THE IMPACT OF QUALITY GOVERNANCE ON INFORMATION TECHNOLOGY SERVICE DELIVERY

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Cape Peninsula
University of Technology

THE IMPACT OF QUALITY GOVERNANCE ON INFORMATION TECHNOLOGY SERVICE DELIVERY

by

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Dissertation to be submitted in fulfilment of the requirements for the degree

MAGISTER TECHNOLOGIAE: QUALITY

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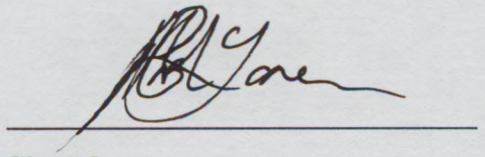
Bellville
November 2010

DECLARATION

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



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13/04/2011

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ABSTRACT

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University: Cape Peninsula University of Technology

Department: Quality in the Faculty of Engineering

Supervisor: Prof, Dr. J A Watkins

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Computacenter SA (CCSA), serves as focus of this study. One of CCSA's clients is Unipart and therefore will be used as the example to mitigate the research problem, serving to demonstrate how Service Levels are structured and how they are monitored. According to the Company policy and agreed Service Level Agreements (SLA's), an acceptance level of 95% should be reached in terms of service delivery. Anything below 95% would be considered a failure, and therefore constitutes a breach of the agreement.

The tool used by Computacenter South Africa (CCSA), to measure or monitor the SLA is referred to as Service Flow. Within Service Flow there are mechanisms known as 'pre exception result' and a 'post exception result'. These concepts constitute a report, which is compiled on a monthly basis to check and evaluate performance. Should a request from a client not be met and there is a valid reason for the non compliance of the request. It can however bean exception and can therefore be processed as being successfully executed within the context of the SLA. If no valid reasons are, however logged in the request work log, the request constitutes as failed and can therefore lead to the team not achieving their agreed SLA with the customer.

Failing SLA's have a significant impact on, not only CCSA, but also on the customer, as the organisation can lose confidence in the ability of Longbow Remote Technical Support Request Management is there to render a quality service. Ultimately, a penalty can be imposed on both the analysts and CCSA. In addition, the customer could withdraw from the contract as the organisation is not

receiving the agreed upon services for which they are paying. CCSA will not only suffer financially, but also lose its credibility in the market as an Information Technology (IT) Service Provider.

For the purpose of this study, questionnaires were formulated to determine where the problem areas are and what CCSA as a service provider can do to not cause their clients to become redundant, and to always meet the service level agreements set by the clients. Results from the research returned that a lack of Information Technology governance structures and best practices within CCSA is the cause of service level agreements failing.

ACKNOWLEDGEMENTS

I would firstly like to thank God for giving me the strength, perseverance, wisdom and ability to complete this study.

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- my family for their love, motivation and support through my studies
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- my classmates, for their motivation and team work.

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CHAPTER ONE

SCOPE OF THE RESEARCH

1.1 INTRODUCTION AND MOTIVATION

Computacenter Pty (LTD) commonly referred to as CC, is one of Europe's leading independent providers of Information Technology infrastructure services. CC is ISO 9001: 2008 certified by the British Standards Institution. The business aims to assist its customers and clients to maximise the value of Information Technology within their own organisations.

CCSA Pty (LTD) is one of CC's wholly owned offshore subsidiary and is based in Cape Town South Africa. It originated from what was known as Capespan's IT Support and Service Desk. CC saw the opportunity to invest in this small company for a number of valid business reasons, based on the work culture of the people and costs in order to provide cheaper services at lower salaries earned. CCSA is an IT service provider providing largely remote support, irrespective of it being user based, server based or network based. The reason for this is that approximately 80 – 90% of CCSAs' customers or clients are United Kingdom (UK) based.

CCSA, in conjunction with its parent company CC, takes on contractual responsibility for the management of the customers' IT infrastructure, not only to reduce costs, but also to improve service levels. Support services, such as remote installations and maintenance of desk- and laptop computers, data centres, networks, user help-desk support and disaster recovery, are all representative of services provided. Services include integration and project management expertise, advice across and range of technologies and areas of services which the company provides. The company will source, configure and deploy hardware and software for customers from a wide selection of leading IT vendors, As a result, procurement consulting, software license management, technology disposal and asset management also form part of the services rendered to customers. Due to the

spectrum of services provided the service provisioning can be grouped as functions of the company. Amongst these are managed and support services, consulting and integration and supply chain services,

Many different departments, contracts and customers from South Africa to the United Kingdom and the United States, all form part of CCSA's responsibility to render excellent and quality service delivery. Entities such as Agility Logistics, Hays Recruitment Agency, Nationwide Bank in the UK, Energy Group (EDF), Glaxo SmithKline (GSK) and Longbow Remote Technical Support (RTS) demonstrate the extent of the responsibility of CCSA. This research will focus and be limited to the Longbow RTS Request Management team, and one of the customers it supports in terms of their Service Level Agreement.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

The client, which will form the objective of this research study will be Unipart. According to the company policy and agreed Service Level Agreements (SLA), an acceptance level of 95% should be reached in terms of service delivery. Anything below 95% would be considered as a failure, and therefore constitute a breach in the agreement. The tool used by CCSA to measure or monitor the SLA is referred to as Service Flow. Within Service Flow there are mechanisms known as 'pre exception result' and a 'post exception result'. These concepts constitute a report, which is drawn every month to check and evaluate performance. Should a request be breached and there is a valid reason for failure, the request can be exceptioned and can therefore be processed as a pass within the context of the SLA. However, if no valid reasons are logged within the requests work logs, the request constitutes a fail and can therefore lead to the team not achieving their agreed SLA with the customer.

Failing SLA's haves a significant impact on not only CCSA, but also on the customer side as the organisation can lose confidence in the ability of Longbow RTS Request Management to render a quality service to it. Ultimately, a penalty can be leveled at both the analysts and CCSA. In addition, the customer could withdraw from the contract, as the organisation is not receiving the agreed upon

services they are paying for. CCSA will not only suffer financially, but will lose its credibility in the market as an IT Service Provider.

For the purpose of this research study, an investigation will be conducted and statistics will be monitored for a number of months to determine to what extent CCSA meets the conditions of the SLA with the customer, and how quality and IT governance interact. Furthermore, also how quality IT governance can assist in preventing non conformance.

1.3 STATEMENT OF THE RESEARCH PROBLEM

Against the above background, the research problem to be investigated within the ambit of this dissertation reads as follows: "Information Technology service providers' non compliance with quality principles and procedures, causing SLA's to fail".

1.4 RESEARCH QUESTION, INVESTIGATIVE SUB-QUESTIONS AND OBJECTIVES

1.4.1 Research question

The research question to be explored within this dissertation reads as follows: "How can quality governance and principles applicable to IT service providers, be improved to have an impact that results in improved service delivery and compliance with the SLA's?"

1.4.2 Investigative sub- questions

Some sub-questions will be researched to support of the research problem like

- whether the absence of set procedures can have a negative effect on client requirements
- how the implementation of frameworks and standards can reduce the risk of failing SLA's
- what the ruling principles of IT SLA's are

- what the ruling principles governing Information Technology Infrastructure Library (ITIL) are

1.4.3 Primary research objectives

The primary objectives of the researcher are:

- to demonstrate that IT governance can prevent failure of IT service delivery
- that recommendations formulated from this research study will have a positive impact and effect on how services will be delivered, without incurring any SLA breaches within the target organisation

1.5 THE RESEARCH PROCESS

The research process provides insight into the process of 'how' the investigation will be conducted from formulating the research proposal, to final submission of the dissertation. Fundamental stages in the research process, common to all scientific based investigations are according to Remenyi, Williams, Money and Swartz (2002:64-65), consisting of eight specific phases such as

- reviewing the literature
- formalising a research question
- establishing the methodology
- collecting evidence
- developing conclusions
- understanding the limitations of the research
- producing management guidelines or recommendations

Collis and Hussey (2003:16) state six fundamental stages in the research process, namely the

- identification of the research topic
- definition of the research problem
- determination of how the research is going to be conducted
- collection of the research data

- analysis and interpretation of the research data
- writing of the dissertation

The research process which will be followed in this dissertation will be to

- determine the 'field of study' for the proposed research
- identify a specific complex problem within a researchable applicable area
- conduct a holistic survey of the functional area in which the complex problem exists, to determine the impact of the problem on the specific area of application, and the value the proposed research may bring
- conduct an abbreviated literature review on the subject matter being investigated
- describe and formulate the research problem
- describe and formulate the research question and the associated investigative sub-questions
- select an appropriate research and design methodology which includes the data collection design and methodology appropriate for this study
- determine the key research objectives for the proposed research
- document the research process
- identify the limitations, which may impact on the proposed research
- formulate a formal research proposal and submit it for approval
- establish a structured working relationship with the allocated supervisor
- conduct and in-depth literature review on the subject being researched
- collect, analyse and interpret the research data
- write the dissertation
- proofread the dissertation and submit it for formal vetting

1.6 THE RESEARCH DESIGN AND METHODOLOGY

According to Yin (1994:19), a research design can be defined as, "... the logical sequence that connects the empirical data to a study's initial research question and ultimately, to its conclusions. Colloquially, a research design is *an action plan from getting from here to there,* where *here* may be defined as the initial set of

questions to be answered, and *there* is some set of conclusions (answers) about these questions".

For the purpose of the proposed research, falling within the phenomenological (qualitative) paradigm, a case study research methodology will be followed. Yin (1994:1) says case study research can be used in many situations, including

- policy, political science, and public administration research
- community psychology and sociology research
- organisational and management studies
- city and regional planning research, such as studies of plans, neighborhood or public agencies
- research into the social sciences, academic disciplines and professional fields, such as business administration, management sciences, and social work

Collis and Hussey (2003:68-70) stipulate that case studies are often described as exploratory research used in areas where there are few theories or a deficient body of knowledge. They also mention other types of case studies such as

- **descriptive case studies** where the objective is restricted to describing current practice
- **illustrative case studies** where the research attempts to illustrate new and possible innovative practices adopted by particular companies
- **experimental case studies** where the research examines the difficulties in implementing new procedures and techniques in an organisation, and evaluating the benefits
- **explanatory case studies** where existing theory is used to understand and explain what is happening

Yin (1994:20-27), emphasizes five components of a research design, which are especially important for case studies like

- **study questions** where the case study strategy is most likely appropriate for 'how' and 'why' questions, which calls for the initial task being to clarify precisely the nature of the study questions

- **study propositions** where a study proposition directs the attention to something that should be examined within the scope of the study. For greater clarity, the proposition points to the 'reason for the study'
- **unit of analysis** where should the case study involve a specific person being studied for example a person with a rare medical problem, the individual being studied, is the primary unit of analysis. The tentative definition of the unit of analysis is related to the way in which the initial research questions were formulated.

1.7 DATA COLLECTION DESIGN AND METHODOLOGY

Forming the crux of the proposed research, questionnaires will be used as the method of data collection. Questionnaires fall within the ambit of a broader definition which is survey and descriptive survey research. The concept of 'survey' is defined by Remenyi *et al.* (2002:290) as: "... the collection of a large quantity of evidence usually numeric, or evidence that will be converted to numbers, usually by means of a questionnaire".

A questionnaire consists of structured questions, chosen after considerable testing, with a view of eliciting reliable responses from a chosen sample. The aim is to establish what selected participants do, think or feel. A positive approach suggests instructed 'closed' questions, while a phenomenological approach suggests unstructured 'open-ended' questions.

1.8 DATA VALIDITY AND RELIABILITY

According to Collis and Hussey (2003:186), 'validity' is concerned with the extent to which the research findings accurately represent what is happening or more specifically, whether the data is a true picture of what is being studied. According to Cooper and Schindler (2006:318-320), three major forms of validity can be identified. These are 'content validity', 'criterion-related validity' and 'construct validity', which is expanded upon below to provide a holistic perspective of each of the concepts such as:

- **Content validity** which is the content of measuring instrument to the extent to which it provides adequate coverage of the investigative sub-

question guiding the study and if the instrument contains a representative sample of the universe of subject matter of interest, then content validity is good

- **Criterion-related validity** which reflects the success of measures used for prediction or estimation and any criterion measure to be judged in terms of four qualities like:
  - **freedom from bias** when the criteria that gives each respondent the opportunity to score well,
  - **reliability** when a reliable criterion is stable and reproducible,
  - **availability** where the information specified by the criterion must be available.
- **Construct validity** where by attempting to evaluate construct validity, both the theory and the measuring instruments being used, should be considered. Collis and Hussey (1979:59) mention that construct validity relates to the problem that there are a number of phenomena, which are not directly observable, such as motivation, satisfaction, ambition and anxiety and these are known as hypothetical constructs, which are assumed to exit as factors which explain observable phenomena

Reliability (also referred to as 'trustworthiness'), is concerned with the findings of the research (Collis & Hussey, 2003:186). There are three common ways of estimating the reliability of the responses to questions in questionnaires or interviews, namely the 'test re-test method', 'split-halves method' and the 'internal consistency method'. The Test re-test method is where the questions are asked to the same people, but on two separate occasions. Responses of the two occasions are correlated and the correlation coefficient of the two sets of data computed, providing an index of reliability. The Split-halves method is where questionnaires or interview record sheets are divided into two equal halves. The two piles are then correlated and the correlation coefficient of the two sets of data computed, this providing an index of reliability. The Internal consistency method is where every item is correlated with every other item across the entire sample and the average inter-item correlation is taken as the index of reliability.

Content and Construct validity will be used when determining the validity of data. Furthermore, the Split-halves method will be used as a method for reliability, as explained by (Collis & Hussey, 2003:186).

1.9 ETHICS

In the context of research, according to Saunders, Lewis and Thornhill, (2000:130), "... *ethics* refers to the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it". Most ethical issues in research fall into one of four categories, namely protection from harm, informed consent, right to privacy and honesty with professional colleagues (Leedy & Ormrod, 2001: 107-108). Protection from harm is in cases where the nature of a study involves creating small amount of psychological discomfort, participants should know about it ahead of time, and any necessary debriefing or counseling should follow immediately after their participation. Informed consent is when participants should be told in advance about the nature of the study to be conducted, and given the choice of either participating or not participating. Furthermore, they should be given the right to withdraw from the study at any time, as participation in a study should be strictly voluntary. It is suggested that an informed consent form that describes the nature of research as well as the nature of the required participation be presented to participants in a research study. Such a form should according to Leedy & Ormrod (2001:108) contain information like

- a brief description of the nature of the study
- a description of what participation will involve in terms of activities and duration
- a statement indicating that participation is voluntary and can be terminated at any time without penalty
- a list of potential risk and/or discomfort that participants may encounter
- a guarantee that all responses will remain confidential and anonymous
- a name of the researcher, plus information about how the researcher can be conducted

- an individual or office that participants can contact, should they have questions or concerns about the study
- an offer to provide detailed information about the study (e.g., a summary of findings) upon its completion
- a place for participants to sign and date the consent form, indicating agreement to participate.

The right to privacy means that any research study should respect participants' right to privacy. In general, a researcher must keep the nature and quality of participants' performance strictly confidential. There must be honesty with professional colleagues and the researcher must report the findings in a complete and honest fashion, without misrepresenting what they have done or intentionally misleading others as to the nature of their findings. Under no circumstances should a researcher fabricate data to support a 'noble' that conclusion may be.

Collis and Hussey (2003:38-39), expand on the above and add 'confidentially/anonymity' 'dignity' and 'publications' to the list.

It is good research practice to offer confidentiality/anonymity to participants in a research project. This would encourage them to give more open and honest responses. Participants' dignity must be respected in research by not embarrass or ridicule participants. The success of a research student is achieved through the acceptance of the thesis or dissertation and it being published. More often than not, research and research findings are falsified in order to achieve publication success. It is highly unethical and more so to exaggerate or omit results in order to present research in a more favourable light. A more complex situation arises when a publication casts a bad light on an individual, group or organisation.

Collis and Hussey (2003:39), citing Kervin (1992:38), also developed a checklist to ensure that research is conducted in an ethical manner. These are whether the

- research process will harm participants or those about whom information is gathered (indirect participants)
- findings of the research is likely to cause harm to others not involved in the research
- practice violated in conducting the research, the data analysis, and drawing conclusions
- community standards of conduct are violated

Informed consent and the right to privacy will be applied to this research study.

1.10 RESEARCH ASSUMPTIONS

The research assumptions applicable in this study are that

- IT service providers are fully trained and competent to do jobs to the best of their ability
- IT frameworks and procedures are set for service providers to adhere to
- improvements and change is not always good to take on.

1.11 RESEARCH CONSTRAINTS

According to Collis and Hussey (2003:128-129), 'limitations' identify weaknesses in the research, while 'de-limitations' explain how the scope of the study was focused on only one particular way or entity, as opposed to a wider or holistic approach.

The research conducted will be limited to the personnel of the organisation and representatives from a specific client to whom the IT services are delivered to. As opposed to doing an investigation on CCSAs' Service Level Agreements with all of its clients it supports, one client was selected for the purpose to collect exact data and to not generalize. The scope of the research has thus been narrowed down to one specific entity as opposed to taking a holistic approach.

1.12 SIGNIFICANCE OF THE PROPOSED RESEARCH

Statistics have shown that due to the fact that Service Level Agreements are not being met within CCSA, certain clients started to withdraw from their contracts because requirements and set agreements were not being adhered to. The clients started losing faith in the company and therefore withdrew their business. As a result, it was decided that this research should be conducted to assist the company in improving methods of work to ensure the clients agreements and requirements are met.

Therefore this research will contribute to the excellence of IT service delivery within the organisation. With the use of previously investigated and compiled structures and policies, a generic framework or model will be developed, to aid in the sustainability of the organisation's IT governance structures.

1.13 CHAPTER AND CONTENT ANALYSIS

The chapter and content analysis, which will pertain to this dissertation, reads as follows:

- **Chapter 1: Scope of the research**. In this chapter, a holistic perspective will be provided of the proposed research. The focus is centered on the research problem, research question and the proposed research design and methodology.
- **Chapter 2: Holistic overview of the research environment**. In this chapter, a holistic perspective will be provided of the organisation in which the research problem exists.
- **Chapter 3: Literature Review**: This chapter will be split into two sections. The first section will provide definitions and the application of the following concepts of Governance, IT Governance, Corporate Governance, Quality, Value, and Service Level Agreements. The second section will review the selected standards, frameworks and codes used in firms as a method of best practice.
- **Chapter 4: Data Collection and Interpretation of the results**. In this chapter, data analysis and subsequent interpretation of the results will be conducted on the data gathered from the research questionnaire.
- **Chapter 5: Conclusion**: The research in this study will be concluded, and a generic IT Quality governance model will be proposed in this chapter to address the research problem within the organisation.

1.14 CONCLUSION

The next chapter will cover a holistic overview of the research environment. Within this Chapter 2, a full and detailed view will be discussed narrowing it down to the problem area and where the problem statement was established.

CHAPTER TWO

HOLISTIC OVERVIEW OF RESEACH ENVIRONMENT

2.1 INTRODUCTION

Computacenter Pty (LTD), also commonly referred to as CC, is one of Europe's leading independent providers of Information Technology infrastructure services. CC is ISO 9001: 2008 certified by the British Standards Institution and the business aims to ensure or help its customers and clients maximise the value of Information Technology within their organisations.

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CCSA, in conjunction with its parent company CC, takes on contractual responsibility for the management of the customers' IT infrastructure, not only to reduce costs, but also to improve service levels. Support services, such as remote installations and maintenance of desk- and laptop computers, data centres, networks, user help-desk support and disaster recovery, are all representative of services provided. Services also include integration and project management expertise, advice across and range of technologies and areas of services which the company provides. The company will source, configure and deploy hardware and software for customers from a wide selection of leading IT vendors, As a result, procurement consulting, software license management, technology disposal and asset management also form part of the services rendered to customers. Due to the

spectrum of services provided the service provisioning can be grouped as functions of the company. Amongst these are managed and support services, consulting and integration and supply chain services,

Many different departments, contracts and customers from South Africa to the United Kingdom and the United States, all form part of CCSA's responsibility to render excellent and quality service delivery. Entities such as Agility Logistics, Hays Recruitment Agency, Nationwide Bank in the UK, Energy Group (EDF), Glaxo SmithKline (GSK) and Longbow Remote Technical Support (RTS) demonstrate the extent of the responsibility of CCSA. This research will focus and be limited to the Longbow RTS Request Management team, and one of the customers it supports in terms of their Service Level Agreement.

2.2 OVERVIEW OF INCIDENT AND REQUEST MANAGEMENT

Together with CCSAs' ISO certification, it is also ITIL certified. The Information Technology Infrastructure Library (ITIL) is a system, which most leading IT companies follow to ensure excellent service provision to their customers and clients. Within the process of this study, the focus will be placed on the request management aspect of ITIL in accordance with the area in which the problem statement lies within CCSA. CCSA provides both Request and Incident management to their customers as part of the support and services they deliver.
To provide for an improved understanding of what is meant by Incident Management in the IT sector of service delivery an incident is a fault, more so defined by ITIL as an unplanned interruption to an IT service causing reduction of the quality of an IT service. Incidents can vary from different priorities depending on the nature of the fault and to what extend the damage are. For example, if one person is affected by the fault, it is known as a priority two and if there is a server outage which prevents users from sending emails or connecting to the internet, it is known as a priority one. Therefore incidents are classified according to the severity of the fault.

On the other hand, a customer's request is what a customer or client asks from the service provider to be executed by IT specialists. A request is a way of pre-

defining the steps to be taken to handle or follow a process in an agreed way. Requests from different customers vary, but the principle remains same. Requests can be anything, from an account created for a new person starting within the company, access to shared drives on a public share to a request for hard- or software installations. If a request, however, is carried out throughout the process it should follow, and the users are still having difficulty receiving the access, it will then be classified as a fault which will then become an incident. Since a request can evolve into an incident it stands to reason that these two elements should be one manager's responsibility. One of the departments at CCSA that focus largely on request and incident management is Longbow RTS.

2.3 LONGBOW REMOTE TECHNICAL SUPPORT DEPARTMENT

Longbow was a transition project by CC to move a number of UK based customer IT services to CCSA. Today, the name Longbow still exists and consists of two main teams which are responsible for providing the necessary services to the customers. Longbow focused mainly on the aspects of Request and Incident Management. The department consists of the following teams, RTS Request Management, RTS Wintel and RTS Groupware. Wintel and Groupware is classified under one big team as it provides second and third line support to customer requests and incidents.

Longbow utilizes various IT technologies to meet the requirements of the user. The engineers log on to a Virtual Private Network (VPN) from where they use Citrix to connect and communicate to the various Servers with the customer. The customers' IT infrastructures are built on either an MS Active Directory and MS Exchange environment, or a MS Active Directory and Domino Lotus Notes environment. Engineers are responsible to see that customers are satisfied by rendering excellent IT services. Depending on the customer, the engineer or analyst is assigned to and the specific need, will determine the scope of the work to be covered or the service to be delivered. The service delivered by the department can be associated as user-, server- and network-based incidents or requests, raised by the user depending on the Service Desk for a particular

customer. Figure 2.1 depicts the process incidents and requests follow from the onset to completion.

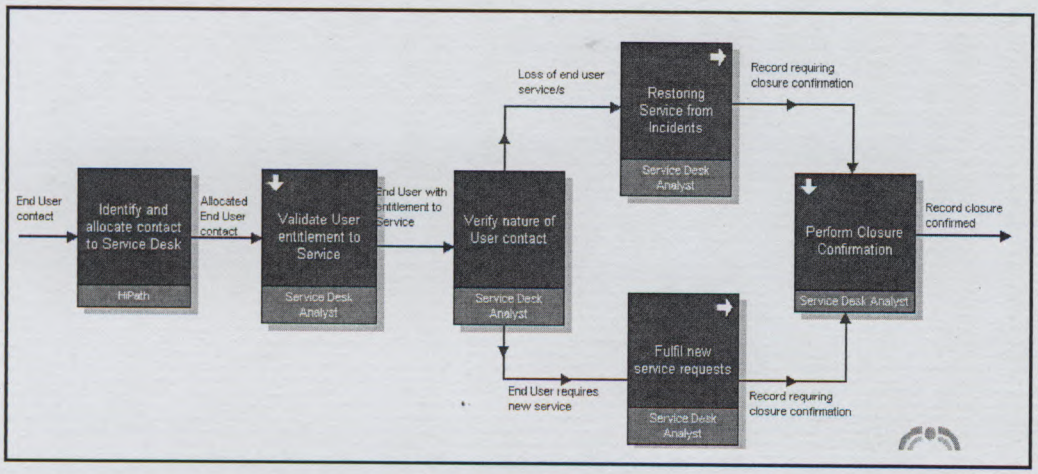

Figure 2.1 Process of Incidents and Requests (**Source**: Own Source)

All the requests and incidents from customers to the Service Desk follow the process as illustrated in Figure 2.1. This forms part of response management, indicating the steps involved to solve the customers' requirements. There are many UK customers which are supported by Longbow. These customers are Channel Four Television and Broadcasting Company, Fremantle Media, Unipart Logistics, TDG, Northern Foods, Shanks, and Parity.

