

**DEVELOPING A SERVICE QUALITY MEASUREMENT INSTRUMENT  
FOR ARCHIVAL INSTITUTIONS**

by

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## DECLARATION

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I, Rosemary Sibanda, declare that *Developing a Service Quality Measurement Instrument for Archival Institutions* is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

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Rosemary Sibanda

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DATE

This thesis is dedicated to my loving daughter Samantha Wenzile Sibanda and my son Breedon Mzingaye Sibanda.

You are the centre of my universe.

## **ABSTRACT**

The service sector of the global economy is undoubtedly growing and increasingly highlighting the criticality of service quality to enhanced profitability in most service organisations. The demand for accountability from different stakeholders, including clients, has also made service quality a highly debated, researched and most powerful competitive trend shaping marketing and business strategy. Developing reliable measurement instruments of service quality and strategies for the improvement of service quality invariably become the most important responsibilities for managers in many organisations.

In the absence of conceptual clarity on service quality, divergent views on the dimensionality of service quality and the lack of a psychometrically valid service quality measure in archival institutions, this study set out to develop and subsequently validate a measurement instrument to assess service quality in an archival institutional setting.

The two research questions investigated in this study were: (1) what are the dimensions for measuring service quality in archival institutions, and (2) how can the dimensions of service quality in archival institutions be measured effectively. The methodology for this study involved a two-phased qualitative and quantitative analysis addressing these two research questions. The study followed the standard psychometric procedure for developing constructs.

This research has resulted in the important findings and relevant conclusions for both academics and practitioners interested in service quality in the archival environment. The service quality measurement instrument formulated is called *ARCHIVqual* and has three dimensions, namely (1) security of information (with 4 items), (2) integrity of information (with 3 items) and (3) usability of information (with 2 items).

Besides measuring service quality in the archival environment, *ARCHIVqual* will also serve as a tool for conducting periodic surveys thereby identifying specific problematic areas in archival institutions.

**KEYWORDS**

*ARCHIVqual; electronic records management; performance-only; service quality in archival institutions; service quality measurement instrument*

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No work of this magnitude is the fruit of its author's sweat alone.

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## ABBREVIATIONS

AIIM	Association for Information and Image Management
ANSI	American National Standards Institute
API	application program interface
ARM	archives and records management
ARMA	Association of Records Managers and Administrators
ASCII	American standard code for information interchange
ASP	application service provider
B2B	business-to-business
B2C	business-to-consumer
BASIC	beginners all-purpose symbolic instruction code
BBS	bulletin board system
Bcc	blind carbon copy
BIOS	basic input/output system
BLOB	binary large objects
BMP	bitmap graphical image format
BPA	business process automation
BPI	bits per inch
BPI	business process integration
BPM	business process management
BPMI	Business Process Management Initiative
BPML	business process modelling language
BPO	business process outsourcing
BPR	business process reengineering or business process redesign
BSP	business service providers
CADD	computer-aided drafting and design

CAE	computer assisted engineering
CAR	computer assisted retrieval
CDIA	Certified Document Imaging Architech
CD-R	compact disk-recordable
CD-ROM	compact disk-read-only memory
CD-RW	compact disk - rewritable
CGI	common gateway interface
CIM	computer input microfilm
CM	content management
COTS	commercial off-the-shelf software
CPDM	collaborative product definition management
CPU	central processing unit
CRM	Certified Records Manager
CSIR	Council for Scientific and Industrial Research
DAM	digital asset management
DASD	direct access storage device
DAT	digital audio tape
DBMS	database management system
DM	document management
DMA	Document Management Alliance
DMIA	Document Management Industries Association
DoC	Department of Communication
DRM	digital rights management
DTD	document type definitions
DVD	digital versatile disk
EAD	encoded archival description
EAI	enterprise application integration
EBCDIC	extended binary coded decimal interchange code
EBPP	electronic bill presentment and payment

ECM	enterprise content management
EDI	electronic data interchange
EDMS	electronic document management system
EFT	electronic funds transfer
EIM	electronic image management
EmTAG	Emerging Technology Advisory Group
ERKS	electronic record keeping system
ERM	electronic records management
ERM	enterprise report management
ERMS	electronic records management system
ERP	enterprise resource planning
ESARBICA	Eastern and Southern Africa Regional Branch of the International Council of Archives
FAT	file allocation table
FbIA	Film-based Imaging Association
FTP	file transfer protocol
HSM	hierarchical storage management
HTML	hypertext markup language
HTTP	hypertext transfer protocol
ICA	International Council on Archives
ICR	intelligent character recognition
ICRM	Institute of Certified Records Managers
ICT	Information and Communication Technology
IDARS	integrated document archive and retrieval systems
IDE	integrated drive electronics
IDE	intelligent drive electronics
IDS	intelligent document scanning
IM	information management
IMAP	Internet message access protocol

