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Evaluating Web-Based Information Systems Effectiveness: An e-Service Quality Multi-Stakeholder Perspective.

by

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Dissertation submitted in partial fulfilment of the requirements for the degree

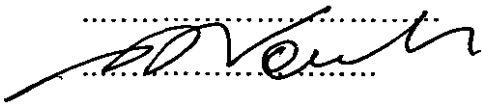Master of Technology: Discipline Information Technology

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STATEMENT OF OWN WORK

I declare that "**Evaluating Web-Based IS Effectiveness: An e-Service Quality Multi-Stakeholder Perspective**" is my own work, that it has not been submitted before for any degree or assessment in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Signature: Herschel G. Nomdoe   Date

ACKNOWLEDGEMENTS

I wish to thank:

ABSTRACT

Over a period spanning approximately twenty five years Information Systems (IS) researchers have been plagued by the problem of how to evaluate IS effectiveness or success. After the advent of the World Wide Web (WWW) in the 1990s, questions have arisen regarding the relevance of previously established evaluation approaches to the evaluation of web-based IS. Subsequently, firms have invested billions of dollars anually in information systems but the lack of appropriate frameworks for evaluating their effectiveness made it difficult to determine the return on IS investment.

In a period spanning 20 years IS researchers proposed a diverse number of approaches e.g. the communications research of Shannon and Weaver (1949) and the information "influence theory" of Mason (1978). These were subsequently incorporated into a single model in 1992, called the IS Success Model (Delone & McLean, 1992). The principal objective of this research project was to develop a generic methodology for web-based Information Systems (IS) success evaluation from a multi-stakeholder perspective for specific IS contexts. The Delone and McLean IS Success Model (Delone and McLean, 1992) provides an underpinning framework for measuring IS effectiveness. In the latter 1990's the concept of service-quality was introduced into the IS effectiveness literature. In their updated IS Success Model, Delone and McLean (2003) then included service quality as key measure in the evaluation of IS success. Consequently this research project focused on how service quality concepts could be applied as a measure of IS effectiveness within e-commerce.

A 3-pronged approach to IS evaluation was proposed viz. identification of generic stakeholder groups such as e-Customer, sponsoring manager, internal users etc.; identification of the context of the IS evaluation for each stakeholder i.e. what is the main function and context of operation of the IS;

and lastly identification of stakeholder specific e-SQ criteria. The study demonstrates that the success of IS deployed within online environments, could be evaluated and measured differently by each stakeholder for the various e-Service Quality (e-SQ) dimensions within a particular IS context.

The study presents the results of an investigation into a web-based IS at a national telecommunications company in South Africa which was evaluated using e-Service Quality (e-SQ) constructs. The study demonstrates the operationalisation of an e-SQ instrument for the purposes of evaluating IS effectiveness amongst multi-stakeholders. Evidence is provided that measuring attitudes of different stakeholders provides a more holistic perspective of IS success.

The primary conclusion reached is that by using a step-by-step methodology of IS success measurement, the objective of establishing whether companies have received a return on web-based IS investment, can be achieved. Furthermore, the outcomes of the study has contributed to existing literature on IS effectiveness measurement. In particular, it will add to the existing body of knowledge regarding the use of e-SQ instrument to evaluate multi-stakeholder perceptions.

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CHAPTER 1

INTRODUCTION

Keen (1987) defines the mission of Information Systems research as the study of the effective design, delivery, use and impact of information technologies in organisations and society.

Over the years organisations have been investing in information systems (IS) to facilitate and improve their business processes. There are a number of management concerns when new information systems are implemented. These concerns include whether the organisation has received a return on IS investment which can be determined through the evaluation of IS success. The 'mission' of the research reported on this dissertation concerns, the measurement of IS effectiveness.

The measurement of information systems' success or effectiveness is critical to understanding the value and efficacy of IS management actions and IS investments (Delone and McLean, 1992). Grover et al. (2004) have found that International firms are investing billions of dollars each year in information systems, with an estimated $779 billion that was spent in 2002. Even though there is such a high growth on IT expenditure there is a lack of appropriate frameworks for evaluating their effectiveness.

Moreover the application of IS within World Wide Web (WWW) contexts is relatively new (10-15 years) and therefore requires special attention. According to Grover et al. (2004), new scales and measures, along with continued research into organisational effectiveness and user satisfaction are needed for IS in WWW environments. These scales and measures could be utilised to evaluate whether organisations are receiving a return on IS investment. However, before an evaluation of an IS can be done, it is imperative that the environment in which the IS has been implemented is understood. In doing so, an understanding of factors influencing the evaluation can be identified.

1.1 E-ENVIRONMENT

An important background to this study is the environment in which WWW applications are implemented, the e-environment.

The phenomenal growth of the Internet has led to the emergence of a great number of new technologies (Hoque, 2000). One of the most important ones is definitely the ability to conduct business over the Internet. The Internet has changed the way companies communicate and how they share information with business partners. It has also changed the way they view their Internet technology investments (Damanpour, 2001). As companies launch electronic business projects, many are focusing on how their initiatives advance their overall business strategy and improve customer satisfaction (Damanpour, 2001).

Numerous terms exist to describe the application of information and communication technologies in conducting online business transactions. Some of the most frequently used terms are 'electronic commerce' (e-Commerce), 'electronic business' (e-Business) and the 'electronic economy'.

E-commerce is often described as the buying and selling of information, products and services with the assistance of computer technology and the Internet (Rayport and Jaworski, 2001; Wen, Chen & Hwang, 2001). This boils down to the exchange of electronic information between parties, normally followed by the exchange of goods and payment transactions.

E-commerce is no longer an alternative, it is imperative (Wen et al., 2001) in order for businesses to keep abreast of how commerce is conducted. Traditional 'brick-and-mortar' businesses are being supplemented, and sometimes even replaced, with electronic shop-fronts, commonly known as e-businesses (Cloete, 2002). In other words, instead of having a walk-in centre, a computer interface allows customers to interact with a business directly. The shift from doing business in the traditional brick-and-mortar

environment to the Internet has resulted in considerable re-thinking of business strategies and how to approach and satisfy the customer. This has resulted in modern business transactions focusing on customer satisfaction by placing much more emphasis on proper service and knowledge about products than just merely ordering and obtaining goods. As a consequence thereof, companies had to investigate opportunities to market directly to the customer in a highly personalised manner, with improved value chain possibilities (Cloete, 2002).

These possibilities, through e-commerce and electronic customer relationship management (e-CRM), have introduced various benefits to organisations. e-Commerce has the potential to reduce operating costs, provide new sales channels and to streamline business processes. These are core management functions and will therefore also have impact on the management of e-business.

It is therefore important that businesses take note of electronic commerce as it is a fast moving field and try to stay abreast of the ever-changing technology and global competition (Cloete, 2002). Porter (2001) argued that the important question is not whether to deploy e-commerce strategies, but rather how to deploy it.

The most successful companies will be those who implement e-commerce to supplement traditional business strategies to improve the value chain (Schneider and Perry, 2001). Web-based IS development has allowed companies to reach a more global customer base.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

There are several approaches to evaluating IS effectiveness, evident in the IS literature.

1.2.1 Information System Effectiveness

The concept of IS Effectiveness is at the core of this study. According to Grover, Purvis & Coffey (2004), IS Effectiveness refers to the evaluation of the effectiveness of technological expenditure, incurred, by firms that form the key ingredient in developing a competitive advantage. By implication, IS researchers need measures of IS effectiveness. In fact at one point it had been described as one of the "haunting problems" of MIS (Davis, 1989).

The lack of appropriate frameworks for evaluating IS effectiveness has prevented companies from determining whether they have received a return on IS investment. With huge sums of money being spent on IT, one would expect that managers and researchers would devote considerable efforts to assessing which forms of IT expenditure are most effective (Seddon et al., 1999).

Over the recent years, studies into IS evaluation have begun to focus on e-commerce. Examples are Delone and McLean (2003), Molla and Licker (2001), Zeithaml (2002) and Pather, Erwin and Remenyi (2004). The introduction of e-commerce has resulted in many companies moving away from traditional brick-and-mortar business models. With the rapid introduction of e-commerce, Whyte & Bytheway (1996) also question whether the implementation of web-based IS has resulted in companies receiving a return on IS investment. The latter could be interpreted in terms of whether the business expectations of stakeholders positively compares with how they perceive the actual IS. In other words, the evaluation of the IS could be regarded as successful if the expectations of the stakeholder are satisfied with regard to how they perceive the IS.

Examples of previous work in which stakeholder expectations have been the basis of measuring IS Effectiveness include Frooman (1999); Jones and Wicks (1999).

1.2.2   Information System Effectiveness Matrix

Thus businesses require evaluation scales to determine the extent to which the needs of their stakeholders are being met. However, providing a single view of evaluation by a single stakeholder could possibly provide an inconclusive measure of IS success (Seddon et al., 1999). Therefore, a multi-stakeholder approach would provide a more holistic perspective of the evaluation. In doing so, a more definitive measure of IS success might be achieved.

Current literature reveals that amongst researchers there are no single accepted means of evaluating IS effectiveness in the web environment (Pather et al., 2004). Seddon et al. (1999) argue that there are two concerns when measuring success: (1) how well does the system fulfil the business needs of stakeholders; (2) what must be measured from each stakeholder's perspective. Figure 1.1 and Figure 1.2 show diagrammatically a multi-stakeholder versus a single stakeholder evaluation of the IS.
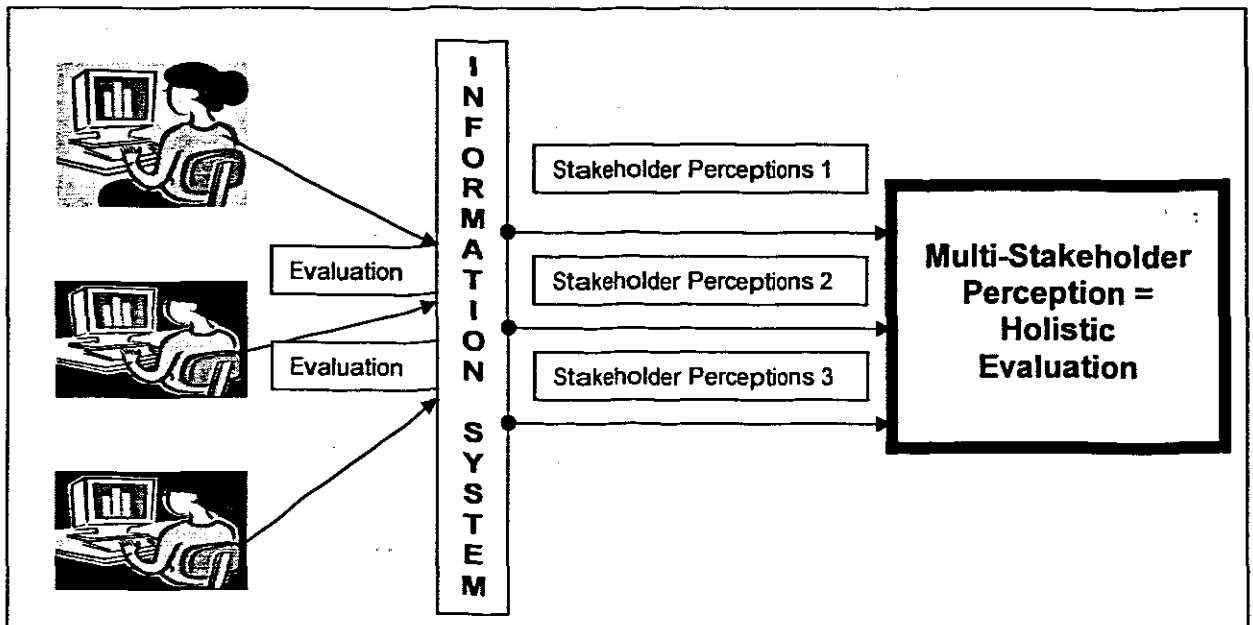
Figure 1.1: Multi-Stakeholder Evaluation
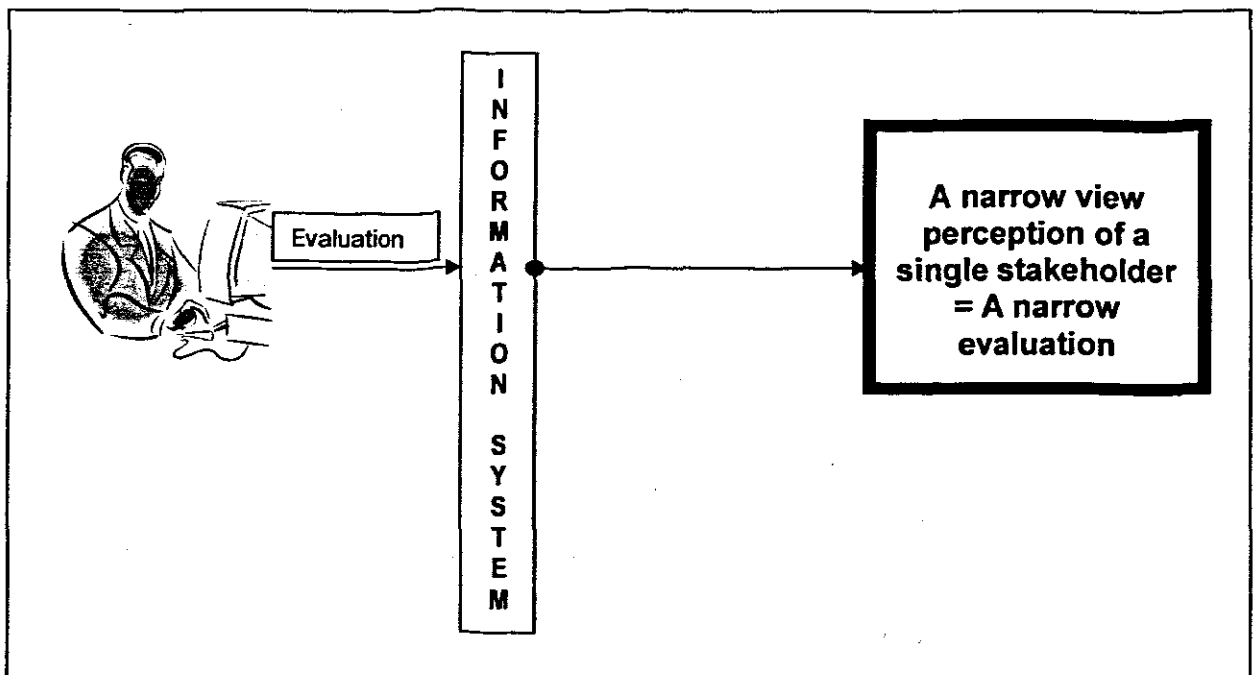
Figure 1.2: Single Stakeholder Evaluation

Figure 1.1 depicts that a multi-stakeholder evaluation, as prescribed by Seddon et al. (1999), provides a more holistic measure of IS success when compared to Figure 1.2, which is a single stakeholder view. The possible issue with a single stakeholder approach is that a positive or negative bias perception might not indicate a conclusive evaluation of the

IS especially when there are different categories of user groups. For example, the developer(s) of an IS might successfully evaluate an IS compared to the end users whose business process requirements have not been satisfied.

In this study, the Delone and McLean (1992) IS success Model (D & M model) along with the Seddon et al. IS Effectiveness Matrix, was used as the basis for IS evaluation. In an updated D & M model (2003), as a result of the work of a number of authors such as Kettinger and Lee (1995), Service Quality was added as a measure to evaluate IS effectiveness.

1.2.3 Service Quality

In the mid-1990's the concept of service quality was introduced to the IS Effectiveness research domain. Various studies were conducted to test the applicability of service quality constructs for evaluating IS Effectiveness e.g. Li (1997), and Wilkin and Hewitt (1999). As a result of this, Delone and McLean (2003) argued that IS Effectiveness will be mismeasured if Service Quality is not included as a measurement of IS success.

The SERVQUAL scale was initially developed by Parasuraman in the marketing research environment. SERVQUAL was the scale used to measure service quality as well as to identify the gap between customer expectation and customer perception. IS researchers have adapted and tested SERQUAL in a number of IS Effectiveness applications. In the online environment Parasuraman, Zeithaml and Malhotra (2005) applied and tested Service Quality constructs. This study resulted in the E-S-Scale and was used to measure service quality of e-commerce IS.

1.3 STATEMENT OF THE RESEARCH PROBLEM

The synopses of the important issues from the foregoing are as follows:

- There is a lack of appropriate IS Effectiveness measurement in the e-commerce environment.

- Service quality has been established as a measure of IS effectiveness.

- A caveat has been identified viz. most IS Effectiveness approaches do not consider multi-stakeholder perceptions.

Taking the above into account, the problem this study addresses is as follows: The application of SQ to evaluate IS effectiveness does not take multi-stakeholder perceptions into consideration which consequently could negatively impact the evaluation of IS success.

Given the foregoing background, this dissertation explores the application of service quality measures further. In particular, taking into account the IS Effectiveness matrix, the study examines how e-SQ metrics can be applied in the evaluation of a web-based IS in which there are multiple users.

1.4 RESEARCH QUESTIONS

The purpose of this study was to investigate how e-SQ constructs could be applied amongst multiple stakeholders to evaluate web-based IS effectiveness.

In pursuance of the above objective, the following research questions were explored:

1.4.1 What are the perceptions of the multiple stakeholders regarding how the System delivers on the various e-service quality dimensions?

1.4.2 How do perceptions of e-SQ differ amongst the different   :
        stakeholder groups?

1.4.3 Does a multi-stakeholder evaluation of an IS provide a more holistic
        perspective of IS effectiveness as compared to an evaluation by a
        single stakeholder?

1.4.4 Are there shortfalls between the stakeholders' expectations
        compared to the stakeholders' perception regarding IS e-SQ
        delivery?

These questions were examined within a single organisational setting, i.e.
a case study approach was adopted in the research. The case entailed
conducting an evaluation of a recently implemented web-based IS, viz.
DealerWeb, within a national telecommunications company in South
Africa. As part of the confidentiality agreement, the company is referred to
as *TechSA* in this dissertation.

1.5 OBJECTIVES OF THE STUDY

The objective of this study was to gain a better understanding of how IS
success can be measured from an e-SQ perspective. In particular, the
study aimed to:

1.5.1 Further our understanding of how e-SQ can be utilised as an
        indicator of IS success in the context of web-based applications;

1.5.2 Identifying how multi-stakeholders perceive e-SQ in a single setting.

1.6 SIGNIFICANCE OF THE STUDY

The outcomes of the study contribute to existing literature on IS
effectiveness measurement in the e-commerce environment. In particular,
they add to the existing body of knowledge regarding the use of electronic
Service Quality (e-SQ) as a measurement of IS Effectiveness. The result
of this study indicates the significance of taking multi-stakeholder

perceptions of IS effectiveness into consideration, rather than a narrow single-stakeholder approach.

1.7 OVERVIEW OF CHAPTERS

Chapter 1: Introduction

This chapter presents the background of the research problem, the need to conduct the research, the underlying research question and sub-questions, and finally the aim and objectives of the study. A clear point of reference for IS Success Measurement is introduced which formed the foundation on which the research was based.

Chapter 2: Literature Review

The main aspects of the study focused on IS effectiveness measurement, and e-SQ. Thus the study of the literature examines two broad areas:

- IS Effectiveness research, in particular the updated D & M IS Success Model (2003) and the IS Effectiveness matrix (Seddon et al., 1999);

- The use of e-SQ for evaluating web-based IS.

The D& M Success model (Delone and McLean, 1992) is important as it provides a point of reference for IS effectiveness evaluation. Representing multiple dimensions of evaluating IS success, the model (Delone and McLean, 2003) informed the derivation of a framework of web-based IS evaluation in this study.

In summary, the literature review seeks to establish a framework of e-SQ dimensions to determine the effectiveness of IS using the D & M Success Model (Delone and McLean, 2003) and the Seddon et al (1999) Stakeholder Matrix as important points of departure.

Chapter 3: Research Design and Methodology

The key focus of this chapter is the research design and methodology. A case study approach is adapted to resolve the research questions. Questionnaires were administered to the various stakeholders who have direct interaction with the DealerWeb system[1]. The cause of the problem, which led to the implementation of the DealerWeb System, namely the lack of a computer interface for business partners to interact with TechSA, led to determining what would be an appropriate method to evaluate the system. Thus the outcome of the research will be a proposed framework for evaluating the DealerWeb System from an e-Service Quality perspective.

Chapter 4: Data Analysis and Interpretation

This chapter analyses and reports on the empirical findings conducted through surveying the sample group. The main outcome is to provide a holistic model based on the Seddon et al. (1999) Stakeholder Matrix for measuring IS success for web-based systems. Secondly, it provides proposed dimensions for evaluating IS effectiveness from a service quality perspective for e-Commerce. The findings of the study contributes to existing and current research for assessing IS effectiveness by providing a proposed framework.

Chapter 5: Conclusions and Recommendations

The author concludes by looking at how the research problem has been addressed and how the research questions were answered based on the analysis of the empirical findings. Recommendations are given of a proposed framework of how to evaluate web-based information systems using a generic approach.

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[1] DealerWeb was the sample system used to determine how e-service quality can be evaluated in web-based IS.

1.8 DEFINITIONS AND CONCEPTS

Various definitions and concepts are used in this study. To avoid any confusion or misunderstanding of terms the following definitions apply:

Dimension: This refers to an evaluation construct used to determine IS effectiveness in the environment that the IS was implemented. Each construct consists of a set of evaluation criteria used as measures of IS success.

e-Commerce: Zwass (1996) defines e-Commerce as "the sharing of business information, maintaining business relationships and conducting business transactions by means of telecommunications networks".

e-SQ: Zeithaml (2002) defines e-service quality (e-SQ) as the extent to which a Web site facilitates efficient and effective shopping, purchasing and delivery. This is also known as electronic service quality.

Information System (IS): An information system comprises computer-based processing and consists of five parts – hardware, software, data/information, procedures and people. The fourth component includes manual and computerised procedures and standards for processing data into usable information (Hutchinson & Sawyer, 1994).

IS Effectiveness: The evaluation of the effectiveness of technological expenditure, incurred, by firms that forms the key ingredient in developing a competitive advantage (Grover, Purvis & Coffey, 2004).

IS Success: IS Success is conceptualised as a value judgement made by an individual, from the point of some stakeholder (Seddon, 1997).

Service Quality: Parasuraman, Zeithaml and Berry (1985) defined service quality as the degree and direction of discrepancy between customers' service perceptions and expectations.

SERVQUAL: SERVQUAL is an instrument defined to quantify the service expectation-perception gap along five generic dimensions namely (1) Reliability (2) Responsiveness (3) Assurance (4) Empathy (5) Tangibles (Parasuraman, 1998).

Stakeholder: A stakeholder is a person or group in whose interest the evaluation of IS success is being performed (Seddon, Staples, Patnayakuni & Bowtell, 1999).

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In a study to develop an IS Effectiveness Framework, Delone and McLean (1992) synthesised a number of IS research papers which resulted in the Delone and McLean IS Success Model. Their literature review begins with the reference to IS research papers to determine the main constructs of IS effectiveness. This is better known as the D & M IS Success Model (1992). The D & M model provides a comprehensive approach in the evaluation of an Information System. However, the general approach taken is to evaluate an IS from the perspective of only one stakeholder.