All these customers have their own sets of documents that contain the procedures to be followed when a certain task is to be completed. Within these documents the Service Level Agreements (SLA) between CC and the customer and CC and CCSA is also stipulated. This forms part of company governance and for each UK customer, CCSA has an agreement with its parent company CC for the customers. All the documents and agreements are drawn up in the transition phase, before the customer's systems are activated. Therefore, when the engineer or analyst starts working on the requests of certain clients they should familiarise themselves with the processes and procedures. Failing to adhere to specified documentation can result in a non conformance, thus allowing the customer to loose faith in the service of the service provider.

Both the Request and Wintel Teams, are divided and assigned to the various clients Longbow supports. Most of the contracts are high maintenance and therefore demand adequate staff. For example one of Longbow's most popular and demanding customers is Fremantle Media. Therefore a total of three request analysts and four incidents and second line engineers are assigned to manage the day to day requests and incidents logged by a customer. The rest of the clients, such as Channel Four, and Unipart are only assigned two request analysts and two second line engineers. The smaller contracts such as Northern Foods and TDG, have only one each analyst and second line engineer assigned to support any requests or incidents the customer might need. The request and second line support teams, work hand in hand, as a request might sometimes be logged that requires the services of both the request team and the second line engineers.

2.3.1 Remote Technical Support Request Management

Request Management is defined by the Information Technology Infrastructure Library (ITIL), as a way of pre-defining the steps that should be taken to handle a process in an agreed way. Within the RTS Request Management Team, these processes and procedures are set and defined on a knowledge portal for analysts to adhere and conform to.

The request team works together with the Service Desk. The process which a request follows is illustrated in Figure 2.2

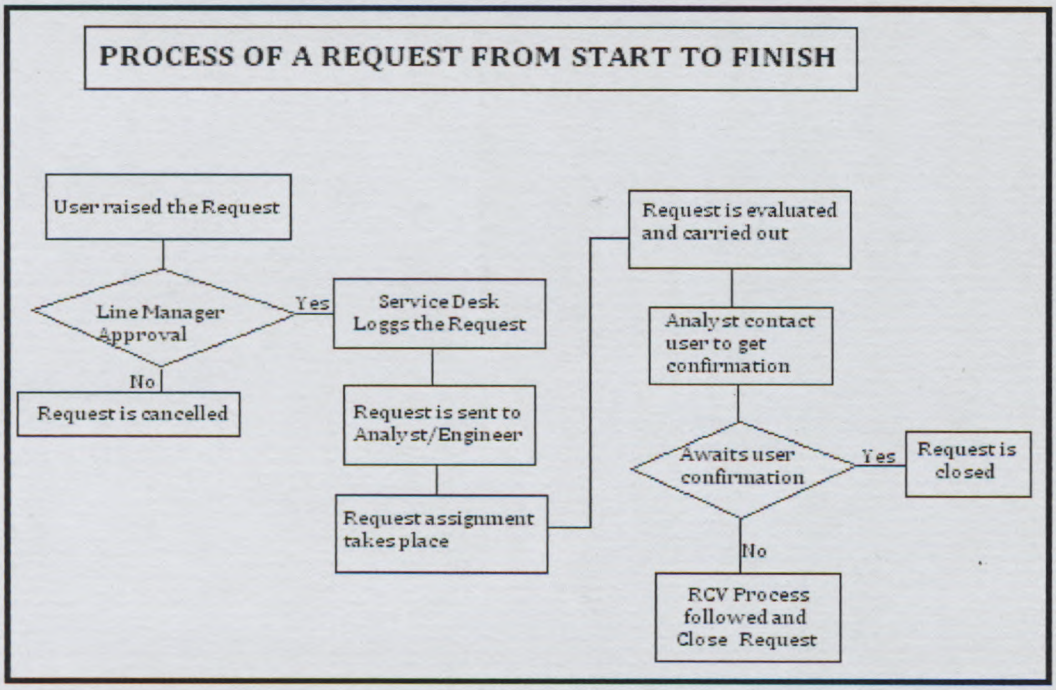

Figure 2.2 Request Management Process (**Source**: Own Source)

Figure 2.2 illustrates that once the user raised the Request with the Service Desk, approval is required from the Line Manager of the specific department within which the user works. Once the request has been approved, an alert is send to the Service Desk where it is logged with the Request Team. The Request Team assigns and carries out the request, by following a set procedure to ensure that the clients receives the necessary access he/she may have requested. Upon completion of the work, an email is sent to the user to test and verify access granted. Only after the user has confirmed, the request may be closed. However, in a case where a user does not confirm, the RCV (Request Closure Verification) process is followed. The RCV process is triggered only after the analyst has tried contacting the user, either by telephone or email for more than three times. If no confirmation has been received, or no indication that the user might be out of office, the analyst sends an email as notification that the work and the request has been completed.

Request types vary from customer to customer, but they all relate to exactly the same principle, as shown in Figure 2.3. The cycle a request follows from when the customer logged it to the time of completion, remains the same for all customers supported by RTS Requests. The responsibility of a request analyst is to ensure that the specific request follows the set process, from start to finish. The work is

to be completed to the best of their knowledge and ability, and should be done within the signed SLA.

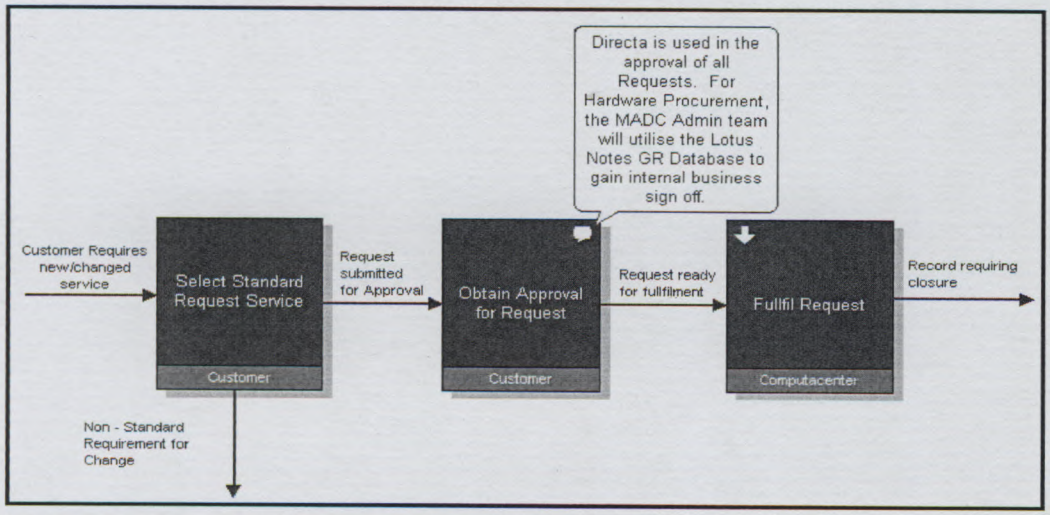

Figure 2.3 Lifecycle of a Request (**Source**: Own source)

Each customer has its own set SLA's regarding the types of requests. For this research the focus will be on the customer, Unipart, and its SLA's being either achieved or not.

2.3.2 Unipart with its Service Level Agreements (SLA) set

Unipart Group of Companies is one of Europe's leading independent logistics, automotive parts and accessories, companies. It is listed as one of the largest private companies in the UK. Unipart's areas of expertise are the

- provisioning of logistics services to the automotive, industrial, aerospace, retail, IT, mobile communications, defence and healthcare sectors
- development and marketing of automotive after sales parts
- manufacturing of original equipment automotive parts
- supplying of truck and trailer components
- marketing and distribution of caravan, camping, marine parts and accessories
- supply of rolling stock parts, services, signaling and telecommunications equipment to the rail industry
- provision of consultant and training services to enable the sustainable organisational change.

When CC takes on customers, SLA's are assigned to the relevant teams, to which the teams must adhere to. However, these agreements are all verbal and none of them are set within a documented procedure, signed off by the service provider and the customer. These SLA's are set with in the Program used by the Service Desk and the Request Team to monitor and receive requests logged by the customer. This Program, named Remedy was designed on the principles of ITIL which configures incident-, change-, request- and problem-management. The SLA's are set for each specific type of request, as the customer might have verbally agreed to. Table 2.1 is an overview of some of the requests being managed by the Unipart Request Team. For most of the requests, SLA's of eight hours is assigned and given to the engineer to complete. Other requests that involves the procurement of Hardware or parts, can take a number of days. To accommodate this an SLA of five days is given to complete these requests.

Table 2.1: Service Level Agreement for Unipart (**Source**: Own Source)

Type of Request	**SLA for request to be complete.**
New Starters	8 hours
Leavers	8 hours
Notes Accounts	8 hours
Database/Mail in Database	8 hours
File/Folder Access	8 hours
Server Admin	8 hours
Hardware	5 days

Unipart is one of the customers that often does not meet the SLA's. This could be due to the lack of resources, the times set for a request to be attained and completed being too short, or it is simply the result of what happens when formal documentation is not in place.

2.4 OVERVIEW OF TOOLS USED TO MONITOR SLA'S WITH CUSTOMERS

Each client supported by RTS Request Management has a verbally agreed upon SLA set and agreed upon after a business takeover. The analyst and engineers must comply with the SLA for to be completed within the agreed timeframes.

Various ways of monitoring SLA's are in place for both the Line Managers and Team Leaders to manage and evaluate the performance of SLA's whether achieved or not.

Remedy as one of the tools is a software package set according to ITIL standards, and is used for request-, incident-, problem-, change- and availability-management. Remedy is used to log a call for example, request for change (RFC), incidents and requests. Every client is setup within the program with the various assignment queues as well as the SLA's for a certain type of request.

The clock on the SLA starts as soon as the request has been logged within the system. It is then the responsibility of the analyst or the engineer to ensure the work is completed within the allocated times given. Figure 2.4 illustrates a summary of how the SLA's are shown and configured within Remedy. SLA status has a response SLA and a resolution SLA. If no response is given immediately or within an hour after the request has been assigned, the top button will go red and the task response time not met. It is of utmost importance to check and update requests received. The resolution SLA refers to the time in which the request will be carried out from start to finish. This specific example was taken from Unipart customer.

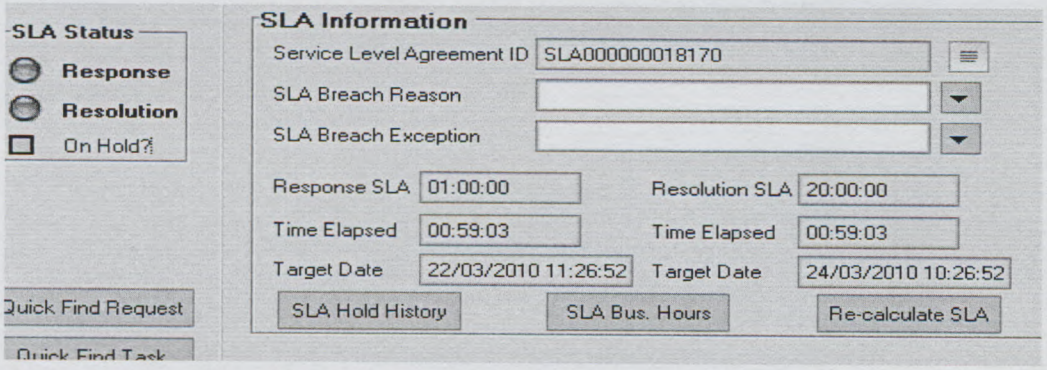

Figure 2.4: Summary of SLA's within Remedy (**Source:** Unipart customer)

Another tool used by RTS is Service Flow which in conjunction with Remedy measures the Key Performance Indicators (KPI's) achieved by the teams. Service Flow is a tool recommended by Computacenter to assist line managers and team leaders to monitor the SLA's by checking the number of requests logged for the engineers and analyst to attend to and whether the SLA was achieved or not. Figure 2.5 shows a statistical overview of how the report is processed.

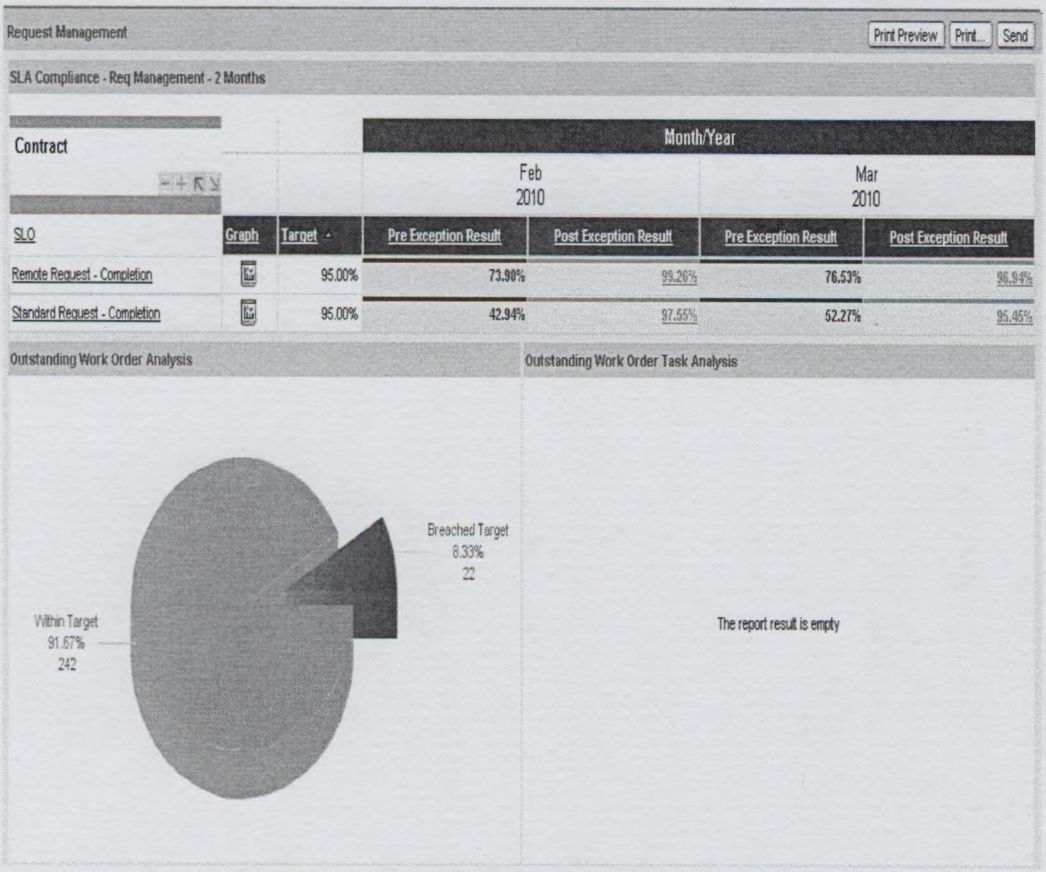

Figure 2.5: Statistical Report of Unipart (**Source**: Own Source)

According to company policy and SLA's agreed upon, an acceptance level of 95% should be reached to pass the SLA. Anything below 95% is a failure, and therefore a breach in the agreement that was set up with the customer. Within Service Flow there are elements known as the pre-exception result and a post exception result. This means, that a report is compiled every month to check and evaluate performances. If a request has not materialized and there is a valid reason for the failure, the request can be considered exceptioned and it can therefore be processed as a pass in SLA. However, if no valid reasons are logged within the request's work log, the request is a failure and it can lead to the team not achieving the SLA agreed to with the customer. Figure 2.6, above, shows the overview of SLA results for February and March. This specific report was developed for Unipart as customer and which the customer being focused on in this research.

2.4.1 Statistical overview of Unipart Service Level Agreements

To provide a detailed analysis of Unipart's requests, a few examples of reports were drawn from Service Flow. As can be seen in Figure 2.6, these are requests that have failed the SLA for both January and February. These requests did not qualify to be 'exceptioned', and therefore caused Unipart not being able to reach the critical 95% level to succeed and pass the SLA with the customer agreement, resulting in non conformance.

Work-Order Failure Analysis

SLO	Resolved Date	Work-Order #	Logged Date	Work-Order Name	Failure Notes
Remote Request - Completion	09-02-10	929396	01-02-10	4.1 - Change User Details	GC - Out of SLA by 2 hrs
	25-02-10	947689	22-02-10	1.1 - Account Administration	GC Out of SLA - Unix account request created locally
Standard Request - Completion	02-02-10	911536	11-01-10	2.1 - Hardware Install	GCUnable to extract date info from call, however looks like its out of SLA. Mike Gamble
	17-02-10	937667	09-02-10	2.1 - Hardware Install	GC Out of SLA. Printer reconfigure (J Sandel)
	18-02-10	920921	21-01-10	2.1 - Hardware Install	GC Stock from Cowley, built at Nuneaton deployed at Magna. Mike Gamble. 1 day out of SLA (MGamble)
	18-02-10	938978	10-02-10	2.1 - Hardware Install	GC Out of SLA. Stock from Cowley, built at Nuneaton deployed at Magna
	18-02-10	925061	26-01-10	2.1 - Hardware Install	GC Out of SLA. Stock from Cowley, built at Nuneaton, deployed at Magna. Mike Gamble 1 day out of SLA
	18-02-10	925099	26-01-10	2.1 - Hardware Install	GC Out of SLA. Stock from Cowley, built in Nunneaton, deployed at Magna, 1 day out of SLA (MGamble)
	18-02-10	917076	18-01-10	2.1 - Hardware Install	GC Out of SLA, just. Stock from Cowley, built in Nunneaton, then deployed to Magna. Mike Gamble
	18-02-10	939119	10-02-10	3.1 - Software Install	GC Out of SLA Mike Gamble. Keane
	25-02-10	937366	09-02-10	2.1 - Hardware Install	GC Out of SLA. Printer install (J Sandel)
	26-02-10	939025	10-02-10	2.1 - Hardware Install	GC Out of SLA. Stock from Cowley to Nunneaton, then needed to be deployed at Magna (MGamble)
	26-02-10	939016	10-02-10	2.1 - Hardware Install	GC. Buffer stock from Cowley, built in the Midlands, appears to be a delay in getting machine to the Midlands (MGamble)

Figure 2.6: Example of breached requests in Service Flow (**Source**: Own Source)

Figure 2.7, gives a brief overview of the number of requests logged for the analysts and engineers in one week. This does not include the outdated requests within the queue. As can be seen in the overview from Monday to Friday, a total of 110 new requests were logged for the request team to execute. A total of 121 requests were however completed. This includes some of the new request that were logged, as well as older requests that were in the queue.

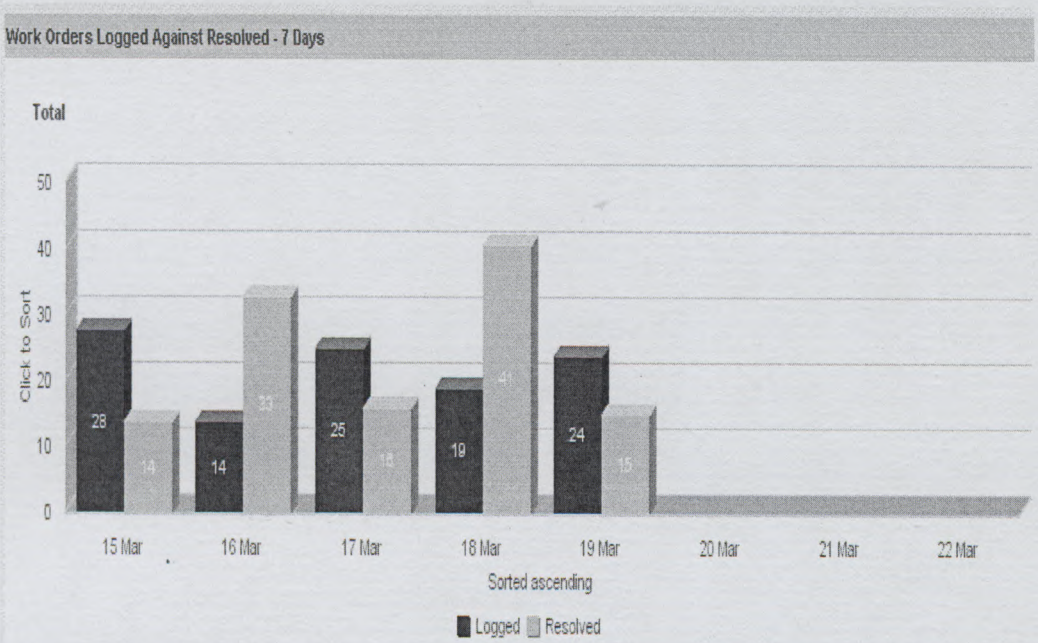

Figure 2.7: Requests received within 1 week for Unipart (**Source**: Own Source)

Depicted in Tables 2.2 and 2.3, are the results of both remote and standard requests for January and February and the percentage of SLA's achieved. Remote requests refers to requests made via the Citrix Server which gives the users access remotely, as done by the request team.

Table 2.2: Unipart's SLA's achieved for January (**Source**: Own Source)

Unipart Request Management	Types of Request	SLA Achievement
	Remote Requests Completion	**98.98%**
	Standard Requests Completion	**95.76%**

Table 2.3: Unipart's SLA's achieved for February (**Source**: Own Source)

Unipart Request Management	Types of Request	SLA Achievement
	Remote Requests Completion	**99.26%**
	Standard Requests Completion	**93.26%**

Standard requests refer to work done on site for example, soft- or hardware installations or set up. In January Unipart just achieved SLA by a small margin on standard requests, while remote requests were well within SLA, conformance

close to 100%. However in February, standard requests failed significantly by almost 2%. These are the areas that have to be addresses.

Failing SLA's has a significant impact not only on CCSA, but also on the customer, as the organisation can lose confidence in the ability of Longbow RTS Request Management to render a quality service to it. Ultimately, a penalty will be imposed on both the analysts and CCSA. Furthermore, the customer may withdraw from the contract, as the organisation is not receiving the agreed upon services for which they are paying CCSA will not only suffer financially, but it will also lose its credibility in the market as an IT Service Provider.

For the purpose of this research study, an investigation will be conducted and statistics will be monitored for a number of months to determine where and when CCSA does not conform to the SLA agreed upon with the customer, how quality and IT governance interact and how quality IT governance can assist in preventing non conformance.

2.5 CONCLUSION

Based on the research problem in Chapter 1 and the overview of where the problem lies in Chapter 2, the following chapter will give a detail literature review on IT Quality Governance. Chapter 3 will define and elaborate on the definitions of the various terms, structured frameworks and also processes set in place to continually improve and maintain the field of IT service delivery.

CHAPTER THREE

IT QUALITY GOVERNANCE: A LITERATURE REVIEW

3.1 INTRODUCTION

In this section the literature review elaborates on the aspects of Governance within Information Technology Service Delivery. Firstly, concepts like Governance Lifecycle, IT governance, International Standards of Quality ISO 9000:2000 and Service Level Agreements (SLAs) will be defined and discussed within the context of this research

Secondly, a review of selected standards, codes, frameworks and best practices such as the Code of Governance for South Africa: The King Reports (III), Information Technology Infrastructure Library (ITIL) v3, Control Objectives for Information and related Technology (CobiT) 4.1, Value IT, ISO/IEC 20000, ISO/IEC 27002 will be discussed.

Finally, IT Governance elements, ensuring excellent IT Service Delivery like ITIL and CobiT, Performance Management, Risk Management, IT Service, Management and Delivery will be discussed.