IRM	information resource management
ISBN	International Standard Book Number
ISDN	integrated services digital network
ISO	International Organization for Standardisation
ISP	internet service provider
IT	information technology
JFIF	JPG file interchange format
JPEG	joint photographic experts group
KB	kilobyte
KM	knowledge management
LAN	local area network
LCD	liquid crystal display
LDAP	limited directory access protocol
LIS	Library and Information Science
LIT	Laureate of Information Technologies
MARC	machine readable cataloging
MB	megabyte
MES	manufacturing execution system
MICR	magnetic ink character recognition
MIME	multi-purpose internet mail extensions
MIPS	million instructions per second
MIT	Master of Information Technologies
MSP	management service provider
NAFVSA	National Film, Video and Sound Archives
NAGARA	National Association of Government Archives and Records Administrators
NARA	National Archives and Records Administration
NAS	Network attached storage
NASA	National Archives of South Africa
NEICON	National Electronic Information Consortium

NHPRC	National Historical Publications and Records Commission
NIC	network interface card
NII	National Information Infrastructure
NIST	National Institute of Standards and Technology
NITF	national imagery transmission format
NPES	The Association for Suppliers of Printing, Publishing, and Converting Technologies
OA	Open Access
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OASIS	Organization for the Advancement of Structured Information Standards
OCR	optical character recognition
ODMA	open document management API
OLAP	online analytical processing
OLE	object linking and embedding
OMG	Object Management Group
OMR	optical mark recognition
OS	operating system
PDF	portable document format
PDF/A	portable document format/archive
PICTA	Partnership for ICTs in Africa
PKI	public key infrastructure
POP	post office protocol
POP3	post office protocol, version 3
PPP	point to point protocol
R & D	Research and Development
R and D	research and development
RAID	redundant array of independent disks
RAM	random access memory
RDBMS	relational database management system



RDF	resource description framework
RFI	request for information
RFP	request for proposal
RIM	records and information management
RM	records management
ROI	return on investment
SADC	Southern African Development Community
SAN	storage area network
SCSI	small computer system interface
SGML	standard generalized markup language
SITA	State Information Technology Agency
SLA	service level agreement
SLIP	serial line internet protocol
SMTP	simple mail transfer protocol
SNIA	Storage Network Industry Association
SOAP	simple object access protocol
SQL	structured query language
SRM	storage resource management
SVG	scalable vector graphics
TAWPI	The Association for Work Process Improvement
TCP/IP	transmission control protocol/internet protocol
TIFF	tag image file format
UDDI	universal discovery, description, and integration
UI	user interface
UML	unified modelling language
UN	United Nations
UN	United Nations
UNISIST	Intergovernmental Conference for the Establishment of a World Science
UPS	uninterruptible power supply

URI	uniform resource identifiers
URL	uniform resource locator
USB	universal serial bus
W3C	World Wide Web Consortium
W3C	World Wide Web Consortium
WAN	wide area network
WAP	wireless application protocol
WCM	web content management
WebDAV	Web document authoring and versioning
WfMC	Workflow Management Coalition
WiFi	wireless fidelity
WIPO	World Intellectual Property Organisation
WML	wireless markup language
WORM	write once, read many
WSDL	web service definition language
WSIS	World Summit on the Information Society
WYSIWYG	what you see is what you get
XFDL	extensible forms description language
XML	extensible markup language
XPDL	XML processing description language or XML process definition language
XQL	XML query language
XSLT	extensible style language transformations

## **CHAPTER 1:**

### **GENERAL ORIENTATION**

#### **1.1 INTRODUCTION**

This chapter contextualises the scope of the research, including the essence of the research philosophy, assumptions and inquiry, and the details of the motivation behind the study and the methodology employed. In addition, the research questions and subsequent research hypothesis are identified. Finally, the thesis layout is presented.

#### **1.2 BACKGROUND OF THE STUDY**

The key element of business achievement is to provide higher service quality (Dale, 1999; Reichheld and Sasser 1990). Without a service quality management approach, a business will not be able to deliver the appropriate service quality, achieve competitive advantage, and build consumer satisfaction and loyalty (Cox and Dale 2001). In fact, service quality is generally recognised as a success factor in a firm's endeavours to differentiate itself from its competitors. Service industries are indeed playing an increasingly important role in the economy of many nations. In today's world of global competition, rendering quality service is key to success (Abdullah 2006). Many experts concur that the most powerful competitive trend currently shaping marketing and business strategy is service quality (Abdullah 2006). Research has also shown that good service quality leads to the retention of existing customers and the attraction of new ones, reduced costs, an enhanced corporate image, positive word-of-mouth recommendations, and, ultimately, enhanced profitability (Berry and Parasuraman 1993; Rust and Oliver 1994; Cronin, Brady and Hult 2000).

Much research on service quality has been conducted in the area of the development of reliable and replicable instruments for measuring the service quality construct. The well-known and predominantly used measure has been the "SERVQUAL" scale which was originally developed by Parasuraman, Zeithaml and Berry (1985, 1988) and later refined by Parasuraman *et al.* (1991, 1994). Initially applied in five service settings, namely (1) retail banking, (2) credit card service, (3) repair and maintenance of electric appliances, (4) long-distance telephone services and (5) title brokerage, the scale has since been used to

measure service quality in a wide variety of service environments. Measuring consumers' perception of service quality and developing strategies for the improvement of service quality invariably become the most important responsibilities for managers in many organisational service settings.

