Evaluation of Information System Service Quality in a South African Governmental Department

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Abstract

The research project was undertaken to investigate the effective usage of Information Systems (IS) and Information Technology (IT) in the Department of Economic Development, Environment, Conservation and Tourism (DEDECT), taking into consideration other factors impacting on service delivery in the Department and their challenges. The survey was confined in the DEDECT Provincial office and at middle management respondents with access to IS equipment and tools. A sample of 25 respondents was selected. The collected data was presented in frequency tables and graphs. The main findings of the study reveal that there is a strong correlation between service delivery and the IS infrastructure in the department and encompassing other factors which may include perceptions of clients, support systems to IS and the capabilities of the IS operators. It is therefore imperative that the various arms of government start working smartly and effectively by using IS and IT to increase productivity. At the end of this article, several general strategies are put forward as possible solutions to achieve this goal.

Keywords: Information Systems, IS success, Information Technology, Middle managers, Reliability, Service delivery.

Introduction

The DEDECT, situated in Mafikeng, is the provincial office with branches in the three districts elsewhere in the North West Province. The offices are linked to one electronic technology like telephones, networked computers, and fax machines, just like any other department in the province. The

objective of linking all these departments is mainly to facilitate internal communication, quick information exchange between offices as they go about serving their clients in order to fulfil their official mandate.

The purpose of this contribution is to report the results of our research on the effective use of IS in this department and observe the other related issues including challenges encountered. The need to investigate the effective use of IS in the department would lead to client satisfaction and within the department the ability to produce tangible deliverables more quickly (Service delivery). The literature used in this study comes from journal articles, different websites and literature from relevant scholars on the subject.

Background

This study focuses into the operations of the Department of Economic Development Environment Conservation, and Tourism (DEDECT) in the Provincial office based in Mafikeng in the Northwest Province of South Africa. The offices are based in a building rented from the North West Development Corporation, which happens to be one of the department's agencies among other parastatal organisations operating in North West Province.

The DEDECT is one of the smaller departments in the province and has about a total of about hundred and five employees, including those in the districts. However, this number includes even people who do not use computers. It is also expected that the number of employees will increase in the near future as the government seeks to try and increase all the positions. The use of IS therefore is an integral part of the Department with almost every office equipped with a Desk top computer or Desk top which is used to generate reports and communicate with other Departments and other organisations through the intranet and the internet. All Departments in the province are linked to one main central server but with each individual Department having its own departmental server managed by a small team of IT personnel to attend to internal IS and IT problems. This article focuses on the before-mentioned small team within the department and seeks to gauge their service delivery as well as to identify problem areas with regard to service delivery. It then comes up with possible recommendations on improving the services in case of any shortfalls.

Problem Statement

A well placed and organised IS system is required in an organisation if it is to be utilised to its full potential, and includes a number of components. Park and Kim (2005) explain that IS are implemented within an organisation for the purpose of improving the effectiveness and efficiency of that organisation.

The importance of IS affords that the effective and responsible use and management of the information technologies is important for managers, professionals, and other knowledge workers in today's internet worked enterprises. IS plays a vital role in the e-business and e-commerce operations, enterprise collaboration and management, and strategic success of businesses that must operate in an Internet work global environment (Sachenko 2011).

The DEDECT has to collaborate with other partners such as Cipro to register business enterprises and Tourism South Africa to process Tourism related issues with partners in towns as well as overseas. These Systems have to be properly put in place and managed by capable trained staff to make them more effective. However, the current status in this department might not be the ideal situation, given the fact that service delivery generally is at its lowest ebb in South Africa as a country, as evidenced by the cry from the public as alluded to by Zuma in 2011. It is therefore with this status quo that this study seeks to investigate.

Other issues that are problematic to be investigated in this department are the usage of computers or IS by staff members, their competency levels in using them, Reliability of the network system, or IS in the department as well as IS support within the department, Satisfaction of the clients of the department as consumers of the product was also looked at.

Literature Review

Assessment of IT Usage

In the IS field, as early as 1992, Delone and Mclean developed a model for measuring IS success model containing six constructs namely:

- System quality
- Information quality
- Use of IS

- User satisfaction
- Individual impact and
- Organisation impact

Since then, the IS success model has been tested by many researchers (Landrum *et al.* 2010). While IT has greatly improved the way organisations provide services to customers, the high capital investment and expenditure is a big hindrance to many and raises serious management concerns in the industry. In the past, performance measures, which were mainly financial, were used to assess the performance of IT departments but these measures were later found to have some serious shortcomings when used to measure service performance of IT departments (Kang & Bradley 2002).

From a user's perspective, a mobile device is not only a tool for communication but also a tool for commerce. In this context, the emphasis of mobile carriers' strategy has shifted from traditional telecommunications service to value- added m-commerce service. According to *iResearch*, a marketing research firm in China, mobile value-added service market in China increased from 54 billion Yuan in 2004 to 100 billion Yuan in 2006 (Lu *et al*. 2009).

The most important and influential instrument in measuring service quality has been SERVQUAL developed by Parasuraman *et al.*, (1988). This instrument contains 22 items and has been widely used for measuring service quality in marketing. It features five service dimensions namely; reliability, responsiveness, assurance, tangibles, and empathy. Customer expectations about the provided service results in the customer's perception of service quality (Landrum *et al.* 2006).

Technology Acceptance Model Constructs

It is of fundamental importance to understand and measure logistics service quality (LSQ) and incorporate a framework Technology Acceptance Model (TAM) to assess logistics information technology use and model of LSQ. The logistical service quality provide an interesting contrast to earlier TAM research with respect to the relationship of the two main TAM constructs of perceived ease of use (PEOU) and perceived usefulness (PU) of information technology with intentions to use information technology tools (Bienstock *et al.* 2008).