In contrast to Delone and McLean (1992), Seddon et al. (1999) have argued that a single perception of IS effectiveness does not provide a holistic evaluation of the IS. Other authors such as Whyte & Bytheway (1997) concur with Seddon et al. (1999) that the perception of IS success should be a collaborative exercise among evaluators, namely the stakeholders that evaluate the effectiveness of the IS in question. Using this multi-stakeholder approach, Seddon et al. (1999) introduce certain elements that have to be considered when evaluating an IS. This definition of a multi-stakeholder evaluation forms the basis for a conceptual model used in this study.

Delone and McLean (2003) have updated the original D & M IS Success Model (1992) to include a new IS measurement construct, namely Service Quality. This construct has been applied from a Marketing context to the IS domain. These authors argue that the IS effectiveness will be mismeasured if Service Quality is ignored. However, researchers such as Pather et al. (2004) question whether Service Quality can readily be used in the evaluation of online web-based IS. Parasuraman, Zeithaml and

Malhotra (2005) have conducted a study to determine the constructs of e-Service Quality (e-SQ) and have empirically proven the applicability of these success dimensions.

This chapter focuses on the following key concepts viz.:

+ Research Framework: IS Effectiveness.
    o Delone and McLean's IS Success Model (1992).
    o Seddon et al's two-dimensional IS Effectiveness Matrix.
    o Delone and McLean's Updated IS Success Model (2003).
+ Service Quality and Marketing.
+ Service Quality used traditionally.
+ Service Quality as a measure of IS effectiveness.
+ Service quality used in online environments i.e. electronic service quality (e-SQ).
+ Multi-stakeholder evaluation of IS.

In pursuance of methodologies to evaluate IS effectiveness, this chapter considers various methods and scales. An overview is presented of the IS Success measurement models which were considered when deriving a framework for measuring IS effectiveness. For this study, the Delone and McLean IS Success Model provides an important point of reference in determining the most effective method of evaluating IS.

2.2 IS EFFECTIVENESS MODELS

There are several approaches to evaluating IS effectiveness evident in the literature. Some examples are: Grover, Jeong and Segars (1996) who propose six effectiveness categories based on Unit of Analysis and Evaluation Type context dimensions; Smithson and Hirschheim (1998) who proposed a framework that consists of three "zones" of measure namely efficiency, effectiveness, and understanding; and the understanding of user perceptions of information systems success (Whyte, Bytheway & Edwards, 1997). What is not clear in the literature is what measures are appropriate in a particular context. Delone and McLean

(1992), classified a huge range of IS success measures into six categories of success measures and presented this as an IS success model. Delone and McLean (1992) argue that when measuring IS success, researchers should "systematically combine" measures from their six IS success categories namely system use, information quality, system quality, user satisfaction, organisational impact and individual impact.

Delone and McLean's (1992) paper is an important contribution to the literature on IS success measurement because it was the first study that tried to impose some order on IS researcher's choices of success measures (Seddon et al., 1999). However, although it distinguishes between individual impact and organisational impact, the paper does not recognise explicitly that different stakeholders in an organisation may validly arrive at different conclusions about success of the same information system (Seddon et al., 1999). By contrast, Seddon (1997) posit that different individuals are likely to evaluate the consequences of IS use in different ways. Seddon (1997, 248) state that "*IS Success is thus conceptualised as a value judgement made by an individual, from the point of some stakeholder*". Whyte et al. (1997) in their understanding of user perceptions of information systems success, take into consideration the nature of the organisation, the level and involvement of users, and the kind of system to which they relate.

Through the observation of a range of measures of IS effectiveness, Seddon et al. (1999) note that different measures are necessary for measuring IS effectiveness in different contexts, and that the systematic combination of six different types of measures as suggested by Delone and McLean (1992), is not going to work. The reason for this is that the users of an information system have to interpret success in their circumstances and against their own expectations as noted by Whyte et al. (1997).

2.3 DELONE AND MCLEAN INFORMATION SYSTEM SUCCESS MODEL (1992)

The IS Success Model (Delone and McLean, 1992) has provided an important framework for IS effectiveness research. In the period 1992 to 2003, nearly 300 articles in refereed journals have cited and critiqued the IS Success Model (Delone and McLean, 2003). This is indicative of the importance attributed to this model by the IS academic community.
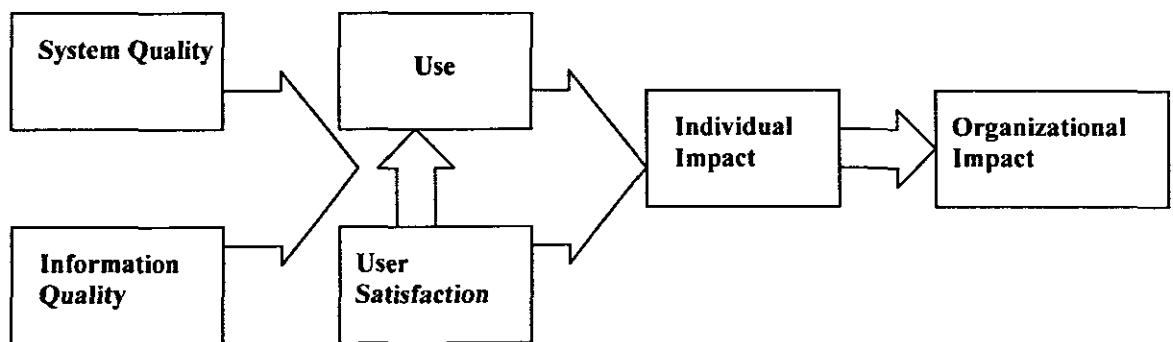
Figure 2.1: DeLone and McLean's Model of IS Success
DeLone and McLean (1992)

The primary purpose of the original Delone and McLean paper (Delone and McLean, 1992) was to synthesise previous research involving IS success into a more coherent body of knowledge and to provide guidance to future researchers (Delone and McLean, 2003). Delone and McLean's (1992) comprehensive review of different information system success measures concludes with a model of interrelationships between six IS Success constructs. These six dimensions of success are defined in Table 2.1:

Table 2.1: Six dimensions of success adapted from the D & M IS Success Model (1992)

Success Dimension	Definition
System Quality	System quality was measured in terms of ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, and performance.
Information Quality	Information quality was measured in terms of accuracy, timeliness, completeness, relevance, and consistency.
System Use	System use was typically voluntary and measured as frequency of use, time of use, number of access, usage pattern, and dependency.
User Satisfaction	User Satisfaction can be measured by the net benefits perceived by the information system's stakeholders (individuals, groups of individuals, management of organizations, and society).
Individual Impact	Individual impacts were measured in terms of job performance and decision making performance; quality of the work environment and job performance; decision-making performance, job effectiveness, and quality of work.
Organisational Impact	Organisational impact is measured by looking at the result of the IS function, such as measuring the quality of customer service and assessing the amount of resulting competitive advantage.

The primary conclusions of the original Delone and McLean (1992) paper were as follows (Delone and McLean, 2002: p239):

1) The multidimensional and interdependent nature of IS success requires careful attention to the definition and measurement of each aspect of this dependant variable. It is important to measure the possible interactions among the success dimensions in order to isolate the effect of various independent variables with one or more of these dependent success dimensions.

2) Selection of success dimensions and measures should be contingent on the objectives and context of the empirical investigation; but, where possible, tested and proven measures should be used.

3) Despite the multidimensional and contingent nature of IS success, an attempt should be made to significantly reduce the number of different measures used to measure IS success so that research results can be compared and findings validated.

4) More field study research should investigate and incorporate organisational impact measures.

5) The IS Success Model clearly needs further development and validation before it could serve as a basis for the selection of appropriate IS measures.

Delone and McLean's (1992) comprehensive review of different information system success measures makes two important contributions to our understanding of Information System (IS) success. First, it provides a scheme for classifying the multitude of IS success measures that have been used in the literature into six categories. Second, it suggests a model of interdependencies between these categories. The IS success model proposed in Figure 2.1 is an attempt to reflect the interdependent, process nature of IS success. Rather than six independent success categories, there are six interdependent dimensions to IS success. This success model clearly needs further development and validation before it could serve as a basis for the selection of appropriate IS measures (Seddon and Kiew, 1996). Recently Delone and McLean (Delone and McLean, 2003) updated the D & M model (see Figure 2.2) to include Service Quality as a component of IS success measurement.

2.4 UPDATED DELONE & MCLEAN IS SUCESS MODEL (2003)

According to Delone and McLean (2003), service quality is a key construct in the evaluation of IS success. Consequently, Delone and McLean state that IS researchers will inaccurately measure IS effectiveness if service quality is excluded. Other authors such as Kettinger and Lee (1995), Li (1997), and Wilkin and Hewitt (1999) concur, citing the need for service quality measure to be a part of IS success.
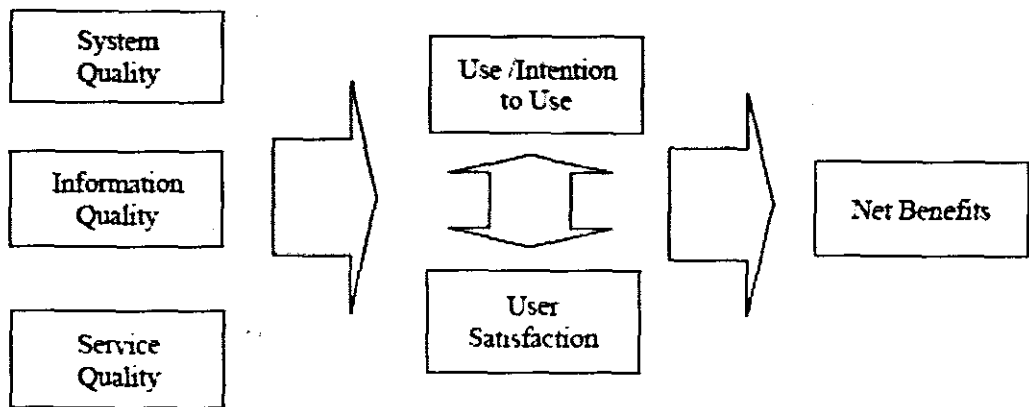
Figure 2.2: Updated D&M IS Success Model (Delone & McLean, 2003: 24)

Although Delone & McLean (2003) make an attempt to demonstrate that their model can be applied to the e-Commerce environment, they make it clear that further research is required with regards to the application of the seven success constructs to IS evaluation in online environments.

2.5 SERVICE QUALITY AND MARKETING

Service Quality was originally used as a Marketing concept to measure customer service through customer-service assessments. This concept has been researched quite extensively in an attempt to determine what customers expect in relation to what they receive. These include studies by Grönroos (1982) and Lewis and Booms (1983); Parasuraman, Zeithaml and Berry (1985). Grönroos (1982) posit that two types of service quality exist namely:

- ↓ Technical quality, which involves what customers actually receive from the service.

- ↓ Functional quality, which involves the manner in which customers receive the service.

The extant literature reveals that Parasuraman et al. (1988) conducted empirical studies in several sectors to develop and refine a scale to measure service quality known as SERVQUAL, which is a multi-item

instrument to quantify the service expectation-perception gap along five generic dimensions (Parasuraman, 1998: p313) viz.:

1) Reliability: ability to perform the promised service dependably and accurately.

2) Responsiveness: willingness to help customers and provide prompt service.

3) Assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence.

4) Empathy: caring, individualised attention the firm provides its customers.

5) Tangibles: appearance of physical facilities, equipment, personnel and communication materials.

These SERVQUAL constructs were applied to an IS context as an additional measurement of IS effectiveness by Parasuraman et. al (2005). Examples of IS studies include Delone and McLean (2003).

2.6 TRADITIONAL SERVICE QUALITY VERSUS ELECTRONIC SERVICE QUALITY

Parasuraman et al. (2005) define traditional service quality (SQ) as quality of all non-Internet based customer interactions and experiences with companies.

Other authors have suggested that SQ stems from a comparison of what customers feel a company should offer (i.e. their expectations) with the company's actual service performance (Grönroos, 1982; Lewis and Booms, 1983; Parasuraman, Zeithaml, and Berry, 1985). Using insights from these studies as a starting point, Parasuraman, Zeithaml, and Berry (1988, 1991) conducted empirical studies in several industry sectors to develop and refine the traditional service quality scale viz. SERVQUAL. The SERVQUAL instrument and its adaptations have been used for measuring SQ in many proprietary and published studies.

Three broad conclusions that are potentially relevant to defining, conceptualising, and measuring perceived e-SQ, emerged from SQ literature dealing with traditional SQ viz.:

- The notion that quality of service stems from a comparison of actual service performance with what it should or would be has broad conceptual support, although some authors still question the empirical value of measuring expectations and operationalising SQ as a set of gap scores;

- The five SERVQUAL dimensions of reliability, responsiveness, assurance, empathy, and tangibles capture the general domain of SQ fairly well, although (again from an empirical stand-point) questions remain about whether they are five distinct dimensions; and;

- Customer assessments of SQ are strongly linked to perceived value and behavioural intentions (Parasuraman et al., 2005).

A noteworthy feature of the extant SQ literature is that it is dominated by people-delivered services. As such, whether the preceding conclusions extend to e-SQ contexts and what similarities and differences are between evaluative processes for SQ and e-SQ are open questions (Parasuraman et al., 2005). The process employed in developing the scale to measure e-SQ is presented in Figure 2.3.

Step 1: Articulated the meaning and domain of e-service quality based on insights from the extant literature and a comprehensive quality study.

Step 2: Developed a preliminary scale (containing 121 items and representing 11 e-service quality dimensions) and revised it based on feedback from two focus groups.

Step 3: Administered the revised scale to a nationally representative sample of Internet users through an online survey – roughly, one third of the respondents evaluated their favourite sites, another third evaluated their second-favourite sites, and the rest evaluated their third-favourite sites; a total of 549 completed questionnaires were collected.

Step 4: Developed a parsimonious scale through an iterative process:
- Examination coefficient alpha and item-to-total correlations by dimension
- Deletion of items
- Reassignment of items and restructuring of dimensions as necessary
- 22-item, 4-dimensional E-S-QUAL scale (and 11-item, 3-dimensional E-RecS-QUAL scale
- Examinations of dimensionality through exploratory factor analysis

Step 5: Conducted CFA and validity tests on the final scales.

Step 6: Administered the final scales via online surveys to representative samples of customers of Amazon.com (n=653) and Walmart.com (n=205) to: (a) re-affirm the scales' reliability and validity and (b) assess the relative importance of the various e-service-quality dimensions in influencing consumers' overall quality and value perceptions and loyalty intentions.

Figure 2.3: Process Employed in Developing the Scale to Measure e-SQ (Parasuraman et al., 2005: p215)

Gefen (2002) extended the SERVQUAL conceptualisation to the electronic context and found that the five service quality dimensions collapse to three with online service quality: (a) tangibles; (b) a combined dimension of responsiveness, reliability, and assurance; and (c) empathy. In that research, tangibles were found to be the most important dimension in increasing customer loyalty while the combination dimension most critical in increasing customer trust. However, the items in the scale were changed to adapt to the electronic context. For example, tangibles were represented in part by an item about appearance of the web site.

Therefore the scales were not comparable across the contexts. It is for this reason that Parasuraman et. al (2005) argue that the study of e-SQ requires the development of scales that extend beyond adapting offline scales (Parasuraman et al., 2005) viz. traditional SQ.

2.7 SERVICE QUALITY AS AN IS SUCCESS MEASURE

To date a number of studies in the IS literature have adapted service quality frameworks such as SERVQUAL which was originally developed in the Marketing domain e.g. Watson, Pitt & Kavan (1998); Watson, Pitt, Cunningham & Nel (1993).   SERVQUAL, originally developed by Parasuraman et al. (1988), continues to be used in a number of studies both from IS and Marketing perspectives for the evaluation of Service Quality.   Pitt and Watson (1995) produced one of the first studies that allude to the IS function as a service component. They argue that commonly used measures of IS effectiveness focus on products, rather than services of the IS function. They conclude that SERVQUAL is an appropriate instrument for researchers seeking a measure of IS service quality.

More recently Parasuraman et al. (2005) updated SERVQUAL for the evaluation of service quality in web-based environments.   This was referred to as e-service quality (e-SQ). The result of their study was the E-S-QUAL scale which is a multi-item scale for assessing e-SQ.

Researchers who have argued that service quality be added to the D & M success model have applied and tested the 22-item SERVQUAL measurement instrument from marketing to an IS context (Delone & McLean, 2003).

Previous work has questioned whether traditional dimensions can be applied to online service quality precisely because of the significance of the machine interface in the customer-business relationship (Pather et al.,

2004). Yang (2001) proposed the following potential factors of online service quality that align with those of the SERVQUAL instrument: Reliability, Responsiveness, Access, Ease of use, Attentiveness, Credibility and Security. Although some determinants are derived from traditional service quality literature, the items would have to be reformulated before they could be meaningfully used in an e-service context (van Riel, Liljander & Jurriens, 2001).

Zeithaml (2002) focused on conceptualising and measuring e-SQ, and particularly in determining the dimensions of the construct. Zeithaml (2002) indicated that e-SQ has seven dimensions that form two scales: a core e-SQ scale and a recovery scale. Four dimensions namely efficiency, reliability, fulfilment and privacy form the core e-SQ scale that can be used to measure customer perceptions of service quality. Three other dimensions become salient when online customers run into problems - responsiveness, compensation and contact. These dimensions are conceptualised as constituting e-SQ recovery (Zeithaml, 2002).

Parasuraman, Zeithaml and Malhotra (2005) have conceptualised e-SQ constructs and tested the multiple-item scale (E-S-QUAL) for measuring the service quality delivered by websites where customers shop online.

Furthermore, Parasuraman et al. (2005) have quantified the e-SQ dimensions in an empirical study. Based on the empirical findings, these e-SQ dimensions have been validated and tested as measures for evaluating e-SQ within the e-commerce environment (Parasuraman et al., 2005). Two stages of empirical data collection revealed that two different scales were necessary for capturing electronic service quality (Parasuraman et al., 2005) namely the E-S-QUAL Scale and E-RecS-QUAL scale (Zeithaml, 2002). These scales consist of the dimensions as conceptualised in the Zeithaml (2002) study.

Santos (2003) specifies that Service Quality be increasingly recognised as an important aspect of electronic commerce (e-commerce). As the online

comparison of the technical features of products is essentially costless, feasible, and easier than comparisons of products through traditional channels, service quality is the key determinant for successful e-commerce (Santos, 2003). With the increasing amount of research into Internet marketing and e-commerce, Yang (2001) concurs that service quality in online environments has become recognised as an important factor in determining the success or failure when evaluating electronic commerce.

2.8 E-COMMERCE PARADIGM

Delone and McLean (2003) indicated that the evaluation of user satisfaction is an established means of assessing Information Systems (IS) effectiveness. However, with the introduction of doing business over the Internet, e-commerce distinguished the traditional end-user from an Internet user viz. e-customer. This advent of e-Commerce has shifted the location of the traditional user of Information Systems out of the physical domain of the organisation or business (Pather et al., 2004). In other words, the e-customer interacts with a web-site to conduct a transaction e.g. the acquisition of products, or requesting pure services such as financial information. The substitution of customer satisfaction for user satisfaction as a dependant variable to e-commerce success warrants further discussion (Molla and Licker, 2001).

Whether traditional information systems success models can be extended to investigating e-commerce success is yet to be investigated (Molla and Licker, 2001). E-commerce reduces the interpersonal encounter with the customer which forms an integral part of customer satisfaction research. The integral role that IS plays in delivering core business services or products implies that evaluation of the satisfaction of the e-customer is implicitly an evaluation of service quality as well. In light of this, already established instruments that measure user satisfaction of IS in traditional (brick and mortar) businesses are not completely appropriate (Pather et

al., 2004). However, the empirically tested e-SQ instrument conceptualised by the Parasuraman et al. (2005) study provides valid measurement criteria for evaluating service quality in online environments.

2.9 PROMINENCE OF THE PARASURAMAN ET AL. (2005) E-SQ STUDY

The SERVQUAL scale was applied to the updated D & M IS Success Model (2003) as a measurement of IS effectiveness. Zeithaml (2002) and other researchers adapted the SERVQUAL scale to e-commerce environments which offer pure services (for example electronic banking) and in situations where a site is visited only for information. Hence the e-SERVQUAL scale was produced. This is a comprehensive scale which emerged as a result of extensive research, and was validated in e-tailing contexts where products are ordered over the Internet. In other words, Parasuraman et al. (2005) conceptualized, constructed, refined, and tested the multiple-item scale (E-S-QUAL & E-RecS-QUAL) for measuring the service quality delivered by websites where customers shop online.

Both scales demonstrate good psychometric properties based on findings from a variety of reliability and validity tests and build on the research already conducted on the topic. Therefore, the Parasuraman et al. (2005) study has prominence in that:

- The e-SERVQUAL scale has been empirically tested.
- It provided quantified e-SQ constructs that can be used in the evaluation of service quality in online environments.

In pursuance of a scale to measure service quality within e-commerce environments, in this study various scales were considered.

2.10 RESEARCH ON WEB-BASED IS EVALUATION AND E-SQ

There are several examples of academic research which have developed scales to evaluate Web sites. For example, Loiacono, Watson, and Goodhue (2002) created WebQual - a scale for rating Web sites on 12

dimensions: informational fit to task, interaction, trust, response time, design, intuitiveness, visual appeal, innovativeness, flow-emotional appeal, integrated communication, business processes, and substitutability. However, this scale's primary purpose is to generate information for web designers rather than to measure service quality as experienced by customers. Although WebQual might influence perceived service quality, other dimensions e.g. innovativeness, business processes, and substitutability are at best tangential to it (Parasuraman et al., 2005). Furthermore, the review of the literature indicates that in this scale, developers excluded a dimension called customer service because it could not be measured under the research methodology that was used. Moreover, WebQual does not include fulfilment, although this is an important e-commerce function, as a dimension.

In another study, Barnes and Vidgen (2002) developed a completely different scale to measure an organisation's e-commerce offering. This scale provides an index of a site's quality (customer perceptions weighted by performance) and has five factors viz. usability, design, information, trust and empathy. Other scales developed include a nine-item SITEQUAL scale for measuring site quality on four dimensions: ease of use, aesthetic design, processing speed, and security. Like WebQual, SITEQUAL does not capture all aspects of the purchasing process and therefore does not constitute a comprehensive assessment of a site's service quality.

Other researchers in pursuance of an evaluation scale, such as Wolfinbarger and Gilly (2003), used online and offline focus groups, a sorting task, and an online-customer-panel survey to develop a 14-item scale called eTailQ. The scale contains four factors:

- Web site design (involving some attributes associated with design as well as items dealing with personalisation and product selection);
- Reliability and fulfilment (involving accurate representation of the product, on-time delivery, and accurate orders);
- Privacy and security (feeling safe and trusting of the site);

↓ Customer service (combining interest in solving problems, willingness of personnel to help, and prompt answers to inquiries).

On the basis of a comprehensive review and synthesis of the extant literature on e-SQ, Zeithaml, Parasuraman and Malhotra (2002) detailed five broad sets of criteria as relevant to e-SQ perceptions:

↓ Information availability and content;

↓ Ease of use or usability;

↓ Privacy and security;

↓ Graphic style;

↓ Reliability and fulfilment

The Parasuraman et al. (2005) study reveals that although the dimensions of existing scales are valid for online environments, these dimensions, as well as other items that might be relevant to customer assessment of service quality on websites, need to be tested further.

Therefore, although past studies provide insights about criteria that are relevant for evaluating e-SQ, scales developed in those studies also raise some important questions that call for additional research on the topic (Parasuraman et al., 2005). Furthermore, the development of e-SQ scales can be influenced when introducing multiple stakeholder perspectives into the evaluation using the Seddon et al. (1999) two-dimensional IS framework. A key component of conceptualising scales used for SQ assessment was understanding which criteria had been used in the development of measurement scale.

