*Respondent 6*

Other respondents also showed that internal processes will impact projects that lead to good service delivery, for e.g., housing developments. Inefficient information systems can pose serious challenges on the efficiency and effectiveness of service delivery in the public sector (Johnson, 2018). Lack of efficient and properly monitored internal processes will lead to failure in administering essential needs to the public (Nkomo, 2017).

**c. How would you describe the importance of information systems in a municipal setting?**

The respondents' feedback showed that information systems are of valuable importance, as service delivery has no boundaries and thus, adhere to many universal principles. Many of the respondents indicated that there is a huge importance to information systems in the municipality. Some of the respondents had these to say;

*It is extremely critical, because it enables us to do our job. He further indicated that the absence of the information system will result in entire failure in the municipal government. Respondent 6*

*Information systems are multitalented and carry out many functions like processing and storage of information, which leads to effective communication and subsequently service delivery. Respondent 9*

According to Kesley, Dougherty and Hattery (2002), information systems provides support to the municipal government in areas like planning information, budget information, local community newsletter, etc. The importance of information systems in the municipal environment has the same magnitudes as its importance in the private organisation (Kesley, et al., 2002). In referring to DeLone and McLean Theory, the service quality deals with the quality of support from information systems and IT personnel. In order words, if the service quality, information quality and systems quality are not as per requirement, it will affect the user satisfaction thereby affecting the net benefit of the system (DeLone & McLean, 2016).

**d. Do you think Information Systems will somehow have an influence on service delivery?**

The participants believe that information systems will have a good influence on the service delivery. It is important to remember that the citizens are growing with regards to their technological smartness. Some of the respondents had these to say:

*Yes, it will definitely, but will also depend on the internal in-house IT support that is given to the technicians. Respondent 4*

*Yes, optimisation comes with technological advancement. Hence, it is vital to improve productivity through internal processes and focus more on service delivery.*

*Respondent 7*

Information systems will continue to have influence on the service delivery. It is important to have an efficient in house back up IT team to maintain and improve the systems in each of the reviewed business units, on a continuous basis. Alrashid

(2016) highlights that optimising information systems at all levels in an organisation will accelerate the quality of service levels obtained. A winning information systems strategy is a strategy that is continuous and should be optimised periodically in order to ensure that all the value pathways of the business are leveraged upon maximally (Alrashid, 2016).

**e. How can information systems be optimized to match the world class, prepare for the fourth revolution and meet the sustainable development goals for 2030?**

Some of the respondents advised to make information systems in the municipality something that is easy to use. The respondents also advised that internal trainings are very important in order to develop a technologically inclined employees who are open to moving to information technology trends. Some of the respondents had these to say;

*Start with thorough research, look at best practices, take stock of current local government activities and identify shortcomings. Review different departments, recruit right staff, train and further develop them as IT is forever evolving. They should also keep abreast of trends in the information systems community.*  
Respondent 1

*Move away from analogue systems to digital systems as everything is moving into the digital phase. Business units to collaborate by sharing ideas and developing impact units*

Respondent 9

To optimise information systems to match the global environment, the municipality need to engage in aggressive acquisitions, transfer and diffusion of technologies (Ndabeni-Abrahams, 2019). Technologies like 5G, Internet of things sensors, edge computing, analytics, robotics and virtual realities are things that need to be put in place in preparing for the fourth revolution (Averweg, 2015).

#### **4.8 Objective 4: To analyse the role of political leadership and employees in implementing new systems**

The following questions were asked to the interviewees to address the fourth objective. They tried to analyse the role of political leadership and employees in implementing new systems in the municipality.

##### **a. What is your understanding of the role of political leadership in your work environment?**

Some of the respondents agreed that political leaders act as principals and should be involved in the administration of the municipal government. A few of the respondents highlighted that their role is more on decision making and that what is important is to always get their buy in or acceptance, as the information systems introduced in the municipality will also affect their family as well. Some of the respondents had these to say;

*My perception is that we are governed by the ruling party, and their positions and the people they put into leadership are always changing. As a result, they bring in different management styles and different agendas that change from time to time.*

*Respondent 3*

*Their support and allocation of budget is required because the business goes through that process. Politicians need to support the existing policies in the field and not to keep changing them.*

*Respondent 8*

*Political leadership should not have any influence on information systems. Influence should directly come from the administration and the best skill set that are within the administration. Respondent 11*

Political leadership play a role in the work environment directly and indirectly. The key thing is that sometimes, their role can be positive and sometimes negative as it depends on the dominant political party (Bjorn & Fathul, 2015). The application and utilisation of information systems have been used in administering the services of the government from a social, economic and political standpoint (Alfian, 2016). A major reason for the failure of information system and e-government is due to poor political leadership that affects governmental and municipal leadership, thereby influencing the outcome of the information systems (Kifle & Cheng, 2009).