Tied to this responsibility of periodically measuring the service quality in most service settings has been the prevailing trend of *service revolution* in the services marketing field which has been viewed as an information revolution (Santos 2000) where *information* is primarily exchanged between the buyer and seller parties (Rust and Lemon 2001). Apparent in this revolution have been the increasing amount of research into Internet marketing and electronic commerce (e-commerce), and the inevitable move of businesses to the electronic environment. Most interactive services are now delivered on the Internet using advanced telecommunications, and information and multimedia technologies. More recently, developments in information and communications technology (ICT) policy strategies in southern Africa have had a profound impact on the already existing challenges such as the expanding and intensifying competition, and increasing client sensitivity. Globalisation of services and standardisation of service quality strategies have led to the recognition that what cannot be measured cannot be managed (Lovelock 1996). These developments have highlighted the need to develop valid and reliable measures of service quality, with the focus on serving the customer more effectively – a shift from short-term transactions to life-long relationships.

Related to these developments from the 1960s onwards, is the fact that international information trends have developed into trade linked to global information technology (IT) and global information communication networking. This has had the effect of moving information-related issues into the public domain, forcing governments to develop national information-related policies to address various relevant issues (Mincio 2006). These developments have called for the need for new and ongoing efforts to facilitate changes related to the Information Age internationally and nationally within the context of South Africa. Bram (2003a) points out that there is a need for research to assist with the conceptualisation of the new influences on information communication-related issues.

Muir and Oppenheim (2002b) refer to the influence of recent developments in information technology, and point out that these developments have changed the call of right to access to information. The right is no longer a simple right linked to the individual's situation and assumptions, but the matter of the digital divide also becomes a consideration. This and other related issues are making it imperative for governments in countries around the world, including South Africa, to address various issues related to information in national policies. It is no longer a matter of value of information in the public domain; it has now translated into the quality of service of information in the public domain.

The information revolution has been more pronounced in the information management industry and is characterised by an explosion of corporate electronic information, increasing corporate criminal charges, investigations and regulatory enquiries. The tremendous growth of electronic information in organisations, especially for key business processes, discovery in litigation, regulatory compliance with governmental agencies and industry regulations, intelligent design, audit, retrieval, and the gathering of corporate mission-critical information is driving the need to change information management strategies to facilitate efficient and economic information management.

Archival information systems have not been spared the challenges of the new electronic developments. Yet despite these developments in archival information systems, an empirically validated instrument for measuring service quality of the integrated electronic records (e-records) management systems in archival institutions has, as yet, not been developed. This is evidenced by the lack of scholarly work focusing on service quality. Engrossed in e-records and archival notions of quality based on conformance with custodianship, archival standards and confidentiality, providers of information of this nature have not been active in replacing the notions with a new imperative of allowing quality to be customer-driven (Sibanda 2005). This dearth of studies with valid instruments to measure service quality in the archival institutions has enormous implications for quality and accessibility to information and management in these institutions, especially in view of the fact that, as already stated, what cannot be measured cannot be managed (Lovelock 1996).

Thus, although the service quality concept has been researched and adapted in the context of information systems (IS) services, business-to-customer (B2C) websites and libraries, and, indeed, in many service industries, including the healthcare sector (Carman 1990; Headley and Miller 1993; Lam 1997; Kilbourne *et al.* 2004); banking (Mels *et al.* 1997; Lam 2002; Zhou *et al.* 2002); fast food (Lee and Ulgado 1997); telecommunications (van der Wal *et al.* 2002); retail chains (Parasuraman *et al.* 1994); library services (Cook and Thompson 2007), these extensions and adaptations of service quality have not dealt with corporate e-records and archives or the measurement of these systems. Instruments do exist, ranging from E-S-QUAL and E-RecS-QUEL (Parasuraman, Ziethml and Malholtra 2005); measurement of service quality of websites on information quality (Stvilia 2006); and LibQUAL which dwells specifically on the incorporation of measures of digital libraries (Heath *et al.* 2003). However, these existing measurement instruments do not address the current gap in the literature of service quality measurement instruments of e-records management systems in archival institutions. Appendix E provides a glossary of terms used in records management and Appendix F presents the glossary of terms used in archives.

It is against this background that this thesis set out to develop and validate an instrument for measuring service quality of the integrated e-records management systems in archival institutions.

### **1.3 PROBLEM STATEMENT**

Immediately after the Group of Seven [G7] *Ministerial Conference on the Information Society Initiatives (AISI)*, held in Midrand (South Africa) in 1996, the South African Government's main expressed interest concerning the development of a national information policy and information society centred on the development of South Africa's information infrastructure (AISI 1996) - in accordance with the National Archives of South Africa (NASA) Act (see Appendix G).

This development had four main objectives. Van Andenhoven (1998, pp.7a) summarised the objectives as follows:

1. To roll out an information and telecommunications network for Africa

2. To ensure regional and international flow of information
3. To support initiatives to improve and create services of society
4. To support the development of ICT skills.