2.11 DEVELOPMENT AND REFINEMENT OF A SCALE TO MEASURE E-SQ

The review of literature reveals that customers' assessment of online environments not only includes experiences during their interactions with the web site but also service aspects that follow. As such e-SQ is defined broadly to encompass all phases of a customer's interactions with a web

site; namely the extent to which the website facilitates efficient and effective shopping, purchases and delivery.

A critical initial step in the scale development is the correct specification of the domain from which items are to be drawn in constructing the scale (Churchill, 1979). Parasuraman et al. (2005) posit that as the theoretical framework of e-SQ implies, the core evaluative process for assessing e-SQ encompasses the perceptual and dimensional levels. These perceptual ratings can provide insights about e-SQ shortfalls at a dimensional level. At the same time, when dimension level e-SQ assessments are needed, they can be obtained easily by aggregating the appropriate perceptual-attribute ratings. These ratings suggest which dimensions have satisfactory or unsatisfactory assessments.

Zeithaml, Parasuraman and Malhotra (2000) identified dozens of website features and categorised them into 11 e-SQ dimensions (Parasuraman et. al, 2005: 218):

1. *Reliability:* Correct technical functioning of the site and the accuracy of service promises (having items in stock, delivering what is ordered, delivering when promised), billing and product information.
2. *Responsiveness:* quick response and the ability to get help if there is a problem or question.
3. *Access:* ability to get on the site quickly and to reach the company when needed.
4. *Flexibility:* Choices of ways to pay, ship, buy, search for, and return items.
5. *Ease of navigation:* site contains functions that help customers find what they need without difficulty, has good search functionality, and allows the customer to manoeuvre easily and quickly back and forth through the pages.
6. *Efficiency:* Site is simple to use, structured properly, and requires minimum information to be supplied by the consumer.

7. *Assurance/trust:* confidence the customer feels when dealing with the site which is due to the reputation of the site and the products or services it sells, as well as clear and truthful information presented.

8. *Security/privacy:* degree to which the customer believes the site is safe from intrusion and personal information is protected.

9. *Price knowledge:* extent to which the customer can determine shipping price, total price, and comparative prices during the shopping process.

10. *Site aesthetics:* appearance of the site

11. *Customisation/personalisation:* how much and how easily the site can be tailored to individual customers' preferences, histories, and ways of shopping.

These dimensions were scrutinised and summarised through an empirical study to form the scale as shown in Table 2.2:

Table 2.2: Definition of e-SQ Dimensions (Parasuraman, et al., 2005)

	e-SQ Dimension	Definition
E-S-QUAL Scale	**Privacy**	The degree to which the site is safe and protects all information.
	Fulfilment	The extent to which the site's promises about order delivery and item availability are fulfilled.
	Efficiency	The ease and speed of accessing and using the site.
	Reliability (system availability)	The correct technical functioning of the site.
E-RecS-QUAL	**Responsiveness**	Quick response and ability to get help if there is a ＿＿＿＿ ＿＿ question.
	Compensation	The degree to which the site compensates users for problems.
	Contact	The availability of assistance through telephone ＿＿ ＿＿＿＿＿ ，＿＿＿＿， to get on the site quickly and to reach the company when needed

The use of findings such as those in Table 2.2 to measure service quality ensure that by using a validated scale, the validity of the data produced is reliable. However, as pointed out previously, these empirical findings can be influenced when taking into consideration more than a single stakeholder perspective of service quality.

2.12   STAKEHOLDER PERSPECTIVE

Stakeholder theory posits that organisation strategies are driven towards satisfying the conflicting goals of organisational stakeholders (Hatch, 1997). In stakeholder theory, a stakeholder is a group or individual affected by the achievement of organisational goals, who can cause difficulties for the organisation if its own needs are not satisfied (Freeman, 1984). An organisational strategy is best understood by identifying stakeholders and how organisational goals influence and are influenced by stakeholder perspectives (Frooman, 1999; Jones and Wicks,1999; Luoma and Goodstein, 1999; Scott and Lane, 2000).

Thus, an organisation is perceived to be surrounded by a set of stakeholders, each of whom is defined by two related functions:

- A utility function that determines how much the stakeholder is being "satisfied" by the organisation, and

- An influence function that determines how much "damage" or "benefit" the stakeholder can cause the organisation given a level of utility (Chua, Khoo,Straub and Kadiyala, 2005).

The organisation allocates its resources to minimise damage and maximise benefit (Phillips, Freeman and Wicks, 2003). Thus, an organisation that focuses exclusively on a single stakeholder will not survive because other (unsatisfied) stakeholders exert their influence on the organisation (Phillips et al., 2003). Therefore, it can be suggested that the perspective of business processes within an organisation requires the contribution of multiple stakeholders.

Hence, in their paper, Seddon et al. (1999), propose a two-dimensional matrix for classifying IS Effectiveness Measures. The first dimension is the type of system being evaluated. The second dimension is the stakeholder in whose interest the system is being evaluated. According to these authors the IS Effectiveness Matrix provides a useful guide for

conceptualising effectiveness measurement in IS research, and for ‚ choosing appropriate measures, both for research and practice (Seddon et. al, 1999). This study (Seddon et. al, 1999) adds value to our understanding of how to go about evaluating IS, by emphasising the significance of two important issues namely the type of system being evaluated and the stakeholders involved in the system being evaluated forming a matrix.

2.13   TWO-DIMENSIONAL INFORMATION SYSTEM EFFECTIVENESS MATRIX VS DELONE & MCLEAN INFORMATION SYSTEM MODEL

Seddon et al. (1999) argue that Delone and McLean (1992) *"do not explicitly recognize that different stakeholders in an organization may validly come to different conclusions about the success of the same information system"* (1999: p4).

What is not clear in the IS Effectiveness literature is what measures are appropriate in a particular context. It is for this reason that Seddon et al. (1999) proposed a two-dimensional matrix for classifying IS Effectiveness measures. The matrix comprised of the following dimensions:

- The first dimension is the type of system studied. These are classified as:
    - an *aspect* of IT use (e.g. a single algorithm or form of user interface)
    - a *single* IT application (e.g. a spreadsheet, a PC, or a library cataloguing system)
    - a type of IT or IT application (e.g. TCP/IP, a GDSS, a TPS, a data warehouse, etc.)
    - all IT applications used by an organisation or sub-organisation
    - an aspect of a system development methodology
    - the *IT function* of an organisation or sub-organisation.

↓ The second dimension is the stakeholder in whose interests the ;
system is being evaluated. A stakeholder is a person or group in
whose interest the evaluation of IS success is being performed.

Researchers such as Seddon (1999) have tested the matrix using it to
classify IS effectiveness measures from empirical papers. The results
indicate that the classifications are meaningful. Hence, the IS
Effectiveness Matrix provides a useful guide for conceptualising
effectiveness measurement in IS research, and for choosing appropriate
measures, both for research and implementation.

2.14   DIMENSIONS OF INFORMATION SYSTEMS EFFECTIVENESS
EVALUATION

In the context of this study, dimensions are referred to as:

↓ There are 2 key dimensions used to measure IS Effectiveness viz.
stakeholder and e-SQ dimensions.

↓ Each e-SQ dimension consists of a number of e-SQ criteria.

↓ Each stakeholder dimension consists of the stakeholders'
perception of e-SQ criteria.

↓ For example:

   o e-SQ dimension = Privacy;

   o Privacy criteria example = the site protects information about
      my business;

   o Stakeholder dimension = Service Provider;

   o Stakeholder perception = perception of the Privacy criteria
      viz. the site protects information about my business.

Thus, by extending the above example to multiple stakeholders by using a
two-dimensional view for IS evaluation, a holistic perspective of IS
effectiveness is achieved.

2.15   PERSPECTIVES OF INFORMATION SYSTEM EFFECTIVENESS

Since the early 1980s various studies have produced many different
perspectives on how IS effectiveness should be measured.   Whyte &

Bytheway (1996) provided an overview of three perspectives viz. Product, Process and Service Perspectives. These three perspectives are summarised by Whyte & Bytheway as:

- The *Product* which is delivered to the users. For example the software and hardware systems, user documentation and training courses. The characteristics of the system are highlighted such as response times, user friendliness, etc.;

- The *Process* that creates the system. Traditionally this includes systems analysis, technical design, programme coding, testing and final handover. Increased system complexity and unsuccessful system led to a shift in attention from product perspective to process perspective;

- The *Service* which deals with the softer issues. For example answering questions, dealing with problems, and generally addressing the concerns and aspirations of users. This perspectiveintroduces the idea of user satisfaction as a means of assessing effectiveness.

- These three perspectives can represented by Figure 2.4:
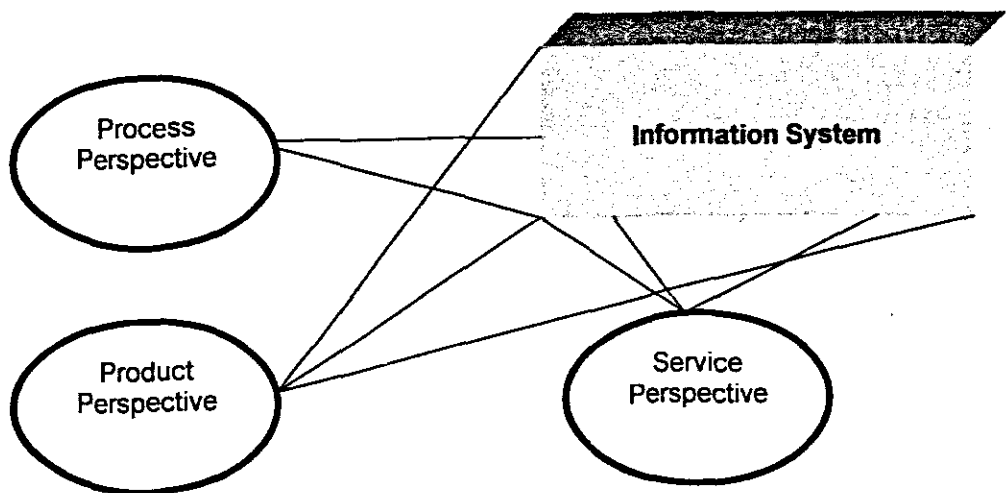
Figure 2.4: Perspectives of information systems (Whyte and Bytheway, 1996: 75)

Although IS departments consider that they are delivering a service, evidence shows that most time is spent monitoring aspects of their operation which is concerned with the product and the process, and which have little to do with service (Whyte and Bytheway, 1996).

The review of the literature reveals that other perspectives of IS effectiveness include service quality concepts which have gained the attention of IS researchers working in the IS effectiveness field. Examples are Watson et al. (1993), Watson et al. (1998), Saunders & William (2002), DeLone & McLean (2003) and Pather et al. (2004). Many studies in the IS effectiveness field are based on the use of the IS Success Model (DeLone & McLean, 1992) as a framework, for example Crowston, Annabi & Howison (2003); Alter (2000) and Seddon and Kiew (1996). Although guidelines are given to ascertain the perspectives of IS effectiveness using measurement frameworks, certain barriers could possibly influence the assessment.

2.16 FACTORS INFLUENCING SERVICE QUALITY – A MANAGEMENT PERSPECTIVE

Certain considerations need to be taken into account when evaluating IS Effectiveness which could influence the assessment. In this regard, System quality, information quality, user IS characteristics, end-user IS performance and technical support are identified as important elements that influence service quality (Bharati and Berg, 2003). The improvement of the quality of services is one of the primary reasons why organisations are investing in information systems (Bharati and Berg, 2003). These authors also note that improved quality is a most important output of information systems or that IS has substantially improved service sector performance.

The increasingly important role played by services and the inability of researchers to apply traditional manufacturing definitions to service quality have led to a new conceptualisation of service quality (Bharati and Berg, 2003). Definitions of service quality by service scholars such as Grönroos (1982) and Parasuraman, Zeithaml and Berry (1985) is governed by the extent to which a service meets the expectations of customers (Reeves and Bednar, 1994).

The literature reveals that the expectations (Parasuraman et al., 1985) versus the perceptions of customers (Whyte and Bytheway, 1997) influence the evaluation of service quality and ultimately IS Effectiveness. Gefen (2002) defines service quality as the subjective comparison that customers make between the quality of service that they want to receive and what they actually get. This implies that a high customer expectation of service quality in comparison to low customer perception of the IS, negatively influences IS effectiveness evaluation which impacts end-user IS performance. Low end-user IS performance could imply that the IS service quality experienced by the end-user has resulted from their expectations of the IS not being met.

2.16.1 Barriers of Web Based Information System Effectiveness

The use of a system depends on the users' evaluation of that system (Bokhari, 2005). If the system improves the users' task performance or decision quality, then they tend to use the system; otherwise they may avoid using a system unless its use is mandatory. Delone and McLean (2002) believe that no system use is totally mandatory. It might happen that at times management may require employees to use the system but continued use and adoption of the system itself may be voluntary, based on management judgement at a higher level. On the other hand, Kim and Lee (1986) caution that the degree of system usage cannot be considered as an appropriate measure for IS success if use is mandatory. For this reason, some researchers prefer to use "user satisfaction" as a measure of success. Delone and McLean (2003) argue that systems use is an appropriate measure of IS success in most cases as in previous research, so the inclusion of systems use in success model is more appropriate than system usefulness suggested by Seddon (Bokhari, 2005).

Forced mandatory use of an IS negatively influences the evaluation of IS effectiveness and is a barrier to IS assessment. Consequently, user satisfaction caused by satisfactory use of IS will positively influence IS effectiveness.

2.16.2 End-user Information System Performance

The impact of IS SQ on end-user IS performance has an influence on the quality of service provided to customers. In other words, the effect of the information on the behaviour of the recipient constitutes end-user impact (Delone and McLean, 1992). It follows that the impact the IS has on the behaviour of the end-user, influences the evaluation of the IS. This implies that at the point of conducting IS evaluation, satisfactory end-user IS performance will positively contribute to the satisfactory assessment of IS success.

Measures of end-user IS performance are efficiency of task completion, decision effectiveness, decision confidence and time to make a decision. Good system performance will positively contribute towards service quality. This relates to a positive rating of an Information System by end-users.

2.17   SERVICE QUALITY AND GAP ANALYSIS

Service quality can be defined as the difference between customers' expectations for service performance prior to the service encounter and their perceptions of the service received (Asubonteng et al., 1996). SERVQUAL entails measuring the gaps between the perceptions of customers, the level of service provided and the potential improvement (Molla and Licker, 2001).

Within e-commerce, a customer's satisfaction is mainly dependant on the customer's experience and expectations in using the e-commerce system. These service quality deficiencies experienced by customers may be a function of four key internal shortfalls or gaps which were defined by Parasuraman (1998) See Table 2.3.

Table 2.3: The four organisational (key internal) shortfalls or gaps (Parasuraman, 1998).

Gap	Definition
Market information gap	Seller's incomplete or accurate or inaccurate knowledge of customers' service expectations.
Service standard gap	Seller's failure to translate accurately customers' service expectations into specifications or guidelines for company personnel.
Service performance gap	Lack of appropriate internal support systems (e.g. recruitment, training, technology, compensation) that enable company personnel to deliver the service standards.
Internal communication gap	Inconsistencies between what customers are told the service will be like and the actual service performance (e.g. due to lack of internal communication between the service "promisers" and service providers.

Understanding customers' service expectations is a prerequisite for delivering superior service because they are implicit performance standards that customers use in assessing service quality (Parasuraman, 1998).

2.18   SUMMARY OF THE LITERATURE REVIEW

E-commerce systems demonstrate similarities with traditional information systems while at the same time allowing additional functionality that cannot be performed on typical information systems. The similarities between e-commerce systems and other information systems provide motivation for the researching of possibilities of extending IS theories to e-commerce. The Delone and McLean IS Success Model (1992) was used as a point of reference for evaluating IS effectiveness. Furthermore, a multi-stakeholder approach as suggested by Seddon et al. (1999) adds a further dimension to the IS Effectiveness evaluation.

The preliminary literature review has provided an overview of the following issues which are important to this study namely:

- IS Effectiveness and IS Effectiveness Frameworks.
- Service quality and e-service quality.
- Service quality as an important measure of IS success.
- A multi-stakeholder IS evaluation.
- IS Success Evaluation within online environments i.e. e-commerce.

The literature review furthermore has highlighted that there is no agreed set of measurements for IS effectiveness. Also, no empirical data has been provided in the IS literature, to verify recent assertions of IS effectiveness. In particular, no evidence has been provided regarding the use of service quality as an indicator of IS effectiveness, for web-based systems.

The literature review can be summarised as follows providing key pillars for evaluating IS success from an e-SQ perspective:

- Delone and McLean (1992) developed the D &M IS Success Model as a framework to evaluate IS Effectiveness.
- The D & M Model (2003) was updated to include Service Quality as a measure of IS effectiveness.
- Service quality is a key construct in the evaluation of IS success (Delone and McLean, 2003).
- IS effectiveness in e-commerce can be validated against quantified e–SQ dimensions based on empirical data (Parasuraman et al., 2005). These e-SQ dimensions provide a valid framework for further e-SQ research.
- IS effectiveness has to be evaluated from a particular stakeholder perspective and context (Seddon et al., 1999) providing a multi-stakeholder approach.
- The customers' expectation as opposed to their perception of service quality identifies shortfalls that need to be addressed (Parasuraman, 1998).

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1   INTRODUCTION

This chapter outlines the research design and methodology followed to conduct the fieldwork. One of the key objectives of the empirical work was to further our understanding of how e-SQ can be utilised as an indicator of IS success and develop a preliminary set of indicators to evaluate multi-stakeholder perspectives of e-SQ. Furthermore, the study sought to determine if there are gaps between stakeholder expectations and stakeholder perceptions regarding the service quality delivered by the IS. In order to achieve this, an 'Expectation' survey of e-SQ was distributed as part of the evaluation questionnaire.

The evidence needed to address the research problem required the research to study attitudes and behaviours of IS usage either directly or indirectly, by the various stakeholders. After careful consideration, it was decided that the objectives of this study would be best achieved using a case study approach. According to Myers (1997), case study research is suitable when a unit of analysis needs to be described e.g. a case study of a particular organisation. For this study, the IS users are the unit of analysis. More specifically, the study focused on whether the perceptions of users evaluating DealerWeb were satisfactory using e-SQ criteria as measures.

Babbie and Mouton (2004) state that a case study is an intensive investigation of a single unit involving the examination of multiple variables.   A case study was thus the most suitable option to investigate how to conduct a multi-stakeholder approach to e-SQ evaluation.

The study employed mainly quantitative methods to collect evidence. Quantitative evidence was gathered through the design and deployment of a questionnaire. The items for the questionnaire were based on an already tested scale, viz. E-S-QUAL which was constructed by Parasuraman et al. (2005). This scale has applied service quality constructs to mainly public open access retail web-site environments and provides a foundation to conduct the evaluation of IS effectiveness. Furthermore by using a scale that was already empirically validated, the questionnaire items ensure the relevance of the questionnaire construction and the reliability of the content produced by the instrument. The questionnaire was administered to three groups of stakeholders in TechSA between June and September 2006 via electronic mail.

[Please refer to the Appendices for the Questionnaire (Appendix A); Data Capturing Spreadsheets with corresponding data (Appendix B,C,D); Raw Data Capture Sheet (Appendix E,F,G); Profiles of respondents (Appendix K); Expectation of e-SQ dimensions survey (Appendix L); Expectation survey data captured (Appendix H,I,J)]; Questionnaire distribution e-mail (Appendix M).

3.2   DISTINGUISHING BETWEEN RESEARCH METHODOLOGY AND RESEARCH DESIGN

Babbie and Mouton (2004) define Research Design as a plan or structured framework of how a researcher intends undertaking the research process in order to solve the problem. Research design can be classified according to whether a study is empirical or non-empirical. Conversely, Research Methodology refers to the methods, techniques, and procedures that are employed in the process of implementing the research design and research plan, as well as the underlying principles and assumptions that underlie their use (Babbie and Mouton, 2004). The differences between research design and research methodology are summarised in Table 3.1:

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

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

3.3   RESEARCH FRAMEWORK

In order to develop an evaluation framework of IS effectiveness, the following approach was derived from IS and Marketing literature viz.:

- Service quality was initially used in a Marketing context and was evaluated using the SERVQUAL scale.

- Parasuraman et. al (1985) used SERVQUAL to identify gaps that exist between customer expectation and customer perception when evaluating service quality.

- Pitt and Watson (1995) applied SERVQUAL from a marketing context to IS.

- Service quality was identified as an important IS effectiveness measure (Delone and McLean, 2003) from the updated D & M IS Success Model.

- The literature however reveals that Service Quality cannot readily be applied within an online context (Pather et al., 2004).

- Parasuraman, Malhotra and Zeithaml (2005) adapted SERVQUAL to e-commerce context which resulted in the E-S-QUAL scale which was empirically tested and validated.

- Furthermore, Seddon et al. (1999) argues that a multi-stakeholder perspective should be considered when evaluating IS to obtain a holistic viewpoint.

- The formulated framework is represented in Figure 3.1:
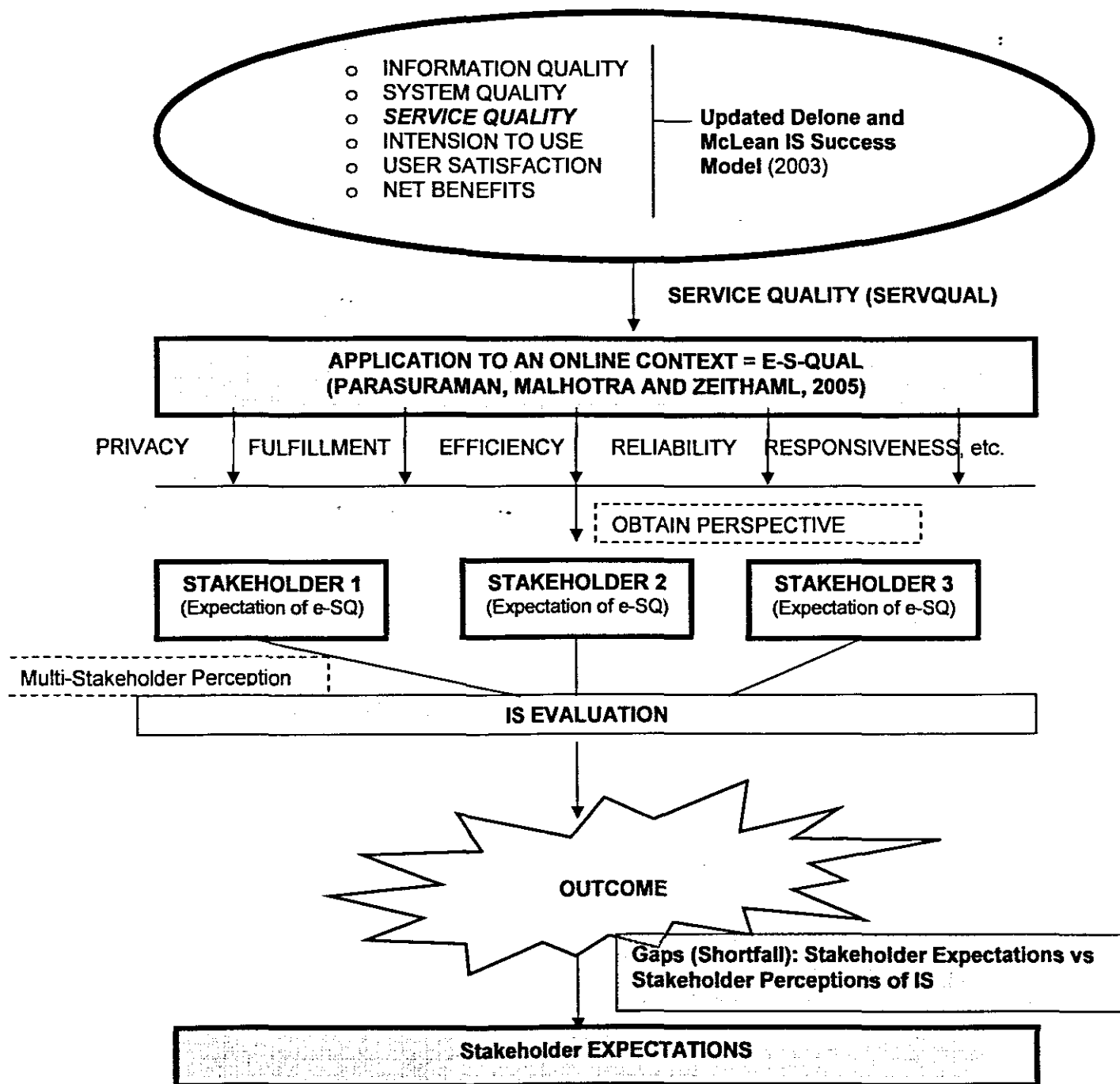
Figure 3.1: E-S-QUAL framework for multi-stakeholder perceptions

Therefore the study was designed to obtain five key deliverables using extant literature to answer the research questions namely:

- Stakeholder expectations of e-Service Quality.
- Stakeholder perceptions of e-Service Quality.