**b. How would you describe the role of political leadership on employees, mainly key decision makers?**

One of the participants feel that there is strong influence from political leadership. Some of the participants feel that it is easier and better when they are involved, as it makes things easier. For example, the change from coins to RMS system was easy to be affected as political leadership got involved. It is also not enough to be involved, but even better to understand what is required based on the advice of the business unit heads and responsible technical team. One of the respondents had this to say;

*Their role is more on budget approval as they are not technically inclined. The budget is where their focus is required the most.*

*Respondent 4*

*They are not involved technically and operationally, as they are not supposed to interfere with the administration. Their role should be more of advisory and with regards to budgets. If they have concerns, such concerns should be referred to the City Manager.*

*Respondent 8 and Respondent 10*

Political administrative boundary is well established in South African view, as it clarifies the association between politics and administration (Mehlape, 2018). This relationship although well outlined is usually complex as the guidelines are often ignored, even though there is clarity with regards to respective functions. The duties of the political role players (e.g. the mayor) and the head of administration (the municipal or city manager) is also well outlined (Mehlape, 2018). The challenge in

obtaining an efficient boundary is based on the politicisation of the administration and management. Sometimes, even the councillors and in particular executive mayors tend to intervene in the management of municipalities which results in issues (Pretorius, 2017). This results in the delay of service delivery subjects that should be focused on (Pretorius, 2017).

**c. How would you describe political leadership role on systems implementation?**

In answering this question, majority of the respondents advised that political leadership have a huge role on system lunch and less on implementation. The political leadership should be made to understand the importance of the relationship between information systems and service delivery. The business units' managers should be able to convey the high level overview of such systems to the Politicians in a clear and concise way. This is done through a holistic and convincing presentations to the political leadership executives. In that way, the politicians will be able to approve their budgets as part of their function is understanding the type of project the tax payers' money is injected into, to ensure that good return on investments is made from possible lunch and subsequent implementation. In buttressing the fact that they do not play much role on implementation, two of the respondents had this to say;

*The political leaders do not implement any system. Their interest is to approve budgets that will better the lives of the public, thus ensuring efficient service delivery. As a result, they are also more focused on the lunch of such systems which adds more colours to their political career and endeavours.*

*Respondent 6*

Political leadership usually are more interested in the announcement or lunch of new systems (Bjorn & Fathul, 2015). The municipal systems council or executives usually play an oversight role and thereby guides the municipality administration that are responsible for implementing executive resolutions (Mthembu, 2012). In the municipal hierarchy, the administration is led by the city manager and heads of business units who are responsible for the leadership role of each unit (Pretorius, 2017). It is the function of the administration (municipality) to implement the executive



resolutions in collaboration with policy implementation processes and programmes (Mthembu, 2012).

**d. How would you describe employees' attitude towards new systems implementation?**

Some of the respondents indicated that employees are excited with new systems and more especially for those who work directly with such systems. The behaviour as highlighted by the respondents is that some of the employees are more neutral in their responses. In contrast, majority of the respondents shared that their employees demonstrate an attitude of resistance to the implementation of these new systems. Four of the respondents in no particular order had these to say;

*There are unions who look after some employees' interest and are usually concerned if implementation of new information system will affect their work. For example, with introduction of CCTV, unions will likely raise privacy concerns. Respondent 1*

*We have had a lot of adoption challenges in our business unit as employees sometimes feel they are being tracked.*

*Respondent 10*

*They show resistance as they feel that the system is requiring them to do what they want to do; hence they think that the systems are there to take away their jobs.*

*Respondent 2*

*In my business unit, new business implementation is usually received negatively. This is because we have bad record of system implementations. For instance, RMS has major problems with delays; JDE has over 3 year issue and yet to be resolved, Ellipse 5 year issues are yet to be resolved. The thought of new system implement creates further resistance in our unit.*

*Respondent 11*

Change is always difficult, and the general life of an employee is such that there is propensity to fall into a routine (Alfian, 2016). Hence, it becomes difficult when workers are introduced to new things or even new technological systems. There is always resistance from employees that is difficult to avoid during the process of new system implementation (Xiao, 2017). In trying to eliminate such resistance, managers need to communicate in an efficient manner and at all levels of the business units (Xiao, 2017). In addition, it is essential to create awareness for the employees before the introduction of the new system by showing or highlighting that a training plan has already been set up (Alfian, 2016). This will increase their comfort level, thereby reducing the degree of resistance to new system implementation (Alfian, 2016). It is also important to ensure that already installed or implemented systems are working. It does not make sense to add new systems or implement new systems when there are issues with existing systems.

**e. How can we bring about synergy between political leadership, employees and systems?**

About 20% of the participants indicated that there is a need to break down silos in the business units if the goal of synergy between political leadership, employees and systems will be realised. They highlighted that silos have caused delayed growth in the municipality as each business unit do not really want to learn what has worked or is working in another business unit. The silos mentality is a mindset where certain business units do not desire to share information with other employees or departments in the same organisation (Gleeson, 2013). The resultant effect of this approach is that it reduces efficiency in the overall business operation, thereby resulting in a negative service delivery to the public (Gleeson, 2013). The negative effects of business or departmental unit silos is made worse when each unit prioritise their own initiatives and goals over the goals of other units, which leads to failed opportunities for efficient collaboration and communication (Harris, 2018). In proffering a solution to silos, two of the respondents had this to say;

*There must be a relationship which can be achieved through discussion forums. Open communication through symposium or an avenue that brings business unit leaders and team should be encouraged. This will create a learning environment that*

*will enhance the creation of synergy between employees, systems and political leadership.*

*Respondent 1*

Strong leadership is also vital in creating a desired synergy. This type of strong leadership will be able to explore what has worked in other municipalities and other public institutions for other organisations. The approach of good leadership and followership must be encouraged in other to realise a degree of synergy (Bray & Severson, 2017). Good leaders must take responsibility (from political to business unit managers), work together in understanding the existing information systems gap that is drawing the organisation backward and then put into practice in a united front, what is required to work in their various organisations (Bray & Severson, 2017). In the case of eThekweni municipality, good leadership can improve the synergy between political leadership, employees and systems.