3.2 DEFINITIONS OF CONCEPTS

3.2.1 Governance Lifecycle

According to Cantor and Sanders (2007:Online), Governance is about the "who, what, when, why, and how" of decision-making. In particular, the governance of organisations like

- decision making required by the organisation
- the roles of those in the organisation accountable for decision making
- the policies that guide how the decisions should be made
- the measures that enable informed decision making
- at what point in the governance process is the decision appropriately made

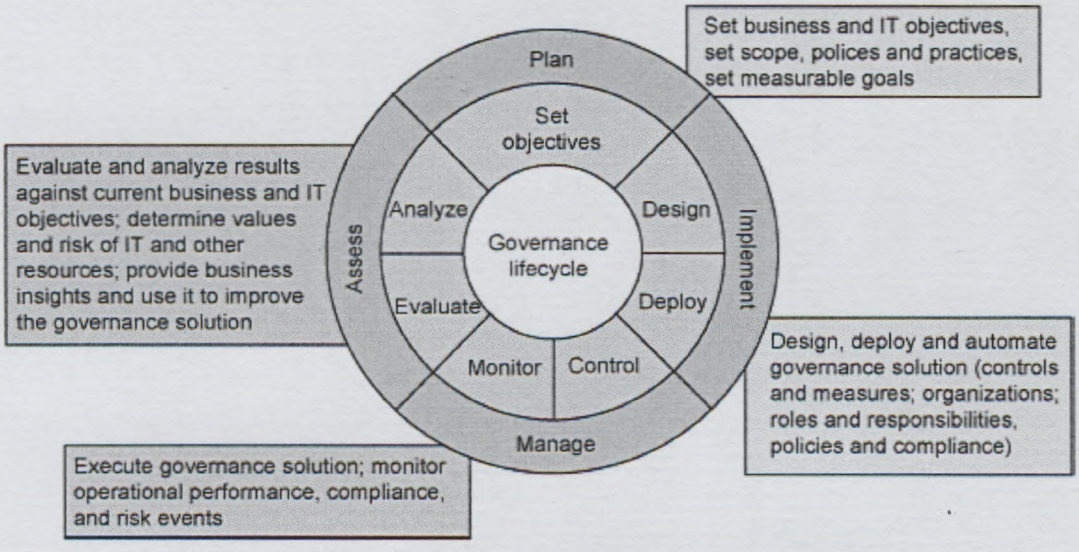

Figure 3.1: The governance lifecycle (**Source**: Cantor and Sanders, 2007:Online)

Figure 3.1, graphically depicts the lifecycle of governance, which consists of four phases. Cantor and Sanders (2007:Online) describes these consisting of elements such as

- a **plan** which captures the governance requirements needed by the organisation, determine financial and organisational responsibility for execution; determine those processes to bring under governance and determine the measures and targets of effectiveness of the governance solutions.
- the **implementation** which specifies the decision rights, measures, and policies to be applied to those processes under governance, specify the automation and tool support, roll out the governance solution to the organisation in stages, monitor and measure, and determine if the governance solution is meeting its effectiveness targets and make adjustments.
- **management** as to whether the organisation executes governance solutions to get a baseline of experience.
- **assess** by collecting governance effective measures, determine if the governance solution is meeting its effectiveness targets, make adjustments and analyze shortfalls.

3.3 THE CONCEPT OF INFORMATION TECHNOLOGY GOVERNANCE

Sallé (2004:2), who is in agreement with the IT Governance Institute (commonly known as ITIG), defines IT Governance as follows: "IT Governance is the responsibility of the Board of Directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives". Key to this definition is the concept of 'alignment of IT with the Business', commonly referred to as 'strategic alignment' (ITGI, 2003:1).

Spafford (2003:1), elaborates on the fact that governance looks at the proper management of the organisation, whereas IT governance uses structures and applies than to specific IT groups. Furthermore, Spafford believes that the best definition for IT governance can be found in one of the IT standards known as CobiT.

According to Sallé (2004:2), IT governance is future orientated and external, while IT management, is internal to the organisation and orientated to the present, as graphically depicted in Figure 3.2. Salle (2004:2), suggests positioning IT Management and IT Governance along two dimensions, namely that of 'business orientation' and 'time orientation'. This will call for IT Governance as a dual focus and demand whether it is contributing to present business operations and performance and transforming and positioning IT to meet future business challenges.

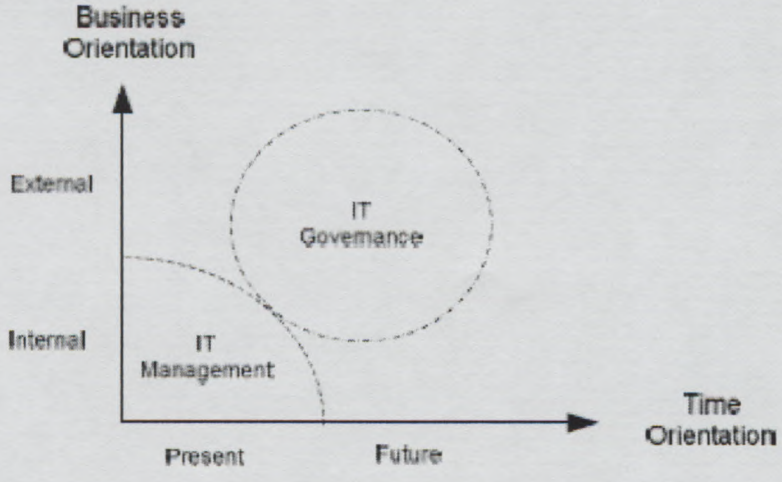

Figure 3.2: IT Governance and IT Management (**Source**: Sallé, 2004:2)

Symons (2005:5-6), explains what he terms the 'four objectives of IT Governance' which are expanded upon below, and in addition, graphically depicted in Figure 3.3:

- **IT value and alignment** which means businesses need to ensure alignment between their business units and IT. Alignment also deals with balances between investments that run the current business, grow existing businesses, and have the potential to transform the business.
- **Risk management** where managing IT risk is paramount. IT risks include security risks arising from hackers and denial of service attacks, privacy risks arising from identity thefts, recovery from disasters, resilience of systems from outages, and the risks associated with project failures.
- **Accountability** as governance is about accountability. IT governance holds IT management accountable for the return on its investment in IT, as well as the credibility of IT's own information and controls.
- **Performance measurement:** Accountability in IT governance requires keeping score, typically by implementing a form of the balanced scorecard. The IT value perspective contains specific measures for IT/business alignment and IT value, while the operational excellence perspective contains specific measures for managing IT risk.

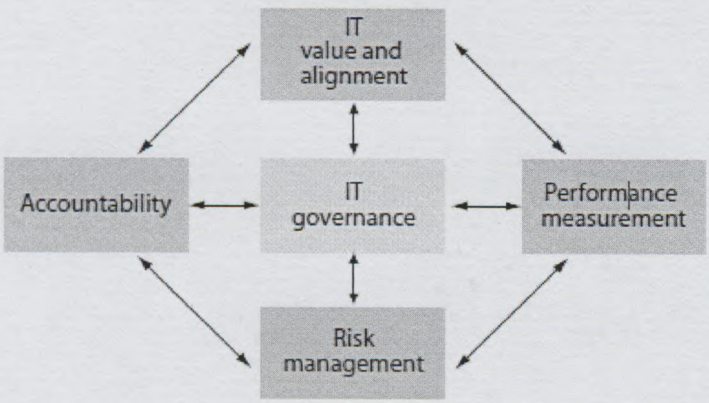

Figure 3.3: The Four Dimensions of IT Governance (**Source:**Symons, 2005:6)

ITIG (2008:11-12), explains that fundamentally IT governance is concerned with two outcomes, namely 'IT's delivery of value to the business' and 'the mitigation

of IT risks'. In this respect, IT governance can be pictured as focusing primarily on five main areas:

- **Strategic alignment:** Achieving the goals and strategies of an enterprise through the consistent undertaking of activities by the different governance structures or management levels within an organisation.
- **Value delivery**: Creating new value for the enterprise, maintaining and extending existing value, and eliminating initiatives and assets that are not creating sufficient value.
- **Risk management**: Addressing IT-related risks and using IT to assist in managing business risks.
- **Resource management**: Having the right capability to execute the strategic plan, and providing sufficient, appropriate and effective resources.
- **Performance measurement**: Tracking the achievement of the objectives of the enterprise and compliance with specific external requirements.

3.4 ISO 9000 – QUALITY MANAGEMENT SYSTEM

The international standard ISO 9000:2000 is the standard relating to quality management and continual improvement. Goetsch and Davis (2002:5-6), explains that ISO 9000:2000 has incorporated continual improvement with total quality management. As a result, the eight quality management principles focused on in ISO 9000:2000 come from Total Quality Management (TQM) with principles such as

- **customer focus** with an understanding of their needs and striving to exceed their expectations
- **leadership** to establish direction, unity of purpose, and a supporting work environment
- **the involvement of people** to ensure that all employees at all levels are able to fully use their abilities for the organisation's benefit
- **a process approach** to recognize that all work is done through processes and managed accordingly
- **a system approach to management** to expand on the previous principle in that achieving an objective requires a system of interrelated processes

- **continual improvement** as a permanent organisational objective, recognising and acting on the fact that no process is so good that further improvement is impossible
- **a factual approach to decision making** acknowledging that sound decisions must be based on analysis of factual data and information
- **a mutually beneficial supplier relationship** so that synergy can be found in such relationships

According to Goetsch and Davis (2002:5-6), the ISO 9000 standard was drawn up to enable organisations to consistently produce products as well as services that met the requirements of the customers and lives up to the organisations stated intentions. One of the main objectives of ISO 9000, was to maintain consistency in products being manufactured or services being delivered, to ultimately meet the customers' and regulatory requirements. Having these systems implemented will result in customer satisfaction, continual improvement and the prevention of non-conformity.

3.5 THE ROLE OF SERVICE LEVEL AGREEMENT (SLA)

Kumbakara (2008:350), is of the opinion that a Service Level Agreement (commonly referred to as a SLA), is an important document that defines the type, performance level, quality, and quantity of services that will be delivered by the service provider. The SLA is unique to the nature of services and the parties involved. When drafted, the SLA should address the

- list of services and expected performance levels
- roles and responsibilities clearly defined
- pricing and performance based incentives and penalties
- security, service continuity, and intellectual property ownership
- frequency of performance reporting and review

Furthermore ITIL® V.3 Foundation (2009:111) explains three types of framework options integrated by the Information Technology Infrastructure Library as:

- **A service-based SLA** used when the SLA covers one particular service within the organisation.

- **A customer-based SLA** when there is an agreement with an individual customer group, that covers all the services used within the specific department of the organisation
- **A multi-level-based SLA** when the agreement is defined in a three layer structure for:
  - **corporate level** to cover all the generic service level management issues appropriate to every customer throughout the organisation
  - **customer level** to cover all service level management issues relevant to a particular customer group or business unit, regardless of the service being used
  - **service level** to cover all the service level management issues relevant to the specific service, in relation to a specific customer group

According to Cockcroft (1999:1), system managers are responsible for the quality of the services rendered to its client. A service needs to be available when it is needed and must have acceptable performance characteristics. In order for these criteria's to be met and adhered to, an agreement needs to be drawn up between the client and the service provider. Figure 3.4 represents the Service level management that involves the interaction between the client and the system managers, vendors and computer systems. A simplified way to capture all the interactions is through what is formally known as a Service Level Agreement.

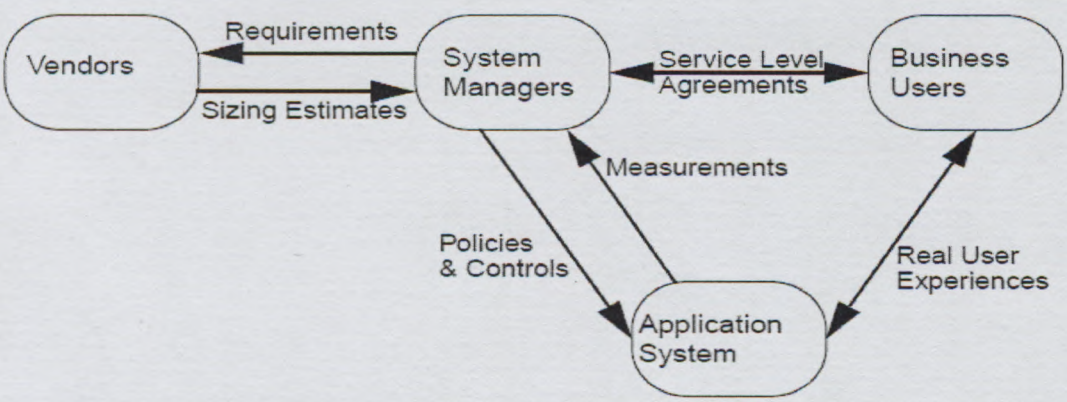

Figure 3.4 Service Level Management Interactions. **Source:** Cockcroft, (1999:2)

3.6 CODE OF GOVERNANCE

3.6.1 King III report

According to the King Committee on Governance (2009:6), King III is the third report on governance in South Africa. It became necessary because of the anticipated new Companies Act and changes in the international governance trends. The report was drawn up or compiled by the King committee with the assistance of the King subcommittees. There are nine subcommittees for King III are

- boards and directors
- audit committees
- risk management
- internal audit
- integrated sustainability reporting
- compliance with laws
- regulations, rules and standards
- managing stakeholders relationships
- fundamental and affected transactions and business rescue

The philosophy of the King report as discussed by the King Committee of Governance (2009:12-13), focuses on leadership, sustainability and corporate citizenship. The Report highlights principles like:

- **Leadership,** where good governance is essentially about effectiveness leadership. Leaders need to raise these challenges if there is to be any change of effective responses. Leaders need to define strategy, provide direction and establish the ethics and values that will influence and guide practices and behavior with regard to sustainability performance.
- **Sustainability** as the primary and economic imperative for the 21st Century and one of the most important sources of both opportunities and risk for businesses.
- **Innovation, fairness and collaboration** as key aspects of any transition to sustainability, along with innovation providing new ways of doing things including profitable responses to sustainability. Fairness is vital because

social injustice is unsustainable, and collaboration is often a prerequisite for large scale change

- **Integrating sustainability and social transformation,** where social transformation and redress is therefore an important aspect and needs to be integrated within the broader transition to sustainability
- **Sustainability reporting in need of renewal,** required to respond to the lasting distrust among civil society of the intentions and practices of big business. Also regarding the concerns among business decision makers that sustainability reporting is not fulfilling their expectations in a cost effective manner

3.6.2 The governance framework

Governance of corporations can be a statutory basis, either as a code of principles and practices, or a combination of the two. The statutory regime is 'comply or else', simply meaning in the event of non-compliance legal sanctions are to be taken. An important argument is being set against the 'comply or else' framework because a "one size fits all" approach cannot logically be suitable as the scales of business carried out by companies varies to a large degree (King Committee of Governance, 2009:7).

The cost of compliance is burdensome in both time and money. The board and the management need to become focused on compliance rather than the business of the enterprise. It is in fact the duty of the board to undertake risk for reward and to try to improve the economic value of a company. Therefore, if the board follows a narrow focus on compliance, the responsibility towards enterprise and its ultimate responsibility, namely performance, may be weakened (King Committee of Governance, 2009:7).

3.6.3 'Comply or explain' versus 'apply or explain'

According to the King Committee of Governance (2009:8), representatives of several of the world bodies were opposed to the word 'comply'. The reason being that it suggested that there has to be adherence and there was no room for

flexibility. It was then agreed by the United Nations (UN), that the code should be on an 'adopt or explain' basis.

King I and II codes are also based on the 'explain' principle. However in the Netherlands, directors are required to 'apply' the code or 'explain' the reason for not adhering to the set principles. A conclusion was then drawn up that 'apply or explain' more appropriately conveys the intent of the King code from inception. Therefore King III is based on 'apply or else' (King Committee of Governance, 2009:8).

In an 'apply or explain' regime, the board of directors has the authority to make the decision, that following a practice recommended in a code would not, in specific circumstance pertaining at the time in regard to an issue, be in the best interest of the company, and apply another practice (King Committee of Governance, 2009:8)..

Together with the King Committee of Governance (2009:8), Engelbrecht (2009:40) explains that the framework of 'comply or explain' was applied mainly by listed companies as a result of the requirement for compliance in the JSE listing requirements. In the reports of many companies, it was specified that companies complied with those principles with which they agreed or which were cost effective but did not comply with the other principles, therefore resulting in many companies reporting on 'substantial compliance' for certain principles and not the code as a whole (Engelbrecht, 2009:40).

According to Malan (2010:1), King III introduced the 'apply or explain' as opposed to 'comply or explain'. With the new regime, the emphasis now falls on how the principles and recommendations can be applied to the organisation instead of whether to comply or not. The 'apply or explain' regime in King III makes it easier for small, medium and state-owned enterprises, government departments and non-profit organisations to apply it, through customised application.

3.6.4 Link between governance principles and law

According to the King Committee of Governance (2009:10-11), good governance does not exists separately from the law. There is always a link between good

governance and the law. It is therefore entirely inappropriate to separate governance from law.

Directors and management must discharge their legal duties. These are grouped into two categories, namely 'duty of care and skill' and 'fiduciary duties'. Corporate Governance is involved with the establishment of structures and processes, with appropriate checks and balances that enable directors to discharge their legal responsibilities. Assessing the standard of appropriate conduct, a court of law will take into account all the relevant circumstances, including what is regarded as the normal or usual practice in the particular situation (King Committee of Governance 2009:10-11). Furthermore, when evaluating the criteria for good governance, governance codes and guidelines will be relevant in the determination of what is regarded as an appropriate standard of conduct. The more established that certain governance practices become, the more likely it is that a Court would regard conduct that conforms with these practices, as meeting the requirements standard of care. Consequently, any failure to meet a recognized standard of governance, although not legislated, may render a board or individual director liable in law (King Committee of Governance 2009:10-11).

3.7 Information Techonology Standards and Frameworks

Kumbakara (2008:342), points out that Information Technology is becoming increasingly crucial to the running of business operations in most organisations. For more effective and efficient IT operations costs, organisations are increasingly resorting to best practices and industry standards in the field of IT Service Management. Standards that are therefore relevant to IT Service Management include

- an Information Technology Infrastructure Library (ITIL)
- Control Objectives for Information and related Technology (CobiT).
- ISO/IEC 20000

3.7.1 Information Technology Infrastructure Library (ITIL)

As defined by ITIL® V.3 Foundation (2009:5), the Information Technology Infrastructure Library (TIL), is a framework developed by the United Kingdom's Office of Government Commerce (OGC).

Sallé (2004:10), expresses the view that ITIL consists of an inter-related set of best practices for lowering the cost, while improving the quality of IT services delivered to users. The key areas around which ITIL is organized include:

- business perspectives
- application management
- service delivery
- service support
- infrastructure management

The ITIL Service Management solution which shows the key areas, listed above, is graphically depicted in Figure 3.5.

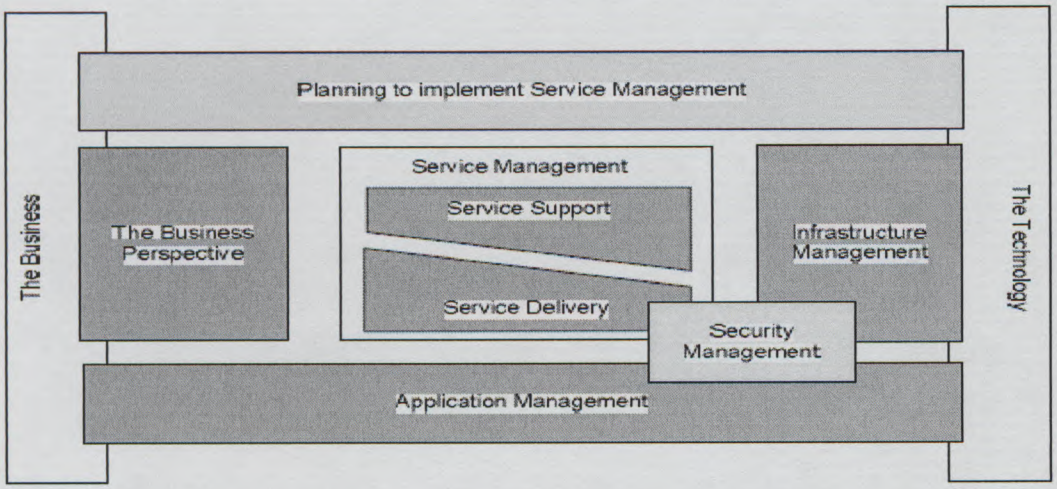

Figure 3.5: ITIL Service Management Solution (**Source:** Sallé, 2004:11)

Cervone (2008:89), is of the opinion that understanding ITIL has been made easier and more efficient. In previous versions of ITIL, the methodology was described in a set of nine books. However in Version 3, of the methodology has been revised and reduced to only five books that cover the major areas of IT service when an organisation is using a lifecycle approach. The five books in ITIL address areas like

- service design
- service transition
- service operation
- continual service improvement

Version 3 of ITIL addresses concerns that senior managers may have regarding resource allocation, decision making related to tradeoffs, and measuring outcomes. Another feature of Version 3 of ITIL is that it captures and documents all standardized definitions of IT services and processes. By using these standardized definitions, an organization can reduce cost of services and provide end-users with consistent results and costs (Cervone, 2008:90).

The five disciplines of ITIL Service support are release-, configuration-, incident-problem-, and change management.

Sallé 2004 depicts in Figure 3.6 the operational process and how the process map relate to each other.

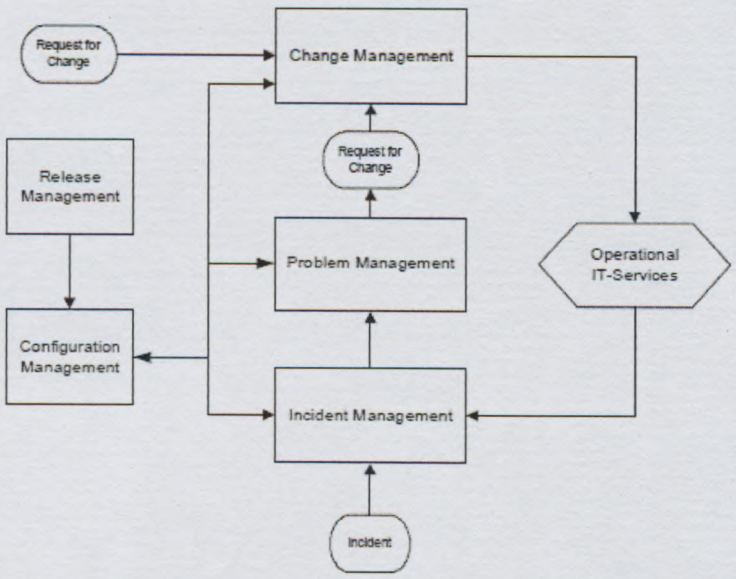

Figure 3.6: The ITIL operational process (**Source:** Sallé 2004:11)

3.7.2 Control Objectives for Information Technology (CobiT)

CobiT is defined by White (2008:140-141), as a business oriented framework covering all IT activities. Furthermore, CobiT can be described as a set of management guidelines enabling management to align IT activities and priorities

with business requirements, detailed control objectives and a set of audit guidelines and an implementation tool set.

Kumbakara (2008: 343-344), mentions that CobiT as an IT governance framework developed by the ITGI,will assist in bridging the gaps between the control requirements, technical issues, and business risks. Depicted in Figure 3.7, the enterprise is required to manage and control IT resources by using a set of processes to deliver required IT services.

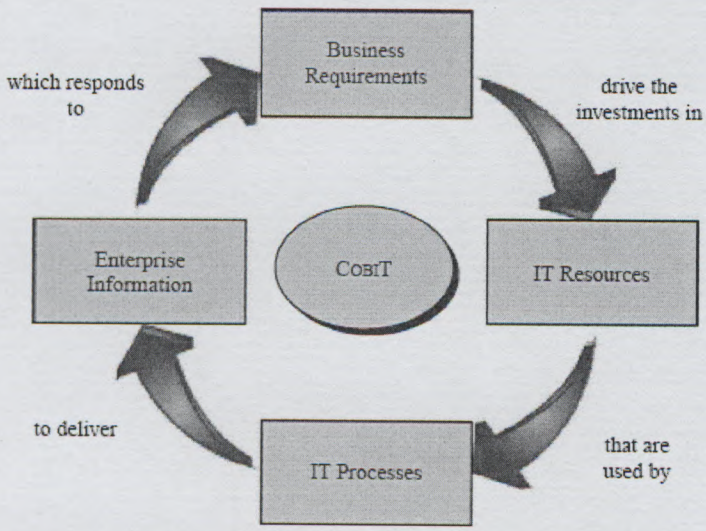

Figure 3.7: CobiT Principles (**Source:** Kumbakara 2008:344)

CobiT is an open standard for the control of IT and contains guidelines such as:

- Key goal indicators for monitoring IT goals
- Key Performance Indicators (KPIs) for the monitoring of performance in IT processes
- Critical success factors for getting IT processes under control
- Maturity models for benchmarking comparison

Sallé (2004:4-6) states that CobiT is designed to be an IT governance aid to management in their understanding, and managing of the risks and benefits associated with information and related technology. CobiT is independent of the technical IT platforms adopted in an organisation, and is an open standard for control over information technology, developed and promoted by the IT Governance Institute. CobiT creates the link between business objectives of an

entity, and the specific IT and associated management tasks, through statements about the control objectives.