- Identify the gaps between stakeholder expectations and stakeholder perceptions.

- Determine whether e-service quality perceptions differ between stakeholder groups.

- Obtain a holistic perspective of e-service quality using multiple stakeholder viewpoints.

To facilitate the empirical study, a case study was implemented at TechSA using DealerWeb as a sample system to determine how e-service quality can be evaluated in web-based IS.

3.4   RESEARCH DESIGN

There were a number of possible research designs that were considered in order to provide acceptable answers to the research questions. These included Surveys, Case Studies, Content Analysis, Literature Reviews and Conceptual Analysis.

However the nature of the research problem guided the choice of design. Collecting data from multiple stakeholders in respect of the same IS was taken into account. It was difficult to find a single web-based application that was being used in multiple organisations. Consequently it was decided to investigate a single organisation in which multiple stakeholder perceptions of a single IS could be investigated.

Thus, case study design was chosen to conduct the field study. Case study approaches have been more traditionally used in disciplines such as business studies, jurisprudence, and social work (Babbie & Mouton, 2004). The case study method as a research tool, is one of many techniques used to collect data, and to build or validate theories (de Weerd-Nederhof, 2001; Yin, 1994). The motivating factors for using a case study approach are as follows:

- Given the time and resources available, it was not possible to study more than a single system. Thus a case-study approach was adopted.

- Case study research is the most common research method used in information systems (Myers, 1997).

- Yin (1994) defines the scope of a case study as follows: A case study is an empirical inquiry that:
  - investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

- The analysis of the case study will identify which multiple variables viz. e-SQ dimensions are most important to the different units of study namely stakeholders.

- In keeping with Babbie and Mouton's (2004) definition of case studies, the context of this study will be an insider perspective of IS usage within a small business (i.e. the Service Provider outlet).

- The case study research method is particularly well suited to IS research, since the objective of this discipline is the study of information systems in organisations, and "interest has shifted to organisational rather than technical issues" (Myers, 1997).

- There are several examples of the use of case studies in e-commerce research:
  - Delone & McLean (2004) used two cases viz. Barnes and Noble; ME Electronics in their study of "Measuring e-Commerce Success: Applying the Delone and McLean Information Systems Success Model".
  - Laosethakul & Boulton (2007) presented detailed case studies of nine e-commerce companies from different industries in Thailand.

- Service Quality research has often been conducted in a single organisation e.g. Riel, Semeijn & Janssen (2003).

The research design has been based on an extensive review of research literature in the areas of IS Effectiveness, IS Effectiveness Frameworks, Marketing, Service Quality and e-Commerce. The extant literature was sourced from IS Journals, IS Conferences Papers, Research Methodology Textbooks and the Internet. Some examples are the International Journal of Electronic Commerce and Journal of Electronic Commerce Research.

3.5   OVERVIEW OF THE CASE STUDY

One of the objectives of the empirical study was to determine if there would be any significant variations in the multi-stakeholder e-SQ perceptions of IS Success when evaluating web-based systems. Seddon et al. (1999) are firm in the view that a multi-stakeholder approach is essential when evaluating an IS. In other words, the key objective was to investigate how e-SQ measurement of a web-based system could be conducted among multiple stakeholders. This section provides an overview of the sample surveyed and the analysis of the data gathered.

In order to provide a realistic approach to the evaluation, a case study was done at *TechSA* [1]after entering into negotiations with senior management and the system sponsor at the company. TechSA is a leading cellular network that provides and maintains cellular telecommunications networks including infrastructure and services. These services include mobile data, blackberry, mobile television and small message services. TechSA also has customer-care walk-in centres that provide assistance with cellular services, handset enquiries, billing enquiries and general information to customers. The network is represented in figure 3.2:

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[1] The reference is not used due to confidentiality concerns of the company where the case study was conducted.
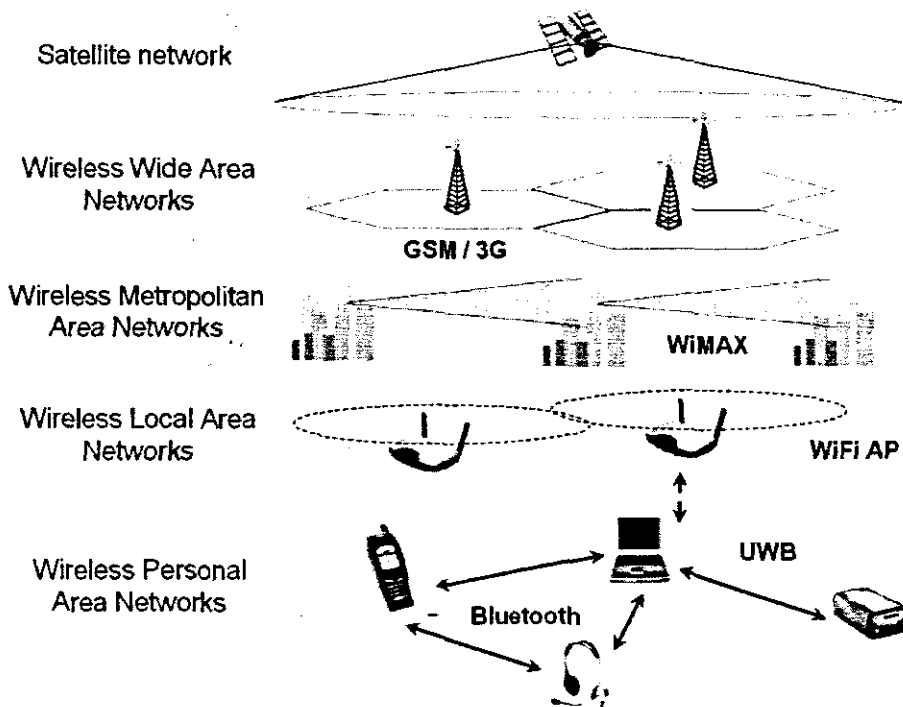
Figure 3.2: Cellular network depicting services offered by TechSA

TechSA utilises a web-based system, *DealerWeb*, to administer day-to-day transactions between Service Provider outlets and the company itself. This system facilitates all customer updates and requests that are made via the Service Providers, i.e. *DealerWeb* provides an interface to the Service Providers to interact with *TechSA*. Some of the transactions *DealerWeb* facilitates are new customer requests; changing existing customer and subscriber profiles; upgrading of contract cellular phones packages amongst others. The three main stakeholders that interact with the *DealerWeb* System are:

- **Service Providers (SP)**: these are agents who use *DealerWeb* on a daily basis to conduct business transactions.

- **HelpDesk Staff**: these are agents who provide a support function to the Service Providers regarding *DealerWeb*. For example, if a Service Provider is unclear as to certain functionality or aspects of the system, the HelpDesk staff would provide assistance.

↓ **Internal IS Staff**: these are the designers and developers of the system. This group is inclusive of IS managers, Business Analysts and Developers.

Surveying these three stakeholder groups could determine whether a multi-stakeholder evaluation provides a holistic perspective (Seddon et al., 1999) of stakeholder perceptions concerning the success of *DealerWeb* e-SQ success. Figure 3.3 shows a subset of the questionnaire distributed to the three stakeholder groups. In the sample below, "*Privacy*" represents the e-SQ dimension with its subsequent units of evaluation (Appendix A).

1	Privacy The degree to which the site is safe and protects all information	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
No	**ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM.** Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.					
1.1	The system does protect information about my system-querying behaviour.					
1.2	It does not share personal information with other sites — my business information is not shared with other Service Providers.					

Figure 3.3: A subset of the research questionnaire used to conduct the field study

3.6   DESIGN OF THE QUESTIONNAIRE

Questionnaires were used as the instrument for data collection. A questionnaire is a method used to collect data by asking questions and recording the responses (Babbie and Mouton, 2004). In other words, a

questionnaire is a document containing questions and other types of items to solicit information appropriate to analysis (Babbie and Mouton, 2004).

The questionnaire format consisted of a 5-point Likert scale to determine the relative intensity of stakeholders' response to different items. The scale includes the response categories of 1=Strongly Disagree; 2=Disagree; 3=Not applicable to me; 4=Agree; 5=Strongly Agree.

In keeping with the approach taken in other similar studies (e.g. Crowston, K., Annabi, H. & Howison, J. (2003)) a quantitative approach was used to carry out the empirical study. Quantitative analysis refers to the numerical representation and manipulation of observations for the purpose of describing and explaining phenomena that those observations reflect (Babbie and Mouton, 2004).

The questionnaire incorporated items from the E-S-QUAL instrument for the following reasons:

- The rate of recurrence of the SERVQUAL scale (Parasuraman et al., 1988), and subsequent E-S-QUAL scale (Parasuraman et al., 2005) in the literature.

- Both these frameworks have been extensively cited and have been tested and adopted in various contexts by both IS and marketing researchers.

- Thus the e-SQ dimensions that comprise the E-S-QUAL Scale (Parasuraman et al., 2005) were used as a basis for the questionnaire.

- Furthermore, this scale has become dominant in that the e-SQ dimensions have been empirically proven as being valid constructs in the evaluation of online service quality.

The E-S-QUAL items were slightly adapted and reworded to suit a Telecommunications context so that the questions asked had relevance within the environment where the questionnaire was being administered. For example the use of a telecommunications concept was added to one

of the questionnaire items for clarity: *The site makes new products (e.g. Data Bundle Voucher) available for delivery within a suitable time frame.*

3.7.1 Use of a questionnaire

Using a questionnaire, the study employed quantitative methods to gather information from the three stakeholder groups. Quantitative research is quite useful when assigning numbers to perceived qualities of things (Babbie and Mouton, 2004). The questionnaire comprised detailed instructions that the respondent had to adhere to in order to accurately complete it. Participants were given the same questionnaire across the stakeholder groups so that direct comparisons between the results were possible.

3.7.2 Sampling

The ultimate purpose of sampling is to select a set of elements from a population in such a way that descriptions of those elements (statistics) accurately portray the parameters of the total population from which the elements are selected.

Sampling refers a lot about observations namely what or who to observe. According to Babbie and Mouton (2004), a social researcher has a whole world of potential observations. A critical part of social research is the decision of what to observe and what not. Sampling is the process of selecting observations.

Sampling types include probability sampling. *"In probability sampling, every member of the target population has a known, non-zero probability of being included in the sample. Probability sampling implies the use of*

random selection. Random sampling eliminates subjectivity in choosing a sample." (Fink, 1995: 29).

Probability sampling was considered, but not used for the reasons given below:

Over a period of four months, the questionnaires were completed electronically and returned to the specified recipient e-mail address. Questionnaire ratios distributed in comparison to those returned are summarised in Table 3.2:

Table 3.2: Number of questionnaires distributed

Respondent group	Distributed
Service Providers	157
HelpDesk Staff	4
Internal IS Staff	5

3.8   RELIABILITY AND VALIDITY: COMPLETENESS CHECKS

After manually screening the data 4 of the returned questionnaires from the Service Provider's were eliminated. The reason for this was that there was a large number of missing values. Data from 2 SP questionnaires was checked and two minor items were not completed. These SP's were contacted and the amendments made to increase the response rate. All questionnaires from the HelpDesk and Internal IS group were correctly completed.

In total 47 questionnaires were used for analysis. This consisted of 38 SP's, 4 HelpDesk Staff and 5 Internal IS Staff.

3.9   CAPTURING OF DATA

The results of the questionnaires were recorded on a spreadsheet consisting of three capture sheets for each of the respondent groups. The capture sheets allowed the researcher to input each response from the questionnaire as reflected in Figure 3.4.

No.	Representative	Service Provider	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
1	Jana van der Walt	Springs	5	5	5	5	5	4	1	4	5
2	Tatum Davids	Canal Walk	3	4	4	4	4	4	4	4	4
3	Belinda Pieterse	Nelson Mandela Square	4	4	3	4	4	4	4	4	4
4	Ilse du Plesis	Mimosa	4	4	4	4	4	4	4	4	4

Figure 3.4: Sample of capturing instrument for each questionnaire item

Responses were coded from 1 to 5 as follows:

↓ 1 = Strongly Disagree

↓ 2 = Disagree

↓ 3 = Not applicable to me

↓ 4 = Agree

↓ 5 = Strongly Agree

Once the data was captured, summaries were created for each of the e-SQ dimensions and stakeholder groups. The open-ended items that did not form part of the e-SQ dimension (see 3.6) were also captured using a spreadsheet and were summarised according to stakeholder group. The questionnaire administration process is depicted in Figure 3.5:
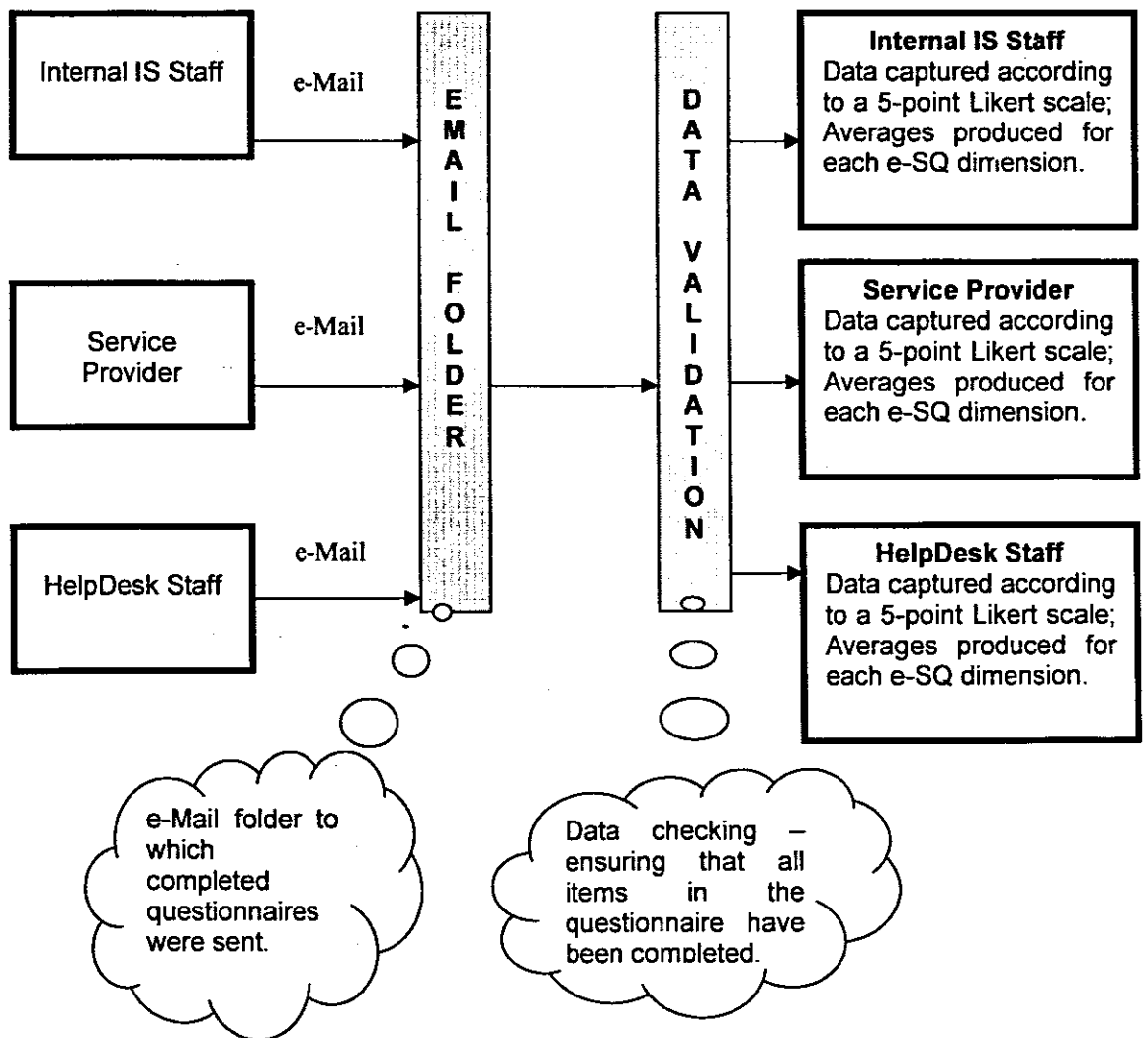
Figure 3.5: Questionnaire administration process

3.10   APPROACH FOR ANALYSING DATA

The goal of analysis is to address the initial propositions of the case study while treating the evidence fairly (Rahim and Baksh, 2003). Analysis involves "breaking up" the data into manageable themes, patterns, trends and relationships (Mouton, 2004). The following approach was used to analyse the data :.

+ Summarise the data received.

+ Compile appropriate tables and graphs.

+ Examine relationships among variables.

🔸 Determine what the perceptions of the multiple stakeholders   .
are regarding how DealerWeb delivers on the various e-
service quality dimensions.

🔸 Compare stakeholder perceptions of e-SQ to determine
differences.

🔸 Determine differences between stakeholder expectations
and stakeholder perceptions of e-SQ and establish gaps, if
any.

🔸 The results from the above would then be used to determine
if a multi-stakeholder evaluation brings about a holistic
perspective of IS effectiveness compared to a single
approach.   ·

🔸 Develop and propose a model of evaluating IS Effectiveness
using e-SQ constructs amongst multiple stakeholders.

The results of the evaluation across the three stakeholders groups were
compared and conclusions were drawn.

3.11   CHAPTER CONCLUSION

In this chapter, a detailed summary was given on the design and
methodology followed to conduct the case study. The case study was
implemented using a single organisation and web-based system. The
chapter can be summarised having covered:

🔸 The research framework
🔸 Research design
🔸 Overview of the case study
🔸 Questionnaire design
🔸 Research methods
🔸 Sampling
🔸 Questionnaire distribution and receipt
🔸 Reliability and validity: completeness checks
🔸 Capturing of questionnaire data

↓ Approach for analysing data: summarising and drawing
   comparisons

In summary, a detailed methodology of how a multi-stakeholder
evaluation of IS Effectiveness was conducted at a single-organisation.
This chapter has identified which considerations must be taken into
account when evaluating IS as a single-stakeholder approach would
indicate a narrow view of IS assessment.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

This chapter presents the results of the data analysis and discusses the findings. Figure 4.1 presents an overview of the key aspects of the analysis, which in turn are responses to the research questions. Figure 4.1 also indicates which sections of this chapter the different analyses are presented in.

Section 4.5   **Section 4.6**   **Section 4.7 & 4.8**

| What are the expectations of the multiple stakeholders regarding e-SQ delivered by DealerWeb? | What are the perceptions of the multiple stakeholders regarding DealerWeb

Research Question: 1.4.1 | Comparing stakeholder expectations to stakeholder perceptions of e-SQ and identifying gaps

Research Question: 1.4.4 |

Section 4.10   **Section 4.9**

| How do perceptions of e-SQ differ amongst the different stakeholder groups

Research Question: 1.4.2 | Does a multi-stakeholder evaluation of an IS provide a more holistic perspective of IS effectiveness

Research Question: 1.4.3 |

Figure 4.1: Overview of the key aspects of data analysis showing which section of this chapter they represent

4.2 SUMMARY OF SURVEY RESPONSES

An overview of the administration of the questionnaire is presented below as well as a profile for each stakeholder group.

4.2.1 Results: Rate of return

Table 4.1: Overall Stakeholder Questionnaire Information

Stakeholder Group	Total Population	Questionnaires Received	Response rate
Service Providers	150	38	25.33%
Helpdesk Staff (Super Users)	4	4	100%
IS Project Team	5	5	100%

From Table 4.1, the ratios of returned and validated questionnaires are as follows:

Service Providers: Internal IS Staff: Helpdesk = 38: 5: 4. The importance of this ratio is that the average percentages would differ significantly where the sample population is minute. In other words, noticeable differences in average stakeholder group responses are visible between rating criteria. The Service Provider has the highest number of responses, hence during analysis it was observed that the variance between rating criteria was less explicit. The response rate of the service providers indicate that less than a third completed and returned the questionnaire. This outcome can be viewed negatively as the true indication of the perception of the DealerWeb system might not be evident given the low return.

4.2.2 Usage of the DealerWeb System

The key objective of this section is to report on the extent to which DealerWeb is used by the 3 stakeholder groups. Furthermore, this section provides information on the use of the system by each stakeholder group.

DealerWeb held by the stakeholder groups. The use of a weighted average for each stakeholder group using e-SQ criteria as well as computing the average across the three groups, provides a holistic perspective of the service quality delivered by the DealerWeb system.

One of the main objectives in reporting the findings is to compare the stakeholder expectations to stakeholder perceptions of e-SQ dimensions. For this study, the importance of e-SQ dimensions are regarded as the expectations the stakeholders had pertaining to those e-SQ dimensions. Low evaluative scores compared to high stakeholder expectations of e-SQ dimensions, could suggest which e-SQ dimensions possibly require greater attention based on the gap between expectation and perception of e-SQ.

The columns in the tables in which the data is reported are organised as follows:

- e-SQ dimension as defined by Parasuraman et al. (2005).
- The total number of responses for each e-SQ dimension.

Note that the items in the 5-point Likert scale in the questionnaire were *Strongly Disagree, Disagree, Not applicable to me, Agree and Strongly Agree*. In order to provide a more definitive rating of each e-SQ dimension and stakeholder group, the rating criteria have been combined as follows:

- Strongly Disagree and Disagree as a single criteria.
- Strongly Agree and Agree as a single criteria.

Other pertinent information that needs to be highlighted as follows:

- Each e-SQ dimension has a weighted average depicting the overall rating for the dimension.
- All items in the questionnaire were positively worded. Therefore the high scores summarised in "strongly agree / agree" columns would indicate satisfaction in a particular dimension.

⤷ A rating of less than 50% represents the minority of the stakeholder responses. In other words, it indicates that an e-SQ dimension has been rated unsuccessfully.