One would ask if service quality is an antecedent of service satisfaction and whether the customer satisfaction acts as a mediating factor between service quality and behavioural intentions and hence strengthening the prediction of the latter. Based on the model constructs and previous research, a survey instrument using a seven –point Likert scale for each of the construct components was developed (Udo *et al.* 2010). The model for business quality used in this paper consists of four constructs:

- IS work quality
- IS user quality
- Business integration quality, and
- Business quality

To sustain a high business quality requires high quality both in terms of IS work quality, IS user quality and business integration quality (Salmela 1997). The procedure of specifying the domain construct should specify the domain of the construct, argues Churchill a researcher from the late 1970's as this helps comparisons of ideologies exact, and this delineates what is included in the definition and what is excluded in the definition (Smith, 1999). Despite the considerable published research relative to the measurement of the relationship between the service quality and customer satisfaction constructs, consensus concerning these issues has not emerged (Brad *et al.*, 2002). This work explores service quality constructs and associated indicators for assessing service quality performance and the relationship between resident satisfaction and service quality in the condominium management sector (Kuo *et al.* 2011).

Effective Logistics Services

Bienstock *et al.,* (2008) refer to adequate IT support logistic service as one of the most critical components in the provision of effective supply chain management field which has since become very prominent in the business world these days. This has resulted into pressure being put on managers to measure the performance of IT departments (Kang & Bradley 2002).

The Service Quality Model (SERVQUAL) model uses both client and supplier perspective to find the expectation and perception gaps between respondents. A gap analysis is used where it represents the mathematical

difference between the assessment of performance perception and expectations for the service required by each respondent (Roses *et al.* 2009). Effective logistics services also encompass quality in an organisation where it is explained as quality excellence, quality value, quality conformity to required specifications, and to meeting customer expectations (Gorla *et al.* 2010).

The relationships between service quality and its dimensions suggest a reflective model. Other researchers (Parasuraman *et al.* 1985/ Brad & Cronin 2002) propose a formative perspective; others suggest both reflective and formative perspectives. Researchers do not have a consensus on this, Martinez and Martinez (2010) proposes therefore that the philosophical framework be adopted for developing the service quality models is not specified for the aforementioned researchers.

Quality

Quality and how quality must be measured are discussions that rage on amongst academics over the years. There are different models of describing quality and the accepted models are those that have a multidimensional service quality conceptualisation that it is inherently linked to the measurement of consumer quality perceptions. Therefore, service quality models offer a frame work for understanding what service quality models offer a framework for understanding what service quality is and how to measure service quality in each proposed concept (Martinez and Martinez 2010).

The e-Government service quality (e-GovSqual) dimension is made up of six service quality dimensions. These are; information quality, security, communication, website aesthetics, website design, and access. These factors are not necessarily within the government circles alone these days but in the private sector as well (Kaisara & Pather 2011).

Quality has been regarded as driver of competitive strategy and many frameworks have been developed and there are still different perspectives on how quality is conceptualised and operational. There is no universal all–encompassing definition or model of quality, the quality constructs is very broad and includes many components such that including all in one model would render it ineffective (Wang & Liao 2008).

The operationalisation of service quality over the years has been led by

the research of academics in the likes of (Piccoli *et al.* 2009) SERVQUAL scale, where they suggested that service quality should be represented as the difference or "gap" between service expectation and actual service performance. In other words the GAP paradigm implies that service performance is equal to or greater than the expected level of service (Brad *et al.* 2002).

Service organisations are continuously endeavouring to improve their quality of service because it is of paramount importance to them for business success. The core driver in this respect is the customer service aspect, which is still vital to a service Organization. This status quo has brought about the urge to research in this important direction (Bharati & Berg 2005).

Service quality is important across all industries and it is appreciated for its role, of bringing about customer loyalty and other benefits. This situation calls for a reliable instrument to measure information quality. SERVQUAL has been applied to various settings and different users but criticized for its weak reliability and validity. Modified versions of SERQUAL have only used its performance measure or SERVPERF (Landrum *et al.* 2007).

Hernon and Nitecki (2001) point out that in some evaluations of libraries the concepts of service quality satisfaction and service quality are used interchangeably, even though the two are not necessarily the same. In any case there is no general consensus on the definition of the two given concepts or whether they may be treated as two separate constructs or a single construct (Roszkowski *et al.* 2005).

Quality may be highly influenced by functional rather than technical dimensions, but may not be independent of each other. The variability in the tangibility of a service and the presence of the customer in its production frequently make it hard to define the boundary between process and outcome dimensions, but process and outcome may be regarded as a single dimension (Smith 1999).

Even though service quality is so important and popular, it is however an elusive abstract to measure and therefore extra effort is required to establish a valid measure. Service quality is rather an exclusive and abstract concept as a result of its intangibility and inseparability of production or consumption. There are therefore a number of different approaches suggested regarding how to define and measure service quality (Lee *et al.* 2011).

Service quality research has been dominated by studies conducted in the context of consumer services, and fewer studies have been conducted addressing business-to-business services. In the current body of research, the dimensions that are service quality are based on in terms of measurements are typically derived from the SERVQUAL scale or one of the variants based on it (Woo & Ennew 2005).

SERVQUAL and Other Constructs

SERVQUAL is a model that is used by many scholars and practitioners to measure service quality even though it has over the years attracted a lot of discussions and criticism regarding its quality and in terms of its effectiveness and accuracy. Some scholars note ambiguity in the definition of expectation measurement (Kuo *et al.* 2011). Service quality represents an ongoing concern for academics and practitioners. While application of ordinary SERVQUAL and SERVPERF have provided positive results in service quality research, these instruments are not focused on the information service area, even if some researchers suggest that service quality is included as an information success measure (Landrum *et al.* 2010).

To examine the applicability of the SERVQUAL instrument in IT setting, many empirical studies adapted the concept of service quality and SERVQUAL to measure the performance of IT service. They took into consideration whether the use of differences in scores of corresponding dimensions of tangibility, reliability, responsiveness, empathy and assurance would be applicable in the IT setting (Kang & Bradley 2002).

Although SERVQUAL has been used successfully in the various industries like insurance services, Library services, information systems, healthcare settings, bank service, hotel services, and many more, there still is a problem with conceptualization and operationalisation of the SERVQUAL scale, especially with regard to applying it five generic SERVQUAL dimensions across the industries (Ladhari 2010).

Defining of service quality revolves around the idea as a result of the comparison that customers make between expectations about a service and perception of the way the service is rendered and in developing the 'Gaps' model, some researchers use the generally accepted psychometric procedures that have resulted in the operationalisation of the service quality instrument SERVQUAL (Wilkins *et al.* 2007).