#### **4.9 Conclusion**

This chapter reviewed the feedback from the interview sessions, findings and discussion of the findings. Information systems is vital in the current work environment and very essential in sustaining many business processes in the workplace. The eThekweni municipality is no exception, as there is the need to revive some of the weak information systems and also implement necessary information systems to improve internal processes, thereby enhancing service delivery to the public. The findings showed that information systems are making positive impact to the internal processes in the eThekweni municipality system and that there is more to be done in other to operate with efficient processes that will lead to optimised service delivery. The feedback from the respondents also provided adequate feedback to the study objectives. The next chapter presents the conclusions and recommendations of the study.

### **CHAPTER FIVE**

#### **CONCLUSIONS AND RECOMMENDATIONS**

##### **5.0 Introduction**

The previous chapter provided the results, findings and discussions on the study. A number of conclusions can be drawn from the discussions in the previous chapter.

In this chapter, the findings from the study were also presented under each objective. This chapter also presents the recommendations of the study and scope for further study. The study objectives that guided the study are as follows;

- a) To explore what Information Systems are currently in place in eThekweni Municipality.
- b) To examine if the Information systems are effectually utilised.
- c) To investigate the relationship between Information systems, internal processes and service delivery.
- d) To analyse the role of political leadership and officials in implementing new systems.

## **5.2 Study Conclusions**

The conclusions drawn from this study are as follows;

- The municipality is already using numerous number of systems even though there are systematic issues of upgrades that need to be addressed. Shutting down the information systems utilised will likely lead to a complete disaster, as these systems support internal processes within eThekweni municipality.
- The respondents are significantly aware of the fourth dimension, even though reasonable improvements are still needed by the municipality to catch up with the fourth revolution. This is true as some of the existing systems still need upgrades which shows that they are possibly slow and takes a while to compile a report as one of the respondents highlighted.
- It is essential to move away from analogue to digital systems as everything is moving into the digital phase.
- System implementation works optimally when they are integrated. There is a need to integrate additional number of systems used for efficient internal processes.
- It was uncovered from the study that some of the systems work well when operated remotely, while difficulties are encountered with other systems in trying to operate remotely.

- The municipality is already spending a lot of money on existing systems, which denotes the commitment of the government to enhance service delivery through effective internal processes. The study also revealed that there is a strong connection between internal processes and service delivery. This is because most of the systems used by the six business units under study are all tied up to meeting service delivery to the public.
- The larger public are becoming technologically smart with the multiplicity of smart phones. This means that information systems will continue to have effect on service delivery and the municipality need to match the growing trends in the general public in order to carryout efficient service delivery.
- Employees are resistant towards the implementation of new information system, as there are issues yet to be resolved with a number of the old systems. Some are also resistant as there is a concern that new systems are aimed at replacing the functions/their jobs in the workplace.
- There is a need for strong and dynamic leadership as it is vital in creating a synergy between political leadership, employees and systems.

### **5.3 Study Recommendations**

The recommendations from this study are as follows;

- It is recommended for the municipality to move away from analogue to digital systems as the latter is more conventional. This will also help to address the existing internal process gaps that will lead to optimised service delivery.
- It is recommended by the research to understand the degree of integration required for any system before the implementation of such systems. Systems should not just be launched just for awareness and political satisfaction's sake. Commitment and energy should be put into systems that address the existing gaps in the municipal internal processes.
- It is recommended for the municipality to proactively learn from other global public service best practices in preparing for the fourth industrial revolution. The information systems future envisaged by eThekwini municipality is already a reality in other countries. Efforts must be made by the political and

business leaders in studying such models and endeavour to transfer the lessons to eThekwini municipality.

- Remote operation of information systems is a growing trend. It is recommended for eThekwini municipality systems to upgrade existing systems where necessary, such that employees can work and operate them remotely as and when required.
- It is recommended for the municipality business units to address existing concerns with the already information systems in use that have issues, which are yet to be resolved.

#### **5.4 Limitations of the Study**

Some of the limitations of the study include;

- a. The study was limited to eThekwini municipality business units. Hence, the findings may not be applied to other municipalities.
- b. The researcher limited the study to only six business units. It is possible that the researcher would have uncovered more if the study was extended to the entire business units.
- c. The study was limited to a qualitative study and this could have created some bias. This is because qualitative data has low level of accuracy and faces challenges with regards to comparison.

#### **5.5 Scope for Further Study**

This study is an excellent contribution should extended to other large metros at doctoral level. It is suggested that a future study should also explore the impact of information systems by utilising quantitative approach. It is also suggested that the feedback of other business units in eThekwini municipality should be explored.