The emphasis on supporting initiatives to improve and create services of society called on custodians of information, including archival institutions, to participate in the e-Readiness exercises carried out as part of G7 initiatives. The quality of public services, the competence of service providers, the co-production and input of clients, and their satisfaction with services have never been more relevant in the discourse on service improvement administrative reforms and, most importantly, the development of measurement instruments of such services.

There has also been a philosophical shift on public sector reform. This has been precipitated by the acknowledgement of failure of the policies and reforms of the 1980s worldwide which gave way to the New Public Management (NPM) as the next model of reform. The popularity of NPM strategies in the whole world saw most African governments embark on NPM-orientated reform that sought to improve public sector efficiency and effectiveness, and focused on service delivery (Baird 2004; Hope and Bornwell 2000; Hope Sr and Chikwo 2000).

Theoretically and intellectually, the general literature on administrative reform and public sector improvements tended to focus on issues such as theoretical bases of reform (Aberbach and Christensen 2003), and the philosophical reasoning and explanations behind broad concepts and policies such as decentralisation, retrenchment and the privatisation of government enterprises, which are often linked together (Adamolekun, Kulemeku and Laleye 1997; Kearney and Hays 1988; Shah 1998). In very broad and general terms, improvements in service delivery have been called for, but the call has been silent on the practical details of how this could or should be achieved. Although “service quality” occupies a unique place in public discourse, the construct itself is amorphous, and defies any creation of a single definition or measurement instrument.

Despite the fact that many scholars have looked at the concept of service quality (e.g., Gronroos 1984; Parasuraman *et al.* 1985; 1988; Brown and Swartz 1989; Bolton and Drew 1991; Cronin and Taylor 1992; Teas 1993), there is still lack of consensus on the conceptual definition of service quality as the literature offers diverse definitions, some of which have not been validated empirically. The use of diverse definitions impairs progress because of the challenges of comparing and developing synthesis of what is known (Msweli 2011; Nunnally and Berstein 1994; Churchill 1979; Hinkin 1998). There is also no consensus on the dimensionality of service quality (SERVQUAL) (Parasuraman *et al.* 1988), SERVPERF (Cronin and Taylor 1992) and EP (Teas 1993a, b). These different views warrant a study that details the relevant dimensions and attributes of service quality measurement instrument at archival institutions.

The calls within the public sector have also coexisted with the increasing need for service quality measurement tools in various sectors. Zeithaml *et al.* (1985) identified a need for researchers to think broadly about researchable issues and to be willing to investigate the role of service quality in areas not normally classified as finance, operations and marketing. They stated that “a need exists for research in the area of services to enter a new phase of empirical work that integrates various disciplines and various service industries” (Zeithaml *et al.*, 1985, p44). This has been in the light of the contention that every sector needs a measurement tool, since service quality is context-bound and service type-dependent (Cai *et al.* 2003). Furthermore, one service system and experience is different from the next in terms of its scope and nature (Rowley 2006), and service quality outcome and measurement are dependent on type, situation, time and need factors. Besides the problem of lack of conceptual consensus on service quality, extant literature on service quality in general does not provide a psychometrically valid service quality measurement instrument of archival institutions.

It has been in this context that Sibanda (2005) highlighted the need for a service quality instrument in archival institutions as most of the existing service quality measurement instruments were sector-specific (Rowley 2006), and not readily applicable and extendable to the unique characteristics of the e-records in an archival documentary environment. Such instruments are not readily extendable to the unique features of the records and archives



management environment characterised by such principles as *provenance, archives fonds*, and *respect* of original order highlighted by Sibanda (2005) on service quality in public archival institutions. These principles invariably affect the finding aids that are accessible to archival material as pointed out by Gigg (2006) in constructing the CIDOC) Conceptual Reference Model, an object-orientated domain ontology for the interchange of rich and heterogeneous cultural heritage in information from museums, libraries and archives.

The lack of conceptual clarity on service quality, the divergent views on the dimensionality of service quality (Gronroos 1994; Parasuraman *et al* 1985, 1988; Cronin and Taylor 1992) and the absence of a psychometrically valid service quality measure in archival institutions in the extant literature not only indicate a gap, but also dearth in the literature on a service quality concept and measurement instrument in the field. The crucial role played by the development of reliable and valid instruments in theory development cannot be overemphasised, as pointed out by Msweli (2011; Hair *et al.* 1978; Nunnally and Bernstein 1994; Hinkin 1998; Churchill 1979). Moreover, what cannot be measured cannot be managed (Lovelock 1996). This study therefore aimed to contribute to the literature by developing and validating a service quality measurement instrument in accordance with measurement development theory.

Translating the problem area of this research focus as described in the previous section and focusing on the services offered at the archival institutions, the central research questions of this study were the following:

**Research Question 1:**

What are the dimensions for the measurement of service quality in archival institutions?

**Research Question 2:**

How can the dimensions of service quality in archival institutions be effectively measured?

**1.4 AIM AND OBJECTIVES**

The aim of this study was to develop and validate a service quality measurement instrument specifically for archival institutions. A measurement instrument of this nature should

measure the unique aspects of archival information that are not currently measured by the existing service quality measurement instruments.