In their effort to develop and refine a valid but reliable scale for measuring physical distribution service quality, some researchers like Bienstock *et al.,* (2008) initiated an integration of logistical and marketing quality measurements literature. In refining the five dimensional SERVQUAL scale of tangibles, responsiveness, empathy, reliability, and assurance, Parasuraman *et al.,* (1988) (interviewed and surveyed retail consumers of repair and maintenance, retail banking, long–distance telephone, securities, brokerage and credit facilities and services (Bienstock *et al.* 2008).

Landrum *et al.,* (2009) decided not to include variables related to the tangible dimension of SERVQUAL because of findings earlier by other researchers that the tangible dimension was relatively less important to information system customers and suggested its removal from the list.

It is envisaged that the concept of service quality can be applied to measure the performance of IT Kang and Bradley (2002). Generally IT service quality is developed based on the service quality "gaps model". Going a step further, this study looks at the practicality of the use of SERVQUAL and the performance of an IT department using a modified version of the three-column- format SERVQUAL. Other researchers like Cronin and Taylor conducted studies across four industries, developing and testing a performance based measure known as SERVPERF. Other researchers however argued that SERVPERF had superior productive power but had rather inferior diagnostic power because it provided less information (Gonzalez *et al.* 2005). To arrive at a reliable measurement of system service quality, more than three SERVQUAL responses to a system were collected from system users and employed as a mean for each system. This research tries to extrapolate the results of marketing research concerning customers' perceptions of service quality and IS/IT research as to employees' perceptions of service quality (Lai 2006).

SERVQUAL may have been used in a wide variety of services but several difficulties have existed regarding the conceptualization and operationalisation of the SERVQUAL scale. Questions have been posed on the use of the five generic dimensions in several service industries resulting in requests of adaptations to be made on the SERVQUAL model (Ladhari 2010). This study presents and validates a model of e-Government systems success based on the Bhararti and Berg (2005) updated IS success model. In

this model, the multidimensional and interdependent nature of G2C of e-Government systems success is measured (Large & Konig 2009).

The conceptualization and measurement for the service quality construct has been dominated by the use of the SERVQUAL scale introduced by other research. This tool employs a pair of 22- item scales each identical, with the exception that the service providers are assessed on perceived performance including consumer expectations regarding the level of service to be received (Brad *et al*. 2002).

Paulins (2005) argues that exploring customer IT service quality in the government by determining whether customer service expectations are being met is of essence and reason for this work. The study seeks to find out if customer categorizing is based on appearance, status in society, or other related facts. SERVQUAL may not be met with enthusiasm as a measure of service quality in government and other sectors such as retail, but its application in this work is exploratory as differentiating trends are sought.

Studies of service quality experienced that there are certain aspects, which result in creating customer perceptions, which will ultimately lead to customer satisfaction or dissatisfaction for that matter. This will eventually lead to the customers behaving or reacting in a certain manner toward the IT services by customers (Udo *et al.* 2010).

It should be noted that IS success has previously been product oriented and that the IS department was not just a product provider but also services. With the escalating part of the IS budget being diverted to the IS services, there is more emphasis now being turned to the service dimension. The SERVQUAL instrument has been validated and is being used in this IS context (Gorla *et al.* 2010).

SERVQUAL evaluates service quality using a questionnaire containing 22 items divided into five dimensions of tangibles, reliability, responsiveness, assurance, and empathy. These elements evaluate both the expectations for agreed services and the perceptions of services previously provided between the clients and suppliers (Roses *et al.* 2009).

Service quality has become an integral part of the success of all Organisations. Hence it is very important to use a completely reliable instrument to measure the impact of information quality, and in this case the most common instrument to use at hand is the SERVQUAL despite the criticism levelled against its reliability and validity (Landrum *et al.* 2007).

The "gap" concept also supports the SERVQUAL instrument created by Parasuraman and his colleagues as a generic measure of service quality in the various sectors of the service economy. It is reasonable to assume that the concerns and dissatisfaction raised regarding SERVQUAL are also pertinent to other components such as LIBQUAL (Roszkowski *et al*. 2005).

Even if SERVQUAL is widely used by academics and practitioners, it has been criticized for its lack of sophistication methods, design of methods, and assessment. However these attributes may be achieved by using alternative methods such as the use of assessment studies (Oztekin 2011).

Parasuraman *et al.,* (1988) presented service quality as a multi–dimensional construct and SERQUAL as an instrument for measurement of quality across service industries and they came up with ten factors as the dimensions on which consumers of services evaluate quality regardless of the nature of the service.

The concept of e-service is not only a combination of the words electronic and service but it entails defining what e-service quality is, identifying its underlying dimensions and determining how it can be conceptualized and measured. Investigations and research in different settings and service industries are continuing on e-services using SERVQUAL or WEBQUAL and no conclusive results or study has come up yet strictly confining itself to the portability of such an instrument (Hernon & Calvert 2000).

Tylor offered a theoretical justification for discarding the expectations portion of SERVQUAL in favour of the performance measures included in the scale. The term they referred to as performance only measures also known as SERVPERF. This is based on only consumer's perception of performance of a service provider as opposed to the difference between the consumers' performance perceptions and their performance perceptions (Brad *et al.,* 2002). This analysis of the SERVQUAL therefore leaves no doubt that this model needs to be researched more as there are a lot of unresolved issues concerning it. These include the need for further research on expectations, as well as the elaboration of gap issues underlying factor structure.

Classification of IT Services

Classification of IT services is a term used to describe the heterogeneous

range of intangible products and activities that are a challenge to explain in simple terms. These services may include enterprise, horizontal, and, vertical applications. Other services will encapsulate activities such as application upgrades, technical support, virus protection, data security, consulting, integration and staff training (Lu *et al.* 2009). Jackson and Humble (1994) suggest that any IT initiative should start defining themselves by listing what services these currently offer, whether it is developing, operations, help-desk, or consulting and then consider the essence of each service offered and listen to customers comments and views gauging their perceptions of value and contribution. This customer information should be used to assess if the service itself is to the customers satisfaction.

Service quality may be divided into two generic functional service dimensions: technical relating to what is offered and functional referring to how the service is provided. These two dimensions would also be applicable in the determination of quality in the nature of service rendered by an organisation (Woo & Ennew 2005).