## **5.6 Conclusion of the Study**

This chapter outlined the conclusions and recommendations from the study, which were extracted from the results, findings and discussions from Chapter Four. Information systems impact internal processes in eThekweni municipality which ultimately affects service delivery. The municipality currently spends a huge amount of money in maintaining existing systems in a bid to service the public in a more effective manner. From the researcher's view, the objectives of the study were intently addressed and reviewed by the feedback from the interviewees. The researcher believes that future studies should utilise a combination of quantitative and qualitative approach, which will greatly assist in assessing the impact of information systems on many more business units.

## REFERENCES

- Abiad, A. & Khatiwada, S., 2018. *5 Ways Technology is Improving Governance, Public Service Delivery in Developing Asia*. [Online] Available at: <https://blogs.adb.org> [Accessed 18 February 2019].
- Adaku, E. et al., 2018. "Improving public sector service delivery: a developing economy experience". *International Journal of Productivity and Performance Management*, 67(7), pp. 1132-1146.
- African News Agency, 2019. *SA small businesses buoyant despite challenging economic climate - survey*. [Online] Available at: <https://www.ftwonline.co.za> [Accessed 12 March 2019].
- Akinboade, O. A., Mokwena, M. P. & Kinfack, E. C., 2014. Protesting for Improved Public Service Delivery in South Africa's Sedibeng District. *Journal of Social Indicators Research*, 119(1), pp. 1-23.
- Alfian, 2016. How Leadership Style Impacts The Management Information System Quality - A Theoretical Study. *International Journal of Scientific and Technology Research*, 5(6), pp. 11-15.
- Alrashid, A., 2016. *Using Information System in Business Model will reduce Cost and Increase Profit*. [Online] Available at: <https://www.medium.com> [Accessed 11 February 2019].
- Altamony, H., Masa'deh, R., Alshurideh, M. & Obeidat, B. Y., 2012. Information Systems for Competitive Advantage: Implementation of an Organization Strategic Management Process. *Journal of Innovation and Competitive Advantage*, pp. 583590.
- Arifin, S. R. M., 2018. Ethical Considerations in Qualitative Study. *International Journal of Care Scholars*, 1(2), pp. 30-33.
- Averweg, U. R., 2015. *Public Service Delivery in a Municipal Information Society*. 3rd ed. Durban: s.n.
- Berryman, R., Yost, N., Dunn, N. & Edwards, C., 2013. Data Interoperability and Information Security in Healthcare. *Transactions of the International conference on Health Information Technology advancement*, 2(1), pp. 84-93.
- Bjorn, F. & Fathul, W., 2015. E-government Challenges and the Role of Political Leadership in Indonesia: the Case of Sragen. *Hawaii International Conference of System Sciences*, pp. 1-10.



Botchway, E. A., YeboahBoateng, E. & Kwofie, T. E., 2015. Challenges to Integration of Information Technology in Physical Infrastructure Development Processes at the Local Government Level. *International Journal of Application or Innovation in Engineering and Management*, 4(9), pp. 135-148.

Bourgeois, D., 2014. *Information Systems for Business and Beyond*, Washington, D.C: The Saylor Academy.

Bray, K. & Severson, Z., 2017. *Three Ways to Increase Team Synergy in Your Business*. [Online] Available at: <https://consciouscompanymedia.com/personaldevelopment/professional-relationships/three-ways-to-increase-team-synergy-inyour-business/> [Accessed 11 May 2019].

Buccafurri, F. et al., 2016. *Availability, Reliability, and Security in Information Systems*. Salzburg, International Cross-Domain Conference.

Chignell, B., 2017. *How your business can benefit from system integration*. [Online] Available at: <https://www.ciphr.com/advice/system-integration/> [Accessed 15 April 2019].

Cline, G. B. & Luiz, J. M., 2013. *Information technology systems in public sector health facilities in developing countries: the case of South Africa*. [Online] Available at: <https://bmcmmedinformdecismak.biomedcentral.com> [Accessed 2 December 2018].

Cooper, D. & Schindler, P. S., 2011. *Business Research Methods*. 11th ed. Melbourne: McGraw-Hills.

Cordella, A. & Iannacci, F., 2010. Information systems in the public sector: The eGovernment enactment framework. *Journal of Strategic Information Systems*, pp. 1-15.

Creswell, J. W. & Creswell, D. J., 2018. *Research design: qualitative, quantitative, and mixed methods approaches*. 5th ed. Los Angeles: SAGE.

Crossman, A., 2019. *What is a Pilot Study in Research*. [Online] Available at: <https://www.thoughtco.com> [Accessed 7 May 2019].

De Clerck, H. M., Willems, R., Timmerman, C. & Carling, J., 2011. Instruments and guidelines for qualitative fieldwork. *Eumagine - Imagine Europe from the Outside*, 27 July, pp. 1-39.

Delone, W. H. & McLean, E. R., 2003. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4), pp. 9-30.

DeLone, W. H. & McLean, E. R., 2016. Information Systems Success Measurement. *Journal of Foundations and Trends in Information Systems*, 2(1), pp. 1-116.

Demirci, N., 2010. Web-Based vs. Paper-Based Homework to Evaluate Students' Performance in Introductory Physics Courses and Students' Perceptions: Two Years Experience. *International Journal of E-Learning*, 9(1), pp. 27-49.

Dikko, M., 2016. Establishing Construct Validity and Reliability: Pilot Testing of a Qualitative Interview for Research in Takaful (Islamic Insurance). *The Qualitative Report*, 21(3), pp. 521-528.