CobiT is designed to help three distinct audiences such as

- managers, who need to balance risk and control investment in an, often unpredictable IT environment
- users, who need to obtain assurance on the security and controls of the IT services upon which they depend to deliver their products and services to internal and external customers
- auditors, who can use it to substantiate their opinions and/or provide advice to management on internal controls

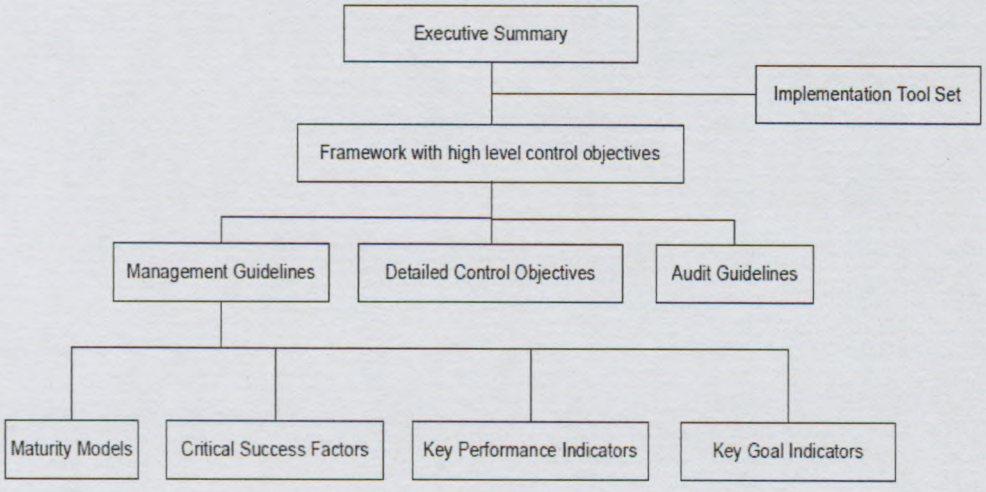

Figure 3.8: The CobiT Structure (**Source**: Sallé, 2004:4)

Shown in Figure 3.8 is the third edition of CobiT comprising of an executive summary that highlights the main benefits. It represents a business orientated framework that covers all the IT activities, a set of management guidelines enabling management to align IT activities and priorities with business requirements.

Sallé (2004:5), describes the framework followed by CobiT and states that the framework identifies information technology processes divided across four domains, a high level approach to control over these processes, as well as detailed control objectives and audit guidelines to assess the IT processes. Activities have

a cycle concept, with a need for ongoing control. Depicted in Figure 3.9, CobiT presents the relationships between the four different domains.

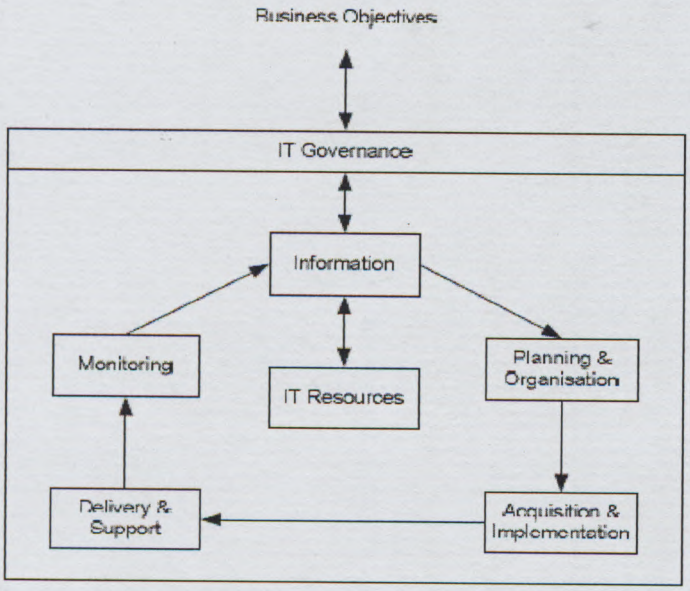

Figure 3.9: Relationship between the four domains of CobiT (**Source**: Sallé. 2004:5)

Sallé (2004:6), elaborates further more that CobiT looks at the quality, fiduciary control and security needs of enterprises providing information criteria that can be used to generically define what the business requires form IT which is:

- **Effectiveness** of information which is relevant and pertinent to the business; information is being delivered in a timely, correct, consistent and usable manner.
- **Efficiency** making provision fir information through the optimal use of resources.
- **confidentiality** for the protection of sensitive data from unauthorized disclosure.
- **Integrity** for accuracy and completeness of information; validity in accordance with business values.
- **Availability** of information is available when required, now and in the future.
- **Compliance** with laws, regulations and contractual arrangements.

- **Reliability** to provide appropriate information for management to operate the entity and for management to exercise its financial and compliance reporting responsibilities.

3.8 VALUE INITIATIVE TECHNOLOGY (VAL IT)

According to the IT Institute of Governance (2006:6), Value Initiative is intended for the need of organisations to optimize, the realisation of value from IT investments. The initiative has drawn on the collective experience of a team of practitioners and academics, existing and emerging practices and methodologies, and research to develop the Val IT framework. As the initiative evolves, it will include a number of various types of research activities, publications and supporting services grouped around the core Val IT framework, as illustrated in Figure 3.10.

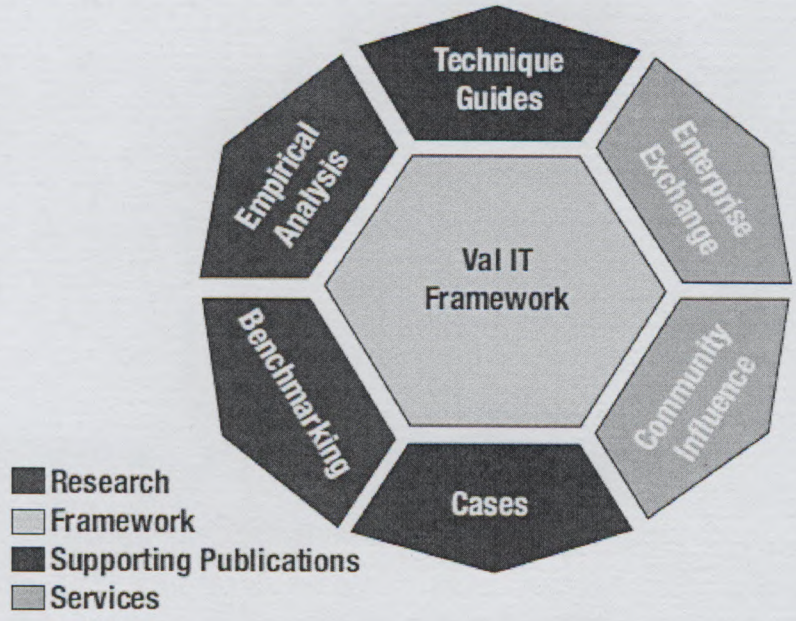

Figure 3.10. The Value IT Initiative. **Source:** ITGI (2006:6)

Val IT now adds best practices, providing the means to clearly measure, monitor and optimise the realisation of business value from investment in IT. Val IT complements COBIT from a business and financial perspective and will help all those with an interest in value delivery from IT, (ITGI 2006:6).

3.8.1 The goal of Value Initiative Technology

The Val IT initiative, contains research, publications and supporting services, to assist management in ensuring their organisations realise optimal value from IT-enabled business investments at an affordable cost with a known and acceptable level of risk. Furthermore ITGI (2006:7), explains that Val IT provides guidelines, processes and supporting practices to assist the board and executive management in understanding and carrying out their roles related to such investments. Although applicable to all investment decisions, Val IT is primarily targeted at IT-enabled business investments: significant business investments in sustaining, growing or transforming the business with a critical IT component, where IT is a means to an end—the end being to contribute to the process of value creation in the enterprise. The end and the means are represented by the 'Four Areas' as illustrated in Figure 3.11.

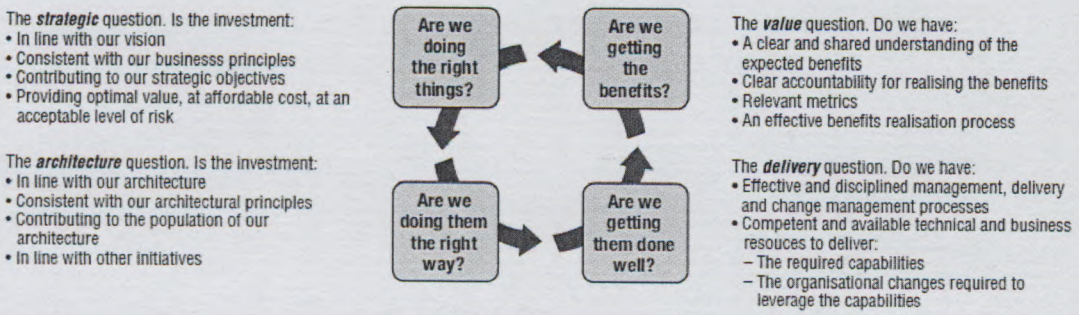

Figure 3.11 Four Areas. **Source:** ITGI (2006:7)

Val IT specifically focuses on the investment decision (are we doing the right things?) and the realisation of benefits (are we getting the benefits?). COBIT, specifically focuses on the execution (are we doing them the right way and are we getting them done well?).

3.8.2 Principles of Val IT

ITGI (2006: 9), explains that value is not a simple concept. It is in fact complex, context specific and dynamic. Therefore the nature differs for different types of organisations. The principles of Val IT are

- IT-enabled investments which will be managed as a **portfolio of investments**
- IT-enabled investments to include the **full scope of activities** that are required to achieve business value
- IT-enabled investments to be managed through their **full economic life cycle**
- Value delivery practices to recognise that there are **different categories of investments** that will be evaluated and managed differently
- Value delivery practices which will define and monitor **key metrics** and will respond quickly to any changes or deviations
- Value delivery practices which will engage all stakeholders and assign **appropriate accountability** for the delivery of capabilities and the realisation of business benefits
- Value delivery practices to **continually monitor, evaluate and improve**

Table 1 explains the benefits once Val IT has been effectively been implemented in the organization (ITGI, 2006:7).

Table 3.1: The effectiveness of Val IT. **Source**: ITGI (2006:7)

1.	➢ Increase the understanding and transparency of cost, risks and benefits resulting in much better informed management decisions
2.	➢ Increase the probability of selecting investments that have the potential to generate the highest return
3.	➢ Increase the likelihood of success of executing selected investments such that they achieve or exceed their potential return
4.	➢ Reduce costs by not doing things they should not be doing and taking early corrective action on or terminating investments that are not delivering to their expected potential
5.	➢ Reduce the risk of failure, especially high-impact failure
6.	➢ Reduce the surprises relative to IT cost and delivery, and in so doing increase business value, reduce unnecessary costs and increase the overall level of confidence in IT

3.9 ISO/IEC 20000

According to the IT Service Management Forum (2006:13), the aim of ISO/IEC 20000 is to provide a common reference standard for any enterprise offering IT services to internal or external customers. One of the essential roles of service management is communication, therefore the most important target of this standard is to create a common terminology for service providers, their suppliers and their customers. The standard promotes the adoption of an integrated process approach for the management of IT services. Depicted in Figure 3.12 is a number of closely related service management processes

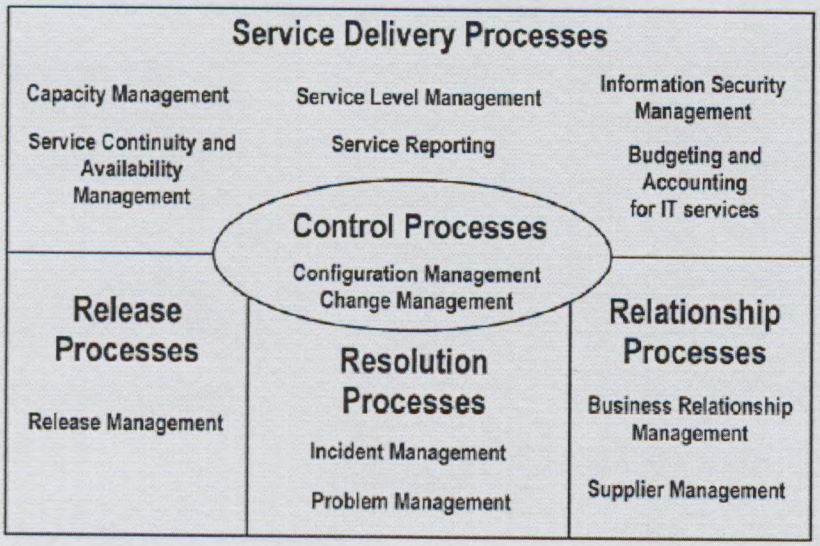

Figure 3.12 Service Management process. **Source**: ISO/IEC 20000-1:2005 (2005:1)

ISO/IEC 20000 (2005:1), defines the requirements for a service provider to deliver managed services of an acceptable quality for its customers. It may be used by

- businesses that are going out to tender for their services
- businesses that require a consistent approach by all service providers in a supply chain
- service providers to benchmark their IT service management
- businesses as the basis for an independent assessment
- organisations which needs to demonstrate the ability to provide services that meet customer requirements

- organisations which aims to improve service through the effective application of processes to monitor and improve service quality

3.10 ISO/IEC 27002

ISO/IEC 27002 (2009:7) explains that the Information Security Management System (ISMS) to provide a model for establishing, implementing, operating, monitoring, reviewing, maintaining and improving the protection of information assets. This will achieve business objectives based upon a risk assessment and the organisation's risk acceptance levels, designed to effectively treat and manage risks. Fundamental principles contribute to the successful implementation of ISMS in an organization like an

- awareness of the need for information security
- assignment of responsibility for information security
- incorporation of management commitment and the interests of stakeholders
- enhancing societal values
- assessment of risks determining appropriate controls to reach acceptable levels of risk
- incorporated security as an essential element of information networks and systems
- active prevention and detection of information security incidents
- assurance of a comprehensive approach to information security management
- assessment and continual reassessment of information security and making of modifications as appropriate

Information security includes three main dimensions: confidentiality, availability and integrity (ISO/IEC 27002 2009:7) all with the aim of ensuring sustained business success and continuity and minimising impacts. Information security involves the application and management of appropriate security measures that require consideration of a wide range of threats. Furthermore ISO/IEC 27002 (2009:7) explains that information security is achieved through the implementation of an applicable set of controls, selected through the chosen risk

management process and managed by using an ISMS, including policies, processes, procedures, organisational structures, software and hardware to protect the identified information assets.

An ISMS is important to both public and private sector businesses. In any industry, an ISMS is an enabler that supports e-business and is essential for risk management activities. The interconnection of public and private networks and sharing of information of assets, increases the difficulty of controlling access to and handling of information. In addition, the distribution of mobile storage devices containing information assets, can weaken the effectiveness of traditional controls. (ISO/IEC 27002, 2009:9)

As discussed by ISO/IEC 27002 (2009:9), information security is not always taken into account in the design and development of information systems. Further, information security is often thought of as being a technical solution. However, the security that can be achieved through technical means, is limited, and may be ineffective unless supported by appropriate management and procedures within the context of ISMS. The successful adoption of an ISMS is important to protect information assets and allows an organisation to

- achieve greater assurance that its information assets are adequately protected against information security risks on a continual basis
- maintain a structured and comprehensive framework for identifying and assessing information security risks, selecting and applying appropriate controls and measuring and improving their effectiveness
- continually improve its control environment, and
- effectively achieve legal and regulatory compliance

3.11. IT GOVERNANCE ELEMENTS, ENSURING EXCELLENT IT SERVICE DELIVERY

3.11.1 COBIT versus ITIL

According to Morency (2005:1), COBIT and ITIL are more complimentary than competitive. COBIT's main focuses fall on the definitions, implementations, auditing, measurements and the improvement of controls for specific processes that cover the entire IT implementation life cycle. It is also known that CobiT is

an excellent reference model for IT governance across the entire implementation life cycle. ITIL's primary focus is to provide the best practice definitions and criteria for operational management. More specifically, ITIL primarily focuses on defining the functional, operational and organizational aspects that need to be in place for operations management to be fully optimized in two key categories. These categories are Service Support Management and Service Delivery Management.

The ITIL categories are supported by a number of sub-categories. Sub-categories for Service Support Management include, Service Desk, Incidents, Problem, Configuration, Change Management, and Release Management. Furthermore, subcategories for Service Delivery Management include, Service Level, Financial, Capacity, Service Continuity and Availability (Morency, 2005:1).

If the goal is to improve the quality and measurability of IT governance across the entire networked application the life cycle or implementing a control system for improved regulatory compliance, CobiT would be a more effective choice. If the objective is to continuously improve IT operations efficiency and IT customer service quality, ITIL would then be the more suitable choice (Morency, 2005:1).

3.11.2 Performance Management

A performance management plan as explained by Selig (2006:10), must be developed for IT. The development of the performance plan should be a collaborative effort between the business and IT. It should be based on a number of considerations such as strategy, finance, quality, operational and service effectiveness which support an organization's vision, mission, plans, objectives and financials. The execution of these plans and objectives must be monitored and measured by a combination of balanced scorecard key performance indicators (KPIs) as well as formal and informal status review meetings and reports (e.g. report cards, dashboards). The outcomes should link critical success factors to KPIs that are measurable, part of a standard reporting system and linked to a governance component. If it cannot be measured, it has no value (Selig 2006:10).

3.11.3 Risk Management

According to ITGI (2005:7), risk management itself is not a new concept and risk taking is part of every day management of an enterprise. Understanding the risks related to the use of information technology, is still a challenge for business executives who do not have an in-depth appreciation for the technical issues. Technical complexity, misunderstanding of risks and a tendency for the media to overemphasize certain risks, can result in some significant risks being overlooked as possibly receiving too much emphasis. Today, risk-taking is ultimately an essential element of business, and success comes to those organisations that identify and manage risks most effectively.

Managing IT risks and exercising proper governance are therefore challenging experiences for business managers faced with technical complexity, dependence on an increasing number of service providers, and a limited supply of reliable risk-monitoring information. Explained by ITGI (2005:9), no single accepted set of generic IT risk definitions is available, but the following headings can be used as a guide for risks like investment or expenditure; access or security; integrity; relevance ; availability; infrastructure project ownership

ITGI(2005:11), recommends that to apply effective governance, IT risks should always be expressed in a business context rather than in the technical language favoured by IT risk experts. Depicted in Figure 3.13 is the generic structure for expressing IT risks in any organisation is recommended, providing a framework for business management to be engaged in the risk management process:

Business-specific risk (e.g., operational risk of orders not being received)
Generic common IT risk (e.g., IT availability risk)
Specific IT risk (e.g., denial-of-service attack on Internet customer order system)

Figure 3.13 Generic Structure for expressing Risks. **Source**: ITGI (2005:11)

Business risks are affected by the business environment (management style/culture; risk appetite; and industry sector factors such as competition, reputation, and national and international regulations) and, therefore, specific IT

risks can be similarly affected. Thus, it is important to consider IT risks within the wider business context (ITGI 2005:11).

3.11.4 IT Service Management and Delivery

According to Selig (2006:9), well executed IT service management and delivery is about maximizing the ability of IT to provide services that are cost-effective and meet or exceed the needs and expectations of the business to reduce the total cost of operations, improve service quality, improve customer satisfaction and improve compliance.

IT service management and delivery concerns itself with minimizing and avoiding business disruptions and assuring the continuity of IT services. Selig (2006:9) further explains the key principles for IT service management and deliver excellence include

- the streamlining of service delivery and support processes
- the development and documentation of repeatable processes and procedures
- reducing the number of service incidents and outages
- implementation of standards and guidelines to do work right the first time and reduce defects and rework
- performing proactive analysis, prevention and resolution
- planning for and ensure future capacity, redundancy, security and disaster prevention and recovery
- defining clear services, service level targets and costs
- accurately allocate and recover costs
- auditing, managing and improving IT processes

3.12 CONCLUSION

In this chapter a literature review was conducted on various aspects of governance and IT governance. The application of these and related aspects pertaining to quality, service level management and IT service delivery were investigated. In addition, various codes, frameworks, standards and best practices were reviewed to establish a framework for the rest of this study.

CHAPTER FOUR

SURVEY DESIGN AND METHODOLOGY

4.1 THE SURVEY ENVIRONMENT

Computacenter Pty (LTD) commonly referred to as CC, is one of Europe's leading independent providers of Information Technology infrastructure services. CC is ISO 9001: 2008 certified by the British Standards Institution. The business aims to assist its customers and clients to maximise the value of Information Technology within their own organisations.

CCSA, in conjunction with its parent company CC, takes on contractual responsibility for the management of the customers' IT infrastructure, not only to reduce costs, but also to improve service levels. Support services, such as remote installations and maintenance of desk- and laptop computers, data centres, networks, user help-desk support and disaster recovery, are all representative of services provided. Services include integration and project management expertise, advice across and range of technologies and areas of services which the company provides. The company will source, configure and deploy hardware and software for customers from a wide selection of leading IT vendors, As a result, procurement consulting, software license management, technology disposal and asset management also form part of the services rendered to customers. Due to the spectrum of services provided the service provisioning can be grouped as functions of the company. Amongst these are managed and support services, consulting and integration and supply chain services,

4.2 AIM OF THIS CHAPTER

The aim of this chapter through survey questionnaires, is to determine why CCSA is failing to adhere to client's specifications and Service Level Agreements. Conducting this study will ultimately solve the research problem stated in Chapter

1, paragraphs 1.3, which reads as follows: "IT service providers non compliance with quality principles and procedures, causing SLA's to fail".

4.3 CHOICE OF SAMPLING METHOD AND TARGET POPULATION

According to Collis and Hussey (2003:155-160), a sample is created by choosing a number of members of the 'population'. All clients supported by the RTS Longbow department have a Service Level Agreement which stipulates the client's requirements and specifications. Of a complement of 40 individuals in the RTS Longbow department, a sample of 20 clients representatives and 20 service providers was selected to participate in this survey. From this composition a number of individuals were selected from

- Service Managers
- Operation Managers
- Team Leaders
- Service Delivery Managers
- Request and Incident Engineers

4.4 DATA COLLECTION

The Questionnaires, fall within the ambit of a broader definition which is Survey Research and Descriptive Survey.

The concept of 'survey' is defined by Remenyi *et al.* (2002:290) as: "... the collection of a large quantity of evidence usually numeric, or evidence that will be converted to numbers, usually by means of a questionnaire".

A questionnaire is a list of structured questions, chosen after considerable testing with the view to elicit reliable responses from a chosen sample. The aim is to establish what a selected group of participants do, think and feel. A positive approach suggests instructed 'closed' questions, while a phenomenological approach suggests unstructured 'open-ended' questions.

4.5 MEASUREMENT SCALES

Forming the crux of this dissertation, survey questionnaires will be based on the Likert scale. The Likert scale gives the respondent the option of five agreement choices when required to agree or disagree with the statement elaborated in the questionnaire (Emory & Cooper, 1995:179). The five agreement choices are:

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

The advantages in using the popular Likert scale according to Emory and Cooper (1995:180-181) are

- the easy and quick manner to construct.
- that each item meets an empirical test for discriminating ability
- the probability that the Likert Scele is more reliable than the Thurston scale, and it provides a greater volume of data than the Thurston's differential scale
- that the Likert scale is also treated as an interval scale

4.6 SURVEY DESIGN

Leedy & Ormrod (200:196), is of the opinion that, "a survey is simple in design: The researcher poses a series of questions to willing participants; summarizes their responses with percentages, frequency counts, or statistical indexes; and then draws inferences about a particular population from the response sample".

A questionnaire based survey should be used by making use of the following process to

- evaluate the research question, investigative question and the key research objectives of the research dissertation
- consider any other information applicable to the research and formulate the questionnaire accordingly

- identify the sample from the target population and select a representative sample
- choose an interviewing method
- conduct a pilot study to ensure the questions are easily understood and not too complex
- conduct the survey

4.7 THE VALIDATION SURVEY QUESTIONS

Two separate survey questionnaires were developed to accommodate the service provider and the service user. The survey conducted on the service provider was divided into two different sections, Section A and Section B.

4.7.1 SERVICE PROVIDER QUESTIONNAIRE ON INFORMATION TECHNOLOGY QUALITY GOVERNANCE

Section A. Governance

Question 1: Poor practice of governance can lead to non-conformance in service delivery. To what extent do you agree or disagree with the above mentioned statement?