The services that were used in the development of SERVQUAL are very different to goods retailing. It may be that consumers use different criteria to evaluate and classify competing goods, retailers who sell a mix of goods and services than they use to evaluate retailers that are primarily service organisations. Classification of services are closely associated to service quality and describe related potential constructs of perceived service quality and identify ten potential overlapping constructs which include, tangibles, reliability responsiveness, communication, credibility, security, competence, courtesy and access all dimensions which have a role in the classification of the services provided in the IT industry (Vazquez *et al.* 2001).

An Effective IT System

Previously IT sections were basically and primarily secondary support structures to other Departments such as sales, finance, and customer services but this trend now has changed. IT is now an independent standalone providing internal services to work units and divisions (Kang & Bradley 2002).

To enhance effective use of IT, the Internet has to bring different innovative means of operations to be effective. This has resulted in one

aspect of the identifying of what are called application service providers. These are generally new small businesses which usually deliver services through the Internet and coordinate with network providers, software vendors and consultants the key motivating fact being to reduce the cost of purchasing, installing, and maintaining software and related hardware (Lu *et al.* 2009).

The purpose of this work is to examine the effectiveness of IS sourcing from the perspective of service quality and maintenance efforts. The integration of outsourcing with the context of effective operation is vital in IS but this concept should be understood well to avoid problems in system management and maintenance (Park & Kim 2005).

The performance of a product and service is directly linked to the effectiveness of a system and is normally expressed by the satisfaction in marketing literature. The direct influence of performance on satisfaction can be reasoned to be more satisfied with an offering has the ability to offer consumers what they need or desire (Kim *et al*. 2011). Customers continue to demand better services through the internet as governments and Organizations develop systems to deliver these services, a need arises to evaluate efforts that among other things asses the effectiveness of the e-government and organizational systems in use (Wang & Liao 2008).

An example of an effective system would be the Hilton on Q system, which is a prototypical example of a network-based customer system. This is a computerised information system, which delivers service to a customer either directly via a browser, or cell phone or indirectly through a service representative or agent accessing the system (Piccoli *et al.* 2009).

In e-Government structures, most users' willingness to adopt e-government services depends on the perceived quality of services provided through offline channels because the business users prior interactions with the government through offline service channels shapes their belief, confidence and trust (Lee *et al.* 2011).

Managing costs is an important aspect affecting IS and has a direct impact on effectiveness. IS quality can be argued on the basis that it is a prerequisite for achieving organizational benefits through information systems and IS work quality and user quality are required to ensure that the IS are actually designed and used in a way that would benefit the business (Salmela 1997).

In e-Retailing vendors provide online self-service facilities to customers for improved service effectiveness and cost efficiency. This has to be done by seeing to it that major issues in service delivery and design are attended to as client's desires and intentions to use a self-service depend on their perceived performance of online customer and organisation interface (Ding *et al*. 2011).

The impact of IS on employee performance has a direct influence on the quality of service provided. Decision effectiveness and efficiency of task completion, as a measure of speed completion have been used with different variations in research studies (Bharati & Berg 2005). Basing on research done previously, the attribute of system quality may are grouped into two broad categories; the system features from the designer perspective referred to as the system flexibility and the system features from the end users perspective called the system sophistication (Gorla *et al.* 2010).

The success of software development depends on the criteria of functionality, quality and timeliness. The software is specifically developed to perform a function, unless this function is executed successfully and effectively, the purpose of the software development is defeated (Kim *et al.* 2011).

Quality and effective is a subjective notion and can be defined in many ways. Three interrelated perspectives define scope of quality. The first is the conformance to the requirements based on the customer expectations. The second is the perspective of fitness for use as determined by the customer and the perspective of willingness to pay based on what the customer can get out rather than what the supplier puts in all contribute to effectiveness (Yeo 2009).

Service performance is however the result of service quality perceived by the internal customer not by the purchaser. Therefore, it is essential to measure the quality perceptions of internal clients' and establishes the fit between the service expectations and the service perceptions (Large & Konig 2009).

The Public Sector

Governments have also embarked on major ICT investments in an attempt to take advantage of the benefits of the Internet and extending channels by which services are provided to their respective clients. However, with the

increasing reliance on ICT's the main challenge confronted by the public sector is how to evaluate the success or effectiveness of their ICT investments (Kaisara & Pather 2011).

A study of a public health care delivery system carried out had contrasting results as employee assessments of service quality were lower than those of their customers and unexpectedly employees with professional training had less congruent assessments than other employees (Roszkowski *et al.* 2005). Prior e-Government research has paid much attention to e-government service from the supplier side –the government while the user side of e-government has been overlooked even though some effort to study individual citizens has been attempted (Bharati & Berg2005). Few studies examined the factors that influence businesses in the decision to adopt e-government services in their transactions with government (Lee *et al.* 2011).

It is therefore important to measure the success of government to client e-government systems from the citizen's perspective. Few studies have been conducted to investigate e-government systems; this study seeks to provide an empirical test in the context of government to client e-Government.

Research Questions

Some of the questions that were posed in the research project on which this paper is based, focus on issues of efficiency:

1. Are the Information systems in the Department able to be used to their full capacity?
2. Are there any technical improvements required to be done on the IS systems?
3. Are the staff members conversant with operating and managing the departmental Information System?
4. Are the customers of the department satisfied with the quality, efficiency of the service they get through the IS systems from the Department?
5. How can the IS related weaknesses be rectified?

Research Methodology

This section outlines the methods that were used to collect the required information from respondents. Research is basically a process of identifying problems that cause systems (including the technologies that are used as

tools to operate such systems) to malfunction, after which the researchers have to derive general research questions from sub-problems, and expand those questions into more detailed questions to use in a research instrument like a questionnaire (in the case of quantitative research) or an interview schedule (in the case of qualitative research) in order to collect, analyse, and interpret data to provide solutions to the problems that were identified (Klopper & Lubbe 2012).

Some of the most pertinent questions that arose for this research to be initiated were those probing about whether the IS&T in the Department are being used to their full maximum capacity. The aim is also investigate if there were any technical improvements required to be done on the IS systems in the department.

Respondents and Data Collection

A quantitative approach to data gathering and analysis was employed in this project, entailing the use of questionnaires to determine IS&T-based service delivery in the head office of Department of Economic Development, Environment, Conservation, and Tourism in Mmabatho in the North West Province.