Dubow, T., 2017. *Civic Engagement: How can digital technologies underpin citizenpowered democracy?*, Santa Monica: Corsham Institute Thought Leadership Programme.

Dunbar, A., 2017. *Paper Based vs. Computer Based*. [Online] Available at: <https://bizfluent.com/about-6605561-paper-based-vs-computer-based.html> [Accessed 15 March 2019].

Dwivedi, Y. K. et al., 2014. Research on information systems failures and successes: Status update and future directions. *Journal of Business Media*, Volume 10, pp. 1-15. eThekwin Municipality, 2018. *eThekwin Municipality*. [Online] Available at: <https://www.durban.gov.za> [Accessed 8 January 2019].

Eveland, J. D. & Bikson, T. K., 2015. *Integrating New Tools into Information Work: Technology Transfer as a Framework for Understanding Success*. [Online] Available at: <https://www.nap.edu/read/1860/chapter/15> [Accessed 11 May 2019].

Ewuim, N. C., Igbokwe-Ibeto, C. J. & Nkomah, B. B., 2016. Information and Communication Technology and Public Service Delivery in Amuwo-Odofin Local Government Council of Lagos State Nigeria. *Singaporean Journal of Business Economics, and Management Studies*, 5(1), pp. 13-25.

Forza, C., 2013. The impact of information systems on quality performance: an empirical study. *International Journal of Operations & Production Management*, 15(6), pp. 69-83.

Garrett, P. et al., 2006. Identifying Barriers to the Adoption of New Technology in Rural Hospitals: A Case Report. *Perspective Healt Information Management*, 3(9).

GCIS, 2016. *Government uses technology to improve Service Delivery*. [Online] Available at: <https://www.gcis.gov.za> [Accessed 4 November 2018].

GEHA, 2014. *How Important is Information Technology to the Government?*. [Online] Available at: <https://www.geia.org> [Accessed 15 January 2019].

Gelinas, U. J., Sutton, S. G. & Federowicz, J., 2008. *Business Processes and Information Technology*. Zurich: Litten Editing and Production.

Ghobakhloo, M., Hong, T. S., Sabouri, M. S. & Zulkifli, N., 2012. Strategies for Successful Information Technology Adoption in Small and Medium-sized Enterprises. Volume 3, pp. 36-67.

Gleeson, B., 2013. *The Silo Mentality: How to Breakdown the Barriers*. [Online] Available at: <https://www.forbes.com/sites/brentgleeson/2013/10/02/the->

[silomentality-how-to-break-down-the-barriers/#b1cd9338c7e9](#) [Accessed 15 June 2019].

Gomez, H. G., Serna, M. D. & Badenes, R. F., 2010. Evolution and Trends of Information Systems for Business Management: The M-Business. A Review. 77(163).

Grabara, J., Kolcun, M. & Kot, S., 2014. The Role of Information Systems in Transport Logistics. *International Journal of Education and Research*, 2(2), pp. 1-8.

Gunawardhana, D. N. T. & Perera, C., 2015. Classification of Failure Factors in Information Systems. *International Journal for Innovation Education and Research*, 3(3), pp. 201-211.

Harris, M., 2018. *Departmental Silos: The Good, the Bad, and the Ugly*. [Online] Available at: <https://www.martechadvisor.com/articles/performance-andattribution/departamental-silos-the-good-the-bad-and-the-ugly/> [Accessed 20 June 2019].

Hasa, A., 2017. *Difference Between Research Metods and Research Design*. [Online] Available at: <https://www.pediaa.com> [Accessed 11 March 2019].

Hoppen, N., Klein, A. Z., Rigoni, E. H. & Ritter, A., 2016. A qualitative research instrument to analyse organisational clusters' competitiveness factors. 13(1), pp. 218.

Ijeoma, M. M., 2018. Importance of Management Information System in Service Delivery and Paper Work in Nigeria University. *Journal of Business and Management*, 20(9), pp. 30-38.

Ismail, Z. & Rahim, F., 2014. A Review of Barriers in Adopting Healthcare Information System. *Advanced Science Letters*, Volume 4, pp. 400-407.

Izuakor, C., 2016. Understanding the Impact of Cyber Security Risks on Safety. *2nd International Conference on Information Systems Security and Privacy*, 15 March, pp. 509-513.

Johnson, S., 2018. *Why Improving Service Delivery in Public Sector Organisation is Difficult*. [Online] Available at: <https://www.socialsolutions.com> [Accessed 10 January 2019].

Kenton, W., 2018. *Population*. [Online] Available at: <https://www.investopedia.com> [Accessed 24 January 2019].

Kesley, T. W., Dougherty, M. J. & Hattery, M., 2002. Information Technology Use by Local Governmentes in the Northeast: Assessment and Needs. *Journal of Extension*, 40(55).

Khalifa, M., 2013. Barriers to Health Information Systems and Electronic Medical Records Implementation. A Field Ststudy of Saudi Arabian Hospitals. *Procedia Computer Science*, Volume 21, pp. 335-342.

Kifle, H. & Cheng, L. K., 2009. e-Government Implementation and Leadership - the Brunei Case Study. *Electronic Journal of edition*, 7(3), pp. 271-282.

Kilani, M. & Kobziev, V., 2016. An Overview of Research Methodology in Information System. *Open Access Library Journal*, 3(11), pp. 1-9.