⤷ A majority percentage of greater than 50% is regarded as a successful evaluation of that e-SQ dimension.

4.4 WEIGHTED AVERAGES

A weighted average differs from an average in that a weighted average returns a number that depends both on its value and its weight (Investopedia, 2007). It is suitable for analysis in that it is representative of the sample population that participated in the evaluation.

In each table a weighted average has been calculated. A weighted average refers to an average in which each quantity to be averaged is assigned a weight (Investopedia, 2007). These weightings determine the relative importance of each quantity on the average. Weightings are the equivalent of having that many like items with the same value involved in the average.   The following example demonstrates weighted averages using 4 steps:

Value: 10   8   5   4   3   2   1   0
Occurrences: 2   2   1   10   8   7   68 2

To average these values, do a weighted average using the number of occurrences of each value as the weight. The formulae to calculate a weighted average is as follows:

1. Multiply each value by its weight.

Calculation	Result
10 * 2	20
8 * 2	16
5 * 1	5
4 * 10	40
3 * 8	24
2 * 7	14
1 * 68	68
0 * 2	0

2. Add up the products of value times weight to get the total value. (Result: $\Sigma = 187$)

3. Add the weights themselves to get the total weight. (Result: $\Sigma = 100$)

4. Divide the total value by the total weight. (Result: 187/100 = 1.87).

In the context of this study, a weighted average refers to the accumulative scores of each e-SQ item and items on the Likert scale, divided by the number of responses. For example, in the 'X' stakeholder group for the 'Y' e-SQ dimension, there were 7 evaluation items:

- Assigned to each evaluation item are rating categories such as Strongly Agree / Agree, Strongly Disagree / Disagree, etc. These ratings will be split across the "7" evaluations items defined above.
- 20 respondents

Therefore weighted average for the 'Y' e-SQ dimension is computed as follows:

For the Service Provider group, and e-SQ dimension, the study reports the following viz.:

- 31 (Strongly Agree) responses
- 9 evaluation items
- 20 respondents
- Therefore the weighted average = 31 / (9 * 20)

$$= 0.17 * 100(\%)$$
$$= 17\%$$

In the results presented, for each stakeholder group, a weighted average has been attached to every e-SQ dimension. This weighted average provides an indication of which dimensions might not have met their Service Quality expectations. Using these averages, the DealerWeb design team has a clearer indication of areas that need attention or possible redevelopment. If these ratings are arranged in ascending order, the focus of the lowest rated dimension can be prioritised as most important. In doing so, the resources in terms of time and material can be apportioned in such a way that the lower rated dimensions receive greater resource provision. Weighted averages are thus useful in that they provide a benchmark against which to evaluate each e-SQ dimension if the same

Information System is evaluated again after improvements have been effected to the system.

4.5 IMPORTANCE OF E-SQ DIMENSIONS TO DEALERWEB USERS

The importance of e-SQ dimensions refers to whether the stakeholders perceived the evaluation criteria used in the instrument to be important to the evaluation exercise. This section presents a summary of responses to the "Expectations of e-SQ" section in the questionnaire which indicated the importance of each dimension. These were used to determine how the stakeholder expectations of e-SQ dimensions compare to the stakeholders perception of the e-SQ dimensions. In the "Expectations of e-SQ" section of the questionnaire, the rating criteria of *important* and *critically important* were combined as the overall rating of how significant each e-SQ dimension is to each of the stakeholder groups. In other words, the accumulative total of the two rating criteria will present the importance rating.

4.5.1 Service Providers

The overall summary of how important the e-SQ dimensions are to the Service Provider stakeholders is depicted in the Table 4.3. Appendix H

contains more detailed tables that show actual responses i.e. the scores for each criteriion contained in each dimension. These tables reflect exactly how the weighted averages have been computed.

Table 4.3: Summary of Service Provider responses

Service Provider				
e-SQ Dimension	Irrelevant	Not Important	Important	Critically Important
Privacy	0%	5%	35%	60%
Fulfilment	0%	0%	30%	70%
Efficiency	0%	0%	10%	90%
Reliability	0%	0%	10%	90%
Responsiveness	0%	0%	20%	80%
Compensation	0%	0%	40%	60%
Contact	0%	0%	25%	75%
Weighted Average	**0%**	**0.71%**	**24.29%**	**75%**

From Table 4.3 the following observations were made:

- All e-SQ dimensions are important to the Service Provider stakeholder group with averages exceeding 50% in important and critically important columns i.e. 75% of the respondents indicated that the e-SQ dimensions were critically important.

- Reliability and Efficiency are the most critically important of the seven dimensions with a weighted average of 90%.

- With each e-SQ dimension having a weighted average of over 50% and an overall weighted average of 75% for critically important, it therefore suggests that all of the e-SQ dimensions are important to this stakeholder group. The overall importance rating = 75% + 24.29% viz. 99.29%.

4.5.2 Helpdesk

The overall summary of how important the e-SQ dimensions are to the Helpdesk stakeholder is shown in Table 4.4. Appendix J contains more detailed tables that show actual responses i.e. the scores for each criteria contained in each dimension.

Table 4.4: Summary of Helpdesk Staff responses

HelpDesk				
e-SQ Dimension	Irrelevant	Not Important	Important	Critically Important
Privacy	0%	0%	25%	75%
Fulfilment	0%	0%	25%	75%
Efficiency	0%	0%	25%	75%
Reliability	0%	0%	50%	50%
Responsiveness	0%	0%	0%	100%
Compensation	25%	25%	0%	50%
Contact	0%	0%	50%	50%
Weighted Average	**3.57%**	**3.57%**	**25%**	**67.86%**

From Table 4.4 the following observations were made:

+ The Service Provider stakeholder group found all e-SQ dimensions to be important.

+ However, the relatively low weighted averages of Reliability, Compensation and Contact (50%) are possible areas of concern as compared to the weighted averages of the other dimensions for this stakeholder group. It is possible that these dimensions may not really be important to this group of stakeholders.

+ The rating of 75% for Reliability for this group warrants some further investigation. This is because one would assume that in terms of the nature of the support provided by this stakeholder, the

4.5.2 Helpdesk

The overall summary of how important the e-SQ dimensions are to the Helpdesk stakeholder is shown in Table 4.4. Appendix J contains more detailed tables that show actual responses i.e. the scores for each criteria contained in each dimension.

Table 4.4: Summary of Helpdesk Staff responses

HelpDesk				
e-SQ Dimension	Irrelevant	Not Important	Important	Critically Important
Privacy	0%	0%	25%	75%
Fulfilment	0%	0%	25%	75%
Efficiency	0%	0%	25%	75%
Reliability	0%	0%	50%	50%
Responsiveness	0%	0%	0%	100%
Compensation	25%	25%	0%	50%
Contact	0%	0%	50%	50%
Weighted Average	**3.57%**	**3.57%**	**25%**	**67.86%**

From Table 4.4 the following observations were made:

- The Service Provider stakeholder group found all e-SQ dimensions to be important.

- However, the relatively low weighted averages of Reliability, Compensation and Contact (50%) are possible areas of concern as compared to the weighted averages of the other dimensions for this stakeholder group. It is possible that these dimensions may not really be important to this group of stakeholders.

- The rating of 75% for Reliability for this group warrants some further investigation. This is because one would assume that in terms of the nature of the support provided by this stakeholder, the

availability, i.e. reliability of the system, should be one of the key system attributes.

↓ Each e-SQ dimension has a weighted average of 50% and above, and an overall weighted average of 67.86%. This suggests that each e-SQ dimension is of critical importance to this stakeholder.

4.5.3 Internal IS Staff

The overall summary of how relevant the e-SQ dimensions are to the IS Staff stakeholders is depicted in the table below. Appendix I contains more detailed tables that show actual responses i.e. the scores for each criterion contained in each dimension.

Table 4.5: Summary of IS Staff responses

Internal IS Staff				
e-SQ Dimension	Irrelevant	Not Important	Important	Critically Important
Privacy	0%	0%	20%	80%
Fulfilment	0%	0%	40%	60%
Efficiency	0%	0%	40%	60%
Reliability	0%	0%	0%	100%
Responsiveness	0%	0%	40%	60%
Compensation	0%	0%	40%	60%
Contact	0%	20%	20%	60%
Weighted Average	**0%**	**2.86%**	**28.57%**	**68.57%**

From Table 4.5 the following observations are made:

↓ All e-SQ dimensions are important to the IS Staff Stakeholders with weighted averages of above 50%.

↓ The IS Staff have rated Reliability as the most critical e-SQ dimension at 100%. This suggests that in order for DealerWeb to

provide satisfactory service quality, the web-based system should
be reliable.

+ Reliability is followed by Privacy at 80%. This would suggest that
Internal IS Staff regards access to certain data and information as
confidential to the information owners.

+ With each e-SQ dimension having a weighted average of above
50%, and an overall weighted average of 68.57%, it therefore
suggests that each e-SQ dimension is of critical importance to this
stakeholder group.

4.5.4 Combined stakeholder responses to importance of e-SQ dimensions

Table 4.6: Summary of the three stakeholders according to weighted averages of e-SQ importance

Stakeholder	Irrelevant	Not Important	Important	Critical
Service Providers	0%	0.71%	24.29%	75%
IS Internal Staff	0%	2.86	28.57	68.57
Helpdesk	3.57%	3.57%	25%	67.86%
Weighted Average	**1.19%**	**2.38%**	**25.95%**	**70.48**

From Table 4.6 the following observations were made:

+ The average of the important and critically important columns
accumulates to 96.43% (i.e. 70.48% + 25.95%). Therefore it can be
noted that the e-SQ dimensions are perceived to be important
across all stakeholder groups.

+ The highest reporting percentage of "Critical" (75%) resides with the
Service Provider stakeholder. This suggests that these are the
primary end-users.

4.6 EVALUATION OF THE DEALERWEB SYSTEM

This section focuses on the scores indicated by each stakeholder group for each e-SQ dimension. These dimensions consist of a set of evaluation criteria items which stakeholders had to respond to. The dimensions were defined in the questionnaire as follows:

Table 4.7: Definition of e-SQ Dimensions

e-SQ Dimension	Definition
Privacy	The degree to which the site is safe and protects all information.
Fulfilment	The extent to which the site's promises about order delivery and item availability are fulfilled.
Efficiency	The ease and speed of accessing and using the site.
Reliability (system availability)	The correct technical functioning of the site.
Responsiveness	Quick response and ability to get help if there is a problem or question.
Compensation	The degree to which the site compensates users for problems.
Contact	The availability of assistance through telephone or online. In other words the ability to get on the site quickly and to reach the company when needed.

In the interpretation of the data in the following sections a majority response is considered to be 51% and above. For example if a particular stakeholder group has returned a summed response of 55% for a specific e-SQ dimension, then this is considered as an expression of satisfaction that the system is perceived to be performing adequately for the specific criteria set.

The same applies where 51% and above have rated an e-SQ dimension as inefficient. This in turn will serve as an indicator in this study to specify perceptions of failure of e-SQ dimensions.

4.6.1 Service Provider Evaluation

Table 4.8: Summary of Service Provider responses

e-SQ	Service Providers' Responses		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
Privacy	8.19%	6.14%	85.67%
Fulfilment	14.25%	10.53%	75.22%
Efficiency	21.99%	7.71%	70.30%
Responsiveness	22.18%	10.90%	66.92%
Contact	22.11%	11.58%	66.32%
Compensation	21.71%	21.05%	57.24%
Reliability	41.73%	7.14%	51.13%
Weighted Average	**21.74%**	**10.72%**	**67.54%**

The overall summary of Service Provider responses according to weighted averages are shown in Table 4.8 in descending order of the rating category Strongly Agee / Agree. Appendix E contains more detailed tables that show actual responses for each of the criteria associated with the e-SQ dimension.

From Table 4.8 the following observations are made:

+ Privacy was rated the highest at 85.67% followed by Fulfilment at 75.22% for this stakeholder group.

+ DealerWeb appears to be meeting all expectations of the Service Providers regarding service quality.

+ However, the relatively low weighted averages for Reliability and Compensation are possible areas of concern as compared to the weighted averages of the other dimensions for this stakeholder group. As this stakeholder group represents the primary end-users, such a low response to reliability of DealerWeb has an impact on the successful evaluation of the system.

⤷ Table 4.3 depicts Reliability as important and critically important in providing Service Quality to the Service Provider group. However, Reliability has the lowest (51.13%) evaluation for this stakeholder group. The rating of just over 50% could be regarded as unsatisfactory in comparison to the extent to which the Service Provider group has indicated the importance of Reliability. The evaluation of Efficiency as one of the top three most successful dimensions coincides with Table 4.3 as being a dimension indicated with a high level of importance for the Service Provider group.

From these ratings it is evident that DealerWeb is possibly lacking in the areas of Reliability and Compensation. These dimensions are both in the 50% category i.e. 50% - 59%, and might require further attention if compared to the other e-SQ dimensions which have weighted averages of greater than 60%.

None of the e-SQ dimensions were rated unsuccessfully by the Service Providers i.e. in the below 50% category. It could thus be concluded that the DealerWeb System has met this stakeholder's expectations of service quality.

For all seven dimensions, the rating criteria of "not applicable to me" are relatively low compared to the other rating categories. Compensation has the highest percentage of 21.05%. This indicates that e-SQ criteria used in this survey are applicable to the evaluation of Service Quality in this type of environment, for this stakeholder group.

Reliability and Efficiency have the highest rating of dissatisfaction of service quality at 41.73% and 21.99% respectively. If the weighted average of 50% justifies satisfactory perception of Service Quality, then Reliability is cause for possible concern at 41.73%. As shown in Table 4.2, more than 50% of the Service Providers utilise DealerWeb for day

to day operations. In other words, the system's availability for business purposes is pertinent to the operability of a Service Provider outlet.

4.6.2 Internal IS Staff Evaluation

Internal IS Staff are responsible for the entire Systems Development Life Cycle (SDLC) of DealerWeb. The SDLC consists of Systems Investigations and Specifications; System Analysis and Design; System Development and Testing; and System Implementation and Maintenance. The responses are summarised in Table 4.9.

Table 4.9: Summary of Internal IS Staff Questionnaire responses

	Internal IS Staff Responses		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
Efficiency	20%	21.43%	58.57%
Fulfilment	8.33%	35%	56.67%
Privacy	15.56%	28.89%	55.56%
Reliability	37.14%	14.29%	48.57%
Responsiveness	25.71%	25.71%	48.57%
Contact	32%	24%	44%
Compensation	35%	40%	25%
Weighted Average	**24.82%**	**27.05%**	**48.13%**

The overall summary of Internal IS Staff responses according to weighted averages are shown in Table 4.9 in descending order of success. Appendix F contains more detailed tables that show actual responses for each of the criteria associated with the e-SQ dimension.

From Table 4.9 the following observations were made:

- ⬥ Efficiency was rated the highest at 58.57% followed by Fulfilment at 56.67% for this stakeholder group.

⬇ DealerWeb does not appear to be meeting the e-SQ expectations of the Internal IS Staff stakeholder group with the overall weighted average being 48.13%.

⬇ The majority of the e-SQ dimensions have been rated as unsatisfactory as four dimensions have been rated below 50%.

⬇ These ratings indicate that DealerWeb is possibly lacking in the areas of Compensation, Contact, Responsiveness and Reliability. The rating of these e-SQ dimensions are below average and possibly not acceptable and therefore requires greater development or maintenance focus.

⬇ A comparison can be made with the results of Table 4.5 in which the Internal IS stakeholder group has indicated that all e-SQ dimensions are important. However, the expectations of the Internal IS group have not been satisfied as four of the e-SQ dimensions have a rating of below 50%.

⬇ In section 4.5.3 it was established that the Internal IS Staff has indicated that Reliability was Critical in providing Service Quality. Consequently, Reliability has been perceived by the Internal IS group as being unsatisfactory with a rating of 48.57%.

Table 4.10: Internal IS Staff weighted averages for disagree and not applicable rating

E-SQ Dimension	Disagree	Not applicable to me
Privacy	15.56%	28.89%
Fulfilment	8.33%	35%
Efficiency	20%	21.43%
Reliability	37.14%	14.29%
Compensation	35%	40%
Contact	35%	25%
Responsiveness	25.71%	25.71%

Table 4.10 depicts that this stakeholder group has percentage ratings in the category "Not applicable to me" as rated higher than the "Disagree" category. For example, this group negatively rated the Compensation of the system at 35%, but at the same time 40% as "Not applicable to me".

This implies that only 25% were satisfied with this e-SQ dimension. A possible reason for the low success rating could be that these are not the primary users of the system. Given that the questionnaire items were phrased from a holistic perspective, variances in stakeholder perceptions could be expected. Possible reasons for the low rating of the system from this group could be related to factors such as insufficient or unclear user requirements; unrealistic time constraints to implement a thorough SDLC; insufficient design or development tools; insufficient infrastructure, among others[1].

This group does not have a rating score of greater than or equal to 60% which indicates that the e-SQ dimensions indicated as satisfactory represents half of the respondent perceptions only. Four of the 7 e-SQ dimensions were rated unsuccessfully by the Internal IS Staff. It could thus be concluded that the DealerWeb System has not met this group's expectations of e-SQ.

In all 7 dimensions, the response to the "not applicable to me" item on the Likert scale are high with a maximum rating percentage of 40% for Compensation. The inverse of this applies to the SP group where most questionnaire items were applicable. This suggests that not all the same questionnaire items to measure e-SQ of DealerWeb are applicable to all stakeholder groups. This is understandable for this category of stakeholder as their role function is the development and maintenance of the system. Nevertheless, their perceptions of the effectiveness are important. For future evaluations, the instrument for this group could be reworded to cater for their view as system developers.

Reliability, Compensation and Contact have the highest rating of dissatisfaction of service quality at 37.14%, 35% and 35% respectively. With 50% justifying satisfactory perception of Service Quality, the dimensions Reliability, Responsiveness, Contact and Compensation are cause for possible concern at 48.57.%, 48.57%, 44% and 25%

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[1] This however is a matter for further investigation

respectively. As indicated in Table 4.2, more than 50% of the IS Staff utilise DealerWeb operationally. This study assumes that this is a support and maintenance function. This could possibly highlight an insider view of poor design or development of the system.

4.6.3 Helpdesk Staff Evaluation

These are Super Users of the system who aid in the operability of Dealerweb to Service Providers. These individuals are the first line of support to Service Providers regarding assistance and queries with Dealerweb. *Super Users* [2] assist in providing detailed system requirements to the IS staff and assists in the User Acceptance Testing of Dealerweb. The responses for this group are presented in Table 4.11:

Table 4.11: Summary of Helpdesk Staff responses

	Helpdesk Staff Responses		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
Privacy	2.78%	13.89%	83.33%
Contact	25%	0%	75%
Efficiency	28.57%	7.14%	64.29%
Responsiveness	21.43%	17.86%	60.71%
Fulfilment	18.75%	29.17%	52.08%
Compensation	12.5%	50%	37.5%
Reliability	57.14%	14.29%	28.57%
Weighted Average	**23.74%**	**18.91%**	**57.35%**

The overall summary of Helpdesk Staff responses are shown in Table 4.11, arranged in descending order of responses for the Strongly Agree /

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2 Super users refer to a group that provides input as to how the Information System should function and assists in the administration of the system. This group also defines the business rules that must be applied.

Agree item of the Likert scale. Appendix G contains more detailed tables
that show actual responses for each of the criteria associated with each e-
SQ dimension.

From Table 4.11 the following observations were made:

- Privacy was rated the highest at 83.33% followed by Contact at
  75%.
- DealerWeb appears to be meeting the overall e-SQ expectations of
  the Helpdesk stakeholder group with a weighted average of
  57.35%.
- However, the relatively low weighted average of Compensation and
  Reliability as compared to others, are possible areas of concern
  with rating percentages of below 50%.
- With 50% and above indicating satisfactory perception of e-SQ, it is
  clear that these dimensions require greater systems development
  or maintenance focus.
- In section 4.3.4 it was established that the Helpdesk had indicated
  Responsiveness as Critical in providing Service Quality. However,
  this dimension is not the highest ranked in terms of the most
  satisfactory dimension. Responsiveness has the fourth highest
  rating which could indicate that its perception is unsatisfactory for
  the HelpDesk stakeholder group.

The HelpDesk staff group had an overall satisfactory perception of e-SQ
(60% +). This group has satisfactory perception rating scores for Privacy,
Efficiency, Contact and Responsiveness. Fulfilment has a rating score of
52.08% and could require improvement to align it with the four satisfactory
e-SQ dimensions.

Only two of the 7 e-SQ dimensions were rated as unsatisfactory by the
Helpdesk viz. Compensation and Reliability. It could be concluded that the
DealerWeb System has met the expectations of service quality. In other

words, holistically, more than half the e-SQ dimensions are regarded as having met the expectations of this stakeholder group.

In all seven dimensions, the items of the Likert scale "not applicable to me" are low except for Compensation which is at 50%. This suggests that the items for each e-SQ dimension are applicable to the HelpDesk group.

Reliability and Compensation have the highest indication of dissatisfaction at 28.57% and 37.5% respectively. Since satisfactory perception is indicated at above 50%, then Reliability and Compensation is cause for possible concern. As shown in the Table 4.2, more than 50% of the HelpDesk Staff use DealerWeb operationally. This study assumes that this is a support function assisting SP's with operational queries. More than 50% of the e-SQ dimensions have been indicated as having satisfactory perceptions. Thus it could be concluded that holistically the system has been perceived to be satisfactory for the HelpDesk group.

4.6.4 Comparing the Evaluation across Stakeholder Groups

Table 4.12 is a comparison of how the 3 stakeholder groups have rated the quality of service provided by DealerWeb in terms of responses to Agree / Strongly Agree on the Likert scale. In Table 4.12, the overall rating has been calculated by adding the weighted averages across the 3 stakeholder groups and then calculates the average thereof. Therefore the overall rating: (67.69% + 47.99% + 57.67%) / 3 = 57.67%. This indicates that overall, the quality of service provided by DealerWeb across the stakeholder groups is satisfactory.

Table 4.12: Comparison of three stakeholder groups - % Agree / Strongly Agree

e-SQ Dimension	Rating		
	Service Providers	Internal IS Staff	Helpdesk
Privacy	85.67%	55.56%	83.33%
Fulfilment	75.22%	56.67%	52.08%
Efficiency	70.30%	58.57%	64.29%
Reliability	51.13%	48.57%	28.57%
Responsiveness	66.92%	48.57%	60.71%
Compensation	57.24%	25%	37.5%
Contact	66.32%	44%	75%
Weighted Average	67.69%	47.99%	57.34%
Overall Rating			**57.67%**

From Table 4.12, the following observations are made:

+ Privacy: The SP's and Helpdesk have a similar rating for this dimension. The Internal IS group rating is lower compared to the HelpDesk and SP group. The assessment of the e-SQ dimensions by the Internal IS group, could have resulted as a consequence of the in depth knowledge the group has with regards to the technical functioning of the system.

+ Fulfilment: The SP's have rated this dimension higher than the other stakeholder groups. Since the SP's are the primary users of the system, this perception of the system is satisfactory as DealerWeb is extensively used in the daily operations of SP outlets.

+ Efficiency: It is positive that SP's have well indicated that this dimension is satisfactory. SP's endeavour to provide an efficient service to customers and DealerWeb supports this initiative. A slightly lower rating by the Helpdesk could mean that certain

processes within the system are not streamlined enough to provide a more efficient service to the SP's.