The target population for respondent selection is the IS users in the department. Twenty-five questionnaires were distributed to the middle managers in the department who depended on IS&T on a daily basis to do their work. The respondents returned all twenty-five questionnaires, so that the survey can be characterised as a census.

The Department of Economic Development is one of the smallest departments in the North West Province and not all its employees have access or use the IS&T equipment in their offices, the focus was on the main office in Mmabatho where the survey was conducted. The participants were people who depend on IS and have been using this equipment for more than two years and are therefore well conversant and have the ability to make a fair judgement of services. Printed questionnaires were distributed to the participants in their offices.

Research Results and Analysis

In this section we discuss the research findings. The survey addressed specific questions, which were asked, and the analysis was done tailored on

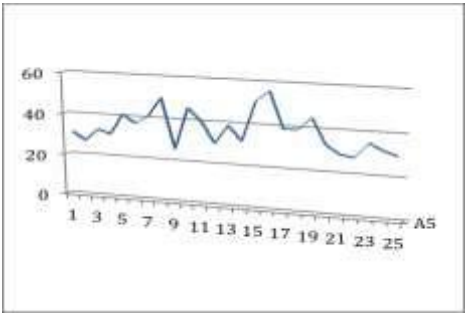
the application of Pearson correlation coefficient and p-value. In its nature the Pearson correlation coefficient method correlates all listed variables with each other and indicates which of the resulting relationships are statistically significant.

Demographics

Questionnaires were distributed to all 25 middle management employees in the provincial office of the Department of Economic Development in Mafikeng, all of them regular IT users. All the twenty-five distributed questionnaires were completed and returned by the respondents. Of the 25 respondents, as figure 1 shows, 56 % were female, and 44% were male. These percentages indicate that the majority of employees in middle management in the Provincial office of this Department are female. The nature of the research was on service delivery and did not directly focus on gender issues but the IS users and beneficiaries in this case. The respondents were employees of the department male and female.

The age range of the twenty-five respondents was between the mid-twenties to the late fifties. The graph in figure 1 clearly depicts their age range distribution. It is clearly a mix of relatively new employees in the Department and those that have been in employment for a while and are in their fifties. However the majority are under the age of forty.

Figure 1: Ages of Respondents



The respondents' area of origin was probed to determine where each of the respondents grew up. This was to establish the extent to which exposure

was experienced with regard to Information Systems. It is commonly known in South Africa that the rural areas have more challenges and less IS infrastructure than the urban areas. The information gathered in the survey showed that most of the respondents originated from the rural areas at 64% while people originating from the urban areas were in the minority at 36% only.

This Department at this level comprised of people of the African descent. This means that all the respondents were Africans giving us a result of 100% Africans. This question sought to establish the classification of the respondents regarding their status in the Department whether they were academic, employees or student/interns working in the department. The results showed that of all the respondents, only 4% of the employees were academic; another 4% worked in the capacity of student interns and the majority as ordinary employees at 92%, completing the 100%. This is indicated in Table 1. Three interrelated perspectives define scope according to Yeo (2009). The first is the conformance to the requirements based on customer expectations, and then the perspective of fitness for use determined by the customer and perspective of willingness to pay based on what the customer can get rather than what the supplier puts in, all this contributes to effectiveness of the system.

Table 1: The status of employees

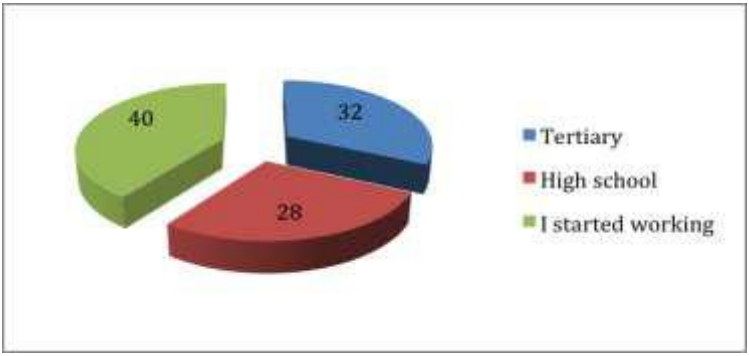
	Frequency	Percent
Academic	1	4.0
Student\ Intern	1	4.0
Employee	23	92.0
Total	25	100.0

The essence of this question was to find out how long or when the respondents had been making use of some if not all of the most common IS equipment. They were expected to state when they had been introduced to using IS in their lives as tools for work or carry out required tasks. The respondents indicated that none of them were ever exposed to the use of IS while in primary school but 28% indicated that they started using IS in high

school, followed by 32% in tertiary and the majority of the respondents said they were exposed to IS when they started working and comprised of the remaining 40%.

The e-Government service quality dimension is made up of six service quality dimensions. These are information, quality, security, communication, website aesthetics, website design, and access, which are not only found in the government only but also in the private sector. (Kaisara and Pather, 2010) therefore exposure of the respondents to IS equipment is not only in the DEDECT environment.

Figure 2: Exposure to IS tools by respondents



Service Quality

The IS service quality and delivery of the department was scrutinised, taking into consideration the flow of information within the department amongst staff members and the interaction of the departmental staff with their clients in providing the mandated services the department is expected to deliver. Only 4% of the respondents strongly agreed that the service quality and delivery services were of very high quality in the department while the other 4% just agreed with the statement. However 56% disagreed with this statement and 36% strongly disagreed with the statement saying that the quality and service of the IS in the department was not of high quality.

Martinez and Martinez (2010) state that there are different models of describing quality and the accepted models are those that have a multidimensional service quality conceptualisation that is inherently linked

to the measurement of the consumer quality perception. On information flow, none of the respondents could agree that the information flow and was accurate and quick in the department, as 72% of them said they disagreed with the statement, 20% strongly disagreeing, while 8% of the respondents agreed with the statement saying information flow was accurate and flowed quickly.

The respondents were further probed to find out if they worked effectively with IS in their Department, but the results showed that 44% strongly disagreed they did, 40% just disagreed, and 16% agreed they did. Service quality will have a direct link to the success or failure of an organisation (Yeo 2009).