Question 2: Upon taking on of new business or client, formal documentation, containing set Service Level Agreements have to be compiled. To what extent do you agree or disagree with the above mentioned statement?

Question 3: IT engineers working on specific clients, are equipped with the necessary skills to deliver the required services. To what extend do you agree or disagree with the above mentioned statement?.

Question 4: IT and Quality governance plays an important role within the IT organisations. To what extent do you agree or disagree with the above mentioned statement?.

Question 5: For IT organisations to comply with customer-client requirements, both corporate and IT governance structures have to be in place. To what extent do you agree or disagree with the above mentioned statement?

Question 6: Failing to have any formal agreements, policies and procedures, can be a reason why SLAs are not being adhered to. To what extend do you agree or disagree with the above mentioned statement?.

Question 7: IT service providers that are not trained up to do the work could be a reason that the client's requirements are not met. To what extent do you agree or disagree with the above mentioned statement?.

Question 8: If frameworks such as ITIL and CoBit are practiced, fewer non-conformances will occur and the client will receive its excellent service delivery. To what extent do you agree or disagree with the above mentioned statement?

Question 9: Combining Quality improvement methods such as ISO and IT governance will assist the company in sustaining their drive for excellence. To what extent do you agree or disagree with the above mentioned statement?.

Question 10: Except having the company ISO 2001:9000 accredited, and using ITIL as best practice; IT Quality governance will be the best suitable way to make sure the company sustains the excellence of delivering IT service delivery. To what extend do you agree or disagree with the above mentioned statement?

Section B. SERVEQUAL QUESTIONNAIRE

Tangibles : To what extent do you agree or disagree to the following statements?

Question 1: Computacenter SA has to have up to date equipment and technology.

Question 2: Computacenter SA should have Appealing facilities.

Question 3: Computacenter SA should use visually appealing materials.

Question 4: Company shared information should be easily accessible.

Reliability: To what extent do you agree or disagree to the following statements

Question 6: When Computacenter SA promises to do something by a certain time it should do so.

Question 7: Computacenter SA should show a sincere interest In solving problems

Question 8: When there is a problem Computacenter SA should show a sincere interest in solving it.

Question 9: Computacenter SA should perform the service right first time.

Question 10: Computacenter SA should provide its services at a time it promises to do so.

Question 11: Computacenter SA should insist on error free records.

Responsitiveness: To what extent do you agree or disagree to the following statements

Question 12: The staff of Computacenter SA should tell you exactly when services will be performed

Question 13: The staff of Computacenter SA should give you propmt service.

Question 14: The staff of Computacenter SA should be always willing to help you.

Question 15: The staff of Computacenter SA should never be too busy to respond to your questions.

Assurance: To what extent do you agree or disagree to the following statements

Question 16: The staff of Computacenter SA should instill confidence in customers.

Question 17: Customers should have comfortable interactions with employees.

Question 18: Staff of Computacenter SA should be consistently courteous with you.

Question 19: Staff of Computacenter SA should have the knowledge to answer your questions.

Empathy: To what extent do you agree or disagree to the following statements

Question 20: Customers should be given individual attention by Computacenter SA staff

Question 21: Computacenter SA operating hours should be convenient to all its customers.

Question 22: Computacenter SA staff should have your best interest at heart.

Question 23: Staff of Computacenter SA should understand your specific needs.

4.7.2 CLIENT QUESTIONNAIRE ON INFORMATION TECHNOLOGY QUALITY GOVERNANCE

Tangibles : To what extent do you agree or disagree to the following statements

Question 1: Computacenter SA has up to date equipment and technology.

Question 2: Computacenter SA has Appealing facilities.

Question 3: Computacenter SA uses visually appealing materials.

Question 4: Knowledge portals, shared drives and e-mails makes you find information easily.

Reliability: To what extent do you agree or disagree to the following statements

Question 6: When Computacenter SA promises to do something by a certain time it does so.

Question 7: Computacenter SA show a sincere interest in solving problems

Question 8: When there is a problem Computacenter SA shows a sincere interest in solving it.

Question 9: Computacenter SA performs the service right first time.

Question 10: Computacenter SA provides its services at a time it promises to do so.

Question 11: Computacenter SA insists on error free records.

Responsitiveness: To what extent do you agree or disagree to the following statements

Question 12: The staff of Computacenter SA tells you exactly when services will be performed

Question 13: The staff of Computacenter SA give you prompt service.

Question 14: The staff of Computacenter SA are always willing to help you.

Question 15: The staff of Computacenter SA is never too busy to respond to your questions.

Assurance: To what extent do you agree or disagree to the following statements

Question 16: The staff of Computacenter SA instills confidence in customers.

Question 17: Customers have comfortable interactions with employees.

Question 18: Staff of Computacenter SA is consistently courteous with you.

Question 19: Staff of Computacenter SA has the knowledge to answer your questions.

Empathy: To what extent do you agree or disagree to the following statements

Question 20: Customers are given individual attention by Computacenter SA staff

Question 21: Computacenter SA operating hours are convenient to all its customers.

Question 22: Computacenter SA staff have your best interest at heart.

Question 23: Staff of Computacenter SA understand your specific needs.

4.8 CONCLUSION

In this chapter, the IT Quality Governance survey design and methodology was addressed. Questionnaires were used as a method of survey design. Questionnaires were divided into two sections, one for the service providers and the other for the clients to measure the service quality the service providers deliver.

CHAPTER FIVE

DATA ANALYSIS AND INTERPRETATION OF SURVEY RESULTS

5.1 INTRODUCTION

Data analysis is "the process of bringing order, structure and meaning to the mass of collected data" (de Vos 2002, 339). This chapter discusses the results of the data analysis in a survey measuring impact of quality governance on information technology service delivery at Unipart. The main goal of this study is to determine whether IT service providers' failure to comply with quality principles and procedures, caused SLAs to fail. The data obtained from the completed questionnaires will be presented and analysed by means of various analyses (uni-variate, bi-variate and multivariate) as it applies.

In most social research the analysis entails three major steps such as the

- cleaning and organising the information that was collected which is called the data preparation step
- description of the information that was collected (Descriptive Statistics)
- testing of the assumptions made through hypothesis and modeling (Inferential Statistics)

The responses to the questionnaires for the purpose of obtaining information predetermining whether IT governance can prevent failure of IT service delivery and customer feedback have been analysed by using SAS software.

5.2 ANALYSIS METHOD

5.2.1 VALIDATION SURVEY RESULTS

Descriptive statistics such as frequency tables are referred to in paragraph 5.3.2 which shows the distributions of the statement responses. Descriptive statistics are used to summarise the data. As a measure of central tendency and dispersion,

tables 5.5 and 5.6 show the means and standard deviation of the statements by means of an ordinal scale of measurement.

5.2.2 DATA FORMAT

The data was received in the form of questionnaires, which were coded and captured on a database that was developed on Microsoft Access for this purpose. These questionnaires are captured twice and the two datasets are compared to ensure that the information was correctly captured. When the database was developed use was made of rules with respect to the questionnaire that set boundaries for the different variables (questions). For instance if the Likert scale is used to elicit responses of respondents to

- strongly disagree and coded as 1
- disagree and coded as 2
- undecided and coded as 3
- agree and coded as 4
- strongly agree and coded as 5

A boundary is set on Microsoft Access as less than 6. This means that if the number 6 or more is captured an error will show until a number less than 6 is captured. It was then imported into SAS-format through the SAS ACCESS module. This information which was double checked for correctness is then analysed.

The researcher coded the questionnaires to measure the IT governance expectations and the actual feedback from the customer questionnaires differently. The IT governance questionnaire was coded as indicated by the Likert scale.

The customer feedback questionnaire however was coded as

- strongly agree coded as 1
- agree coded as 2
- undecided coded as 3
- disagree coded as 4
- strongly disagree coded as 5

5.2.3 PRELIMINARY ANALYSIS

The reliability of the statements in the questionnaire posted to the respondents is tested by using the Cronbach Alpha tests. (See paragraph 5.3.1). Descriptive statistics was performed on all variables; displaying means, standard deviations, frequencies, percentages, cumulative frequencies and cumulative percentages. These descriptive statistics are discussed in paragraphs 5.3.2 and 5.3.3. (Annexure A and B).

5.2.4 INFERENTIAL STATISTICS

The following inferential statistics were performed on the data:

- Cronbach Alpha test which is an index of reliability associated with the variation accounted for by the true score of the "underlying construct". Construct is the hypothetical variables that are being measured (Cooper & Schindler, 2001:216-217). Another way to put it would be that Cronbach's alpha measures how well a set of items (or variables) measures a single uni-dimensional latent construct.
- Chi-square tests for nominal data. The Chi-square (One-sample) tests are probably the most widely used nonparametric test of significance that is useful for tests involving nominal data, but it can be used for higher scales as well like cases where persons, events or objects are grouped in two or more nominal categories such as 'yes-no' or cases A, B, C or D. The technique is used to test for significant differences between the observed distribution of data among categories and the expected distribution based on the null hypothesis. It has to be calculated with actual counts rather than percentages (Cooper & Schindler, 2001:499).
- The SAS software computes a P-value (Probability value) that measure statistical significance when comparing variables with each other, determining relationship between variables or determining association between variables. Results will be regarded as significant if the p-values are smaller than 0.05, because this value presents an acceptable level on a 95% confidence interval ($p \leq 0.05$). The P-value is the probability of observing a sample value as extreme as, or more extreme than, the value

actually observed, given that the null hypothesis is true. This area represents the probability of a Type 1 error that must be assumed if the null hypothesis is rejected (Cooper & Schindler, 2001:509).

- The p-value is compared to the significance level (α) and on this basis the null hypothesis is either rejected or accepted. If the P- value is less than the significance level, the null hypothesis is rejected (if p value $<\alpha$, reject null). If the p value is greater than or equal to the significance level, the null hypothesis is not rejected (if p value $\geq\alpha$, don't reject null). Thus with α=0.05, if the p value is less than 0.05, the null hypothesis will be rejected. The p value is determined by using the standard normal distribution. The small p value represents the risk of rejecting the null hypothesis.
- A difference has statistical significance if there is good reason to believe the difference does not represent random sampling fluctuations only. Results will be regarded as significant if the p-values are smaller than 0.05, because this value is used as cut-off point in most behavioural science research.

5.2.5 TECHNICAL REPORT WITH GRAPHICAL DISPLAYS

A report with explanations of all variables and their outcome has been compiled. A Cross analysis of variables was performed where necessary, attaching statistical probabilities to indicate the magnitude of differences or associations. All inferential statistics are discussed in paragraph 5.3.4.

5.2.6 ASSISTANCE TO RESEARCHER

The conclusions made by the researcher, are validated by the statistical report. Assistance was given to interpret the outcome of the data. The final write up of the report by the researcher/author of this study was validated and checked by a statistician to exclude any misleading interpretations.

5.2.7 SAMPLE

The target population was selected from the employees of a client of CCSAs, Unipart.

5.3 ANALYSIS

In total there were 10 respondents for the "Impact of quality governance on information Technology" questionnaire and 12 respondents from the "Customer feedback" questionnaire. The items (statements) in the questionnaire was tested for reliability.

5.3.1 RELIABILITY TESTING

The reliability test (Cronbach's Alpha Coefficient) was done on all the items (statements) which represent the measuring instrument of this survey, with respect to the responses rendered in this questionnaire. Note must be taken that if a statement was not answered, that specific statement will be shown as being missing. Thus the results as presented in tables 5.1, 5.2 and Annexure C are based on the statements leaving out the questionnaire with missing values. That is why the sample size of "Customer feedback" questionnaire for the Cronbach alpha is 10 as there were two questionnaires that weren't completely answered. Due to the voluminous nature of Table 5.1 and Table 5.2, the tables and associated descriptions, are continued in Annexure A.

5.3.2 DESCRIPTIVE STATISTICS

In tables 5.3 and 5.4 the descriptive statistics for all the variables in the "Impact of quality governance on information technology" questionnaire and the "Customer feedback from" questionnaire are shown, by calculating the frequencies in each category and the percentage out of total number of questionnaires. The descriptive statistics are based on the total sample. In some cases respondents did not supply answers and it is shown as unknown in the descriptive statistics. These descriptive statistics are also shown in Annexure D and E. Due to the nature of

Table 5.3, 5.4, 5.5 and 5.6, the tables and associated descriptions are contained in Annexure B.

5.3.3 UNI-VARIATE GRAPHS

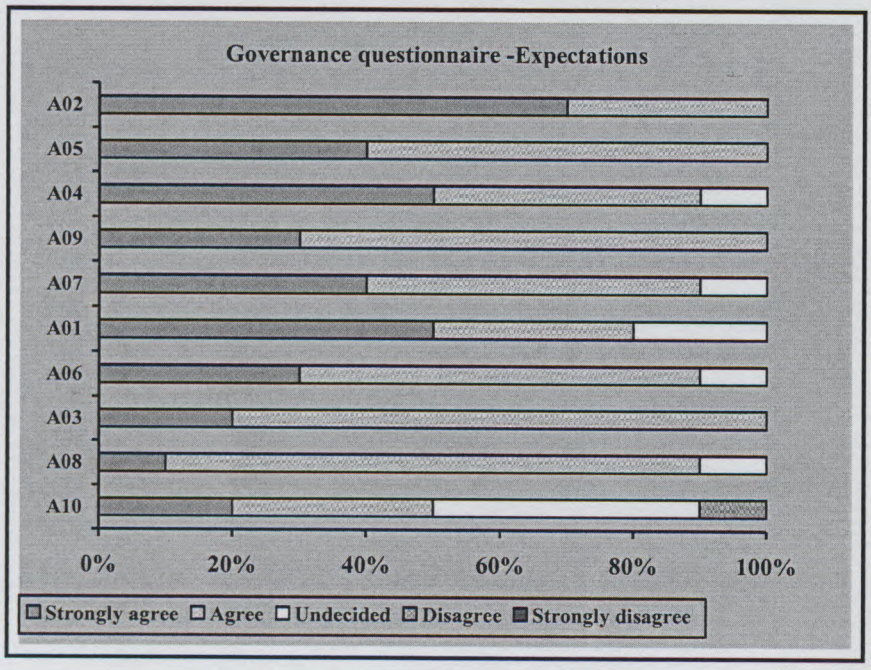

Figure 5. 4: Expectations of IT Governance

A large number (40%) of the respondents was undecided whether IT Quality governance would be the best suitable way to ensure that the company sustains excellence in IT service delivery and 50% agree to "strongly agree.

All respondents agreed to strongly agree with all the statements in the IT Governance questionnaire. After weighting the degree to which the respondents agree by giving the strongly agree a higher weight than the respondents who only agree the following statements had the highest score:

- upon taking on of new business or clients, formal documentation containing set service level agreements has to be compiled. (70% strongly agree and 30% agree)
- for IT organisation to comply with customer/client requirements both corporate and IT governance structures have to be in place. (40% strongly agree and 60% agree)

- IT and Quality governance plays an important role within the IT organisations. (50% strongly agree and 40% agree)

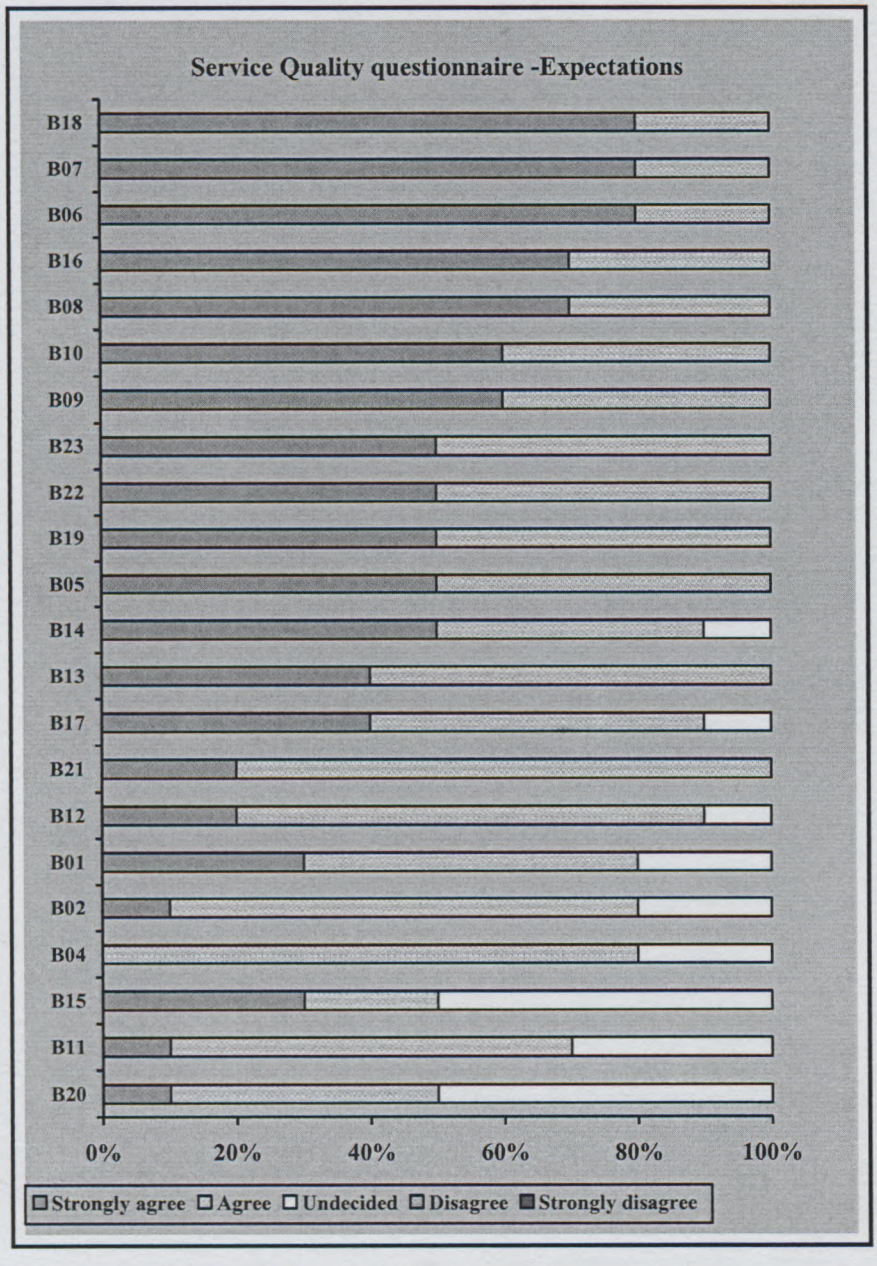

Figure 5. 5: Service Quality questionnaire: Expectations

The respondents agreed to strongly agree with all the statements for the Service Quality questionnaire. After weighting the degree to which the respondents agree by giving the strongly agree a higher weight than the respondents who only agree the following statements had the highest score:

- staff of the Computacenter SA should be consistently courteous to you, (80% strongly agree 20% agree)
- Computacenter SA should show a sincere interest in solving problems. (80% strongly agree 20% agree)
- when Computacenter SA promises to do something by a certain time, it should do so. (80% strongly agree 20% agree)
- staff of the Computacenter SA should instil confidence in customers. (70% strongly agree 30% agree)
- when there is a problem Computacenter SA should show a sincere interest in solving it. (70% strongly agree 30% agree)

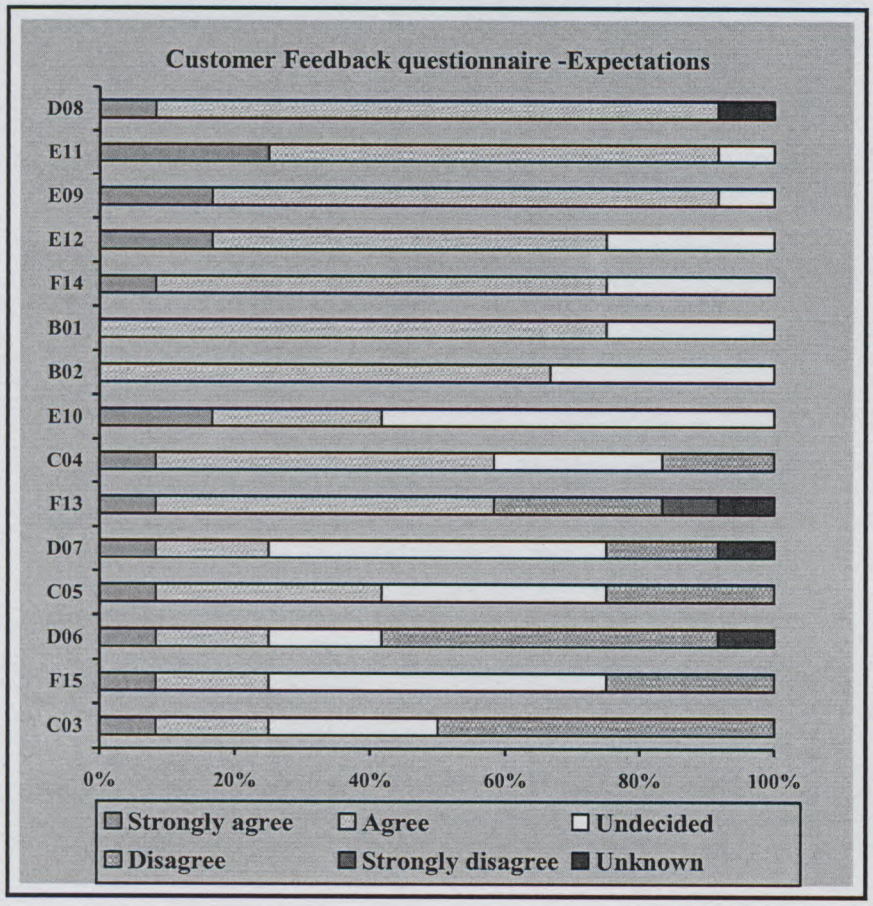

Figure 5. 6: Customer Feedback questionnaire: Expectations

The respondents agreed to strongly agree with more than half of the statements in the Customer Feedback questionnaire. After weighting the degree to which the

respondents agree by giving the strongly agree a higher weight than the respondents that only agree the following statements had the highest score:

- Computacenter SA is always willing to assist you. (8.3% Strongly agree 83.3% agree)
- Computacenter SA is friendly, helpful and courteous. (25.0% Strongly agree 66.7% agree)
- Computacenter SA reflects good interactions/relations with you. (16.7% Strongly agree 75.0% agree)
- Computacenter SA portrays good knowledge when attending to my requests (16.7% Strongly agree 58.3% agree)
- Computacenter SA has your best interest at heart. (8.3 Strongly agree 66.7% agree)
- Computacenter SA uses up to date technology. (75.0% agree)

The respondents disagreed with a few of the statements of the Customer Feedback questionnaire. After weighting the degree to which the respondents agree by giving the strongly agree a higher weight than the respondents that only agree or disagree, the following statements had the lowest score:

- Computacenter SA completes tasks on time. (8.3% Strongly agree, 16.7% agree and 50% disagree)
- Computacenter SA has a full understanding of your requirements and expectations. (8.3% Strongly agree, 16.7% agree and 25% disagree)

5.3.4 COMPARATIVE STATISTICS

To determine whether there were differences between the proportions of respondents who agreed with the statements and those who did not agree with the statements the Chi-Square test was used. In many of the cases there were only responses of agree and strongly agree. Thus it is not necessary to test these statements, but if the difference between the degree to which they agree is statistically significant, it will be shown in the following table.

The hypothesis being tested when comparing the genders will be as follows:

- H_0 = There is no difference between the proportions of the categories with regard to the measuring instrument.
- H_1 = There is a difference between the proportions of the categories with regard to the measuring instrument.

If the P-value is less than 0.05, then H_0 will be rejected. Thus the assumption can be made that there is a statistically significant difference between the category proportions.

None of the proportions was statistically significant different due to the fact that in most of the cases, the expected frequency in a cell (category) is less than 5, and the chi-square may not be valid. Then, due to the number of respondents in the sample even a proportion split of 80% and 20% between the categories, would not be a statistically significant difference in proportion. However the computer printouts for all the tests are shown in Annexure B and C.

The mean of the different measurements for the expectations are quoted in the following table to show which measurement the respondents agreed to the most.

Table 5. 3: Sorted means from highest of the expectations of the service quality in the IT Governance Questionaire.

Position	Measurement	Mean	Standard deviation
1	Assurance	4.58	0.1280
2	Reliability	4.55	0.1691
3	Empathy	4.20	0.2449
4	Responsiveness	4.18	0.1658
5	Tangibles	4.08	0.1787

"Assurance" was scored the highest by the respondents which means that they agree to strongly agree the most with the statements under the "Assurance" measurement. "Reliability" is scored as the second highest as an expectation in the IT governance Service Quality Expectation questionnaire.