Koigi, B., 2019. *Africa Business Communities*. [Online] Available at: <https://www.africabusinesscommunities.com> [Accessed 28 April 2019].

Kumar, V., 2011. Impact of Health Information Systems on Organisational Health Communication and Behaviour. *The Internet Journal of Allied Health Sciences and Practice*, 9(2), pp. 1-5.

Labarre, O., 2019. *Enterprise Resource Planning (ERP)*. [Online] Available at: <https://www.investopedia.com/terms/e/erp.asp> [Accessed 27 May 2019].

Lee, J., 2017. *What are Smart Cities and How Do They Work*. [Online] Available at: <https://learn.g2.com/smart-cities> [Accessed 11 May 2019].

Leung, L., 2015. Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, 4(3), pp. 324-327.

Lose, T., Nxopo, Z., Maziriri, E. & Madinga, W., 2016. Navigating the Role of Business Incubators: A Review on the Current Literature on Business Incubator in South Africa. *Acta Universitatis Danubius*, 12(5), pp. 130-140.

Makhafola, G., 2019. *#Sona2019: Ramaphosa dreams of building a new "smart city"*. [Online] Available at: <https://www.iol.co.za/news/politics/sona2019ramaphosa-dreams-of-building-a-new-smart-city-26879831> [Accessed 20 June 2019].

Marczyk, G. R., Dematteo, D. & Festinger, D., 2005. *Essentials of research design and methodology*. New Jersey: John Wiley & Sons.

Markgraf, B., 2019. *Importance of Information Systems in an Organisation*. [Online] Available at: <https://smallbusiness.chron.com/importance-information-systemsorganization-69529.html> [Accessed 11 May 2019].

Marr, B., 2018. *The 4th Industrial Revolution Is Here - Are You Ready?*. [Online] Available at: <https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4thindustrial-revolution-is-here-are-you-ready/#beea1ed628b2> [Accessed 3 May 2019].

Masutha, M. & Rogerson, C. M., 2014. Small enterprise development in South Africa: The role of business incubators. *Bulletin of Geography and Socio-Economic Series*, Volume 26, pp. 141-155.

Mawela, T., Ochara, N. M. & Twinomurizi, H., 2017. E-Government Implementation: A Reflection on South African Municipalities. *South African Computer Journal*, 29(1), pp. 147-171.

- Mehlape, M. M., 2018. *The Effects of Political Leadership on Public Administration Within South African Local Government*. Saldanha Bay, Stellenbosch University.
- Mthembu, B. J., 2012. *The Role of Leadership in Implementing Service Delivery Initiatives: A Case Study of Buffalo City Municipality*, Makhanda: Rhodes Business School.
- Mutula, S. M. & Mostert, J., 2010. Challenges and opportunities of e-government in South Africa. *The Electronic Library*, 28(1), pp. 38-53.
- Ndabeni-Abrahams, S., 2019. *Africa 4.0: Preparing for the Fourth Industrial Revolution*. [Online] Available at: <https://www.brandsouthafrica.com/investmentsimmigration/conferences/davos/africa-4-0-preparing-for-the-fourth-industrialrevolution> [Accessed 30 May 2019].
- Ndlovu, N. P., 2015. *The Role of Management Information Systems in Measuring Organizational Performance in the KwaZulu-Natal Department of Arts & Culture*, s.l.: Stellenbosch University.
- Niculescu, C. E. & Berceanu, B., 2014. The leadership role of a local public administration CIO: the Case of Bucharest. *Journal of Theoretical and Applied Economics*, 21(11), pp. 141-156.
- Nkomo, S., 2017. Public Service Delivery in South Africa. *Afrobarometer Policy Paper*, October, pp. 1-17.
- O'Connor, S., 2017. *What is Interoperability, and Why Is it Important?*. [Online] Available at: <https://www.adsc.com/blog/what-is-interoperability-and-why-is-it-important> [Accessed 11 April 2019].
- Ojo, A. I., 2017. Validation of the DeLone and McLean Information Systems Success Model. *Journal of Health Information Research*, 23(1), pp. 60-66.
- Olugbode, M., Elbeltagi, I., Simmons, M. & Biss, T., 2015. The Effect of Information Systems on Firm Performance and Profitability Using a Case-Study Approach. *The Electronic Journal Information Systems Evaluation*, 11(1), pp. 11-16.
- Onobrakpeya, A. S., Nana, O. G. & Odu, P. E., 2018. Improving Service Delivery Through Information and Communication Technology in the Nigerian Manufacturing Industry. *Journal of Management Sciences and Technology*, 5(2), pp. 61-84.
- Opuma, M. A., 2016. *Nine Benefits of Work*. [Online] Available at: <https://www.plasmacomp.com/blogs/nine-benefits-of-workflow-automation/> [Accessed 12 June 2019].
- Payet, C., 2018. *Using Technology to Improve Service Delivery*. [Online] Available at: <https://www.durban.gov.za> [Accessed 5 January 2019].
- Pillay, V., 2015. *Mail & Guardian*. [Online] Available at: <https://www.gc.co.za> [Accessed 12 February 2019].

Pojani, D. & Stead, D., 2015. Sustainable Urban Transport in the Developing World: Beyond Megacities. *Journal of Sustainability*, Volume 7, pp. 7784-7805.