Table 2: Service quality and delivery

	I Strongly agree %	I agree %	I disagree %	I strongly disagree %
The IS service quality and delivery of services is of very high quality in the Department.	4	4	56	36
Information flow is accurate and quick in the department.	0	8	72	20
Do you believe, you work effectively with IS in your Department?	0	16	40	44

Respondents were asked on whether honest when interacting and dealing with their Clients. This would determine the impact on the outcome rating of the department by the clients where service delivery was concerned. According to table three, 4% of the respondents did not want to answer this question posed to them. The majority of 72% confessed to being honest at all times when dealing with clients.

Piccoli *et al.,* (2009) state that the different functions of the IT systems is a process where a network of software applications that manage and coordinate the work flow activities designed to enable end to end client services as this determines how service delivery takes place.

Table 3: Honesty in dealing with clients

		Frequency	Percent
Valid	I'm always honest	18	72.0
	I'm honest most of the time	3	12.0
	I'm honest sometimes	1	4.0
	I'm never honest	2	8.0
	I do not want to answer this question	1	4.0
	Total	25	100.0

It was also important to establish the type of clients and projects the respondents were servicing in the department and judge if it would have an impact on the results. It was then established that the vast majority comprising of 88% of the respondents were servicing all types of clients that is small, medium, and big while only 12% of the respondents were servicing medium size projects and clients. The quality of services will have a bearing on the number of clients into the department and, the quality of service depends on evaluation by the consumer (Vazquez *et al.* 2001).

It was necessary to establish the condition of the IS infrastructure as perceived by the respondents in the department. They were required to state if the infrastructure of IS in the department was good enough to sustain their needs in terms of service delivery when doing their work. Table 4 shows that only 20% of the respondents in the Department agreed that the infrastructure was good enough for them but 40% disagreed and another 40% strongly disagreed with the statement. Department will achieve network completeness when customer expectations have been met through proper network infrastructure (Piccoli *et al.* 2009).

Table 4: Good infrastructure

	Frequency	Percent
I agree	5	20.0
I disagree	10	40.0
I strongly disagree	10	40.0
Total	25	100.0

Wang and Liao (2008) state that customers continue to demand better services through the internet as governments and organisations develop systems to deliver these services, a need arises to evaluate efforts that that among other things asses the effectiveness of the e-government and organisational systems in use. The DEDECT results from the respondents are however not positive as most of them stated that the Infrastructure in the department was not good enough.

The respondents capacity and capability to comprehend IS had to be put into perspective so that their judgment would be relied on regarding the valuation of services and in executing certain decision associated with service delivery, quality, and condition of IS in the department. Table 5 shows that most of the respondents (64%) said they understood the functions of IS components moderately and 16% said they understood IS components very well and lastly 20% are the one who did not know anything about IS. This would give us a fair result because the majority would be in a position to make a good judgment or decision concerning IS.

Table 5: Understanding IS components

	Frequency	Percent
Very well	4	16.0
Moderately	16	64.0
Don't know anything	5	20.0
Total	25	100.0

The capacity of respondents to be in a position to use IS equipment plays a vital role as this would assist in the delivery of quality services to their clients. It would be also be of use in identifying the areas where improvement is required in Oder to improve service delivery. Capability of using IS equipment and tools could be a major hindrance to service delivery.

This survey therefore set out to scan the capabilities of the people in the department, so as to have an idea of the status quo. According to Table 6 of the 25 respondents surveyed, 7 turned out to be very good at using IS tools and this translated into 28%. The bulk of the respondents were moderate users at 68% and only 4% were very poor. This in essence was a good result, in terms of the use of IS equipment.

Table 6: Ability to use IS equipment / tools

	Frequency	Percent
Very good	7	28.0
Moderate	17	68.0
Very poor	1	4.0
Total	25	100.0

While the staff in the department have their own issues with regard to capacity and capabilities of handling IS gadgets, there are certain procedures that need to be addressed by an IT support unit in the department. Its job is to correct mistakes and set up the IS equipment in such a way that they can be operated by the rest of the staff in carrying out their duties. Other services will encapsulate activities such as applications upgrades Virus protection, data security, consulting staff training (Lu *et al.* 2009). The DEDECT has such a unit in place and this survey took the initiative to find out how they performed in terms of supporting and solving problems related to the IS within the department. The respondents were asked to rate the swiftness of the support team in attending to problems. The results were down as shown in Table 8. More than 50% (56%) of the respondents said that the support team responds slowly to IS problems while 12% reckoned the team is not responsive at all. Respondents that stated that the team responds at a moderate pace were 28% and only 4% said the response was quick.

Table 7: The IS technical team in the department

	Frequency	Percent
Responds very quickly to IS problems	1	4.0
Responds Moderately	7	28.0
Responds very slowly to IS problems	14	56.0
Is not responsive at all	3	12.0
Total	25	100.0

The respondents were further subjected to questions, which probed into service delivery, and problems that affected them in operating IS equipment. All respondents did use IS tools to service clients but at different levels and different rates. Table 8 outlines the respondents' responses and the questions fielded to them. The results are in percentages.

Table 8: Service delivery and quality

Research Question	A bit	Somewhat	Neutral	Not at all
Do you think IS can improve service delivery?	48%	36%	16%	0%
Have you ever encountered hardships using IS equipment at work?	48%	32%	16%	4%
Do you use a Computer and telephone to offer services to clients?	40%	48%	12%	0%
Do you think it is possible to service clients with office IS equipment ONLY?	20%	24%	12%	44%

The level of satisfaction of the services rendered to the clients of the respondents was further probed. The questions were however posed to the

respondents to find out in their opinion, and based on their assessments as the people dispensing the services to their clients, what the clients thought of them. Most of the respondents, according to table nine,52% believed that only some of their clients were satisfied, while 48% said their clients were not satisfied. Other researchers have developed models which measure both customer expectations of service based on what customers believe it should be like based on their perceptions (Kang & Bradley 2002).

Table 9: Client satisfaction

	Frequency	Percent
Some	13	52.0
No	12	48.0
Total	25	100.0

The logic in finding out whether the IS was to gauge the respondent's seriousness in utilizing the tools of IS and their comprehension thereof. The results as table 10 shows were such that, most of the respondents agreed that good IS services in the department were not effective, 20% strongly agreed with this sentiment, 36% agreed 20% disagreed and 24% strongly disagreed. This meant that the majority did agree that the department's IS were not effective. In e-government structures, most users' willingness to adopt e-government services depends on the perceived quality of services provided through offline channels (Lee *et al.* 2011).