Table 5. 4: Sorted means from highest of the customer feedback questionaire.

Position	Measurement	Mean	Standard deviation
1	Reliability	2.81	0.2394

Position	Measurement	Mean	Standard deviation
2	Responsiveness	2.64	0.4628
3	Understanding	2.61	0.2757
4	Tangibles	2.29	0.0566
5	Assurance	2.06	0.1500

The customer feedback respondents scored "Assurance" the lowest which actually also mean that they agree to strongly agree, most with the "Assurance" measurement. "Reliability" is scored the highest by the respondents in the customer feedback questionnaire thus although most of the respondents agree to strongly agree with this statements in the "Reliability" category, it was the group of statements that the customers agreed with the least.

This shows that there some difference between the expectations of service quality and the actual performance of service quality. The emphasis lies in different categories.

CHAPTER SIX

CONCLUSION

6.1 OVERVIEW OF RESEARCH

This chapter represents the summary and conclusions regarding IT governance in IT Service Delivery. The research started in Chapter 1 where an overview was given how the research would be done and on what it would be based. Chapter 2 gave a holistic overview of the area in which the problem statement lies. In-depth information was discussed and elaborated on as to why and how the problem statement came about. After the overview in Chapter 2, a literature review was described on IT quality governance. Conclusions were drawn from previous researchers who conducted research on the selected research topic. Various governance best practices were discussed in this chapter.

Chapter 4 followed, in which different research methodologies were discussed. The most applicable methodology was then selected and the dissertation was written, based on it. The data collection, statistical validation followed, in which evidence shown that it is due to the lack of IT quality governance that SLAs fail. In Chapter 6, the problem statement, research objectives, investigative and sub-investigative questions are revisited Making use of analogies drawn from the statistics and the literature review, the questions are then answered and the relevant recommendations are suggested or implemented.

6.2 ANALOGIES DRAWN FROM THE DATA ANALYSIS

From the results obtained through this survey measuring the expectations of IT governance, the following analogies can be drawn from this research:

- Upon taking on of new business or clients, formal documentation containing set Service Level Agreements must be compiled.
- For IT organisations to comply with customer/client requirements, both Corporate and IT Governance Structures have to be in place.

- IT and Quality governance plays an important role within IT organisations.

From the results obtained through this survey measuring the expectations of service quality, the following analogies can be drawn from this research:

- Staff of the Computacenter SA should be consistently courteous.
- Computacenter SA should show a sincere interest in solving problems.
- When Computacenter SA promises action within a certain time, it should be done.
- Staff of Computacenter SA should instil confidence in customers.
- When there is a problem, Computacenter SA should show a sincere interest in solving it.

The main aspects regarding service quality expectations are assurance and reliability.

From the results obtained through the survey measuring customer feedback of service quality the following analogies can be drawn from this research:

- Computacenter SA is always willing to assist.
- Computacenter SA is friendly, helpful and courteous.
- Computacenter SA reflects good interactions / relations.
- Computacenter SA portrays good knowledge when attending to requests.
- Computacenter SA has your best interests at heart.
- Computacenter SA uses up to date technology.

Note should be taken that the customer feedback survey shows that:

- Computacenter SA does not complete tasks on time.
- Computacenter SA does not have a full understanding of requirements and expectations of customers.

The main aspects regarding service quality performance, are assurance and tangibles. Although reliability is seen to be one of the most important factors in IT governance, Computacenter SA does not seem to live up to its own priorities,

according to the customer feedback. This would be an area of concern for the future.

6.3 RECOMMENDATIONS TO MITIGATE THE RESEARCH PROBLEM

The research problem which was formulated in Chapter 1 paragraph 1.4 reads as follows: "IT service providers not complying with quality principles and procedures, causing SLA's to fail".

A statistical analysis was conducted to investigate the cause of the problem and what has led to it. In conjunction with the statistical analysis, a review on the various IT governance frameworks and best practices was conducted. Summaries were drawn from previous literature and research journals. This was to aid in both using the findings to resolve the problem and also to continuously improve the quality of service provided to the clients of CCSA. According to the analogies drawn from the statistical analysis CCSA, the Service Provider, does not appear to meet and exceed the customer and client expectations or requirements let alone exceed them. It was highlighted that this is the area which requires improvement and sustainability so that customers can regain that trust in the reliability within CCSA as their Service Provider.

6.3.1 Suggested Governance Structure for CCSA

The Governance Structures of CCSA should be revised and restructured according to the King III principles on IT governance. The King principles highlights the some principles to be followed which when implemented in the restructuring of CCSA, CCSA will not only be able to ensure that the client or customers expectations are met, but in fact that it is exceeded. The principles referred in paragraph 3.6.1 are as follows:

- **Leadership** where good governance is essentially about effectiveness leadership. Leaders need to raise these challenges if there is to be any change of effective responses. Leaders need to define strategy, provide direction and establish the ethics and values that will influence and guide practices and behaviour with regard to sustainability performance.

- **Sustainability** as the primary and economic imperative for the 21st Century and one of the most important sources of both opportunities and risk for businesses.
- **Innovation, fairness and collaboration** as key aspects of any transition to sustainability, along with innovation providing new ways of doing things including profitable responses to sustainability. Fairness is vital because social injustice is unsustainable, and collaboration is often a prerequisite for large scale change
- **Integrating sustainability and social transformation** where social transformation and redress is therefore an important aspect and needs to be integrated within the broader transition to sustainability
- **Sustainability reporting in need of renewal** required to respond to the lasting distrust among civil society of the intentions and practices of big business. Also regarding the concerns among business decision makers that sustainability reporting is not fulfilling their expectations in a cost effective manner

6.3.2 Best Practices suitable to continually sustain the reliability between the client and the service provider

Currently, CCSA is ISO 9000 accredited and follows the ITIL Best Practice. However, following a standard and practicing a standard within your organization is completely. The practice of IT governance frameworks needs to be enforced for clients to rely on the services provided by CCSA.

As discussed in the literature Chapter 3 paragraph 3.7.1, ITIL consists of an inter-related set of best practices for lowering the cost, while improving the quality of IT services delivered to users. The key areas around which ITIL is organized include is explained in paragraph 3.7.1 in chapter 3

More suitable for the current situation is adaptation of the CobiT framework practiced together with the principles of Val IT. ITIL assists in improving quality of service delivery, however it does not enforce guidelines and best practice methods as CobiT and Val IT depicts.

CobiT can be described as a set of management guidelines enabling management to align IT activities and priorities with business requirements, detailed control objectives, set of audit guidelines and an implementation tool set. The CobiT framework assists in bridging the gaps between the control requirements, technical issues, and business risks.

CobiT is an open standard for the control of IT and contains guidelines such as:

- Key goal indicators for monitoring IT goals
- Key Performance Indicators (KPIs) for the monitoring of performance in IT processes
- Critical success factors for getting IT processes under control
- Maturity models for benchmarking comparison

CobiT is designed to help three distinct audiences, namely the managers, the users which is the client or customer and then last but not least the auditors who can use it to substantiate their opinions and/or provide advice to management on internal controls. In paragraph 3.7.2, CobiT looks at the quality, fiduciary control and security needs of enterprises providing information criteria that can be used to generically define what the business requires from IT which is:

- **Effectiveness** of information which is relevant and pertinent to the business; information is being delivered in a timely, correct, consistent and usable manner.
- **Efficiency** making provision for information through the optimal use of resources.
- **Confidentiality** for the protection of sensitive data from unauthorised disclosure.
- **Integrity** for accuracy and completeness of information; validity in accordance with business values.
- **Availability** of information is available when required, now and in the future
- **Compliance** with laws, regulations and contractual arrangements.
- **Reliability** to provide appropriate information for management to operate the entity and for management to exercise its financial and compliance reporting responsibilities.

Once again the highlighted issue is reliability. With CobiT, reliability is one of the factors it considers to be importance in IT service delivery.

Another best practice to consider is Val IT. Val IT initiative contains research, publications and supporting services to assist management in ensuring their organisations realise optimal value from IT-enabled business investments at an affordable cost with a known and acceptable level of risk. It provides guidelines, processes and supporting practices to assist the board and executive management in understanding and carrying out their roles related to such investments.

Although applicable to all investment decisions, Val IT is primarily targeted at IT-enabled business investments: significant business investments in sustaining, growing or transforming the business with a critical IT component, where IT is a means to an end. The end being to contribute to the process of value creation in the enterprise. The end and the means are represented by the 'Four Ares' as illustrated in Figure 3.11 in Chapter 3. Val IT specifically focuses on the investment decision (are we doing the right things?) and the realisation of benefits (are we getting the benefits?). COBIT specifically focuses on the execution (are we doing them the right way and are we getting them done well?).
The principles of Val IT therefore read as follows:

- IT-enabled investments will be managed as a **portfolio of investments**.
- IT-enabled investments will include the **full scope of activities** that are required to achieve business value.
- IT-enabled investments will be managed through their **full economic life cycle.**
- Value delivery practices will recognise that there are **different categories of investments** that will be evaluated and managed differently.
- Value delivery practices will define and monitor **key metrics** and will respond quickly to any changes or deviations.
- Value delivery practices will engage all stakeholders and assign **appropriate accountability** for the delivery of capabilities and the realisation of business benefits.
- Value delivery practices will be **continually monitored, evaluated and improved**.

To conclude, CobiT and Val IT frameworks should be made use of to ensure that both quality and IT governance practices are enforced within CCSA. This will result in the client's requirements being exceeded which will in turn lead to the passing in Service Level Agreements.

6.4 FINAL CONCLUSION

The statement "IT Service Providers non compliance with quality principles and procedures, is causing SLA's to fail" has been tested and the results were analysed and proved the above statement to be true. Recommendations are given to assist in to correct and improve the quality of service provided to CCSA's clients.

Quality needs consistent improvement. With continual improvement, and the practices of the applicable IT governance frameworks, CCSA can be a successful IT Service Provider.

BIBLIOGRAPHY

Cervone, F. 2008. *ITIL: a Framework for managing digital library services.* 2008.

Cockcroft, A. 1999. *Service Lever definitions and Interactions.* Enterprise Engineering: Sun Blue Print Online.

Collis, J. & Hussey, R. 2003. *Business research: A practical guide for undergraduate and post graduate students.* Palgrave: Macmillan

Cooper, D. R. & Schindler, P. S. 2006. *Business research methods.* Boston: McGraw- Hill.

De Vos, A.S. (2002). Scientific theory and professional research. in de Vos, A.S. Strydom, H. Fouché, C.S.L. & Delport, C.S.L. (eds) Research at grass roots: for the social sciences and human service professions. 2nd edition. Pretoria: Van Schaik.

Emroy, C.W. & Cooper, D.R. 1995. *Business Research Methods.* Fifth Edition. Irwin: Homewood.

Engelbrecht, L. 2009. King III: Comply vs Apply – What's the difference? *Business Brief,* April. 1

Goetsch, D. L. & Davis, S. B. 2002. *Understanding and Implementing ISO 9000:2000.* New Jersey: Pearson Education

International Standard Organisation (ISO). 2009. International Standard ISO/IEC 27002: Information Technology – Security Techniques – Code of practice for Information security management. [**Online**]. Available from: http:/www.iso.org/. [Accessed 13/07/2010]

International Standard Organisation (ISO). 2005. International Standard ISO/IEC 20000: Information Technology – Service Management. [**Online**]. Available from: http:/www.iso.org/. [Accessed 13/07/2010]

IT Governance Institute (ITGI). 2003. *Board Briefing on IT Governance.* [**Online**]. Available from: http:/www.itig.org/. [Accessed 13/07/2010]

IT Governance Institute (ITGI). 2008. *Unlocking Value: An Executive Primer on the Critical Role of IT Governance.* [**Online**]. Available from: http:/www.itig.org/. [Accessed 13/07/2010]

IT Governance Institute (ITGI). 2008b. *Aligning CobiT 4.1, ITIL V3 and ISO/IEC 27002 for Business Benefits.* [**Online**]. Available from: http:/www.itig.org/, http:/www.isaca.org/. [Accessed 13/07/2010]

IT Governance Institute (ITGI). 2006. *Enterprise Value: Governance of IT Investments, The Business Case.* [**Online**]. Available from: http:/www.itig.org/. [Accessed 29/07/2010]

IT Governance Institute (ITGI). 2005. *Information Risks: Whose Business Are They?* [**Online**]. Available from: http:/www.itig.org/, http:/www.isaca.org/. [Accessed 13/07/2010]

ITIL® V.3 Foundation. 2009. *Leading the way in IT Management.* Woodmead: Pink Elephant

King Committee on Governance. 2009. *Draft Code of Governance Principles for South Africa – 2009 (King III).* Institude of Directors in South Africa

Kumbakara, N. 2008. *Managed IT services: the role if IT standards*

Leedy, P.D. & Ormrod, J.E. 2001. *Practical research.* New Jersey: Meril Prentice Hall Company.

Malan, D. 2010. King III – International best practice or best preach? *Leader,* May, 13

Morency, J. 2005. *COBIT versus ITIL.* [**Online**] Available from: http:www.networkworls.com. [Accessed 13/07/2010]

Nunnally, J.C. (1978). Psychometric theory (2nd ed.). New York. McGraw-Hill.

Remenyi, D. Williams, B. Money, A. & Swartz, E. 2002. *Doing research in business and management.* London: Sage.

Salle, M. 2004 *IT Service Management and IT Governance: Review, Comparative Analysis and their Impact on Utility Computing..*

Sanders, D. J. & Cantor, C. 2007. *Operational IT Governance.* [**Online**]. Available from: http:/www.ibm.com/. [Accessed 14/07/2010]

Saunders, M.N.K. Lewis, P. & Thornhill, A. 2000. Research methods for business students. Edinburgh Gate: Pearson Education

Schindler, D.R. & Cooper, P.S. 2001/2003. *Business Research Methods.* Seventh/Eight Edition. New York, NY. McGraw-Hill.

Selig, G.J 2008. *Implementing IT Governance – A practical guide to Global Best Practices in IT Management.* First Edition. Van Harren.

Spafford, G. 2003 *The Benefits of Standard IT Govenance Frameworks.* [**Online**]. Available from: http:/www.itsmwatch.com /. [Accessed 21/05/2010]

Symons, C. 2005 *IT Governance Framework Structures, Processed and Communication.*

White, B. J. 2008 *IT Governance, IT Service Management and the organizing tole of the Information Technology infrastructure Library.*

Yin, R.K 1994. *Case Study Research: Design and Methods*. Sage: Thousand Oakes

ANNEXURE A:

Table 5.1 and Table 5.2

TABLE 5. 1: Cronbach's Alpha Coefficients for IT governance questionnaire.

Statements	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
PART A – Governance questionnaire			
1. Poor practice of governance can lead to non conformation in service delivery.	A01	0.7839	0.8859
2. Upon taking on of new businesses or clients, formal documentation containing set service level agreements has to be compiled.	A02	0.4512	0.8940
3. IT engineers working on specific clients are equipped with the necessary skill set to deliver the necessary services.	A03	0.1981	0.8974
4. IT and Quality governance plays an important role within the IT organizations.	A04	0.4159	0.8946
5. For IT organisations to comply with customer/client requirements, both corporate and IT governance structures have to be in place.	A05	0.7348	0.8895
6. Failing to have any formal, policies and procedures can be a reason why SLA's are not being adhered to.	A06	-0.2850	0.9124
7. IT service providers that are not trained to do the work could be a reason the client requirements are not met.	A07	0.6202	0.8904
8. If frameworks such as ITIL and COBIT are practiced, less non conformances will occur and the client will receive its excellent service delivery.	A08	0.7558	0.8897
9. Combining quality improvement methods such as ISO and IT governance will assist the company in sustaining their drive for	A09	0.6534	0.8911

Statements	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
excellence.			
10. Except having the company ISO 2001:9000 accredited, and using ITIL as best practice; IT quality governance will be the best suitable way to make sure the company sustain the excellence of delivering IT service delivery.	A10	0.6635	0.8891
PART B – SERVQUAL QUESTIONNAIRE			
Tangibles			
1. Computacenter SA has to have up to date equipment and technology.	B01	0.3195	0.8968
2. Computacenter SA should have appealing facilities.	B02	0.4455	0.8939
4 Computacenter SA should use visually appealing materials.	B04	0.6587	0.8916
5. Company shared information should be easily accessible.	B05	0.3901	0.8948
Reliability			
6. When Computacenter SA promises to do something by a certain time, it should do so.	B06	-0.5260	0.9059
7. Computacenter SA should show a sincere interest in solving problems.	B07	0.6289	0.8920
8. When there is a problem Computacenter SA should show a sincere interest to solve it.	B08	0.5543	0.8925
9. Computacenter SA should perform the service right the first time.	B09	-0.1500	0.9028
10. Computacenter SA should provide its service at a time it promises to do so.	B10	0.3838	0.8949
11. Computacenter SA should insist on error free records.	B11	0.4596	0.8936
Responsiveness			
12. The staff of Computacenter SA should tell	B12	0.9121	0.8858

Statements	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
you exactly when service will be performed.			
13. The staff of Computacenter SA should give you prompt service.	B13	0.5381	0.8926
14. The staff of Computacenter SA should be always willing to help you.	B14	0.8637	0.8850
15. The staff of Computacenter SA should never be too busy to respond to your questions.	B15	0.4850	0.8940
Assurance			
16. The staff of Computacenter SA should instil confidence in customers.	B16	0.2984	0.8962
17. Customers should have comfortable interactions with employees.	B17	0.8150	0.8863
18. The staff of Computacenter SA should be consistently courteous with you.	B18	0.6587	0.8916
19. The staff of Computacenter SA should have the knowledge to answer you.	B19	0.0225	0.9004
Empathy			
20. Customers should be give individual attention by the staff of Computacenter SA.	B20	0.5361	0.8921
21. Computacenter SA operating hours should be convenient to all its customers.	B21	0.4581	0.8942
22. Computacenter SA should have your best interest at heart.	B22	0.2968	0.8963
23. Staff of Computacenter SA should understand you specific needs.	B23	0.4372	0.8941
Cronbach's Coefficient Alpha for standardized variable			**0.9007**
Cronbach's Coefficient Alpha for raw variables			**0.8970**

According to the Cronbach's Alpha Coefficients (Table 5.1) for all the items serving as a measuring instrument in the questionnaire:

- 0.8970 for raw variables; and
- 0.9007 for standardized variables;

which were more than the acceptable level of 0.70 (***Nunnally, 1978***: 245), these items prove to be reliable and consistent.

TABLE 5. 2: Cronbach's Alpha Coefficients for customer feedback questionnaire.

Statements	Variable nr.	Correlation with total	Cronbach's Alpha Coefficient
Section 2: Tangibles			
1. Computacenter SA uses up to date technology.	B01	-0.0190	0.9258
2 Computacenter SA uses visually appealing materials.	B02	-0.2755	0.9311
Section 3: Reliability			
3. Computacenter SA completes tasks in time.	C03	0.7296	0.9099
4. Computacenter SA shows interest in solving issues/problems.	C04	0.8059	0.9071
5. Computacenter SA responds well to initial response	C05	0.8629	0.9041
Section 4: Responsiveness			
6. You are well informed on progress of your request.	D06	0.7866	0.9078
7. You receive prompt response.	D07	0.8776	0.9040
8. Computacenter SA is always willing to assist.	D08	0.7889	0.9151
Section 5: Assurance			
9. Computacenter SA reflects good interactions/relations with you.	E09	0.8414	0.9121
10. You have confidence that Computacenter SA attends to your requirements.	E10	0.6603	0.9120
11. Computacenter SA is friendly, helpful and courteous.	E11	0.7196	0.9131

12. Computacenter SA portrays good knowledge when attending to my requests.	E12	0.6573	0.9127
Section 6:Understanding			
13. Computacenter SA operating hours is convenient to customers.	F13	0.7330	0.9126
14. Computacenter SA has your best interest at heart.	F14	0.7404	0.9129
15. Computacenter SA has a full understanding of your requirements and expectations.	F15	0.7370	0.9093
Cronbach's Coefficient Alpha for standardized variable			**0.9211**
Cronbach's Coefficient Alpha for raw variables			**0.9185**

According to the Cronbach's Alpha Coefficients (Table 5.2) for all the items serving as a measuring instrument in the questionnaire:

- 0.9185 for raw variables; and
- 0.9211 for standardized variables;

which were more than the acceptable level of 0.70, these items prove to be reliable and consistent.

ANNEXURE B:

Tables 5.3, 5.4, 5.5 and5.6

Table 5. 3: Descriptive statistics for all the variables in IT governance questionnaire

Variables	Categories	Frequency	Percentage out of total
SECTION A – Governance questionnaire			
1. Poor practice of governance can lead to non conformation in service delivery.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	2	20.0%
	Agree	3	30.0%
	Strongly agree	5	50.0%
	Unknown	0	0.0%
2. Upon taking on of new businesses or clients, formal documentation containing set service level agreements has to be compiled.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	3	30.0%
	Strongly agree	7	70.0%
3. IT engineers working on specific clients are equipped with the necessary skill set to deliver the necessary services.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	8	80.0%
	Strongly agree	2	20.0%
4. IT and Quality governance plays an important role within the IT organizations.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.0%
	Agree	4	40.0%
	Strongly agree	5	50.0%

5. For IT organisations to comply with customer/client requirements, both corporate and IT governance structures have to be in place.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	6	60.0%
	Strongly agree	4	40.0%
6. Failing to have any formal, policies and procedures can be a reason why SLA's are not being adhered to.	Strongly disagree	0	0.0%
	Disagree	1	10.0%
	Undecided	0	0.0%
	Agree	6	60.0%
	Strongly agree	3	30.0%
7. IT service providers that are not trained to do the work could be a reason the client requirements are not met.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.0%
	Agree	5	50.0%
	Strongly agree	4	40.0%
8. If frameworks such as ITIL and COBIT are practiced, less non conformances will occur and the client will receive its excellent service delivery.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.0%
	Agree	8	80.0%
	Strongly agree	1	10.0%
9. Combining quality improvement methods such as ISO and IT governance will assist the company in sustaining their drive for excellence.	Strongly disagree	0	0.0%
	Disagree	0	.0.0%
	Undecided	0	0.0%
	Agree	7	70.0%
	Strongly agree	3	30.0%
10. Except having the company ISO 2001:9000 accredited, and using ITIL as best practice; IT quality governance will be the best suitable way to make sure the company sustain the excellence of delivering IT service delivery.	Strongly disagree	0	0.0%
	Disagree	1	10.0%
	Undecided	4	40.0%
	Agree	3	30.0%
	Strongly agree	2	20.0%

PART B – SERVQUAL QUESTIONNAIRE			
Tangibles			
1. Computacenter SA has to have up to date equipment and technology.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	2	20.0%
	Agree	5	50.0%
	Strongly agree	3	30.0%
2. Computacenter SA should have appealing facilities.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	2	20.0%
	Agree	7	70.0%
	Strongly agree	1	10.0%
4 Computacenter SA should use visually appealing materials.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	2	20.0%
	Agree	8	80.0%
	Strongly agree	0	0.0%
5. Company shared information should be easily accessible.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	5	50.0%
	Strongly agree	5	50.0%
Reliability			
6. When Computacenter SA promises to do something by a certain time, it should do so.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	2	20.0%
	Strongly agree	8	80.0%
7. Computacenter SA should show a sincere interest in solving problems.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	2	20.0%
	Strongly agree	8	80.0%

8. When there is a problem Computacenter SA should show a sincere interest to solve it.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	3	30.0%
	Strongly agree	7	70.0%
9. Computacenter SA should perform the service right the first time.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	4	40.0%
	Strongly agree	6	60.0%
10. Computacenter SA should provide its service at a time it promises to do so.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	4	40.0%
	Strongly agree	6	60.0%
11. Computacenter SA should insist on error free records.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	3	30.0%
	Agree	6	60.0%
	Strongly agree	1	10.0%
Responsiveness			
12. The staff of Computacenter SA should tell you exactly when service will be performed.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.%
	Agree	7	70.0%
	Strongly agree	2	20.0%
13. The staff of Computacenter SA should give you prompt service.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	6	60.0%
	Strongly agree	4	40.0%
14. The staff of Computacenter SA should be always willing to help you.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.0%