Porter, M. E. & Millar, V. E., 2015. *How Information Gives You Competitive Advantage*. [Online] Available at: <https://www.hbr.org> [Accessed 2 November 2018].

Pretorius, M. C., 2017. *The Influence of Political and Administrative Interaction on Municipal Service Delivery in Selected Municipalities in the Free State Province*, Bloemfontein: Central University of Technology.

Ramey, K., 2012. *Use of Information Technology in Competitive Advantage*. [Online] Available at: <https://www.useoftechnology.com> [Accessed 11 November 2018].

Ramey, K., 2014. *Impact of Information Technology in an Organization*. [Online] Available at: <https://www.useoftechnology.com> [Accessed 5 December 2018].

Resnik, D. B., 2015. *What is Ethics in Research and Why it is Important?*. s.l.:s.n.

Rujan, A. & Simpkinson, N., 2018. *Thinking about becoming a smart city? Ten benefits of smart cities*. [Online] Available at: <https://www.plantemoran.com/exploreour-thinking/insight/2018/04/thinking-about-becoming-a-smart-city-10-benefits-ofsmart-cities> [Accessed 20 May 2019].

Sain, R., 2019. #SONA2019: New 'smart' city will be easy to run. [Online] Available at: <https://www.iol.co.za/news/politics/sona2019-new-smart-city-will-beeasy-to-run-says-dlamini-zuma-26994480> [Accessed 21 June 2019].

Sanjari, M. et al., 2014. Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guidance. *Journal of Medical Ethics and History of Medicine*, 7(14).

Saunders, M., Lewis, P. & Thornhill, A., 2012. *Research Methods for Business Students*. London: Pearson.

Scheck, S., 2016. *Eight Major Impacts of Information Technology*. [Online] Available at: <https://www.tweakyourbiz.com> [Accessed 3 February 2018].

Schultz, H., 2018. *Improving service delivery: Challenges in the public sector and how to address them*. [Online] Available at: <https://www.dailymaverick.co.za> [Accessed 4 December 2018].

Sekaran, U. & Bougie, R., 2013. *Research Methods for Business: A Skill Building Approach*. Chichester, West Sussex: John Wiley & Sons Ltd.

Sheehan, J., 2016. *Remote Access Services - Advantages, Disadvantages and Its Monitoring*. [Online] Available at: <https://medium.com/@managemynet.com/remote-access-services-advantagesdisadvantages-and-its-monitoring-a43d19665792> [Accessed 15 May 2019].

Sisilana, G., 2016. *Service delivery report*. [Online] Available at: <https://www.durban.gov.za> [Accessed 12 April 2019].

Standard Bank, 2018. *How the Public Sector can improve service delivery to citizens*. [Online] Available at: <https://www.bizconnect.standardbank.co.za> [Accessed 11 February 2019].

Stokbroekx, H., 2017. *Eight Ways Technology is Changing the Service Industry*. [Online] Available at: <https://www.infoworld.com> [Accessed 15 February 2019].

Surbhi, S., 2016. *Difference Between Probability and Non-Probability Sampling*. [Online] Available at: <https://www.keydifferences.com> [Accessed 15 March 2019].

Tworek, K. & Liu, S., 2018. Reliability of information systems in organisation in the context of banking sector: Empirical study from Poland. *Journal Cogent Business and Management*, 15(2).

Urbach, N. & Mueller, B., 2011. The Updated Delone and McLean Model of Information Systems Success. *Integrated Series in Information Systems*, 28(1).

Verduyn, M., 2018. *Investment Support for Black Business*. [Online] Available at: <https://www.entrepreneurmag.co.za> [Accessed 2 March 2019].

Worth, D., 2018. *At least 57 negative impacts from cyber-attacks*. [Online] Available at: <https://www.sciencedaily.com> [Accessed 19 January 2019].

Xiao, C., 2017. The Reason and Coping Measures of Employees' Resistance to Information System. *Journal of Human Resource and Sustainability Studies*, Volume 5, pp. 87-93.

Xu, M., David, J. M. & Kim, S. H., 2018. The Fourth Industrial Revolution: Opportunities and Challenges. *International Journal of Financial Research*, 9(2), pp. 90-95.

Yang, D., 2015. The analysis of information technology' effects on public service productivity. *International Conference on Engineering Management, Engineering Education and Information Technology*, pp. 408-413.

Zandbergen, P., 2016. *What are Information Systems? Definitions and Types*. [Online] Available at: <https://www.study.com> [Accessed 2 December 2018].

Zietsman, G., 2018. *Get Moving with Gauteng's new integrated transport app*. [Online] Available at: <https://www.traveller24.com> [Accessed 20 April 2019].

Zwass, V., 2014. *Editorial Introduction - Information Systems*. [Online] Available at: <https://www.britannica.com> [Accessed 12 December 2018].