Table 10: Good IS are not effective in this department

		Frequency	Percent
Valid	I Strongly agree	5	20.0
	I agree	9	36.0
	I disagree	5	20.0
	I strongly disagree	6	24.0
	Total	25	100.0

Correlations

This is a technique used in research statistics to analyse relationships between variables. It relates two variables together (Gray 2009). In statistics, dependence refers to any statistical relationship between two random variables or two sets of data. Correlation refers to the statistical relationships involving dependence. The aim of this section is to establish if IS infrastructure, service quality, and the use of IS equipment by the respondents is has a correlation with service delivery by the DEDECT.

In this study a number of concepts were put forward to the respondents to get the views on these concepts, the data was analysed and they had certain implications. The values that were taken into consideration were those that were positive and higher. According to the data collected, there were also variables with a negative lower results indicating that some of the concepts were not correlated but these were not discussed in detail as the focus of interest was in those with a positive correlation in this case.

An example of such concepts with two variables was: Do you believe you work effectively with IS in your Department? This was in comparison to the statement that: we have a good IS infrastructure in the Department. This yielded a result of 0.488% meaning that there is a strong correlation between having a good IS infrastructure and working effectively due to this infrastructure. This was a positive result indicating that respondents would work effectively if the infrastructure was good.

The correlation between service delivery and client satisfaction with services from the department was 0.578%, a positive correlation between the two variables according to the criteria prescribed by the concepts of correlations. The relationship is strong and this means that the clients will react and respond to the services rendered by the department. This result is above 5%, which is positive.

The data correlation result from the between service quality and delivery of service variables is 0.578 %positive two tailed, which is well above 5%, representing the fact that when the respondents deliver high quality IS services to the clients, the impact on the clients is that they get satisfaction from the services rendered by the department. It is closely correlated and has a direct impact on the clientele of the department. This is a positive aspect for the department as service quality will produce good service delivery and bring a positive impact to the department taking into

consideration that customers continue to demand better services through the internet and organisations continue to evaluate assess the effectiveness of e-government and organisational systems (Wang & Liao 2008).

Conclusion and Recommendation

In this section, the detailed results of the research using statistical methods have been provided. Tables, graphs and stats were used to present the results of the survey, and data analysis was also presented as part of the section. Data analysis is important as it assists in understanding the various elements and contents of collected data. This is done through investigating the interpretations of the concepts involved, variables or constructs.

Customer satisfaction of services from the department was also found to be closely correlated to the very high quality of IS services in the department. The ability to operate IS equipment in the office by the respondents in turn also had an impact on working effectively in the department. The use of IS technology also posed some challenges in terms of satisfying customers as this is correlated quite strongly.

Summary

Generally government departments are hard at work to try and improve ICT by investing a lot of resources in this sector in an attempt to take advantage of the benefits of the Internet and all IS in general to the benefit of their respective clients in the form of services rendered. The increasing reliance on ICT's including IS has brought about the challenge in the public sector of how to evaluate the success or effectiveness of the ICT investment to determine if there is any return on investment through these efforts by the different public sector entities (Kaisara & Pather 2011).

This research was aimed at identifying the problem areas in the department of economic development through the respondents who are all IS consumers and users within the Department. These areas would cover the perspectives of the user (respondents) and the external beneficiaries of the services based on the users opinions.

This study revealed that service delivery is closely correlated to logistical issues regarding IS infrastructure, handling capacity, user capability, customer evaluation of the services received from the department, and quality. The proper use and addressing of problem area regarding these

aspects will ensure the effective use of IS systems in any Organisation and hence improve service delivery including the DEDECT.

Kaisara and Pather (2011) state that e-government research was confined to e-government service from the supplier side only while the user side of e-government was overlooked but that trend seems to be changing for the better in recent times as more efforts by many researchers are taking the initiative to address this problem.

Response to Research Questions

The findings of this research in relation to each research question are discussed. Each question is followed by a discussion of the findings relating to that question.

Are the IS in the Department able to be used to their full capacity?

Salmela (1997) states that the quality of Information Systems can either influence the cost of information processing or it can influence the content quality and reliability of the information that users actually while using the system. It is therefore imperative that the IS infrastructure in the Department is maintained in good order and the users are in a position to obtain the necessary skills of handling and managing all the IS equipment that is found in the Department.

Where there is lack of capacity it should be provided in the form of capacity building. This will result in having a budget for such activities, to be made available but it is return on investment, as the exercise will result in the use to full capacity.

When respondents were asked to state their levels of understanding IS components it was found that 64% of the respondents said they did understand the components moderately while 16% said they did so very well and 20 % replied by saying they did not know anything regarding IS components. This phenomenon addresses the utilisation of the departmental IS to full capacity and in this case, only 16% percent of the respondents can achieve that.

Are there any technical improvements required to be done on the IS?

Brady *et al.,* (2002) state that an initial concern with any research is the reliability and validity of the measures used to operationalise the constructs of interest. Service quality is operationalised using Servperf model to the superiority performance based measures and will be used to measure service quality (Kuo *et al*. 2011).

The data results in this research conclude a very conclusive response to this question. The respondents were asked if the IS service quality and delivery of services was of very high quality in the Department to which the 56% disagreed and 36% strongly disagreed giving a total of 92% respondents completely disagreeing with the statement. This means that only eight percent agreed with the statement. This clearly indicates that there has to be some technical interventions made to the IS in the DEDECT given the outcome of these statistics.

Are the staff members conversant with operating and managing the departmental IS?

The respondents in the department were probed in terms of their ability and capacity to operate IS in the work place. This question would theoretically explain the service level delivery aspects in general.

Piccoli *et al.,* (2009) classify four basic service systems as, transactional, executive, basic and process handling. All these processes are supposed to be carried out by officials in the course of their daily duties.

The research results reveal that just under a third (28%) of the respondents reported that they were very good in using IS equipment, and that just over two-thirds (68%) of them said they were moderately good. This investigation adapts the procedures from popular measuring instrument analysis for exploring quality indicator and additionally the structure equation analysis confirms service competence and service performance reliability, which are dimensions of quality (Lu *et al*. 2009).