The specific objectives that drove this study were to

- Identify the dimensions for the measurement of service quality in archival institutions; and
- Validate the identified dimensions of the service quality measurement instrument in archival institutions.

### **Hypothesis**

The service quality in the archival environment is adequately explained by the following information dimensions:

1. Security;
2. Reliability;
3. Authenticity;
4. Usability;
5. Assurance; and
6. Integrity.

### **1.5 SIGNIFICANCE AND CONTRIBUTION OF THE STUDY TO KNOWLEDGE**

The specific topic of this thesis was identified as a result of initiatives in the public sector to improve service delivery (Aberbach and Christensen 2003), and the study by Sibanda (2005) which highlighted the absence of a service quality measurement instrument in the field despite the public sector's call for the managers in these institutions to be more competitive and to adopt more competitive strategies to manage such institutions. The realisation has been centred on the fact that service quality measurement tools presented an immediate challenge to management today as it was difficult to manage what is difficult to measure in the organisation.

Anchored in service quality, this thesis is influenced by the theoretical reasoning residing in the variety of fields, including those in services marketing, electronic information management and public archival institutions. There are a daunting number of management books, academic articles and doctoral theses and dissertations available on the topic of

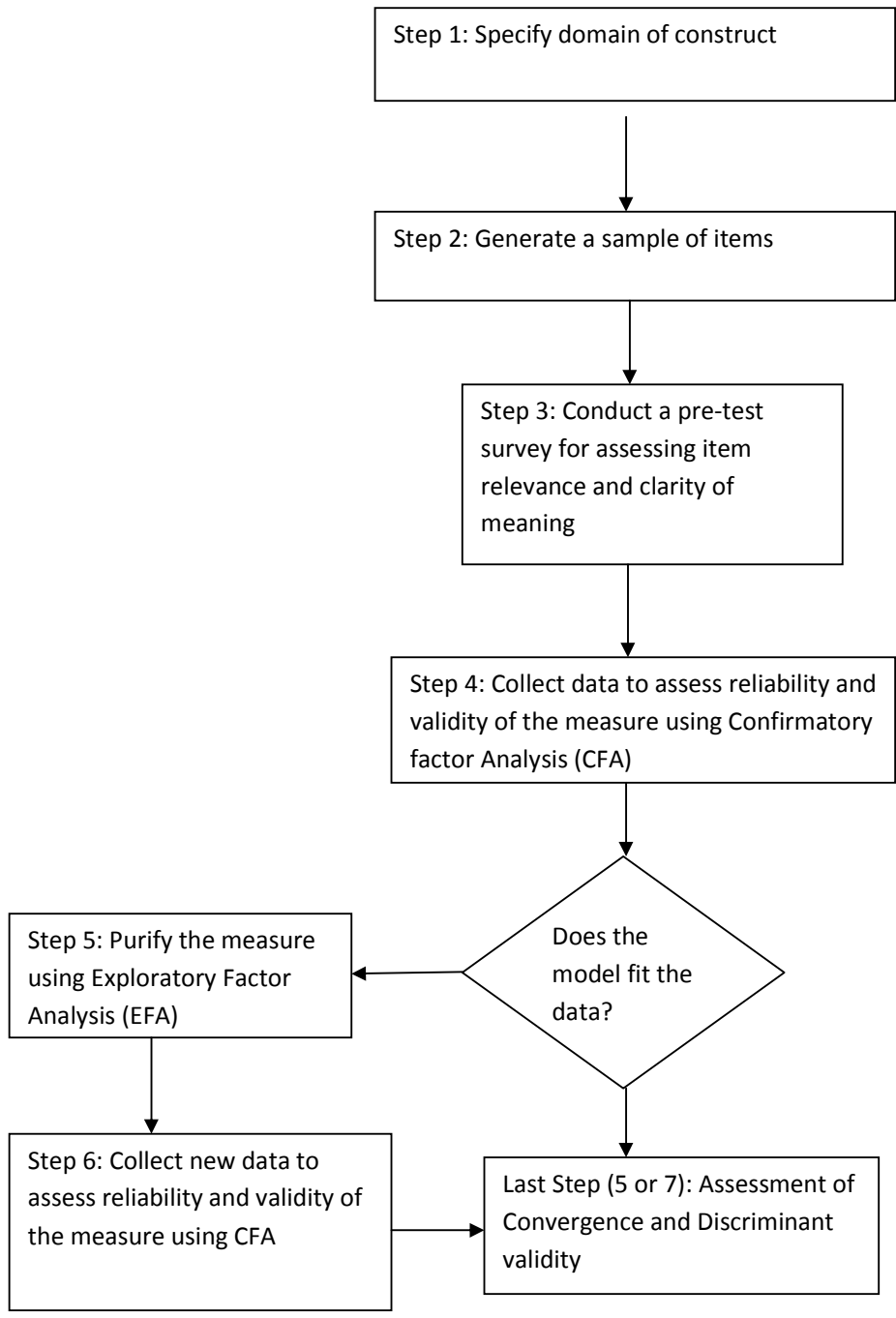
service quality, and the development of measurement instruments in different sectors. Despite that, there has been lack of consensus in the literature about the dimensionality of service quality and the lack of such a measure in archival institutions.