## **APPENDIX – ETHICAL CLEARANCE**





13 May 2019

Ms Nontobeko Prisca Mnguni (200309380)  
Graduate School of Business & Leadership  
Westville Campus

Dear Ms Mnguni,

Protocol reference number: HSS/2158/018M

Project title: The impact of Information Systems on internal processes and Service Delivery in eThekweni Municipality

**Full Approval – Expedited Application**

With regards to your response received on 15 April 2019 to our letter of 05 February 2019, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Title of the Project, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

**PLEASE NOTE:** Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 1 year from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Rosemary Sibanda (Chair)

**APPENDIX – GATE KEEPERS LETTER**



Pod 1, Second Floor, Intuthuko Junction, 750 Mary Thiphe Street, Umkhumbane, Cato Manor, Durban 4001.  
Tel: 031 322 4513, Fax: 031 261 3405, Fax to email: 086 265 7160, Email: [mile@durban.gov.za](mailto:mile@durban.gov.za), Website: [www.mile.org.za](http://www.mile.org.za)

For attention:  
Chair of Ethics Committee  
Graduate School of Business and Leadership  
College of Law and Management Studies  
University of Kwazulu Natal  
Westville Campus  
4001

9 April 2019

RE: LETTER OF SUPPORT TO Ms N. NGUNI, STUDENT NUMBER 200309380 - GRANTING PERMISSION TO USE  
ETHEKWINI MUNICIPALITY AS A CASE STUDY

The Information Management Unit and eThekweni Municipal Academy (EMA), have considered a request from Ms Nontobeko Mnguni to use eThekweni Municipality as a research study site leading to the awarding of a Master of Business Administration degree. The study, entitled: *"The Impact of Information systems in internal processes and service delivery in eThekweni Municipality."* is recorded.

We wish to inform you of the acceptance of her request and hereby assure her of our utmost cooperation towards achieving her academic goals; the outcome which we believe will help our municipality improve its service delivery. The student is advised of the ethical considerations at all times when conducting this research. In return, we stipulate as conditional that the student, supported by her academic supervisor contacts Collin Pillay, Program Manager at MILE ( [collin.pillay@durban.gov.za](mailto:collin.pillay@durban.gov.za)) to present the results and recommendations of this study to the related unit/s on completion of her research study.

Wishing Ms Mnguni all the best in her studies.

Mr Robert Dlamini  
Head: Information Management Unit  
eThekweni Municipality

Dr M. Ngubane  
Head: eThekweni Municipal Academy  
eThekweni Municipality

## APPENDIX – INTERVIEW SCHEDULE

## **INTERVIEW SCHEDULE**

The impact of Information systems on internal processes and service delivery in  
eThekweni Municipality

### **Introduction**

We are carrying out an evaluation of the impact of the impact of Information systems on internal processes and service delivery in EThekweni Municipality

### **Aim**

To determine a sustainable and strategic approach to Information systems optimisation to enhance service delivery and internal process flows in eThekweni Municipality.

### **Would you mind answering a few questions on your experience of the service?**

Your answers will be treated with confidentiality among project staff for the purpose of evaluating the impact of Information systems on internal processes and service delivery in eThekweni Municipality, and in the production of the project report. All responses will remain anonymous. However, we would like to talk to you again in about 12 months' time to see how things have changed. Would you be agreeable to that?

How would it be best to contact you later on?

Name:
Contact Number:
Email Address:

Interview Reference Number:

### **Notes:**

Each interview is expected to take 45 minutes to an hour or more, are you comfortable with this time?

Please note that you may withdraw at any time from participating in the study should you wish so kindly alert me.

1. To explore what information's systems are currently in place in eThekweni Municipality

Questions	Response	Further Comments
1.1 The fourth revolution is already upon us, what's your take on the matter?		
1.2 Do you use systems on your daily operations: if Yes which systems and please list their uses?		
1.3 How many systems do you and your team use in total in order to perform your duties?		
1.4 If more than one systems are the information systems integrated?		
1.5 How would you describe your experience with the systems you are working with?		

2. To examine if the Information systems are effectually utilised

Questions	Response	Further Comments
2.1 What do you use Information systems for mainly in your typical day?		
2.2 Does your job entails online approvals, if yes what online approvals do you do?		
2.3 Are you able to access the systems remotely or out of office? If yes are the data connectivity the same with office connections.		
2.4 Is there anything that is done manually that you feel can be done on the systems, if yes please elaborate?		

2.5 Would you still be able to perform your daily duties without the current information systems		
2.6 What is the average cost that you spend on information systems annually?  Can you recall what these cost incorporate? System Development, Maintenance Cost, Systems upgrade? Or any other cost		

3. To investigate the relationship between Information systems, internal processes and service delivery.

Questions	Response	Further Comments
3.1 What is your understanding of internal processes and services delivery?		
3.2 How would you describe the importance of Information systems in a Municipal setting?		
3.3 How would you describe the impact of internal processes on service delivery?		
3.4 Do you think optimizing Information Systems will somehow have an influence on service delivery?		
3.5 How can Information Systems be optimized to match the world class and prepare for the fourth revolution		

and meet the sustainable development goals for 2030		
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4. To analyse the role of political leadership and employees in implementing new systems

Questions	Response	Further Comments
4.1 What is your understanding of the role of Political leadership in your work environment?		
4.2 How would you describe the role of political leadership on employees, mainly key decision makers?		
4.3 How would you describe political leadership role on systems implementation.		
4.4 How would you describe employees attitude towards new systems implementations		
4.5 How can we bring about synergy between political leadership, employees and systems		

**Thank you very much for taking the time to answer my questions. I have really learnt a lot! Handshake, Goodbye!**

*Please may I confirm your contact details on the first page?*