- Reliability or system availability: Both the Internal IS and Helpdesk group have rated this dimension as unsuccessful. Consequently, the SP's have indicated that this dimension is satisfactory. However with a low rating of 51.13%, there might be cause for concern. The low perception of the dimension by the Internal IS and Helpdesk group highlights that a few possibilities could have resulted in this rating e.g. inferior or unreliable infrastructure that the application was developed on or used to host to the system. From an IS development perspective, the development tools or infrastructure used were possibly not the recommended or adequate tools for the development of a reliable system. Other possibilities include limited application development budget to purchase the recommended development tools or bad management decisions. Therefore, it could have resulted in the Internal IS team developing the application below their personal recommended standards. This possibility is supported by the low perception allocated to this dimension by the SP's.

- Responsiveness: The SP and the Helpdesk group have indicated that this dimension provided above average (60% +) service quality. This suggests that both groups perceived that DealerWeb provides a satisfactory level of interaction with the users of the system. In the context of the Helpdesk Staff, this could be interpreted as sufficient feedback being provided which limits queries the SP's might have regarding system functionality. Consequently, the Helpdesk might have rated this dimension differently if ongoing support to the SP was not sufficiently facilitated by the system.

- Compensation: The Internal IS and Helpdesk group have perceived this dimension as being unsuccessful. However, the evaluation results indicate that the item of the Likert scale "not applicable to me" is high at 40% for the Internal IS and 50% for the Helpdesk groups. Therefore it can be concluded that this dimension is not as important for these 2 groups. This correlates with Table 4.4 and Table 4.5 which shows that the HelpDesk and Internal IS group have not indicated the e-SQ dimension as critical in comparison to other dimensions for these groups.

- Contact: As stated previously, the primary and super users of DealerWeb are the SP and HelpDesk groups. These stakeholders have indicated that the system provides a satisfactory level of service quality from a Contact perspective. The Helpdesk has indicated the highest rating for this dimension, namely 75%. This could suggest that the system facilitates providing assistance that would normally be provided by a Helpdesk agent. However, the Internal IS group has perceived this dimension as unsuccessful. This could imply that the full capability of providing assistance to the user has not fully been incorporated into the system.

In summary, the Internal IS group gave an overall rating of 47.99% to the DealerWeb System providing service quality across the 7 dimensions. This is a concern as the Internal IS group has the responsibility of the analysis, design and development of the application. Factors that could possibly have influenced the unsatisfactory perception of the system are limited budget for a comprehensive SDLC, developing against a poorly specified user requirement document, not having adequate development tools, etc. Additionally, some e-SQ dimensions are less important to one group as compared to another, which in turn has influenced how these stakeholder groups have evaluated the system.

From Table 4.12 it can be observed that collectively the three stakeholder groups have indicated that DealerWeb provides a satisfactory level of service quality with an overall rating of 57.67%. It is however clear that across the DealerWeb, not all features of the system represented by the e-SQ dimensions are optimal and therefore require attention.

4.7 COMPARING STAKEHOLDER EXPECTATIONS TO STAKEHOLDER PERCEPTIONS OF E-SQ[3]

This section compares the perceptions of e-SQ dimensions in 4.6 to the stakeholders' expectations of e-SQ dimensions in 4.5.

The rating criteria used to indicate the importance of the e-SQ dimensions for each stakeholder group are: Irrelevant; Not Important; Important; and Critically Important. For this study, Important and Critically Important criteria were combined and used as a single indicator of e-SQ importance. For example, if an e-SQ dimension was rated as Important (10%), and Critically Important (60%), then 70% would indicate the level of importance of a particular e-SQ dimension. The tables that follow depict the following in sequence:

- ↓ The perception of the e-SQ dimension
- ↓ Rating of "Important" then "Critically Important" e.g. 10% ; 60%
- ↓ The accumulative sum of the indicators "Important" and "Critically Important" e.g. 70%.

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[3] Expectations refer to what the stakeholder desires whereas perception refers to how the stakeholder observes a certain scenarios.

4.7.1 Service Providers

Table 4.13: Service Providers: Stakeholder expectation versus stakeholder perception of e-SQ dimensions

e-SQ Dimension	Stakeholder Perception	Stakeholder Expectation		
		Important	Critically Important	Accumulative sum
Privacy	85.67%	35%	60%	95%
Efficiency	70.30%	10%	90%	100%
Responsiveness	66.92%	20%	80%	100%
Reliability	51.13%	10%	90%	100%
Contact	66.32%	25%	75%	100%
Compensation	57.24%	40%	60%	100%
Fulfilment	75.22%	30%	70%	100%

Table 4.13 clearly indicates that each dimension evaluated is important to the Service Provider group. It is evident that all of the Service Provider expectations of the e-SQ dimensions have been satisfied as the percentage rating exceeds 50%.

Reliability and Compensation has the lowest perception of satisfaction. Compared to the expectations of these 2 e-SQ dimensions, the perception of Reliability and Compensation has not satisfied the expectations for the Service Provider group.

4.7.2 Internal IS Staff

Table 4.14: Internal IS staff: Stakeholder expectation versus stakeholder perception of e-SQ dimensions

e-SQ Dimension	Stakeholder Perception	Stakeholder Expectation
		Important / Critically Important
Privacy	55.56%	100%
Efficiency	58.57%	100%
Responsiveness	48.57%	100%
Reliability	48.57%	100%
Contact	44%	80%
Compensation	25%	100%
Fulfilment	56.67%	100%

The Internal IS group has indicated that each e-SQ dimension is important. Contact has the only expectation rating of lower than 100% but this is representative of the majority of the respondents.

In comparison to the Internal IS group's expectations of the e-SQ dimensions, the perceptions of e-SQ indicate a shortfall of more than 50% in most cases. In other words, the evaluation results of the e-SQ dimensions suggest that the perceptions are unsatisfactory in relation to the expectations of the Internal IS group.

The low perception of the Internal IS group is of concern as this stakeholder group has the responsibility of the design, analysis, development and maintenance of DealerWeb. Section 4.6.2 highlights possible reasons why most e-SQ dimensions have a low rating for the Internal IS group. Consequently, this stakeholder group has high expectations of the e-SQ dimensions delivered through DealerWeb.

4.7.3 HelpDesk Staff

Table 4.15: Helpdesk: Stakeholder expectation versus stakeholder perception of e-SQ dimensions

e-SQ Dimension	Stakeholder Perception	Stakeholder Expectation
		Important / Critically Important
Privacy	83.33%	100%
Efficiency	64.29%	100%
Responsiveness	60.71%	100%
Reliability	28.57%	100%
Contact	75%	100%
Compensation	37.5%	50%
Fulfilment	52.08%	100%

From Table 4.15 it can be observed that the HelpDesk group has indicated that each of the e-SQ dimensions is of importance to the group. Compensation is the only dimension that has an expectation rating of 50%, which is not representative of the majority of the responses for this

group. In other words, the Compensation dimension has significance to half the respondents in this group only. The HelpDesk has indicated that the Compensation dimension is unsatisfactory (35.7%). However, the expectation attached to Compensation for this group is not high. This suggests that this dimension is not significant to this stakeholder group.

Table 4.15 depicts that Reliability 28.57% was perceived as providing unsatisfactory service quality. In comparison to the expectations (100%) of the HelpDesk group, a gap exists between what the HelpDesk has expected from the Reliability dimension compared to the perception of this e-SQ dimension. The remaining dimensions have evaluation scores of greater than 60% indicating a satisfactory perception of service quality. It could be concluded that Contact, Privacy, Efficiency, Responsiveness and Fulfilment have satisfied the expectations of the HelpDesk group in terms of satisfying e-SQ perceptions.

4.7.4 Summary of expectation versus perception comparison

From Tables 4.13, 4.14 and 4.15 it can be observed that each e-SQ dimension is important in the perception of e-SQ for each of the stakeholder groups. However, the HelpDesk group has indicated Compensation as the only dimension to have a low stakeholder expectation. The dimension that has been perceived as most unsatisfactory for all stakeholder groups is Reliability. Consequently, Reliability is indicated as an important dimension for all stakeholder groups.

All stakeholder groups have indicated that each e-SQ dimension is important to the evaluation of e-SQ. Very high stakeholder expectations have been indicated across the 3 stakeholder groups. Although these groups have collectively indicated satisfactory levels of e-SQ perception, there are shortfalls when compared to the expectations of the e-SQ dimensions. This suggests that gaps exist and certain areas of DealerWeb that deliver e-SQ functionality, require possible improvement.

4.8 GAP BETWEEN EXPECTATION OF E-SQ AND ACTUAL EVALUATION

This section highlights the gap between stakeholder expectation and the actual evaluation results of DealerWeb. The higher percentage gap between the evaluation and expectation could suggest that more focus should be given to the improvement of functionality the e-SQ dimensions represents.

Table 4.16: Gap between Service Provider expectation and evaluation

e-SQ Dimension	Actual Evaluation	e-SQ Expectation	Gap
Privacy	85.67%	95%	9.33%
Efficiency	70.30%.	100%	29.7%
Responsiveness	66.92%	100%	33.08%
Reliability	51.13%	100%	48.87%
Contact	66.32%	100%	33.68%
Compensation	57.24%	100%	42.76%
Fulfilment	75.22%	100%	24.78%

From Table 4.16 it can be observed that the Reliability (48.87%) dimension has the largest gap for the SP group. This is followed by the Compensation (42.76%) dimension. These gaps suggest that Reliability and Compensation have not met the expectations of this stakeholder group and could possibly require greater focus in comparison to the other e-SQ dimensions.

Table 4.17: Gap between Internal IS Staff expectation and evaluation

e-SQ Dimension	Actual Evaluation	e-SQ Expectation	Gap
Privacy	55.56%	100%	44.44%
Efficiency	58.57%	100%	41.43%
Responsiveness	48.57%	100%	51.43%
Reliability	48.57%	100%	51.43%
Contact	44%	80%	36%
Compensation	25%	100%	75%
Fulfilment	56.67%	100%	43.33%

From Table 4.17 it can be observed that the Compensation (75%) dimension has the largest gap for the Internal IS group. This is followed by the Responsiveness (51.43%) and Reliability (51.43%) dimensions. These

gaps suggest that Reliability, Responsiveness and Compensation have not met the expectations of this stakeholder group and could possibly require greater focus in comparison to the other e-SQ dimensions.

Table 4.18: Gap between HelpDesk Staff expectation and evaluation

e-SQ Dimension	Actual Evaluation	e-SQ Expectation	Gap
Privacy	83.33%	100%	16.67%
Efficiency	64.29%	100%	35.71%
Responsiveness	60.71%	100%	39.29%
Reliability	28.57%	100%	71.43%
Contact	75%	100%	25%
Compensation	37.5%	50%	12.5%
Fulfilment	52.08%	100%	47.92%

From Table 4.18 it can be observed that the Reliability (71.43%) dimension has the largest gap for the HelpDesk Staff group. This is followed by the Fulfilment (47.92%) dimension. These gaps suggest that Reliability and Fulfilment have not met the expectations of this stakeholder group and could possibly require greater focus in comparison to the other e-SQ dimensions.

Reliability appears to be the common e-SQ dimension across the stakeholder groups which has a large gap when comparing stakeholder expectations to actual evaluation scores. The size of the gap could serve as an indicator of which e-SQ dimensions require the most focus and could be prioritised for improvements. A level of tolerance per e-SQ dimension in terms of "allowed" gaps could be suggested in order to justify whether gaps are acceptable or not.

4.9 PROVIDING A HOLISTIC VIEW

Table 4.19: Holistic View of Stakeholder Perceptions of DealerWeb

Stakeholder	Strongly disagree / disagree	Not applicable to me	Strongly agree / Agree
Service Providers	21.74%	10.72%	67.54%
Internal IT Staff	24.82%	27.05%	48.13%
Helpdesk	23.74%	18.91%	57.35%

Table 4.19 depicts the overall ratings for the items on the Likert scale used by the stakeholder groups to evaluate DealerWeb. In Table 4.19, the overall perceptions of e-SQ differing across the 3 stakeholder groups, are shown.

Furthermore, from Table 4.19 it can be observed that SP's (67.54%) and the Helpdesk (57.35%) have indicated that DealerWeb provides satisfactory e-SQ. The Internal IS Staff has indicated that DealerWeb provides unsatisfactory e-SQ. The perspectives of the 3 stakeholder groups differ noticeably which suggests that a multi-stakeholder evaluation results in different evaluation outcomes. In other words, using a single evaluation approach, DealerWeb would have been perceived as providing unsatisfactory e-SQ if using only the perceptions of the Internal IS group. On the other hand, if the single evaluation of the HelpDesk or SP's was used, it would suggest the system provides satisfactory e-SQ. Consequently, a single approach could suggest a higher perception of e-SQ if the viewpoints of other stakeholders are not considered i.e. if SP perceptions alone were considered.

Table 4.20: Total Summary across Stakeholder Groups

Stakeholder	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
DealerWeb System	23.43%	18.89%	57.67%

From Table 4.20, a more holistic evaluation is given which indicates the overall perception of DealerWeb by the 3 stakeholder groups. From Table 4.20, it can be concluded that DealerWeb provides satisfactory e-SQ across the 3 stakeholder groups suggesting a holistic perspective of e-SQ. It can therefore be suggested that a single approach could indicate an inconclusive evaluation of e-SQ, and therefore IS Effectiveness.

4.10 SUMMARY OF E-SQ PERCEPTIONS COMPARED ACROSS STAKEHOLDER GROUPS

Table 4.21 depicts the different ratings assigned to the e-SQ dimensions for the 3 stakeholder groups. Furthermore, Table 4.21 shows the overall average for each e-SQ across the 3 stakeholder groups. The results indicate that the 3 stakeholder groups perceive the e-SQ dimensions differently.

Table 4.21: Weighted average per e-SQ dimension per Stakeholder Group

e-SQ Dimension	Rating			
	Service Providers	Internal IS Staff	Helpdesk	Weighted Average
Privacy	85.67%	55.56%	83.33%	74.85%
Efficiency	70.30%	58.57%	64.29%	64.39%
Contact	66.32%	44%	75%	61.77%
Fulfilment	75.22%	56.67%	52.08%	61.32%
Responsiveness	66.92%	48.57%	60.71%	58.73%
Reliability	51.13%	48.57%	28.57%	42.76%
Compensation	57.24%	25%	37.5%	39.91%

From Table 4.21, it can be observed that Privacy (74.85%) was evaluated as the most satisfactory e-SQ dimension. Compensation (39.91%) was perceived as the most unsatisfactory e-SQ dimension. Reliability (42.76%) and Compensation (39.91%) require attention as the overall evaluation of these e-SQ dimensions by the 3 stakeholder groups are indicated as unsatisfactory.

4.11   OPEN-ENDED QUESTIONS IN THE QUESTIONNAIRE

The questionnaire allowed respondents to give further input which might not have been covered by the questionnaire evaluation items. Each of the comments made by the respondents relates to the e-SQ dimensions. In other words, aspects such as inefficiencies and the unreliability of DealerWeb had the most focus. A common aspect mentioned in this section was the unavailability of the system at crucial periods i.e. DealerWeb is considered to be offline for long periods. There is a considerable number of respondents who have mentioned that the previous version of the DealerWeb system was more Efficient and Reliable compared to the current version. Although the current version of the Information System has more functionality, it has been discredited by its

unreliability and inefficiencies. The lack of *Change Management* [4]has also been highlighted here. In other words, the migration to a new version of the DealerWeb system was not seamless and functions the user was accustomed to, no longer exist or lack previous efficiencies.

4.12   JUSTIFYING LOW E-SQ PERCEPTIONS

This section suggests certain possibilities which could be considered that would justify the unsatisfactory outcomes of certain e-SQ dimensions. Some of these factors are:

- DealerWeb is a web-based (browser) application and requires the end-user to dial into an Internet Service Provider or network to access the system remotely.
- From Table 4.22 it can be observed that methods used are ISDN and ADSL.

Table 4.22: Sample Profiles across stakeholder groups

Stakeholder Group	Computer literacy experience				Level of computer literacy			How do you connect to the system		
	< 6 months	6 month to a year	1 to 2 years	3 to 5 years	Poor	Average	Very good	ISDN	ADSL	Other
Service Providers	5.26%	0%	10.53%	84.21%	0%	76.32%	23.68%	28.95%	18.42%	52.63%
Internal IT Staff	0%	0%	0%	100%	0%	0%	100%	20%	0%	80%
Helpdesk	0%	0%	0%	100%	0%	0%	100%	25%	0%	75%
Weighted average								24.65%	18.42%	69.21%

- ISDN and ADSL provide quite efficient dial-up and data transfer speeds (ITWeb, 2006). Other forms of dial-up include the traditional standard Analogue (Telkom) line, which is slow (ITWeb, 2006) for dial-up and data speeds.

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4 Change management is a structured approach to change in individuals, teams, organizations and societies that enables the transition from a current state to a desired future state.

- The study made the following assumptions :
    - Service Providers are the primary users and are remotely placed i.e. external to TechSA's Local Area Network
    - Helpdesk Staff are internal users and are internal to the Local Area Network (LAN).
    - IS Staff are internal users as well as internal to the Local Area Network.
- Where the stakeholder groups have indicated "Other" in terms of dial-up connection, it is assumed that these are traditional analogue connections. Hence the following applies for the 3 stakeholder groups:
    - Service Provider: Analogue (Other) = 52.63%
    - Helpdesk: Analogue (LAN) = 75%
    - Internal IS Staff: Analogue (LAN) = 80%

Table 4.22 therefore indicates that the majority of Service Providers connect using analogue connections which could explain the low Reliability perceptions.

Furthermore, Table 4.22 shows that the "level of computer literacy" for the Service Provider group is low for the rating item "Very Good". This percentage indicates that of the 38 Service Providers that responded to the survey, only 23.68% has a very good level of computer literacy. This could suggest that the level of computer literacy resulted in the low rating and that further training is required.

4.13   CHAPTER CONCLUSION

This chapter has reported on the results of the evaluation of DealerWeb by the 3 stakeholder groups. The data suggests that a holistic perspective of service quality is achieved through a multi-stakeholder evaluation of an IS. The results have shown:

- The expectations of e-SQ dimensions by the 3 stakeholder groups.

- The perception of e-SQ dimensions by the 3 stakeholder groups.

- Which e-SQ dimensions are important to the 3 stakeholder groups.

- What the gaps are between the stakeholder expectations and stakeholder perceptions of e-SQ dimensions.

- The perception of e-SQ differs noticeably between the 3 different stakeholder groups.

- Using the gaps between stakeholder expectation and perception of e-SQ dimensions, the higher gaps could be used to prioritise IS development work related to the functionality of each e-SQ dimension.

- Therefore, a multi-stakeholder evaluation brings about a holistic perspective of IS Effectiveness compared to a single approach.

Furthermore, a single approach to IS evaluation could have resulted in a biased evaluation not depicting a holistic perspective of the service quality provided by DealerWeb to the 3 stakeholder groups.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The main objective of this study was to determine a generic approach of evaluating web-based information systems using e-SQ dimensions as criteria to measure success. This approach includes determining a holistic perspective of the system's success through a multi-stakeholder evaluation of the IS. DealerWeb was used as a sample system in the case study to determine if a multi-stakeholder evaluation brings about a holistic perspective of a system's success.

Furthermore, gap analysis was done between the stakeholder group's expectation of e-SQ and the stakeholder perceptions. The gaps were used as indicators to suggest which e-SQ dimensions are perceived to be the most unsatisfactory, and therefore requiring possible prioritised attention.

5.2 DIFFERING STAKEHOLDER EVALUATION

From the data reported it can be concluded that the following e-SQ dimensions provide unsatisfactory service quality to the three stakeholder groups:

- Service Provider
  - o No unsatisfactory ratings
- Internal IS Staff
  - o Reliability
  - o Responsiveness
  - o Contact
  - o Compensation
- HelpDesk
  - o Compensation

    o Reliability

From the gap analysis, the following gaps were highlighted across the three stakeholder groups i.e. the system did not meet the expectations in respect of these e-SQ dimensions:

- Service Providers
  - o Gaps exist but are outweighed by the perception of e-SQ dimensions
- Internal IS Staff
  - o Responsiveness
  - o Reliability
  - o Contact
  - o Compensation
- HelpDesk Staff
  - o Reliability
  - o Compensation

5.3 A MULTI-STAKEHOLDER EVALUATION OF IS EFFECTIVENESS

The data reported from the case study indicates that a multi-stakeholder evaluation of IS Effectiveness, results in a holistic perspective of success as compared to a single approach. The 3 stakeholder groups have reported the following results for the evaluation of DealerWeb using e-SQ criteria:

Table 5.1: Overall positive perception of e-SQ for each stakeholder group

Stakeholder	Overall positive perception of e-SQ
Service Providers	67.54%
Internal IT Staff	48.13%
Helpdesk	57.35%
Average	**57.67%**

From Table 5.1 it can be observed that a single evaluation of IS Effectiveness will suggest that DealerWeb provides satisfactory Service Quality to the Service Provider (67.54%) and HelpDesk (57.37%) group. Consequently, an unsatisfactory result would be reported if the Internal IS group results were only reported. Furthermore, if the results of all 3 stakeholder groups were not collectively considered, the rating percentage would not be an accurate reflection. In other words, the overall indication of e-SQ satisfaction across the 3 stakeholder groups were lowered by the results of the Internal IS (48.13%) and HelpDesk (57.37%) group. Alternatively, the results reported would have been increased by the Service Provider (67.54%) evaluation if only the Internal IS or HelpDesk results were reported.

The overall average of 57.67% shown in Table 5.1, represents a holistic evaluation of the IS, and indicates that collectively across the 3 stakeholder groups, the e-SQ dimensions delivered through DealerWeb is satisfactory.
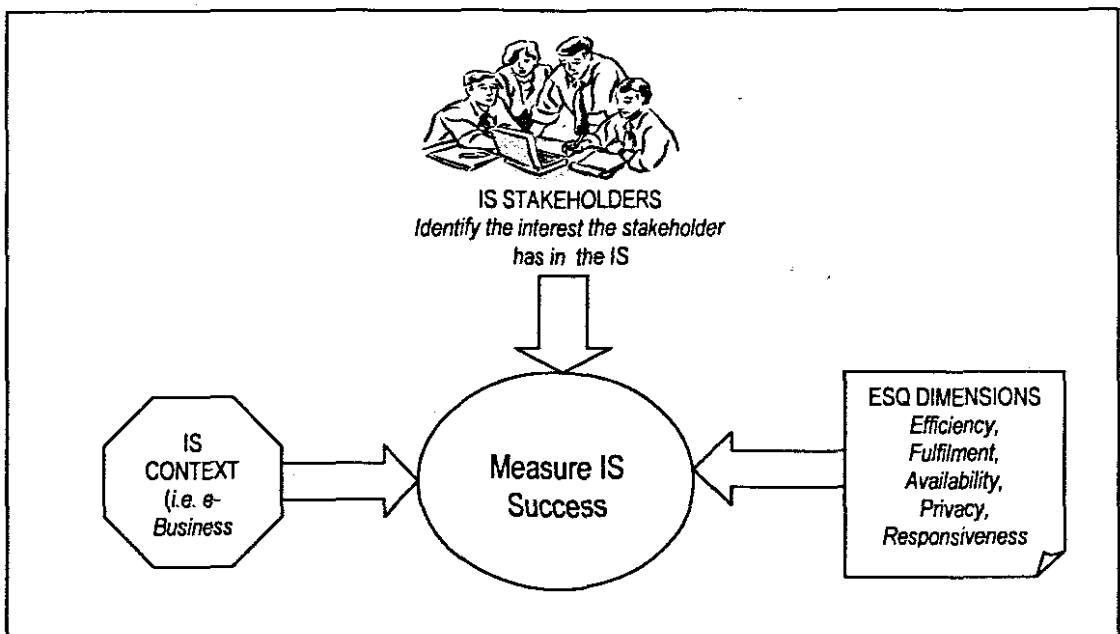
Figure 5.1: Three factors relevant in measuring IS success

As shown in Figure 5.1, a multi-stakeholder perspective of e-SQ indicates a holistic perspective of IS Effectiveness. The data shows that a single approach would have reported an incomprehensive perspective of e-SQ.