Besides, service quality measurement instruments are sector-specific. It is therefore becoming increasingly important to formulate some service quality measurement instruments as shown by the number of service quality measurement instruments formulated in various sectors and industries. Such instruments become industry-specific as no measurement instrument can measure across industries and culture (Malai and Speece 2005). The issue of archives-specific measurement instrument has not enjoyed any explicit attention in general. For the archival industry, this study is important in that it makes an original contribution to the literature by developing and validating a measurement instrument to measure the unique features of integrated e-records systems in an archival-specific environment.

## **1.6 RESEARCH DESIGN**

This study followed the standard psychometric procedure for developing measures of constructs as highlighted by Msweli (2011), and suggested by Nunnally (1978) and Hinkin (1998). Nunnally (1978) defines a construct as a representation of something that does not exist as an observable dimension of behaviour. The first step in the measurement instrument development was, in accordance with the procedures suggested by Nunnally (1978), to establish the domain of service quality construct. Review and synthesis of past literature was used to identify the service quality dimensions. Literature was also examined to provide the definitions required in specifying the domain of the construct and the items that capture it. In the second step, a sample of the items representing the identified dimensions of service quality was generated to be included in a pre-test survey to the industry experts who were attending the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) Conference. The items that were included in the pre-test survey instrument are shown in Appendix D. This was done through in-depth unstructured interviews and the Delphi Technique exercise of a purposively selected sample of experts in the archival institutions. In the third step, the pre-test survey was conducted firstly to tap into the insights of the panel of experts in the archival industry and identify

dimensions and generate items that measure service quality at the archival institutions that might not have been captured in the literature and the Delphi Technique exercise, and secondly, to determine if the respondents felt that the items were relevant and there was clarity in the meaning. The suggestions and the comments from the respondents were incorporated into the final survey instrument. In the fourth step, data was collected to assess reliability and validity of the measure using Confirmatory factor Analysis (CFA). If the model fit to the data was good, the researcher would go ahead and assess the convergence and discriminant validity of the measure (step 5), otherwise, the next step would be to do an Exploratory Factor Analysis (EFA) to purify the measure (step 5); after which, the reliability and validity of the measure would be assessed using CFA (step 6). The final step (7) would again be the measure for convergence and discriminant validity to be assessed. A summary of procedures followed to develop the service quality measure in archival institutions is shown in Figure 1.1 and a detailed analysis of the research methodology followed in this study is discussed in Chapter four.



**Figure 1.1: Measurement development Study Process**

*Source:* Adapted from P. Msweli (2011)

### **1.7 DELIMITATION OF THE SCOPE OF THE STUDY**

The following delimitations were utilised for this study:

- The study focused on the unweighted SERVPERF performance – based approach and used performance perceptions (Cronin and Taylor 1992) a measure of service quality.
- In phase 1 of this study, the study was delimited to panels of experts who attended the ESARBICA Conference in Namibia.
- The researchers at the national archives in this study represent only a portion of the participants in the archives industry. Therefore the results of this study may be difficult to generalise to other types or archival institutions, especially the private archives.

### **1.8 LIMITATIONS OF THE STUDY**

The following were the limitations of this study:

- Survey research was employed in this study. Therefore limitations attributed to survey research may have influenced the results due to potential problem areas which include (a) ensuring that the questions are clear and not misleading and (b) encouraging respondents to answer questions thoughtfully and honestly.

### **1.9 ASSUMPTIONS**

The following assumptions were made for this study:

- The respondents provided honest and informed responses to reflect their perceptions based on the service quality.
- The respondents completed the surveys based on their own perceptions regarding service quality without any input from others.

### **1.10 STRUCTURE OF THE THESIS**

The structure and content of this thesis is as follows:

- Chapter one serves as an introduction and orientation to the research under review and it gives a broad outline of the background to the study, the problem statement, the research questions, and the significance and contribution of the

study to knowledge. The research design is presented and the structure of the thesis is outlined.

- Chapter two provides an overview and analysis of the archives industry.
- Chapter three undertakes a literature review in order to facilitate an analysis of the definitions and conceptualisation of service quality. Defining the theoretical meaning and conceptual domain of the construct is necessary for developing the appropriate measures and obtaining valid results. Besides serving as a point of departure for a general discussion of service quality constructs from other relevant contexts, the analysis also serves to identify the gaps in the literature and to extract service quality constructs to identify the vital issues of what a service quality measurement instrument at the archival institutions should consist.
- Chapter four provides a full exposition of the research design and methodology.
- Chapter five provides data analysis and presentation of the research findings of this study.
- Chapter six discusses the outcome of the study, its conclusions, and recommendations.

### **1.11 SUMMARY OF THE CHAPTER**

This chapter provided the introduction and orientation of the research under review. This was followed by a broad outline of the purpose, process and objective of the research. The research problem and research questions were posed, and the research design was presented. To summarise Chapter one, this thesis looks into the indistinct construct of service quality, and focuses on the development and subsequent validation of a measurement instrument to assess service quality in an archival institution setting.