	Agree	4	40.0%
	Strongly agree	5	50.0%
15. The staff of Computacenter SA should never be too busy to respond to your questions.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	5	50.0%
	Agree	2	20.0%
	Strongly agree	3	30.0%
Assurance			
16. The staff of Computacenter SA should instil confidence in customers.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	3	30.0%
	Strongly agree	7	70.0%
17. Customers should have comfortable interactions with employees.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	1	10.0%
	Agree	5	50.0%
	Strongly agree	4	40.0%
18. The staff of Computacenter SA should be consistently courteous with you.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	2	20.0%
	Strongly agree	8	80.0%
19. The staff of Computacenter SA should have the knowledge to answer you.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	5	50.0%
	Strongly agree	5	50.0%
Empathy			
20. Customers should be give individual attention by the staff of Computacenter SA.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	5	50.0%
	Agree	4	40.0%
	Strongly agree	1	10.0%

21. Computacenter SA operating hours should be convenient to all its customers.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	8	80.0%
	Strongly agree	2	20.0%
22. Computacenter SA should have your best interest at heart.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	5	50.0%
	Strongly agree	5	50.0%
23. Staff of Computacenter SA should understand you specific needs.	Strongly disagree	0	0.0%
	Disagree	0	0.0%
	Undecided	0	0.0%
	Agree	5	50.0%
	Strongly agree	5	50.0%

Table 5. 4: Descriptive statistics for all the variables in customer feedback questionnaire

Variables	Categories	Frequency	Percentage out of total
Section 2: Tangibles			
1. Computacenter SA uses up to date technology.	Strongly agree	0	0.0%
	Agree	9	75.0%
	Undecided	3	25.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
2 Computacenter SA uses visually appealing materials.	Strongly agree	0	0.0%
	Agree	8	66.7%
	Undecided	4	33.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
Section 3: Reliability			

Variables	Categories	Frequency	Percentage out of total
3. Computacenter SA completes tasks in time.	Strongly agree	1	8.3%
	Agree	2	16.7%
	Undecided	3	25.0%
	Disagree	6	50.0%
	Strongly disagree	0	0.0%
4. Computacenter SA shows interest in solving issues/problems.	Strongly agree	1	8.3%
	Agree	6	50.0%
	Undecided	3	25.0%
	Disagree	2	16.7%
	Strongly disagree	0	0.0%
5. Computacenter SA responds well to initial response.	Strongly agree	1	8.3%
	Agree	4	33.3%
	Undecided	4	33.3%
	Disagree	3	25.0%
	Strongly disagree	0	0.0%
Responsiveness			
6. You are well informed on progress of your request.	Strongly agree	1	8.3%
	Agree	2	16.7%
	Undecided	2	16.7%
	Disagree	6	50.0%
	Strongly disagree	0	0.0%
	Unknown	1	8.3%
7. You receive prompt response.	Strongly agree	1	8.3%
	Agree	2	16.7%
	Undecided	6	50.0%
	Disagree	2	16.7%
	Strongly disagree	0	0.0%
	Unknown	1	8.3%

Variables	Categories	Frequency	Percentage out of total
8. Computacenter SA is always willing to assist.	Strongly agree	1	8.3%
	Agree	10	83.3%
	Undecided	0	0.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
	Unknown	1	8.3%
Assurance			
9. Computacenter SA reflects good interactions/relations with you.	Strongly agree	2	16.7%
	Agree	9	75.0%
	Undecided	1	8.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
10. You have confidence that Computacenter SA attends to your requirements.	Strongly agree	2	16.7%
	Agree	3	25.0%
	Undecided	7	58.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
11. Computacenter SA is friendly, helpful and courteous.	Strongly agree	3	25.0%
	Agree	8	66.7%
	Undecided	1	8.3%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
12. Computacenter SA portrays good knowledge when attending to my requests.	Strongly agree	2	16.7%
	Agree	7	58.3%
	Undecided	3	25.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
Understanding			

Variables	Categories	Frequency	Percentage out of total
13. Computacenter SA operating hours is convenient to customers.	Strongly agree	1	8.3%
	Agree	6	50.0%
	Undecided	0	0.0%
	Disagree	3	25.0%
	Strongly disagree	1	8.3%
	Unknown	1	8.3%
14. Computacenter SA has your best interest at heart.	Strongly agree	1	8.3%
	Agree	8	66.7%
	Undecided	3	25.0%
	Disagree	0	0.0%
	Strongly disagree	0	0.0%
15. Computacenter SA has a full understanding of your requirements and expectations.	Strongly agree	1	8.3%
	Agree	2	16.7%
	Undecided	6	50.0%
	Disagree	3	25.0%
	Strongly disagree	0	0.0%

Descriptive statistics which measure the central tendency and dispersion are also shown in the following tables.

Table 5. 5: Descriptive statistics – Mean, Median, Standard Deviation and Range for IT governance questionnaire

Variable	N	Mean	Std Dev	Median	Range
PART A – Governance questionnaire					
1. Poor practice of governance can lead to non conformation in service delivery.	10	4.3	0.8233	4.5	2.0
2. Upon taking on of new businesses or clients, formal documentation containing set service level agreements has to be compiled.	10	4.7	0.4830	5.0	1.0

Variable	N	Mean	Std Dev	Median	Range
3. IT engineers working on specific clients are equipped with the necessary skill set to deliver the necessary services.	10	4.2	0.4216	4.0	1.0
4. IT and Quality governance plays an important role within the IT organizations.	10	4.4	0.6992	4.5	2.0
5. For IT organisations to comply with customer/client requirements, both corporate and IT governance structures have to be in place.	10	4.4	0.5164	4.0	1.0
6. Failing to have any formal, policies and procedures can be a reason why SLA's are not being adhered to.	10	4.1	0.8756	4.0	3.0
7. IT service providers that are not trained to do the work could be a reason the client requirements are not met.	10	4.3	0.6749	4.0	2.0
8. If frameworks such as ITIL and COBIT are practiced, less non conformances will occur and the client will receive its excellent service delivery.	10	4.0	0.4714	4.0	2.0
9. Combining quality improvement methods such as ISO and IT governance will assist the company in sustaining their drive for excellence.	10	4.3	0.4830	4.0	1.0
10. Except having the company ISO 2001:9000 accredited, and using ITIL as best practice; IT quality governance will be the best suitable way to make sure the company sustain the excellence of delivering IT service delivery.	10	3.6	0.9661	3.5	3.0
PART B – SERVQUAL QUESTIONNAIRE					
Tangibles					
1. Computacenter SA has to have up to date equipment and technology.	10	4.1	0.7379	4.0	2.0
2. Computacenter SA should have appealing facilities.	10	3.9	0.5676	4.0	2.0
4 Computacenter SA should use visually appealing materials.	10	3.8	0.4216	4.0	1.0
5. Company shared information should be easily accessible.	10	4.5	0.5270	4.5	1.0
Reliability					
6. When Computacenter SA promises to do something by a certain time, it should do so.	10	4.8	0.4216	5.0	1.0
7. Computacenter SA should show a sincere interest in solving problems.	10	4.8	0.4216	5.0	1.0

Variable	N	Mean	Std Dev	Median	Range
8. When there is a problem Computacenter SA should show a sincere interest to solve it.	10	4.7	0.4830	5.0	1.0
9. Computacenter SA should perform the service right the first time.	10	4.6	0.5164	5.0	1.0
10. Computacenter SA should provide its service at a time it promises to do so.	10	4.6	0.5164	5.0	1.0
11. Computacenter SA should insist on error free records.	10	3.8	0.6325	4.0	2.0
Responsiveness					
12. The staff of Computacenter SA should tell you exactly when service will be performed.	10	4.1	0.5676	4.0	2.0
13. The staff of Computacenter SA should give you prompt service.	10	4.4	0.58164	4.0	1.0
14. The staff of Computacenter SA should be always willing to help you.	10	4.4	0.6992	4.5	2.0
15. The staff of Computacenter SA should never be too busy to respond to your questions.	10	3.8	0.9189	3.5	2.0
Assurance					
16. The staff of Computacenter SA should instil confidence in customers.	10	4.7	0.4830	5.0	1.0
17. Customers should have comfortable interactions with employees.	10	4.3	0.6749	4.0	2.0
18. The staff of Computacenter SA should be consistently courteous with you.	10	4.8	0.4216	5.0	1.0
19. The staff of Computacenter SA should have the knowledge to answer you.	10	4.5	0.5270	4.5	1.0
Empathy					
20. Customers should be give individual attention by the staff of Computacenter SA.	10	3.6	0.6992	3.5	2.0
21. Computacenter SA operating hours should be convenient to all its customers.	10	4.2	0.4216	4.0	1.0
22. Computacenter SA should have your best interest at heart.	10	4.5	0.5270	4.5	1.0
23. Staff of Computacenter SA should understand you specific needs.	10	4.5	0.5270	4.5	1.0

Table 5. 6: Descriptive statistics – Mean, Median, Standard Deviation and Range for customer feedback questionnaire

Variable	N	Mean	Std Dev	Median	Range
Section 2: Tangibles					
1. Computacenter SA uses up to date technology.	12	2.2	0.4523	2.0	1.0
2 Computacenter SA uses visually appealing materials.	12	2.3	0.4924	2.0	1.0
Section 3: Reliability					
3. Computacenter SA completes tasks in time.	12	3.2	1.0299	3.5	3.0
4. Computacenter SA shows interest in solving issues/problems.	12	2.5	0.9045	2.0	3.0
5. Computacenter SA responds well to initial response	12	2.8	0.9653	3.0	3.0
Section 4: Responsiveness					
6. You are well informed on progress of your request.	11	3.2	1.0787	4.0	3.0
7. You receive prompt response.	11	2.8	0.8739	3.0	3.0
8. Computacenter SA is always willing to assist.	11	1.9	0.3015	2.0	1.0
Section 5: Assurance					
9. Computacenter SA reflects good interactions/relations with you.	12	1.9	0.5149	2.0	2.0
10. You have confidence that Computacenter SA attends to your requirements.	12	2.4	0.7930	3.0	2.0
11. Computacenter SA is friendly, helpful and courteous.	12	1.8	0.5774	2.0	2.0
12. Computacenter SA portrays good knowledge when attending to my requests.	12	2.1	0.6686	2.0	2.0
Section 6:Understanding					
13. Computacenter SA operating hours is convenient to customers.	11	2.7	1.2721	2.0	4.0
14. Computacenter SA has your best interest at heart.	12	2.2	0.5774	2.0	2.0
15. Computacenter SA has a full understanding of your requirements and expectations.	12	2.9	0.9003	3.0	3.0

ANNEXURE C

Cronbach Alpha Coefficients for IT Governance questionnaire

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
A01	10	4.30000	0.82327	43.00000	3.00000	5.00000	A01
A02	10	4.70000	0.48305	47.00000	4.00000	5.00000	A02
A03	10	4.20000	0.42164	42.00000	4.00000	5.00000	A03
A04	10	4.40000	0.69921	44.00000	3.00000	5.00000	A04
A05	10	4.40000	0.51640	44.00000	4.00000	5.00000	A05
A06	10	4.10000	0.87560	41.00000	2.00000	5.00000	A06
A07	10	4.30000	0.67495	43.00000	3.00000	5.00000	A07
A08	10	4.00000	0.47140	40.00000	3.00000	5.00000	A08
A09	10	4.30000	0.48305	43.00000	4.00000	5.00000	A09
A10	10	3.60000	0.96609	36.00000	2.00000	5.00000	A10
B01	10	4.10000	0.73786	41.00000	3.00000	5.00000	B01
B02	10	3.90000	0.56765	39.00000	3.00000	5.00000	B02
B04	10	3.80000	0.42164	38.00000	3.00000	4.00000	B04
B05	10	4.50000	0.52705	45.00000	4.00000	5.00000	B05
B06	10	4.80000	0.42164	48.00000	4.00000	5.00000	B06
B07	10	4.80000	0.42164	48.00000	4.00000	5.00000	B07
B08	10	4.70000	0.48305	47.00000	4.00000	5.00000	B08
B09	10	4.60000	0.51640	46.00000	4.00000	5.00000	B09
B10	10	4.60000	0.51640	46.00000	4.00000	5.00000	B10
B11	10	3.80000	0.63246	38.00000	3.00000	5.00000	B11
B12	10	4.10000	0.56765	41.00000	3.00000	5.00000	B12
B13	10	4.40000	0.51640	44.00000	4.00000	5.00000	B13
B14	10	4.40000	0.69921	44.00000	3.00000	5.00000	B14
B15	10	3.80000	0.91894	38.00000	3.00000	5.00000	B15
B16	10	4.70000	0.48305	47.00000	4.00000	5.00000	B16
B17	10	4.30000	0.67495	43.00000	3.00000	5.00000	B17
B18	10	4.80000	0.42164	48.00000	4.00000	5.00000	B18
B19	10	4.50000	0.52705	45.00000	4.00000	5.00000	B19
B20	10	3.60000	0.69921	36.00000	3.00000	5.00000	B20
B21	10	4.20000	0.42164	42.00000	4.00000	5.00000	B21
B22	10	4.50000	0.52705	45.00000	4.00000	5.00000	B22
B23	10	4.50000	0.52705	45.00000	4.00000	5.00000	B23

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.897018
Standardized	0.900698

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
A01	0.783932	0.885929	0.763342	0.892264	A01
A02	0.451158	0.894011	0.469124	0.897413	A02
A03	0.198085	0.897365	0.188737	0.902148	A03
A04	0.415944	0.894602	0.415684	0.898328	A04
A05	0.734784	0.889505	0.713437	0.893151	A05
A06	-.285012	0.912422	-.241602	0.909096	A06
A07	0.620205	0.890401	0.631003	0.894604	A07
A08	0.755813	0.889725	0.762703	0.892276	A08
A09	0.653418	0.891083	0.635254	0.894529	A09
A10	0.663505	0.889067	0.683565	0.893679	A10
B01	0.319506	0.896819	0.334731	0.899703	B01
B02	0.445524	0.893924	0.448112	0.897774	B02
B04	0.658663	0.891628	0.661125	0.894075	B04
B05	0.390109	0.894848	0.358074	0.899308	B05
B06	-.525950	0.905919	-.521737	0.913420	B06

B07	0.628935	0.892005	0.623345	0.894738	B07
B08	0.554348	0.892524	0.556751	0.895899	B08
B09	-.149978	0.902838	-.134599	0.907404	B09
B10	0.383773	0.894949	0.400916	0.898580	B10
B11	0.459597	0.893641	0.438123	0.897945	B11
B12	0.912116	0.885839	0.922023	0.889409	B12
B13	0.538083	0.892581	0.525486	0.896441	B13
B14	0.863706	0.885036	0.859333	0.890544	B14
B15	0.485006	0.893951	0.484874	0.897142	B15
B16	0.298419	0.896182	0.292790	0.900410	B16
B17	0.815028	0.886343	0.822703	0.891203	B17
B18	0.658663	0.891628	0.661125	0.894075	B18
B19	0.022479	0.900446	-.003816	0.905304	B19
B20	0.536066	0.892097	0.533418	0.896304	B20
B21	0.458079	0.894155	0.423979	0.898187	B21
B22	0.296760	0.896291	0.292933	0.900408	B22
B23	0.437157	0.894115	0.454395	0.897666	B23

Cronbach Alpha Coefficients Customer feedback questionnaire

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
B01	10	2.20000	0.42164	22.00000	2.00000	3.00000	B01
B02	10	2.30000	0.48305	23.00000	2.00000	3.00000	B02
C03	10	3.00000	1.05409	30.00000	1.00000	4.00000	C03
C04	10	2.40000	0.84327	24.00000	1.00000	4.00000	C04
C05	10	2.80000	1.03280	28.00000	1.00000	4.00000	C05
D06	10	3.20000	1.13529	32.00000	1.00000	4.00000	D06
D07	10	2.80000	0.91894	28.00000	1.00000	4.00000	D07
D08	10	1.90000	0.31623	19.00000	1.00000	2.00000	D08
E09	10	1.80000	0.42164	18.00000	1.00000	2.00000	E09
E10	10	2.30000	0.82327	23.00000	1.00000	3.00000	E10
E11	10	1.70000	0.48305	17.00000	1.00000	2.00000	E11
E12	10	2.00000	0.66667	20.00000	1.00000	3.00000	E12
F13	10	2.80000	1.31656	28.00000	1.00000	5.00000	F13
F14	10	2.00000	0.47140	20.00000	1.00000	3.00000	F14
F15	10	2.80000	0.91894	28.00000	1.00000	4.00000	F15

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.918466
Standardized	0.921126

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
B01	-.019025	0.925849	0.030676	0.933739	B01
B02	-.275479	0.931056	-.223766	0.940646	B02
C03	0.729578	0.909873	0.686160	0.914305	C03
C04	0.805924	0.907056	0.733751	0.912797	C04
C05	0.862906	0.904127	0.828323	0.909762	C05
D06	0.786596	0.907805	0.802104	0.910609	D06
D07	0.877584	0.903968	0.849967	0.909060	D07
D08	0.788890	0.915081	0.819340	0.910053	D08
E09	0.841373	0.912057	0.863263	0.908627	E09
E10	0.660294	0.912025	0.705513	0.913693	E10
E11	0.719638	0.913146	0.674980	0.914657	E11
E12	0.657346	0.912673	0.677346	0.914582	E12
F13	0.732972	0.912555	0.679839	0.914504	F13
F14	0.740436	0.912928	0.729853	0.912921	F14
F15	0.736957	0.909273	0.780468	0.911305	F15

ANNEXURE D:

Descriptive statistics for IT governance questionnaire

A01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	2	20.00	2	20.00
Agree	3	30.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	1.4000
DF	2
Pr > ChiSq	0.4966

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

A02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	3	30.00	3	30.00
Strongly agree	7	70.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	1.6000
DF	1
Pr > ChiSq	0.2059

Sample Size = 10

A03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	8	80.00	8	80.00
Strongly agree	2	20.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578

Sample Size = 10

A04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00
Agree	4	40.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	2.6000
DF	2
Pr > ChiSq	0.2725

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

A05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	6	60.00	6	60.00
Strongly agree	4	40.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.4000
DF	1
Pr > ChiSq	0.5271

Sample Size = 10

A06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disgree	1	10.00	1	10.00
Agree	6	60.00	7	70.00
Strongly agree	3	30.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.8000
DF	2
Pr > ChiSq	0.1496

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

A07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00
Agree	5	50.00	6	60.00
Strongly agree	4	40.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.6000
DF	2
Pr > ChiSq	0.2725

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

A08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00
Agree	8	80.00	9	90.00
Strongly agree	1	10.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	9.8000
DF	2
Pr > ChiSq	0.0074

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

A09	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	7	70.00	7	70.00
Strongly agree	3	30.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.6000
DF	1
Pr > ChiSq	0.2059

Sample Size = 10

A10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Disgree	1	10.00	1	10.00
Undecided	4	40.00	5	50.00
Agree	3	30.00	8	80.00
Strongly agree	2	20.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.0000
DF	3
Pr > ChiSq	0.5724

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	2	20.00	2	20.00
Agree	5	50.00	7	70.00
Strongly agree	3	30.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.4000
DF	2
Pr > ChiSq	0.4966

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	2	20.00	2	20.00
Agree	7	70.00	9	90.00
Strongly agree	1	10.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	6.2000
DF	2
Pr > ChiSq	0.0450

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	2	20.00	2	20.00
Agree	8	80.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578

Sample Size = 10

B05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	5	50.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.0000
DF	1
Pr > ChiSq	1.0000

Sample Size = 10

B06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	2	20.00	2	20.00
Strongly agree	8	80.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578

Sample Size = 10

B07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	2	20.00	2	20.00
Strongly agree	8	80.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578

Sample Size = 10

B08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	3	30.00	3	30.00
Strongly agree	7	70.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.6000

DF	1
Pr > ChiSq	0.2059

Sample Size = 10

B09	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	4	40.00	4	40.00
Strongly agree	6	60.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	0.4000
DF	1
Pr > ChiSq	0.5271

Sample Size = 10

B10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	4	40.00	4	40.00
Strongly agree	6	60.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	0.4000
DF	1
Pr > ChiSq	0.5271

Sample Size = 10

B11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	3	30.00	3	30.00
Agree	6	60.00	9	90.00
Strongly agree	1	10.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	3.8000
DF	2
Pr > ChiSq	0.1496

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00
Agree	7	70.00	8	80.00
Strongly agree	2	20.00	10	100.00

Chi-Square Test for Equal Proportions

Chi-Square	6.2000
DF	2
Pr > ChiSq	0.0450

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	6	60.00	6	60.00
Strongly agree	4	40.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.4000
DF	1
Pr > ChiSq	0.5271

Sample Size = 10

B14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00
Agree	4	40.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.6000
DF	2
Pr > ChiSq	0.2725

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	5	50.00	5	50.00
Agree	2	20.00	7	70.00
Strongly agree	3	30.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.4000
DF	2
Pr > ChiSq	0.4966

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	3	30.00	3	30.00
Strongly agree	7	70.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.6000
DF	1
Pr > ChiSq	0.2059

Sample Size = 10

B17	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	1	10.00	1	10.00

Agree	5	50.00	6	60.00
Strongly agree	4	40.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.6000
DF	2
Pr > ChiSq	0.2725

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	2	20.00	2	20.00
Strongly agree	8	80.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578

Sample Size = 10

B19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	5	50.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.0000
DF	1
Pr > ChiSq	1.0000

Sample Size = 10

B20	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Undecided	5	50.00	5	50.00
Agree	4	40.00	9	90.00
Strongly agree	1	10.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.6000
DF	2
Pr > ChiSq	0.2725

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 10

B21	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	8	80.00	8	80.00
Strongly agree	2	20.00	10	100.00

Chi-Square Test
for Equal Proportions

Chi-Square Test for Equal Proportions	
Chi-Square	3.6000
DF	1
Pr > ChiSq	0.0578
Sample Size = 10	

B22	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	5	50.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	0.0000
DF	1
Pr > ChiSq	1.0000
Sample Size = 10	

B23	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	5	50.00	5	50.00
Strongly agree	5	50.00	10	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	0.0000
DF	1
Pr > ChiSq	1.0000
Sample Size = 10	

Variable: A01 (A01)

N	10	Sum Weights	10
Mean	4.3	Sum Observations	43
Std Deviation	0.8232726	Variance	0.67777778
Skewness	-0.6869824	Kurtosis	-1.0434983
Uncorrected SS	191	Corrected SS	6.1
Coeff Variation	19.1458745	Std Error Mean	0.26034166

Basic Statistical Measures

Location		Variability	
Mean	4.300000	Std Deviation	0.82327
Median	4.500000	Variance	0.67778
Mode	5.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: A02 (A02)

N	10	Sum Weights	10
Mean	4.7	Sum Observations	47
Std Deviation	0.48304589	Variance	0.23333333
Skewness	-1.0350983	Kurtosis	-1.2244898
Uncorrected SS	223	Corrected SS	2.1
Coeff Variation	10.2775722	Std Error Mean	0.15275252

Basic Statistical Measures

Location		Variability	
Mean	4.700000	Std Deviation	0.48305
Median	5.000000	Variance	0.23333
Mode	5.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: A03 (A03)

N	10	Sum Weights	10
Mean	4.2	Sum Observations	42
Std Deviation	0.42163702	Variance	0.17777778
Skewness	1.77878118	Kurtosis	1.40625
Uncorrected SS	178	Corrected SS	1.6
Coeff Variation	10.0389767	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	4.200000	Std Deviation	0.42164
Median	4.000000	Variance	0.17778
Mode	4.000000	Range	1.00000
		Interquartile Range	0

Variable: A04 (A04)

N	10	Sum Weights	10
Mean	4.4	Sum Observations	44
Std Deviation	0.6992059	Variance	0.48888889
Skewness	-0.7801058	Kurtosis	-0.1461039
Uncorrected SS	198	Corrected SS	4.4
Coeff Variation	15.8910432	Std Error Mean	0.22110832

Basic Statistical Measures

Location		Variability	
Mean	4.400000	Std Deviation	0.69921
Median	4.500000	Variance	0.48889
Mode	5.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: A05 (A05)

N	10	Sum Weights	10
Mean	4.4	Sum Observations	44
Std Deviation	0.51639778	Variance	0.26666667
Skewness	0.48412292	Kurtosis	-2.2767857
Uncorrected SS	196	Corrected SS	2.4

Coeff Variation	11.7363132	Std Error Mean	0.16329932

Basic Statistical Measures

Location		Variability	
Mean	4.400000	Std Deviation	0.51640
Median	4.000000	Variance	0.26667
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: A06 (A06)

N	10	Sum Weights	10
Mean	4.1	Sum Observations	41
Std Deviation	0.87559504	Variance	0.76666667
Skewness	-1.4648424	Kurtosis	3.61328652
Uncorrected SS	175	Corrected SS	6.9
Coeff Variation	21.3559765	Std Error Mean	0.27688746