5.4 CONCLUSION AND RECOMMENDATION

The main objective of the study was to investigate how e-SQ constructs could be applied amongst multiple stakeholders to evaluate web-based IS effectiveness. The rationale behind this objective was based on a study by Seddon et al. (1999) which argued that evaluating the IS from a single stakeholder perspective might provide an inconclusive report of the effectiveness of the system.

DealerWeb was used as a sample system in the case study to determine if a multi-stakeholder evaluation brings about a holistic perspective of a systems success.

5.4.1 Evaluation of the stakeholder results

The Service Provider group has reflected a higher overall rating of DealerWeb as effective in comparison to the HelpDesk and Internal IS group. The difference in the overall rating is quite significant viz. 67.54%, 48.13% and 57.35%. If the Service Providers were the only group to be surveyed, it would be reported that 67.54% represents the majority of stakeholders that have rated DealerWeb as successful. Alternatively, it could have been evaluated at 48.13% or 57.35% if only surveying the IS Staff and HelpDesk respectively. More importantly, if the Internal IS Staff was the only evaluation reported on, it would be recorded that less than 50% of the majority of respondents for this group have indicated the DealerWeb system as ineffective.

In essence, a report would have reflected DealerWeb as effective if only realising the evaluation from the Service Provider or HelpDesk group, and ineffective if only reported from the Internal IS group. This distinction indeed would play a pivotal role in management having to determine if a return on IS investment has indeed been achieved.

In response to research question 3, it is suggested that a single stakeholder perspective is not conclusive of the overall rating of DealerWeb. Taking the average of the overall rating across the three stakeholder groups i.e. (67.54% + 48.13% + 57.35%) / 3 = 57.67% suggests that the overall majority of stakeholders has evaluated DealerWeb as effective.

5.4.2 Recommendations and Further Study

This study has highlighted the following regarding IS evaluation:

- There are many facets to IS evaluation, and no general agreement on a single approach.

- Measuring IS success in online environments requires rethinking of traditional measures that are applicable within brick & mortar environments.

- Delone and McLean (1992) developed a conceptual model to evaluate IS Effectiveness, of which service quality is a success measure in the updated model (Delone and Mclean, 2003).

- Whilst there is agreement on the value of using service quality to assess IS, this study provides evidence of its application to IS evaluation in online environments.

- IS effectiveness has to be evaluated from a particular stakeholder perspective and context providing a multi-stakeholder approach.

↓ Measurement of IS cannot be complete without taking into account perspectives of evaluation from different stakeholders.

In light of the above, a Service-Quality-Multi-Stakeholder approach for evaluating IS in online environments is suggested. A high-level approach to operationalise the evaluation is summarised as follows:

i.   The first step should focus on benchmarking of acceptable levels of e-SQ per stakeholder group within a particular business. In other words, Management determines what is an acceptable rating of IS Effectiveness per e-SQ dimension and Stakeholder Group. There are various scientifically developed processes for benchmarking which could be considered. Based on this rating, Management could determine whether a return of IS investment has been achieved. For example, if Management has consensus that the e-SQ dimension Privacy for the SP group should have a minimal rating percentage of 60% as acceptable level of effectiveness, a rating of below this benchmark would be deemed ineffective for this group and dimension. Management would also need to determine what the overall rating for a particular group should be e.g. should the overall rating of 50% or greater be acceptable to report effectiveness for the group?

ii.   The next step involves a survey of stakeholders in which perceptions regarding e-SQ dimensions are scored. These criteria could be defined differently for each stakeholder e.g. questions regarding privacy may be different for a line manager within a business as opposed to a customer.

iii.   Using the benchmarks i.e. individual e-SQ benchmark and overall benchmark per group, the necessary information can be reported when determining the return on IS investment. Using this approach, it could be determined which e-SQ dimensions have caused the low overall rating for the group. This could aid management in determining which e-SQ dimension and

therefore which functions or features of the system needs prioritisation in respect of system enhancement.

5.4.3 A proposed e-SQ evaluation methodology for IS effectiveness

Based on the lessons learned in this study, a generic approach to evaluate IS effectiveness using e-SQ criteria to measure success is shown in Figure 5.2.
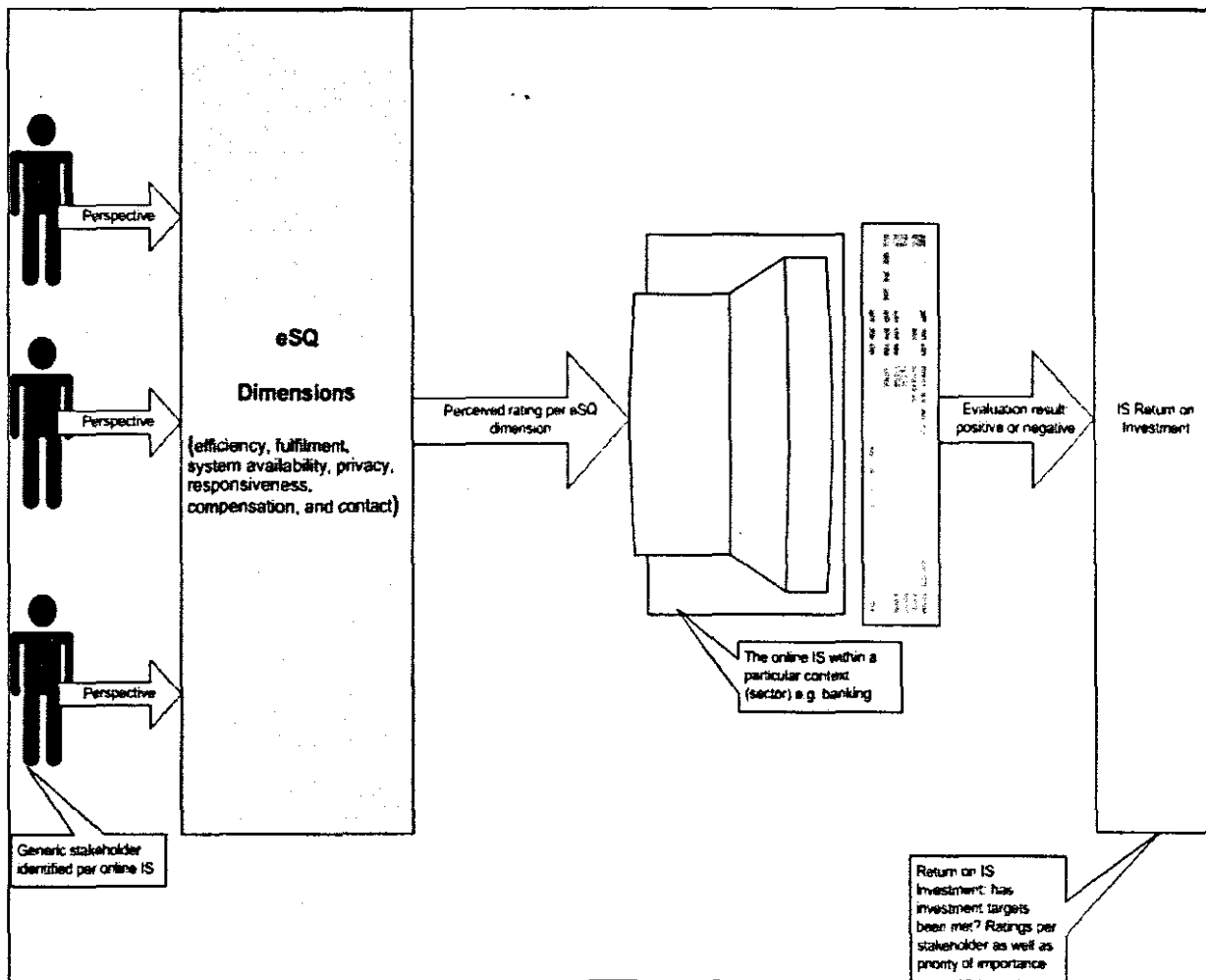
Figure 5.2: Proposed methodology of evaluating IS effectiveness

Step 1: Identify the context of the IS evaluation for each stakeholder i.e. what is the main function and context of operation of the IS. *(See Table 5.2 for a demonstration of how this could work)*

Step 2: Identify generic stakeholder groups e.g. e-Customer, sponsoring manager, internal users etc.

Step 3: Identify stakeholder specific e-SQ criteria.

Through the use of these proposed steps, a methodology of how e-SQ can be measured for each stakeholder, within a particular context, is proposed. Based on the Seddon et al. (1999) matrix (see Table 5.2 for a scaled down matrix), the matrix could be modified by attaching a rating scale for each stakeholder and e-SQ dimension. A scale of 1-7 is used to illustrate this (see Table 5.3). The values in the table are hypothetical as well.

Table 5.2: Identify the context of evaluation for each stakeholder

No	Stakeholder	An aspect of IT design or use	A single application in an organisation	A type of IT or IT application
1	User/Client			
2	IT Staff			
3	Management			

Table 5.3: A hypothetical example of the rating of an IS using the proposed methodology.

(Rating refers to the grading of the e-SQ dimensions by the relevant stakeholders within a particular context i.e. how would the stakeholders class the e-SQ dimensions.)

Online Context (Sector)							
Generic Stakeholder	Efficiency	Fulfilment	System availability	Privacy	Responsiveness	Compensation	Contact
Priority of importance	3	4	2	1	5	7	6
User/Client	3	5	2	1	2	1	3
IT Staff	5	2	4	7	5	5	2
Management	4	2	4	2	7	4	2

Using the proposed methodology of IS effectiveness evaluation, it is possible then to evaluate online information systems in a business per online context, per generic online stakeholder and e-SQ dimension. Using

the proposed three-step approach as reflected in Figure 5.2, viz. per stakeholder, per e-SQ dimension and per context (sector), a deduction can be made as to whether an online application meets the average success criteria.

Operationalising such an approach would require the following:

- Benchmarking of acceptable levels of e-SQ per stakeholder group within a particular business.
- A survey of stakeholders in which perceptions regarding e-SQ dimensions are scored.
- These criteria could be defined differently for each stakeholder e.g. questions regarding privacy may be different for a line manager within a business as opposed to a customer.
- The analysis of the scores, which are considered against the established benchmarks.

If this scored rating and the sector benchmark differ negatively, the evaluation would point towards investigation of specific aspects of the IS that require attention.

5.4.4 Limitations

The limitations of this study include:

- An inequitable distribution of the questionnaire among the 3 stakeholder groups. The ideal scenario would be groups of the same or similar size.
- There were no estimated benchmarks to which to compare the results of the assessment. If these were in place, levels of satisfactory IS evaluation of e-SQ dimensions could more readily be achieved.
- No previous empirical study taking into consideration holistic IS evaluation was readily available to compare too.

⤵ As the participants were geographically spread across South Africa, the questionnaire could only be administered by email. Personnel interviews would have allowed for more focussed completion of the questionnaire allowing the participant to ask questions or clarify concepts not understood.

⤵ The items in the questionnaire were not focussed on the specific aspects of DealerWeb relative to the immediate interaction a specific group has with the system. This would allow for items being more realistic to the participant and adding greater informational value in this way.

5.4.5 Recommendations for future research

Future work includes benchmarking e-SQ dimensions within different industries to determine what are the levels of satisfactory IS effectiveness evaluation. In doing so, researchers will be able to assess whether the results of an IS evaluation is satisfactory. This will require further testing to identify how these levels of acceptance differ or need to be altered for a particular industry or sector.

5.4.6 Conclusion

The study contributes to the ongoing debate regarding measuring IS success, especially in online businesses. It is hoped that together with future empirical studies, some inroads would be made in assisting businesses to make well-founded judgments, and to take appropriate action regarding investments in IS.

For an evaluation to be regarded as successful for given e-SQ dimensions, individual businesses should ascertain benchmark scores for each dimension of Service Quality. These benchmarks could further be segmented based on the type of industry or sector the IS resides, as well as per the stakeholder groups involved.

⤙ As the participants were geographically spread across South Africa, the questionnaire could only be administered by email. Personnel interviews would have allowed for more focussed completion of the questionnaire allowing the participant to ask questions or clarify concepts not understood.

⤙ The items in the questionnaire were not focussed on the specific aspects of DealerWeb relative to the immediate interaction a specific group has with the system. This would allow for items being more realistic to the participant and adding greater informational value in this way.

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For an evaluation to be regarded as successful for given e-SQ dimensions, individual businesses should ascertain benchmark scores for each dimension of Service Quality. These benchmarks could further be segmented based on the type of industry or sector the IS resides, as well as per the stakeholder groups involved.

The study has shown that stakeholders at different levels in an organisation, having different roles and responsibilities, evaluate IS differently and thus give a holistic evaluation perspective. This could reflect either further or lowered success, or failure compared to a single stakeholder evaluation. In fact the results of the evaluation reflect lower weighted averages from the Internal IS Stakeholders when compared to quite a high weighted average of the Service Providers who represented the external stakeholder group in the case study.

However, the inherent problem with a holistic approach could result in indicators of success or failure not being a clear definitive of satisfaction i.e. the outcome of the evaluation could indicate average perceptions. This is due to the questions on the survey not being specific enough to the environment of the group completing the evaluation. This problem can be overcome through the questionnaire focussing on actual scenarios encountered within the IS environments of the groups performing the evaluation.

Finally, this study provides evidence:

- To demonstrate how e-SQ metrics can be used in IS evaluation;

- That for a single system, different stakeholders evaluate the various dimensions of e-SQ differently; and

- That the evaluation of multi-stakeholder perspectives provides a more holistic evaluation of IS effectiveness as opposed to a single stakeholder approach.

From Table 5.4, it can be observed that the data reported indicates that the research questions of the study have been answered:

Table 5.4: Summary of research questions answered

Has the question been answered in the study?	Answered: Y/N
In order to create a holistic perspective of e-SQ using quantified e-SQ dimensions (Parasuraman et al., 2005), from each stakeholder context (Seddon et al., 1999), the following principal question has been developed: Which quantified dimensions of the Parasuraman et al. (2005) e-SQ framework and the Seddon et al. (1999) matrix are relevant to creating a holistic framework for assessing the effectiveness of the Web-Based Information Systems?	Y
The main objective of the study was to investigate how e-SQ constructs could be applied amongst multiple stakeholders to evaluate web-based IS effectiveness.	
What are the perceptions of the multiple stakeholders regarding how DealerWeb delivers on the various e-service quality dimensions?	Y
Each stakeholder group has indicated whether the e-SQ dimensions were satisfactory or not. Where the dimensions were indicated as having a rating of above 50%, was an indication of satisfaction.	
How do perceptions of e-SQ differ amongst the different stakeholder groups?	Y
There were noticeable differences in evaluation results between the stakeholder groups for the e-SQ dimensions evaluated. The results indicate that in some instances, an e-SQ dimension was indicated as satisfactory by a stakeholder group but was indicated as unsatisfactory by another.	
Does a multi-stakeholder evaluation of an IS provide a more holistic perspective of IS effectiveness as compared to an evaluation by a single stakeholder?	Y
The case study data indicates that taking all three perceptions of e-SQ into consideration, has indicated that a multi-stakeholder approach achieves a holistic perspective. The data reported indicates that a single stakeholder evaluation would have concluded satisfactory IS effectiveness where the stakeholders were the SP and HelpDesk Group. Consequently, IS Effectiveness would have indicated to be unsatisfactory if the perceptions of the Internal IS group was only considered.	
Are there gaps between the stakeholders' expectations compared to the stakeholders' perception regarding IS e-SQ delivery?	Y
Gap analysis was conducted which highlighted that there are gaps between stakeholder expectations and stakeholder perceptions of e-SQ. Furthermore, the larger the gap, the more focus could be suggested against the dimension to improve future evaluations of the e-SQ dimension.	

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Appendix A

Dear Sir / Madam

CLIENT SURVEY: DEALER WEB SYSTEM

Introduction

Firstly, thank you for the time you have taken to complete this Questionnaire. This survey, which has been endorsed by **TechSA**, will be used to evaluate certain criteria of the **DealerWeb System**. The Questionnaire is easy to complete and shouldn't take more than twelve to fifteen (12-15) minutes of your time.

The Objective

The aim of this questionnaire is to assess whether the *DealerWeb System*, facilitates an acceptable level of service. In other words, does the *DealerWeb System* satisfy the expectations of service quality that you would expect from **TechSA?**

The results of this evaluation will be used to identify which criteria are most relevant in respect of delivering key service quality objectives within the Service Provider environment. These in turn can be prioritised during Information System development which would ultimately benefit you our clients through improved information system capability.

You are hereby assured that all responses will be treated in the utmost confidence and will not be given to third parties.

The time taken to complete this survey is highly appreciated.

Yours faithfully

....

H. Nomdoe
Researcher

Appendix A
<u>INSTRUCTIONS</u>

Please follow the instructions of each section carefully. Try to answer each question as honestly and candidly as possible. All responses are confidential.

SECTION 1

1.1   Please tell us about yourself:

Name: _____

Contact number: _____

Organisation: _____

Business Sector: _____

Position: _____

1.2   Please Mark with an X.

How often do you use DealerWeb	Everyday	X	Once a week		Once a month	
What is the main purpose you use it for	Reports		Operational		Management	
It is a desired application to use	I agree		Not applicable to me		Disagree	

1.3   Computer Literacy Experience

I have been using computers for: **(Please mark with an X)**

Less than 6 months	X
6 months to a year	
1 to 2 years	
3 to 5 years	

1.4   I consider my level of general computer literacy to be: (Please mark with an X)

Poor	
Average	X
Very good	

1.5   How do you connect to DealerWeb system (Please mark with an X)

Dial-up using a modem and standard telephone line	

Appendix A

ISDN	
ADSL	
Other	

SECTION 2

2.1 In this section you are required to reflect on your use of the DealerWeb System.

In the table that follows, indicate whether you agree or disagree with each statement by, choosing one of the five columns to indicate the strength of your agreement or disagreement. PLEASE SELECT ONLY <u>ONE</u> RESPONSE PER QUESTION. If you have no view, please indicate *not applicable to me*.

1	Privacy *The degree to which the site is safe and protects all information.*					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
1.1	The system does protect information about my system-querying behaviour.					
1.2	It does not share personal information with other sites – my business information is not shared with other Service Providers.					
1.3	The site protects information about my business.					
1.4	The site is secure (safe) and does protect confidential information.					
1.5	The subscriber information linked to my business is not given to other Service Providers.					
1.6	The security setting to keep my information secure is adequate.					
1.7	The system protects the information of the subscribers linked to this Service Provider.					
	The system does provide mechanisms to keep the site secure e.g. periodic password change.					
1.8	The site is safe from intrusion and personal information is protected – the site authenticates my access each time I login.					
1.9	Are there any other aspect(s) of the DealerWeb System concerning **Privacy** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

2	Fulfilment *The extent to which the site's promises about order delivery and item availability are fulfilled.*

No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
2.1	The system delivers relative quotations when promised (it has the latest product information as inputs – e.g. Tariff rates).					
2.2	The site makes new products (e.g. Data Bundle Voucher) available for delivery within a suitable time frame.					
2.3	It quickly delivers what I request e.g. query feedback / response.					
2.4	It sends out the applications (new business applications) requested timeously.					
2.5	It has in 'stock' the products (to meet a specific investment portfolio) the company claims to have e.g starter packs, 32-Meg SIM cards.					
2.6	It is truthful about its offerings (the information/content is truthful).					
2.7	It makes accurate promises about delivery of products (e.g. by the end of next year Mobile TV will be available to all subscribers).					
2.8	The site's promises about 'order' delivery and item availability are fulfilled (e.g. responses to ad hoc queries within 24 hours).					
2.9	The processes of the business are improved by the new system.					
2.10	Appropriate targets are set for improved performance of the DealerWeb System, and they are being met.					
2.11	The targets that were set, relative to the DealerWeb System, were appropriate to the needs of an agreed business strategy.					
2.12	The DealerWeb System is aligned to the actual strategic needs of the business.					
2.13	Are there any other aspect(s) of the DealerWeb System concerning **Fulfilment** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

3	**Efficiency** The ease and speed of accessing and using the site.					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
3.1	This site does make it easy to find what I need to do my work.					
3.2	It makes it easy to get anywhere on the site – navigation is easy.					
3.3	It enables me to complete a transaction completely.					
3.4	Information on this site is well organised.					
3.5	It loads its pages fast – the system does not hang.					
3.6	This site is simple to use and has online help.					
3.7	This site enables me to get on to it quickly (load time of the site | system is quick).					
3.8	This site is well organised – the layout of the site is logical.					
3.9	The site is simple to use, structured properly, and requires a minimum of information to be input by the user.					
3.10	The ease and speed of accessing and using the site is optimal.					
3.11	The DealerWeb System works well and meets the needs of the business.					

No		Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
3.12	The business adapted itself well to the DealerWeb system successfully and the costs were according to plan – costs incurred to use the application.					
3.13	The processes of the business are now improved by the DealerWeb system.					
3.14	There is visible evidence of business performance based on DealerWeb, whether improved or not.					
3.15	Are there any other aspect(s) of the DealerWeb System concerning **Efficiency** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

4	**Reliability (system availability)** The correct technical functioning of the site.					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
4.1	The technical functioning of the site is correct and product information is accurate.					
4.2	The accuracy of service promises (having accessibility to products, delivering what is ordered, etc), is correct.					
4.3	The system is always available for business.					
4.4	This site launches and runs right away.					
4.5	This site does not crash.					
4.6	Pages at this site do not freeze when using the DealerWeb System.					
4.7	The implementation of the technology was well managed and appropriate support was provided to the business.					
4.8	Are there any other aspect(s) of the DealerWeb System concerning **Reliability** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

5	**Responsiveness** Quick response and ability to get help if there is a problem or question.					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
5.1	It provides me with convenient options for cancelling requests such as application for new subscriber products | services | requests.					
5.2	This site handles product returns well e.g. cancellation of an 'authorised' application.					
5.3	This site offers a meaningful service delivery guarantee.					
5.4	It tells me what to do if my transaction is not processed – an error occurs.					

No		Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
5.5	It takes care of problems promptly – transactions cannot continue due to missing information.					
5.6	Effectively handles of problems and returns feedback through the site.					
5.7	The system facilitates quick response and ability to get help if there is a problem or question.					
5.8	Are there any other aspect(s) of the DealerWeb System concerning **Responsiveness** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

6	**Compensation** The degree to which the site compensates users for problems.					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
6.1	The system compensates me for problems it creates e.g. missing information.					
6.2	It compensates me when the new product data is not available on-time.					
6.3	It picks up items (cancellation of client application) I want to return from my business.					
6.4	The site compensates users for problems (e.g. provides an offline mode).					
6.5	Are there any other aspect(s) of the DealerWeb System concerning **Compensation** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.					