The next chapter provides a brief overview and examination of the archives industry. The terms used in the archives industry and in this study are defined.

## **CHAPTER 2:**

### **THE ARCHIVES INDUSTRY**

#### **2.1 INTRODUCTION**

In order to appreciate the essence of the research under review, this chapter provides a brief overview and examination of the archival industry; the background to the National Archives of South Africa (NASA); an examination of the major issues in e-records management; an overview of the functions of the ESARBICA; and the definition of terms used in the archives industry and in the study under review.

#### **2.2 THE ARCHIVES INDUSTRY**

There are various functions of archives services in both national and international contexts. In this section, a brief survey of the types of institutions, the services offered and the competition in the industry are analysed.

##### **2.2.1 Archives categories**

There are distinct categories into which archives fall and these can be viewed in the following ways:

The first sense in which archives are used is to denote recorded information accumulated in the course of official governmental activity, that is, in the case of public archives or in the course of a private organisation's activity in the case of private archives (Sibanda 2005). In that sense, archives, whether they are in public or private institutions and organisations, are no longer needed to conduct current business transactions but are preserved either as evidence of origins, structures, functions and activities of organisations or because of the value of the information they contain regardless of whether or not they have been transferred to an archival institution. Under such circumstances, information is of fundamental and continuing value for administrative, fiscal, legal, evidential or information (historical) purposes (Sibanda 2005).



The second sense in which archives can be viewed is the information recorded or received by the private individuals and employees of a governmental entity or private organisation or institution, and not created or received by private organisation or institution, and not received during the course of conducting official business (Sibanda 2005). This is generally contained in what are termed *personal papers*. Archives are usually a result of regular functional activity, individuals or families, on the other hand, accumulate personal papers in pursuance of their personal, professional and private concerns. This has raised some controversy because the line between organisational records and personal papers has at times been very thin and challenging to define. The distinction is usually important when legal issues arise on what is and what is not a record (Sibanda 2005). Personal papers do belong to and are subject to the disposition of an individual; records, on the other hand, are generally subject to laws and regulations or corporate policies and procedures that authorise their disposition at a specified time and in a specific manner (Sibanda 2005).

As Bradsher (1988) points out, while archives are records not all records are archives. Archives comprise a small section of core records, usually not more than 5 per cent of the volume of all public records, but with enduring value. It is this “enduring value” that distinguishes archives proper from records in general. Thus although all records have relative value to individuals, only those of sufficient value, as determined by archivists, are retained as archives only as long as their value is of enduring nature (Bradsher 1988, p. 4).

The third sense in which archives can be viewed is to denote the building, part of the building or storage area in which the archives are housed (Sibanda 2005). These institutes are either publicly or privately funded, their function is the preservation and administration of archives and they are known as “archives” or “manuscripts repositories” depending on the type of material they contain or how it is acquired. “Manuscript repositories” are responsible mostly for personal papers and artificial miscellaneous collections such as historical manuscripts acquired by purchase or donation primarily for cultural and educational purposes (Sibanda 2005).

*Archives* are responsible for the archival records of the organisation or institution of which they are a part. They also serve as the archives of their own or some other institutions. In common usage the terms *archives*, *archival institutions* or *archival repositories* denote entities that maintain archives and manuscript collections. Archives are maintained by most national governments, as are the archives in South Africa and most of the surveyed countries in this study in the Eastern and Southern African region. Other official bodies also maintain archives, for instance, the institutions of higher learning, and business, religious, labour, ethnic, patriotic, charitable, political, fraternal and social organisations. Archives, personal papers and historical manuscripts are at times found in libraries and historical societies. They are also maintained in hospitals and other institutions where it is found to be important to retain indefinitely those non-current records of the greatest historical value, and of the greatest potential use to their creators and other researchers interested in documenting and understanding the past, dealing with the present and preparing for the future (Sibanda 2005).

### **2.2.2 Competition in the industry**

In most national archival institutions owned by the state, as is the case of NASA, competition is not pronounced. In a sense, such entities could be regarded as monopolies in that they store state-generated information exclusively housed and managed by the respective archival institutions. They have been classified as non-profit-making organisations. It should also be noted that the work and structure of state-owned archives have been largely guided by legislation. The legislation therefore is more likely to affect the control of access and design of the records series; an issue that has been the major source of many records management problems (Sibanda 2005).

One should hasten to point out that, despite the classification of most state archival institutions as non-profit-making organisations, most of them, the South African National Archives included, have been challenged to improve and create quality services through the participation in the e-Readiness exercises carried out as part of the G7 initiatives. These exercises included a roll-out of an information and telecommunications network for Africa, and the development of ICT programmes. The New Public Management (NPM) strategies which predominantly sought to improve public sector efficiency and effectiveness had the

effect of re-directing the focus of public sector entities to service delivery (Baird 2004; Hope and Chikwo 2000).