Basic Statistical Measures

Location		Variability	
Mean	4.100000	Std Deviation	0.87560
Median	4.000000	Variance	0.76667
Mode	4.000000	Range	3.00000
		Interquartile Range	1.00000

Variable: A07 (A07)

N	10	Sum Weights	10
Mean	4.3	Sum Observations	43
Std Deviation	0.67494856	Variance	0.45555556
Skewness	-0.4336374	Kurtosis	-0.2829948
Uncorrected SS	189	Corrected SS	4.1
Coeff Variation	15.6964781	Std Error Mean	0.21343747

Basic Statistical Measures

Location		Variability	
Mean	4.300000	Std Deviation	0.67495
Median	4.000000	Variance	0.45556
Mode	4.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: A08 (A08)

N	10	Sum Weights	10
Mean	4	Sum Observations	40
Std Deviation	0.47140452	Variance	0.22222222
Skewness	0	Kurtosis	4.5
Uncorrected SS	162	Corrected SS	2
Coeff Variation	11.785113	Std Error Mean	0.1490712

Basic Statistical Measures

Location		Variability	
Mean	4.000000	Std Deviation	0.47140
Median	4.000000	Variance	0.22222
Mode	4.000000	Range	2.00000
		Interquartile Range	0

Variable: A09 (A09)

N	10	Sum Weights	10
Mean	4.3	Sum Observations	43
Std Deviation	0.48304589	Variance	0.23333333
Skewness	1.03509834	Kurtosis	-1.2244898
Uncorrected SS	187	Corrected SS	2.1
Coeff Variation	11.2336254	Std Error Mean	0.15275252

Basic Statistical Measures

Location		Variability	
Mean	4.300000	Std Deviation	0.48305
Median	4.000000	Variance	0.23333

Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: A10 (A10)

N	10	Sum Weights	10
Mean	3.6	Sum Observations	36
Std Deviation	0.96609178	Variance	0.93333333
Skewness	0.11090339	Kurtosis	-0.6231778
Uncorrected SS	138	Corrected SS	8.4
Coeff Variation	26.8358829	Std Error Mean	0.30550505

Basic Statistical Measures

Location		Variability	
Mean	3.600000	Std Deviation	0.96609
Median	3.500000	Variance	0.93333
Mode	3.000000	Range	3.00000
		Interquartile Range	1.00000

Variable: B01 (B01)

N	10	Sum Weights	10
Mean	4.1	Sum Observations	41
Std Deviation	0.73786479	Variance	0.54444444
Skewness	-0.1659504	Kurtosis	-0.7336229
Uncorrected SS	173	Corrected SS	4.9
Coeff Variation	17.9967021	Std Error Mean	0.23333333

Basic Statistical Measures

Location		Variability	
Mean	4.100000	Std Deviation	0.73786
Median	4.000000	Variance	0.54444
Mode	4.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: B02 (B02)

N	10	Sum Weights	10
Mean	3.9	Sum Observations	39
Std Deviation	0.56764621	Variance	0.32222222
Skewness	-0.0911204	Kurtosis	1.49821641
Uncorrected SS	155	Corrected SS	2.9
Coeff Variation	14.5550311	Std Error Mean	0.17950549

Basic Statistical Measures

Location		Variability	
Mean	3.900000	Std Deviation	0.56765
Median	4.000000	Variance	0.32222
Mode	4.000000	Range	2.00000
		Interquartile Range	0

Variable: B04 (B04)

N	10	Sum Weights	10
Mean	3.8	Sum Observations	38
Std Deviation	0.42163702	Variance	0.17777778
Skewness	-1.7787812	Kurtosis	1.40625
Uncorrected SS	146	Corrected SS	1.6
Coeff Variation	11.0957111	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	3.800000	Std Deviation	0.42164
Median	4.000000	Variance	0.17778
Mode	4.000000	Range	1.00000
		Interquartile Range	0

Variable: B05 (B05)

N	10	Sum Weights	10
Mean	4.5	Sum Observations	45

Std Deviation	0.52704628	Variance	0.27777778
Skewness	0	Kurtosis	-2.5714286
Uncorrected SS	205	Corrected SS	2.5
Coeff Variation	11.7121395	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	4.500000	Std Deviation	0.52705
Median	4.500000	Variance	0.27778
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

NOTE: The mode displayed is the smallest of 2 modes with a count of 5.

Variable: B06 (B06)

N	10	Sum Weights	10
Mean	4.8	Sum Observations	48
Std Deviation	0.42163702	Variance	0.17777778
Skewness	-1.7787812	Kurtosis	1.40625
Uncorrected SS	232	Corrected SS	1.6
Coeff Variation	8.78410461	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	4.800000	Std Deviation	0.42164
Median	5.000000	Variance	0.17778
Mode	5.000000	Range	1.00000
		Interquartile Range	0

Variable: B07 (B07)

N	10	Sum Weights	10
Mean	4.8	Sum Observations	48
Std Deviation	0.42163702	Variance	0.17777778
Skewness	-1.7787812	Kurtosis	1.40625
Uncorrected SS	232	Corrected SS	1.6
Coeff Variation	8.78410461	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	4.800000	Std Deviation	0.42164
Median	5.000000	Variance	0.17778
Mode	5.000000	Range	1.00000
		Interquartile Range	0

Variable: B08 (B08)

N	10	Sum Weights	10
Mean	4.7	Sum Observations	47
Std Deviation	0.48304589	Variance	0.23333333
Skewness	-1.0350983	Kurtosis	-1.2244898
Uncorrected SS	223	Corrected SS	2.1
Coeff Variation	10.2775722	Std Error Mean	0.15275252

Basic Statistical Measures

Location		Variability	
Mean	4.700000	Std Deviation	0.48305
Median	5.000000	Variance	0.23333
Mode	5.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: B09 (B09)

N	10	Sum Weights	10
Mean	4.6	Sum Observations	46
Std Deviation	0.51639778	Variance	0.26666667
Skewness	-0.4841229	Kurtosis	-2.2767857
Uncorrected SS	214	Corrected SS	2.4
Coeff Variation	11.2260387	Std Error Mean	0.16329932

Basic Statistical Measures

Location		Variability	
Mean	4.600000	Std Deviation	0.51640
Median	5.000000	Variance	0.26667
Mode	5.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: B10 (B10)

N	10	Sum Weights	10
Mean	4.6	Sum Observations	46
Std Deviation	0.51639778	Variance	0.26666667
Skewness	-0.4841229	Kurtosis	-2.2767857
Uncorrected SS	214	Corrected SS	2.4
Coeff Variation	11.2260387	Std Error Mean	0.16329932

Basic Statistical Measures

Location		Variability	
Mean	4.600000	Std Deviation	0.51640
Median	5.000000	Variance	0.26667
Mode	5.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: B11 (B11)

N	10	Sum Weights	10
Mean	3.8	Sum Observations	38
Std Deviation	0.63245553	Variance	0.4
Skewness	0.13176157	Kurtosis	0.17857143
Uncorrected SS	148	Corrected SS	3.6
Coeff Variation	16.6435666	Std Error Mean	0.2

Basic Statistical Measures

Location		Variability	
Mean	3.800000	Std Deviation	0.63246
Median	4.000000	Variance	0.40000
Mode	4.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: B12 (B12)

N	10	Sum Weights	10
Mean	4.1	Sum Observations	41
Std Deviation	0.56764621	Variance	0.32222222
Skewness	0.09112038	Kurtosis	1.49821641
Uncorrected SS	171	Corrected SS	2.9
Coeff Variation	13.8450296	Std Error Mean	0.17950549

Basic Statistical Measures

Location		Variability	
Mean	4.100000	Std Deviation	0.56765
Median	4.000000	Variance	0.32222
Mode	4.000000	Range	2.00000
		Interquartile Range	0

Variable: B13 (B13)

N	10	Sum Weights	10
Mean	4.4	Sum Observations	44
Std Deviation	0.51639778	Variance	0.26666667
Skewness	0.48412292	Kurtosis	-2.2767857
Uncorrected SS	196	Corrected SS	2.4
Coeff Variation	11.7363132	Std Error Mean	0.16329932

Basic Statistical Measures

Location		Variability	
Mean	4.400000	Std Deviation	0.51640
Median	4.000000	Variance	0.26667
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: B14 (B14)

N	10	Sum Weights	10
Mean	4.4	Sum Observations	44
Std Deviation	0.6992059	Variance	0.48888889
Skewness	-0.7801058	Kurtosis	-0.1461039
Uncorrected SS	198	Corrected SS	4.4
Coeff Variation	15.8910432	Std Error Mean	0.22110832

Basic Statistical Measures

Location		Variability	
Mean	4.400000	Std Deviation	0.69921
Median	4.500000	Variance	0.48889
Mode	5.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: B15 (B15)

N	10	Sum Weights	10
Mean	3.8	Sum Observations	38
Std Deviation	0.91893658	Variance	0.84444444
Skewness	0.47251414	Kurtosis	-1.8074792
Uncorrected SS	152	Corrected SS	7.6
Coeff Variation	24.1825417	Std Error Mean	0.29059326

Basic Statistical Measures

Location		Variability	
Mean	3.800000	Std Deviation	0.91894
Median	3.500000	Variance	0.84444
Mode	3.000000	Range	2.00000
		Interquartile Range	2.00000

Variable: B16 (B16)

N	10	Sum Weights	10
Mean	4.7	Sum Observations	47
Std Deviation	0.48304589	Variance	0.23333333
Skewness	-1.0350983	Kurtosis	-1.2244898
Uncorrected SS	223	Corrected SS	2.1
Coeff Variation	10.2775722	Std Error Mean	0.15275252

Basic Statistical Measures

Location		Variability	
Mean	4.700000	Std Deviation	0.48305
Median	5.000000	Variance	0.23333
Mode	5.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: B17 (B17)

N	10	Sum Weights	10
Mean	4.3	Sum Observations	43
Std Deviation	0.67494856	Variance	0.45555556
Skewness	-0.4336374	Kurtosis	-0.2829948
Uncorrected SS	189	Corrected SS	4.1
Coeff Variation	15.6964781	Std Error Mean	0.21343747

Basic Statistical Measures

Location		Variability	
Mean	4.300000	Std Deviation	0.67495
Median	4.000000	Variance	0.45556
Mode	4.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: B18 (B18)

N	10	Sum Weights	10
Mean	4.8	Sum Observations	48
Std Deviation	0.42163702	Variance	0.17777778

Skewness	-1.7787812	Kurtosis	1.40625
Uncorrected SS	232	Corrected SS	1.6
Coeff Variation	8.78410461	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	4.800000	Std Deviation	0.42164
Median	5.000000	Variance	0.17778
Mode	5.000000	Range	1.00000
		Interquartile Range	0

Variable: B19 (B19)

N	10	Sum Weights	10
Mean	4.5	Sum Observations	45
Std Deviation	0.52704628	Variance	0.27777778
Skewness	0	Kurtosis	-2.5714286
Uncorrected SS	205	Corrected SS	2.5
Coeff Variation	11.7121395	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	4.500000	Std Deviation	0.52705
Median	4.500000	Variance	0.27778
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

NOTE: The mode displayed is the smallest of 2 modes with a count of 5.

Variable: B20 (B20)

N	10	Sum Weights	10
Mean	3.6	Sum Observations	36
Std Deviation	0.6992059	Variance	0.48888889
Skewness	0.78010575	Kurtosis	-0.1461039
Uncorrected SS	134	Corrected SS	4.4
Coeff Variation	19.4223861	Std Error Mean	0.22110832

Basic Statistical Measures

Location		Variability	
Mean	3.600000	Std Deviation	0.69921
Median	3.500000	Variance	0.48889
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: B21 (B21)

N	10	Sum Weights	10
Mean	4.2	Sum Observations	42
Std Deviation	0.42163702	Variance	0.17777778
Skewness	1.77878118	Kurtosis	1.40625
Uncorrected SS	178	Corrected SS	1.6
Coeff Variation	10.0389767	Std Error Mean	0.13333333

Basic Statistical Measures

Location		Variability	
Mean	4.200000	Std Deviation	0.42164
Median	4.000000	Variance	0.17778
Mode	4.000000	Range	1.00000
		Interquartile Range	0

Variable: B22 (B22)

N	10	Sum Weights	10
Mean	4.5	Sum Observations	45
Std Deviation	0.52704628	Variance	0.27777778
Skewness	0	Kurtosis	-2.5714286
Uncorrected SS	205	Corrected SS	2.5
Coeff Variation	11.7121395	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	4.500000	Std Deviation	0.52705
Median	4.500000	Variance	0.27778
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

NOTE: The mode displayed is the smallest of 2 modes with a count of 5.

Variable: B23 (B23)

N	10	Sum Weights	10
Mean	4.5	Sum Observations	45
Std Deviation	0.52704628	Variance	0.27777778
Skewness	0	Kurtosis	-2.5714286
Uncorrected SS	205	Corrected SS	2.5
Coeff Variation	11.7121395	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	4.500000	Std Deviation	0.52705
Median	4.500000	Variance	0.27778
Mode	4.000000	Range	1.00000
		Interquartile Range	1.00000

NOTE: The mode displayed is the smallest of 2 modes with a count of 5.

ANNEXURE E:

Descriptive statistics for Customer feedback questionnaire

B01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	9	75.00	9	75.00
Undecided	3	25.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.0000
DF	1
Pr > ChiSq	0.0833

Sample Size = 12

B02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Agree	8	66.67	8	66.67
Undecided	4	33.33	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.3333
DF	1
Pr > ChiSq	0.2482

Sample Size = 12

C03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	1	8.33	1	8.33
Agree	2	16.67	3	25.00
Undecided	3	25.00	6	50.00
Disagree	6	50.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	4.6667
DF	3
Pr > ChiSq	0.1979

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

C04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	1	8.33	1	8.33
Agree	6	50.00	7	58.33
Undecided	3	25.00	10	83.33
Disagree	2	16.67	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	4.6667
DF	3
Pr > ChiSq	0.1979

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

C05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	1	8.33	1	8.33
Agree	4	33.33	5	41.67
Undecided	4	33.33	9	75.00
Disagree	3	25.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	2.0000
DF	3
Pr > ChiSq	0.5724

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

D06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
Strongly agree	1	8.33	2	16.67
Agree	2	16.67	4	33.33
Undecided	2	16.67	6	50.00
Disagree	6	50.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	7.1667
DF	4
Pr > ChiSq	0.1273

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

D07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
Strongly agree	1	8.33	2	16.67
Agree	2	16.67	4	33.33
Undecided	6	50.00	10	83.33
Disagree	2	16.67	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	7.1667
DF	4
Pr > ChiSq	0.1273

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

D08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
Strongly agree	1	8.33	2	16.67
Agree	10	83.33	12	100.00

Chi-Square Test

for Equal Proportions

Chi-Square 13.5000

DF 2

Pr > ChiSq 0.0012

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

E09	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	2	16.67	2	16.67
Agree	9	75.00	11	91.67
Undecided	1	8.33	12	100.00

Chi-Square Test for Equal Proportions

Chi-Square 9.5000

DF 2

Pr > ChiSq 0.0087

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

E10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	2	16.67	2	16.67
Agree	3	25.00	5	41.67
Undecided	7	58.33	12	100.00

Chi-Square Test for Equal Proportions

Chi-Square 3.5000

DF 2

Pr > ChiSq 0.1738

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

E11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	3	25.00	3	25.00
Agree	8	66.67	11	91.67
Undecided	1	8.33	12	100.00

Chi-Square Test for Equal Proportions

Chi-Square 6.5000

DF 2

Pr > ChiSq 0.0388

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

E12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	2	16.67	2	16.67
Agree	7	58.33	9	75.00
Undecided	3	25.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	3.5000
DF	2
Pr > ChiSq	0.1738

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

F13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	8.33	1	8.33
Strongly agree	1	8.33	2	16.67
Agree	6	50.00	8	66.67
Disagree	3	25.00	11	91.67
Strongly disagree	1	8.33	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	8.0000
DF	4
Pr > ChiSq	0.0916

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

F14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	1	8.33	1	8.33
Agree	8	66.67	9	75.00
Undecided	3	25.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	6.5000
DF	2
Pr > ChiSq	0.0388

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

F15	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Strongly agree	1	8.33	1	8.33
Agree	2	16.67	3	25.00
Undecided	6	50.00	9	75.00
Disagree	3	25.00	12	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	4.6667
DF	3
Pr > ChiSq	0.1979

WARNING: The table cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 12

Variable: B01 (B01)

N	12	Sum Weights	12
Mean	2.25	Sum Observations	27
Std Deviation	0.45226702	Variance	0.20454545
Skewness	1.32664992	Kurtosis	-0.3259259
Uncorrected SS	63	Corrected SS	2.25
Coeff Variation	20.1007563	Std Error Mean	0.13055824

Basic Statistical Measures

Location		Variability	
Mean	2.250000	Std Deviation	0.45227
Median	2.000000	Variance	0.20455
Mode	2.000000	Range	1.00000
		Interquartile Range	0.50000

Variable: B02 (B02)

N	12	Sum Weights	12
Mean	2.33333333	Sum Observations	28
Std Deviation	0.49236596	Variance	0.24242424
Skewness	0.81240384	Kurtosis	-1.65
Uncorrected SS	68	Corrected SS	2.66666667
Coeff Variation	21.1013985	Std Error Mean	0.14213381

Basic Statistical Measures

Location		Variability	
Mean	2.333333	Std Deviation	0.49237
Median	2.000000	Variance	0.24242
Mode	2.000000	Range	1.00000
		Interquartile Range	1.00000

Variable: C03 (C03)

N	12	Sum Weights	12
Mean	3.16666667	Sum Observations	38
Std Deviation	1.0298573	Variance	1.06060606
Skewness	-0.9876542	Kurtosis	-0.021551
Uncorrected SS	132	Corrected SS	11.6666667
Coeff Variation	32.5218095	Std Error Mean	0.2972942

Basic Statistical Measures

Location		Variability	
Mean	3.166667	Std Deviation	1.02986
Median	3.500000	Variance	1.06061
Mode	4.000000	Range	3.00000
		Interquartile Range	1.50000

Variable: C04 (C04)

N	12	Sum Weights	12
Mean	2.5	Sum Observations	30
Std Deviation	0.90453403	Variance	0.81818182
Skewness	0.44221664	Kurtosis	-0.3259259
Uncorrected SS	84	Corrected SS	9
Coeff Variation	36.1813613	Std Error Mean	0.26111648

Basic Statistical Measures

Location		Variability	
Mean	2.500000	Std Deviation	0.90453
Median	2.000000	Variance	0.81818
Mode	2.000000	Range	3.00000
		Interquartile Range	1.00000

Variable: C05 (C05)

N	12	Sum Weights	12
Mean	2.75	Sum Observations	33
Std Deviation	0.9653073	Variance	0.93181818
Skewness	-0.1364408	Kurtosis	-0.7695419
Uncorrected SS	101	Corrected SS	10.25

Coeff Variation	35.1020836	Std Error Mean	0.27866021

Basic Statistical Measures

Location		Variability	
Mean	2.750000	Std Deviation	0.96531
Median	3.000000	Variance	0.93182
Mode	2.000000	Range	3.00000
		Interquartile Range	1.50000

NOTE: The mode displayed is the smallest of 2 modes with a count of 4.

Variable: D06 (D06)

N	11	Sum Weights	11
Mean	3.18181818	Sum Observations	35
Std Deviation	1.07871978	Variance	1.16363636
Skewness	-1.0139334	Kurtosis	-0.2058919
Uncorrected SS	123	Corrected SS	11.6363636
Coeff Variation	33.9026217	Std Error Mean	0.32524625

Basic Statistical Measures

Location		Variability	
Mean	3.181818	Std Deviation	1.07872
Median	4.000000	Variance	1.16364
Mode	4.000000	Range	3.00000
		Interquartile Range	2.00000

Variable: D07 (D07)

N	11	Sum Weights	11
Mean	2.81818182	Sum Observations	31
Std Deviation	0.8738629	Variance	0.76363636
Skewness	-0.6902394	Kurtosis	0.77947846
Uncorrected SS	95	Corrected SS	7.63636364
Coeff Variation	31.0080383	Std Error Mean	0.26347958

Basic Statistical Measures

Location		Variability	
Mean	2.818182	Std Deviation	0.87386
Median	3.000000	Variance	0.76364
Mode	3.000000	Range	3.00000
		Interquartile Range	1.00000

Variable: D08 (D08)

N	11	Sum Weights	11
Mean	1.90909091	Sum Observations	21
Std Deviation	0.30151134	Variance	0.09090909
Skewness	-3.3166248	Kurtosis	11
Uncorrected SS	41	Corrected SS	0.90909091
Coeff Variation	15.7934514	Std Error Mean	0.09090909

Basic Statistical Measures

Location		Variability	
Mean	1.909091	Std Deviation	0.30151
Median	2.000000	Variance	0.09091
Mode	2.000000	Range	1.00000
		Interquartile Range	0

Variable: E09 (E09)

N	12	Sum Weights	12
Mean	1.91666667	Sum Observations	23
Std Deviation	0.51492865	Variance	0.26515152
Skewness	-0.2108475	Kurtosis	2.2197551
Uncorrected SS	47	Corrected SS	2.91666667
Coeff Variation	26.8658426	Std Error Mean	0.1486471

Basic Statistical Measures

Location	Variability

Mean	1.916667	Std Deviation	0.51493
Median	2.000000	Variance	0.26515
Mode	2.000000	Range	2.00000
		Interquartile Range	0

Variable: E10 (E10)

N	12	Sum Weights	12
Mean	2.41666667	Sum Observations	29
Std Deviation	0.79296146	Variance	0.62878788
Skewness	-0.9876048	Kurtosis	-0.4636957
Uncorrected SS	77	Corrected SS	6.91666667
Coeff Variation	32.8121984	Std Error Mean	0.22890826

Basic Statistical Measures

Location		Variability	
Mean	2.416667	Std Deviation	0.79296
Median	3.000000	Variance	0.62879
Mode	3.000000	Range	2.00000
		Interquartile Range	1.00000

Variable: E11 (E11)

N	12	Sum Weights	12
Mean	1.83333333	Sum Observations	22
Std Deviation	0.57735027	Variance	0.33333333
Skewness	-0.0629837	Kurtosis	0.65454545
Uncorrected SS	44	Corrected SS	3.66666667
Coeff Variation	31.4918329	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	1.833333	Std Deviation	0.57735
Median	2.000000	Variance	0.33333
Mode	2.000000	Range	2.00000
		Interquartile Range	0.50000

Variable: E12 (E12)

N	12	Sum Weights	12
Mean	2.08333333	Sum Observations	25
Std Deviation	0.66855792	Variance	0.4469697
Skewness	-0.0861961	Kurtosis	-0.1896007
Uncorrected SS	57	Corrected SS	4.91666667
Coeff Variation	32.0907803	Std Error Mean	0.19299605

Basic Statistical Measures

Location		Variability	
Mean	2.083333	Std Deviation	0.66856
Median	2.000000	Variance	0.44697
Mode	2.000000	Range	2.00000
		Interquartile Range	0.50000

Variable: F13 (F13)

N	11	Sum Weights	11
Mean	2.72727273	Sum Observations	30
Std Deviation	1.27207776	Variance	1.61818182
Skewness	0.62123732	Kurtosis	-1.0068173
Uncorrected SS	98	Corrected SS	16.1818182
Coeff Variation	46.6428511	Std Error Mean	0.38354587

Basic Statistical Measures

Location		Variability	
Mean	2.727273	Std Deviation	1.27208
Median	2.000000	Variance	1.61818
Mode	2.000000	Range	4.00000
		Interquartile Range	2.00000

Variable: F14 (F14)

N	12	Sum Weights	12
Mean	2.16666667	Sum Observations	26
Std Deviation	0.57735027	Variance	0.33333333
Skewness	0.06298367	Kurtosis	0.65454545
Uncorrected SS	60	Corrected SS	3.66666667
Coeff Variation	26.6469355	Std Error Mean	0.16666667

Basic Statistical Measures

Location		Variability	
Mean	2.166667	Std Deviation	0.57735
Median	2.000000	Variance	0.33333
Mode	2.000000	Range	2.00000
		Interquartile Range	0.50000

Variable: F15 (F15)

N	12	Sum Weights	12
Mean	2.91666667	Sum Observations	35
Std Deviation	0.90033664	Variance	0.81060606
Skewness	-0.7120909	Kurtosis	0.53265787
Uncorrected SS	111	Corrected SS	8.91666667
Coeff Variation	30.8686847	Std Error Mean	0.2599048

Basic Statistical Measures

Location		Variability	
Mean	2.916667	Std Deviation	0.90034
Median	3.000000	Variance	0.81061
Mode	3.000000	Range	3.00000
		Interquartile Range	1.00000