7	**Contact** The availability of assistance through telephone or online | Ability to get on the site quickly and to reach the company when needed.					
No	ALL QUESTIONS BELOW PERTAIN TO YOUR USE OF, AND YOUR KNOWLEDGE OF THE *DEALER WEB* SYSTEM. Mark your choice with an 'X' with respect to each statement. Mark the statement as **Not applicable to me** if you are undecided.	Strongly disagree	Disagree	Not applicable to me	Agree	Strongly agree
7.1	The site provides a telephone number to reach the company for assistance.					
7.2	The site has customer service representatives available online (email correspondence).					
7.3	It offers the ability to speak to a live person if there is a problem.					
7.4	The availability of assistance through telephone or online is adequate.					
7.5	The ability to get on the site quickly and to reach the company when needed is acceptable.					

7.6	Are there any other aspect(s) of the DealerWeb System concerning **Contact** that you feel is lacking in the Application? Feel free to describe the issue in any way you wish.

Summary

	In the Table below there are seven features of the Dealer Web System listed. Please indicate how important (relevant) you think each of them are to you, as a user of the Dealer Web system. Place an **X** in the appropriate column alongside each of the criteria to indicate your view of its importance.	Irrelevant	Not important	Important	Critical
1.	**Privacy** - The degree to which the site is safe and protects all information.				
2.	**Fulfilment** - The extent to which the site's promises about order delivery and item availability are fulfilled.				
3.	**Efficiency** - The ease and speed of accessing and using the site.				
4.	**Reliability** - The correct technical functioning of the site.				
5.	**Responsiveness** – Quick response and ability to get help if there is a problem or question.				
6.	**Compensation** - The degree to which the site compensates users for problems.				
7.	**Contact** - The availability of assistance through telephone or online | Ability to get on the site quickly and to reach the company when needed.				

	How likely are you to... **Mark your choice with an 'X'.**	Very Unlikely	Unlikely	Neutral	Likely	Very Likely
1.	Say positive things about this DealerWeb to other people?					
2.	Recommend DealerWeb to someone who seeks your advice?				X	
3.	Encourage colleagues to do business with DealerWeb?					
4.	Consider this application your first choice for future transactions?					
5.	Do more business with DealerWeb in the coming months?					

Is there any other aspect of the *DealerWeb* not covered above that you would like to comment on?

Thank you.

Appendix E

No	Privacy :Rating Total number of items for Privacy = 342		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	3	7	28
2.	2	3	33
3.	2	3	33
4.	5	1	32
5.	4	1	33
6.	3	4	31
7.	3	2	33
8.	3	0	35
9.	3	0	35
Weighted Average	28: 8.19%	21: 6.14%	293: 85.67%

Table 1: Service Providers

Table 1 has a weighted average of 8.19% for unsatisfactory quality of service, 6.14% as not applicable and 85.67% as satisfactory service provided by DealerWeb.

No	Fulfilment :Rating Total number of items for Fulfilment = 456		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	1	36
2.	4	8	26
3.	8	1	29
4.	5	1	32
5.	4	9	25
6.	3	3	32

7.	12	5	21
8.	6	6	26
9.	4	0	34
10.	9	6	23
11.	5	6	27
12.	4	2	32
Weighted Average	65: 14.25%	48: 10.53%	343: 75.22%

Table 2: Service Providers

Table 2 has a weighted average of 14.25% for unsatisfactory quality of service, 10.53% as not applicable and 75.22% as satisfactory service provided by DealerWeb.

No	Efficiency :Rating Total number of items for Efficiency = 532		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	7	1	30
2.	7	1	30
3.	6	0	32
4.	7	1	30
5.	21	1	16
6.	10	3	25
7.	16	1	21
8.	4	1	33
9.	9	3	26
10.	14	2	22
11.	8	1	29
12.	2	11	25
13.	4	6	28

14.	2	9	27
Weighted Average	117:21.99%	41:7.71%	374:70.30%

Table 3: Service Providers

Table 3 has a weighted average of 21.99% for unsatisfactory quality of service, 6.14% as not applicable and 70.30% as satisfactory service provided by DealerWeb.

No	Reliability :Rating Total number of items for Reliability = 266		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	4	3	31
2.	3	9	26
3.	31	1	6
4.	18	0	20
5.	27	1	10
6.	22	1	15
7.	6	4	28
Weighted Average	111:41.73%	19:7.14%	136:51.13%

Table 4: Service Providers

Table 4 has a weighted average of 41.73% for unsatisfactory quality of service, 7.14% as not applicable and 51.13% as satisfactory service provided by DealerWeb.

No	Compensation :Rating Total number of items for Compensation = 152		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	7	8	23
2.	9	8	21
3.	3	10	25

4.	14	6	18
Weighted Average	33:21.71%	32:21.05%	87:57.24%

Table 5: Service Providers

Table 5 has a weighted average of 21.71% for unsatisfactory quality of service, 21.05% as not applicable and 57.24% as satisfactory service provided by DealerWeb.

No	Contact :Rating		
	Total number of items for Contact = 190		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	12	3	23
2.	8	7	23
3.	5	5	28
4.	9	2	27
5.	8	5	25
Weighted Average	42: 22.11%	22: 11.58%	126:66.32%

Table 6: Service Providers

Table 6 has a weighted average of 22.11% for unsatisfactory quality of service, 11.58% as not applicable and 66.32% as satisfactory service provided by DealerWeb.

No	Responsiveness :Rating		
	Total number of items for Responsiveness = 266		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	8	4	26
2.	11	8	19
3.	3	9	26
4.	9	1	28

5.	6	1	31
6.	9	5	24
7.	13	1	24
Weighted Average	59: 22.18%	29: 10.90%	178: 66.92%

Table 7: Service Providers

Table 7 has a weighted average of 22.18% for unsatisfactory quality of service, 10.90% as not applicable and 66.92% as satisfactory service provided by DealerWeb.

Appendix F

No	Privacy :Rating Total number of items for Privacy = 45		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	2	2
2.	0	2	3
3.	0	2	3
4.	1	0	4
5.	0	2	3
6.	1	2	2
7.	0	1	4
8.	3	1	1
9.	1	1	3
Weighted Average	7: 15.56%	13: 28.89%	25: 55.56%

Table 1: Internal IS Staff

Table 9 has a weighted average of 15.56% for unsatisfactory quality of service, 28.89% as not applicable and 55.56% as satisfactory service provided by DealerWeb.

No	Fulfilment :Rating Total number of items for Fulfilment = 60		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	1	3
2.	1	1	3
3.	0	1	4
4.	0	2	3
5.	1	1	3
6.	0	1	4
7.	1	3	1
8.	0	4	1
9.	0	1	4
10.	1	2	2
11.	0	2	3
12.	0	2	3
Weighted Average	5: 8.33%	21: 35%	34: 56.67%

Table 2: Internal IS Staff

Table 2 has a weighted average of 8.33% for unsatisfactory quality of service, 35% as not applicable and 56.67% as satisfactory service provided by DealerWeb.

No	Efficiency :Rating Total number of items for Efficiency = 70		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree

	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	1	4
2.	0	0	5
3.	1	0	4
4.	0	1	4
5.	3	2	0
6.	3	2	0
7.	1	0	4
8.	0	0	5
9.	1	1	3
10.	3	1	1
11.	2	1	2
12.	0	4	1
13.	0	0	5
14.	0	2	3
Weighted Average	14: 20%	15: 21.43%	41: 58.57%

Table 3: Internal IS Staff

Table 3 has a weighted average of 20% for unsatisfactory quality of service, 21.43% as not applicable and 58.57% as satisfactory service provided by DealerWeb.

No	Reliability :Rating		
	Total number of items for Reliability = 35		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	0	5
2.	0	2	3
3.	2	2	1
4.	2	0	3
5.	4	1	0

No			
6.	4	0	1
7.	1	0	4
Weighted Average	13: 37.14%	5: 14.29%	17: 48.57%

Table 4: Internal IS Staff

Table 4 has a weighted average of 37.14% for unsatisfactory quality of service, 14.29% as not applicable and 48.57% as satisfactory service provided by DealerWeb.

No	Compensation :Rating Total number of items for Compensation = 20		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	3	1
2.	2	2	1
3.	0	3	2
4.	4	0	1
Weighted Average	7: 35%	8: 40%	5: 25%

Table 5: Internal IS Staff

Table 5 has a weighted average of 35% for unsatisfactory quality of service, 40% as not applicable and 25% as satisfactory service provided by DealerWeb.

No	Contact :Rating Total number of items for Contact = 25		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	3	0	2
2.	1	1	3
3.	2	1	2
4.	1	2	2
5.	1	2	2

Weighted Average	8: 32%	6: 24%	11: 44%

Table 6: Internal IS Staff

Table 6 has a weighted average of 32% for unsatisfactory quality of service, 24% as not applicable and 44% as satisfactory service provided by DealerWeb.

No	Responsiveness :Rating Total number of items for Responsiveness = 35		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	1	4
2.	0	3	2
3.	1	3	1
4.	2	0	3
5.	1	0	4
6.	2	1	2
7.	3	1	1
Weighted Average	9: 25.71%	9: 25.71%	17: 48.57%

Table 7: Internal IS Staff

Table 7 has a weighted average of 25.71% for unsatisfactory quality of service, 25.71% as not applicable and 48.57% as satisfactory service provided by DealerWeb.

Appendix G

No	Privacy :Rating Total number of items for Privacy = 36		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree

No	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	1	3
2.	0	0	4
3.	0	1	3
4.	0	1	3
5.	0	0	4
6.	0	1	3
7.	0	0	4
8.	0	1	3
9.	1	0	3
Weighted Average	1: 2.78%	5: 13.89%	30: 83.33%

Table 1: Helpdesk Staff

Table 1 has a weighted average of 2.78% for unsatisfactory quality of service, 13.89% as not applicable and 83.33% as satisfactory service provided by DealerWeb.

No	Fulfilment :Rating Total number of items for Fulfilment = 48		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	0	3
2.	0	2	2
3.	0	1	3
4.	0	3	1
5.	0	3	1
6.	0	0	4
7.	1	1	2
8.	0	3	1
9.	0	1	3

1.	0	1	3
2.	0	0	4
3.	0	1	3
4.	0	1	3
5.	0	0	4
6.	0	1	3
7.	0	0	4
8.	0	1	3
9.	1	0	3
Weighted Average	1: 2.78%	5: 13.89%	30: 83.33%

Table 1: Helpdesk Staff

Table 1 has a weighted average of 2.78% for unsatisfactory quality of service, 13.89% as not applicable and 83.33% as satisfactory service provided by DealerWeb.

No	Fulfilment :Rating Total number of items for Fulfilment = 48		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	0	3
2.	0	2	2
3.	0	1	3
4.	0	3	1
5.	0	3	1
6.	0	0	4
7.	1	1	2
8.	0	3	1
9.	0	1	3

10.	3	0	1
11.	3	0	1
12.	1	0	3
Weighted Average	9: 18.75%	14: 29.17%	25: 52.08%

Table 2: Helpdesk Staff

Table 2 has a weighted average of 18.75% for unsatisfactory quality of service, 29.17% as not applicable and 52.08% as satisfactory service provided by DealerWeb.

No	Efficiency :Rating		
	Total number of items for Efficiency = 56		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	0	4
2.	1	0	3
3.	1	0	3
4.	1	0	3
5.	4	0	0
6.	1	0	3
7.	3	0	1
8.	0	0	4
9.	0	0	4
10.	2	0	2
11.	2	1	1
12.	1	1	2
13.	0	0	4
14.	0	2	2
Weighted Average	16: 28.57%	4: 7.14%	36: 64.29%

Table 3: Helpdesk Staff

Table 3 has a weighted average of 28.57% for unsatisfactory quality of service, 7.14% as not applicable and 64.29% as satisfactory service provided by DealerWeb.

No	Reliability :Rating Total number of items for Reliability = 28		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	1	1	2
2.	0	1	3
3.	4	0	0
4.	3	0	1
5.	3	0	1
6.	4	0	0
7.	1	2	1
Weighted Average	16: 57.14%	4: 14.29%	8: 28.57%

Table 4: Helpdesk Staff

Table 4 has a weighted average of 57.14% for unsatisfactory quality of service, 14.29% as not applicable and 28.57% as satisfactory service provided by DealerWeb.

No	Compensation :Rating Total number of items for Compensation = 16		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	2	2
2.	1	3	0
3.	0	2	2
4.	1	1	2
Weighted Average	2: 12.5%	8: 50%	6: 37.5%

Table 5 has a weighted average of 12.5% for unsatisfactory quality of service, 50% as not applicable and 37.5% as satisfactory service provided by DealerWeb.

No	Contact :Rating		
	Total number of items for Contact = 20		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	2	0	2
2.	1	0	3
3.	0	0	4
4.	0	0	4
5.	1	0	3
Weighted Average	4: 25%	0: 0%	16: 75%

Table 6: Helpdesk Staff

Table 6 has a weighted average of 25% for unsatisfactory quality of service, 0% as not applicable and 75% as satisfactory service provided by DealerWeb.

No	Responsiveness :Rating		
	Total number of items for Responsiveness = 28		
	Strongly disagree / Disagree	Not applicable to me	Strongly Agree / Agree
1.	0	2	2
2.	0	2	2
3.	1	0	3
4.	1	0	3
5.	0	0	4
6.	1	1	2

7.	3	0	1
Weighted Average	6: 21.43%	5: 17.86%	17: 60.71%

Table 7: Helpdesk Staff

Table 7 has a weighted average of 21.43% for unsatisfactory quality of service, 17.86% as not applicable and 60.71% as satisfactory service provided by DealerWeb.

	Service Provider	Privacy				Fulfillment				Efficiency				Reliability				Responsiveness				Compensation				Contact			
		Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical
1	Tzaneen (Ret)			1					1			1					1				1			1				1	
2	Rhodesdene			1			1						1				1				1			1					1
3	Canal Walk				1				1				1				1				1			1					1
4	Newcastle				1				1				1				1				1				1				1
5	Woodmead				1				1				1				1				1				1				1
6	Knysna 2			1			1						1				1			1				1				1	
7	Empangeni				1				1				1				1				1				1				1
8	Krugersdorp (Ret)				1				1				1				1				1				1				1
9	Polokwane				1				1				1				1				1				1				1
10	Welkom				1				1				1				1				1				1				1
11	Kroonstad (Ret)				1				1				1				1				1				1				1
12	Nelson Mandela Square (Ret)			1					1				1				1				1				1				1
13	Wonder Park (Ret)			1					1				1				1				1				1				1
14	Springs (Ret)				1				1				1				1				1				1				1
15	Simmonds Street (Ret)			1				1				1			1					1				1				1	
16	Bloemfontein Mimosa (Ret)				1				1				1			1					1				1				1
17	Alberton City (Ret)	1						1					1			1				1				1				1	
18	Potchefstroom (Ret)			1				1				1					1				1				1				1
19	City Centre			1			1						1				1				1				1			1	
20	Melville			1			1						1				1				1			1					1
	Total	0	1	7	12	0	0	6	14	0	0	2	18	0	0	2	18	0	0	4	16	0	0	8	12	0	0	5	15
		0	5	35	60	0	0	30	70	0	0	10	90	0	0	10	90	0	0	20	80	0	0	40	60	0	0	25	75

Internal Staff	Privacy				Fulfillment				Efficiency				Reliability				Responsiveness				Compensation				Contact			
	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical
Salomie Swart			1					1				1				1			1				1				1	
Shaun Herselman				1			1				1					1				1				1				1
Denise Nortier				1				1				1				1				1				1				1
Eddie Simes				1			1				1					1			1				1			1		
Samantha Coldicott				1				1				1				1				1				1				1
Total	0	0	1	4	0	0	2	3	0	0	2	3	0	0	0	5	0	0	2	3	0	0	2	3	0	1	1	3
	0	0	20	80	0	0	40	60	0	0	40	60	0	0	0	100	0	0	40	60	0	0	40	60	0	20	20	60

Representative	Privacy				Fulfillment				Efficiency				Reliability				Responsiveness				Compensation				Contact			
	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical	Irrelevant	Not important	Important	Critical
Valarie Valtyn				1				1				1				1				1				1				1
Paul Chauke				1			1				1				1					1		1					1	
Sandy Mbuli				1				1				1				1				1				1				1
Bella Ntsimane			1					1				1			1					1	1						1	
Total	0	0	1	3	0	0	1	3	0	0	1	3	0	0	2	2	0	0	0	4	1	1	0	2	0	0	2	2
	0	0	25	75	0	0	25	75	0	0	25	75	0	0	50	50	0	0	0	100	25	25	0	50	0	0	50	50
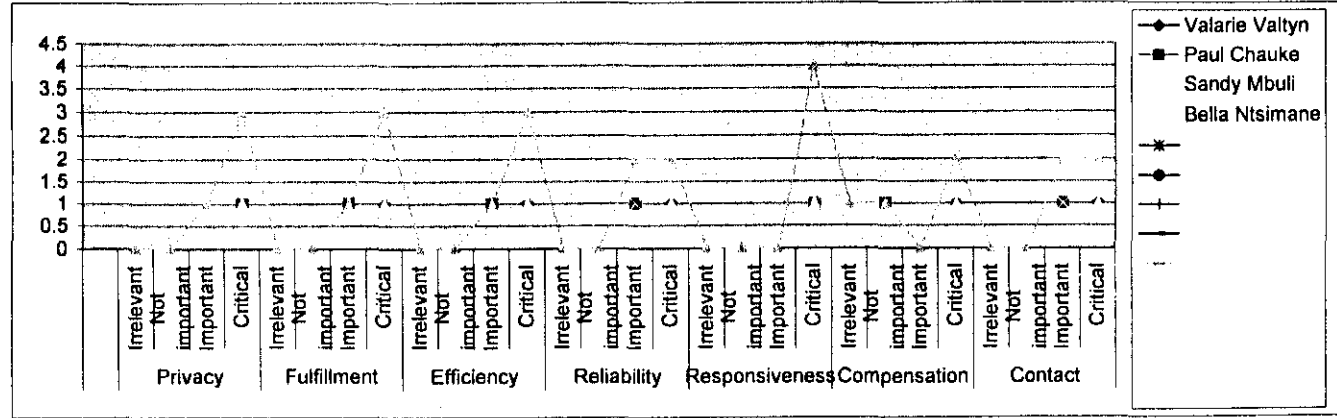
Stakeholder Profile: Service Provider

Stakeholder	Position in VSP			How often do you use DealerWeb				What is the main purpose you use it for			It is a desired application to use		Computer Literacy Experience				Level of computer literacy			How do you connect to the Internet		
	Store Manager	Process Clerk	Other	Everyday	Once a week	Once a month	Other	Reports	Operational	Management	I agree	Not applicable to me / Disagree	< 6 months	6 month to a year	1 to 2 years	3 to 5 years / Poor	Average	Very Good	ISDN	ADSL	Other
1 Potchefstroom																					
2 Woodmead																					
3 Fabiavenue																					
4 Krugersdorp																					
5 Empangeni																					
6 Worcester																					
7 Voortrap Tzaneen																					
8 Bloemfontein (Mimosa)																					
9 Canal Walk																					
10 Knysna																					
11 Welkom																					
12 Nelson Mandela Square																					
13 Newcastle																					
14 Springs																					
15 Simmonds Street																					
16 Alberton City																					
17 Rhodesdene																					
18 Menlln																					
19 Kroonstad																					
20 City Centre																					
21 Vangate Mall																					
22 Westgate																					
23 Dealers Are																					
24 Admin																					
25 Tracy (Admin Processing)																					
26 Atterbury																					
27 Westgate																					
28 Boulders																					
29 Hermanus																					
30 Secunda																					
31 4U																					
32 Malmesbury																					
33																					
34 Flamwood Park																					
35 Centurion																					
36 Boulders (Fundi)																					
37 Ifnton Plaza																					
38 Kilarney																					
Total	28		9	38	0	0	1	0	32	14	37	0 / 1	2	0	4	32 / 0	29	9	11	7	20
				100	0	0		0	84.21	36.84	97.37	2.63	6.26	0	10.53	84.21	78.32	23.68	28.95	18.42	52.63

Stakeholder Profile: Helpdesk Staff

	Stakeholder	Position in VSP	How often do you use DealerWeb			What is the main purpose you use it for			It is a desired application to use			Computer Litercy Experience				Level of computer literacy			How do you connect to the internet		
		Helpdesk Clerk	Everyday	Once a week	Once a month	Reports	Operational	Management	I agree	Not applicable	Disagree	< 6 months	6 month to a	1 to 2 years	3 to 5 years	Poor	Average	Very Good	ISDN	ADBL	Other
1	Valeris Vaaltyn	1	1					1			1				1			1			1
2	Paul Chauke	1	1				1		1						1			1	1		
3	Sandy Mbuli	1	1				1		1						1			1			1
4	Bella Nsimane	1	1				1		1						1			1			1
	Total	4	4	0	0	0	3	1	3	0	1	0	0	0	4	0	0	4	1	0	3
			100	0	0	0	75	25	75	0	25	0	0	0	100	0	0	100	25	0	75

Stakeholder Profile: Internal Staff

Stakeholder	Position in VRP			How often do you use DealerWeb			What is the main purpose you use it for			It is a desired application to use			Computer Literacy Experience				Level of computer literacy			How do you connect to the Internet		
	Business Analyst	Project Manager	Developer	Everyday	Once a week	Once a month	Reports	Operational	Management	I agree	Not applicabl	Disagree	< 6 months	6 month to a	1 to 2 years	3 to 5 years	Poor	Average	Very Good	ISDN	ADSL	Other
1 Denise Notley	1			1				1		1						1			1	1		1
2 Eddie Simes			1		1			1		1						1			1			1
3 Samantha Caldicott		1			1			1			1					1			1	1		
4 Salome Swart	1			1				1		1						1			1			1
5 Shaun Heiselman	1			1				1		1						1			1			1
Total	3	1	1	3	2	0	0	5	0	4	1	0	0	0	0	5	0	0	5	1	0	4
	60	20	20	60	40	0	0	100	0	80	20	0	0	0	0	100	0	0	100	20	0	80

APPENDIX L

	In **your view**, rate the following criteria with regards to the **DealerWeb** System. Mark your choice with an '**X**'.	Irrelevant	Not important	Important	Critical
1.	**Privacy** - The degree to which the site is safe and protects all information.				
2.	**Fulfilment** - The extent to which the site's promises about order delivery and item availability are fulfilied.				
3.	**Efficiency** - The ease and speed of accessing and using the site.				
4.	**Reliability** - The correct technical functioning of the site.				
5.	**Responsiveness** – Quick response and ability to get help if there is a problem or question.				
6.	**Compensation** - The degree to which the site compensates users for problems.				
7.	**Contact** - The availability of assistance through telephone or online	Ability to get on the site quickly and to reach the company when needed.				

Appendix M

Herschel Nomdoe

From:	Maxine Poonawassy
Sent:	15 June 2006 02:21 PM
To:	VSP Vodashops
Cc:	Herschel Nomdoe
Subject:	FW: DealerWeb - ATT: Store Managers
Attachments:	DealerWebQuestionnaire.doc

Good Day All,

Kindly respond to the e-mail below as a matter of urgency.

Also note the e-mail address to which you have to respond.

Thank you and kind regards

From: Herschel Nomdoe
Sent: 15 June 2006 07:37 AM
To: Gideon Hugo (VSPC)
Subject: RE: DealerWeb

Good morning.

Please find the questionnaire attached.

When sending out the mail, could you please list the following as instructions?

1) Please return completed questionnaire by no later than 5 July 2006
2) Please return to herschel.nomdoe@vcontractor.co.za (021-440 8688 | 082 495 8039)

Kind regards,

Herschel Nomdoe

2008/09/12