Given these statistics, it means the majority are just moderate while the minority at 4% are very poor or not conversant in operating the IS in the department. It is therefore vital that the DEDECT takes measures to improve

the abilities of the majority who are moderate to bring them very good and to capacitate the 4% who are very poor. This is significant because there is a strong correlation between ability to operate IS equipment/ tools and service delivery by the department.

Are the customers of the department satisfied with the quality, and efficiency of the service they get through the IS of the DEDECT?

Roses *et al.,* (2009) state that SERVQUAL evaluates services using a questionnaire based on twenty two items which are categorized in five dimensions of; tangibles reliability, responsiveness, assurance and empathy. It should be noted that these elements also evaluate both the expectations for agreed services and the perceptions of services previously provided between the clients and suppliers.

The respondents were requested to state if their clients were satisfied with their services or not. The most frequent response to this was: "Some of them" (52%), while the rest of them (48%), replied "No." This result did not exhibit a very strong discrepancy in this case. Showing that there is a lot of uncertainty amongst the respondents in the service they render to their clients.

This uncertainty is brought about because of the different individual interpretations of and perception of service delivery thereby posing a challenge to the general concept. This may explain why other researchers have developed other models which measure both customer expectations of service delivery based on what customers believe it should be like, relating it to individual perceptions (Kassim & Bojei 2002).

How can the existing IS related weaknesses be rectified?

According to Park and Kim (2005), the rapid technological trends are hard to keep up with; therefore to meet these rapid changes and remain relevant and reliable, certain IS activities such as maintenance may be out sourced to external vendors.

Concern for the clients is the key to achieve reliability and success say Jackson and Humble (1994). This concern has to be addressed in the

following questions from a service provider's perception; who are the clients that need the service, and what kind of services that they require, giving detail to aspects like quality of services they require, in what quantities, where and as in when do they need the service. Other areas that we need to keep alert about are the trends needed by the customers.

The needs of clients are not static but dynamic and change with time. Therefore it is very important for service providers to keep monitoring and observing these changes, so that the services of the department may be adjusted to suite the times at the same pace in the quest to satisfy the customer's needs as they arise. While pursuing objectives, it is also important to seek innovative ways of how we provide those needs most effectively and reliably. The DEDECT however does have two options of external vendors in some cases and also an internal service centre, which seeks to attend to technical challenges with in the departmental confines.

Limitations of the Project

This research project mainly focused on the IS systems that are operated in the Department of Economic Development Environment Conversation Tourism and did not cover much of the external support system which is centrally operated in the Province for all government Departments. Beneficiaries such as the SMMEs and other beneficiaries were mentioned as they are the clients but not in detail, however most of this study will concerned itself with the operations within the Department, and deal with the employees, their calibre, needs of individuals and how they respond to challenges.

This is a provincial office based in Mafikeng with branches at the district level in the three districts of Bojanala, Kenneth Kaunda and Ruth Mompati, and may include data and other information from the district offices as their systems are linked. Scrutiny was be on weak and negative points in the value chain so that the Department may be in a position to put mitigating measures in place, as well as the positives so that these are up held or improved with the objective of satisfying the consumers or clients who will mainly be employees in this case.

Managerial Guidelines

From the results of this study the following guidelines are given to the DE-

DECT if they are to improve and enhance their service delivery incorporating quality, promptness, user friendly IS tools and maintain a satisfied clientele base. Improving the DEDECT IS infrastructure and upgrading, while carrying out a comprehensive staff audit on IS capability to establish the rate and level of IS use and educational level. An effective logistics service also encompasses quality in an organization where it is explained as quality value, quality conformity to required specifications, and meeting customer expectations (Gorla *et al.* 2010).

Implementing staff further Training of IS support staff in the use if IS equipment and tools including problem shooting of IS. A continuous monitoring and evaluation process of the IS equipment in the DEDECT regarding the reliability and relevance of the IS. Quality has been regarded as a driver of competitive strategy and many frameworks have been developed and there are still different perspectives on how quality is conceptualised and operationalised. This will include training to improve quality and service delivery (Wang & Liao 2008).

To see to it that customer surveys are done so as to measure client satisfaction from time to time so that client needs are established and also identified, in terms of demand and to seek the best cost effective ways of providing required services and recognising the new trends. Kim *et al.*, (2010) state that early research evaluated IS performance from a perspective of quality of the system itself such as accessibility, response time, integration, efficiency, and system flexibility and quality of information such as accuracy, completeness, relevance, precision, and currency. But now IS organisations are performing the dual role of both information and service provider.

The department needs to promote IS related projects in the rural areas to facilitate early exposure of the population to IS, this is because this research has shown that the earlier people are exposed to IS, the more effective they become in working with them. This is clearly illustrated in the figure showing the percentages of people exposed to IS tools in this work. Studying and outsourcing maintenance and service quality could potentially yield results for limiting IS costs and improving effectiveness and interrogating the differences between IS types or systems to establish traits (Park & Kim 2005).

This study did not establish any preference for gender or age in the use of computers but that the earlier the respondents were to IS use in their lives the more effective they were able to work with them. In the DEDECT up to 40%, according to the collected statistics got exposed to IS only at the time they started working.

Conclusions

The findings of this survey, which sampled the IS service quality in the DEDECT in the North West Provincial office to determine the relationship to service delivery, may be summarises as follows:

1. The gender and age aspects do not have a significant impact in the use of IS equipment and tools in the DEDECT with regard to service delivery. However A good IS infrastructure will have a great influence in the manner in which the services are rendered to the customers, both internal and external.
2. A good infrastructure, meaning an infrastructure which is able to be utilised to the best of it ability and sustain all the requirements of promptness in responding to requests, processing, less hardships, reliable, competitive advantage and other dynamics will result in the effective use and operations of the Department.
3. There is an interdependence of the factors for good service delivery to be rendered and cannot be effective if done in isolation. Some of these factors will include the ability of the operators to be able to handle the IS tools with less hardships and quick response will lead to customer perceived satisfaction as a result due to the understanding of the IS components shown by the IS operator. Others may interpret this as quality service.
4. However, it should be noted that there will be hardships when working IS equipment and tools from time to time so it is vital to have support systems in place to sort these issues as they arise. There might be a possibility of out sourcing to external vendors for such problems in the event where internal resources are not available or have not enough capacity. It is evident that the DEDECT is need of capacity and complete overhaul of the IS if their service delivery is to improve and make a difference.

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