There has also been an interest shown in the collection and preservation of business records in South Africa during the past decade. Besides the business records held by public institutions such as NASA, universities and public institutions internationally, most corporations globally have started introducing their own corporate archival programmes.

### **2.2.3 Archives characteristics**

There are characteristics that invariably cut across various aspects within the archival sector. These characteristics are underpinned by the fact that archives, be they public or private, are created in the normal conduct of business by particular entities and maintained in a definite arrangement usually related to the actions that resulted in their accumulation. The most basic characteristics of archives and all archival principles derive from the following facts.

#### **2.2.3.1 *Respect des fonds or provenance principle***

The archives of a particular entity are accumulated as a direct result of its functional activities and, as such, are intended to reflect the policies, functions and transactions of that entity alone; hence the *respect des fonds or provenance* principle, which relates to (for archival management purposes) the maintenance and grouping of the archives of one entity separate from those of others, thereby respecting the natural body of documentation left by the creating entity and reflecting its work.

#### **2.2.3.2 Sanctity of the original order principle**

Sanctity of the original order principle pertains to the organic character of records (Sibanda 2005). As a transaction progresses, records relating to it grow naturally. This principle has had a tremendous impact on the archival management of records because of its emphasis on retaining their quality in reflecting accurately what has gone before, why and how. Taken out of the sequence, or arranged in a manner different from that in which they are created, archives tell an incomplete or inaccurate story (Sibanda 2005).

### **2.2.3.3 The legal principle**

From the third characteristic, which is the official character of archives, flows the archival principle that archives must remain in the custody of their creator or its legitimate successor in order to ensure that no tampering takes place by unauthorised individuals (Sibanda 2005). The legal implications are the assurance that archives will be acceptable by a court of law as evidence of a transaction.

### **2.2.3.4 Uniqueness**

Books are mass-produced for cultural and educational purposes, unlike archives. Archives are therefore unique in that they are essentially single file units created or accumulated in connection with a specific business or administrative transaction. If a copy of a book is destroyed, it can easily be replaced, yet if archival file units are destroyed, other copies of the document in them might exist, but it is highly unlikely that they would be maintained in the same sequence or context (Sibanda 2005).

The maintenance of archives according to these basic principles does not only ensure the provision of evidence about the nature of their creator, but also assists in preserving the values arising from their organic characteristics; providing evidence as to how and why they were created and used; and in protecting their integrity, and allows them to be arranged, described and administered efficiently and effectively. The difference between archives and other reference material, such as libraries, is that the latter do not have the characteristics described above.

Most national archival institutions have the above characteristics. Besides these characteristics their roles include the records and information management programmes; public archives and research; and the national reference libraries' management.

## **2.3 RECORDS AND INFORMATION MANAGEMENT PROGRAMMES**

Records and information management programmes are key to the accomplishment of the national archival mission statements. The major objectives are the controlled creation, use maintenance and disposal of records throughout their life cycles. The exercises assist in achieving economy efficiency and effectiveness in record-creating agencies. Most national

archival institutions have provisional departments spread throughout the respective countries. Besides being the receiving points for all government departments, parastatals and local authorities wishing to deposit their records, these provincial records centres train the registry operatives on how best to create, use, maintain and dispose of their records.

#### **2.4 PUBLIC ARCHIVES AND RESEARCH**

National archival institutions have research sectors responsible for facilitating the public's access to the archives. Government records that have been scheduled for permanent preservation are transferred to the public archives and research sections when they are over 25 years old. These records are usually inventoried and indexed according to the principles of archival science pointed out earlier in this study. In most national archival institutions the section also deals with postal and telephonic research. The "public are gradually realising that the archives exist not so much to do research for them but make material available to them and help them to be able to do research themselves" (Sibanda 2005).

#### **2.5 NATIONAL REFERENCE LIBRARIES**

Most national archival institutions house national reference libraries. However, the functions of such libraries, unlike most libraries found anywhere, are the acquisition for permanent preservation of a copy of every book published in or about the respective country regardless of subject, form or language. Material published locally in the countries is acquired by legal deposits, and material published outside these countries is acquired through purchase and donations. Most national libraries housed by the national archival institutions also administer the International Standard Book Number (ISBN) scheme.

Besides the main functions highlighted above, most national archival institutions have technical sections responsible for collecting and preserving audiovisual material for historical purposes; ensuring the implementation of the archive automation programmes; repairing and restoring all forms of hard copy and electronic-related material; and many other country specific functions. The functions of the technical sections are more of what Lovelock (1996) describes as "backstage activities".

## **2.6 THE NATIONAL ARCHIVES OF SOUTH AFRICA (NASA)**

South Africa's National Archives as an institution will be utilised in this thesis for the validation of the service quality instrument developed in this study. This necessitates a brief outline of NASA as an institution.

NASA was enacted by the National Archives of South Africa Act of 1996 (Act No. 43 of 1996).

According to the Act, the National Archives was to provide

1. for a National Archives;
2. proper management and care of the records of governmental bodies;
3. for the preservation and use of a national archival heritage; and
4. for matters connected therewith.

In enacting NASA, the Parliament of South Africa outlined the powers and duties of the professionals within the archival institution. Of particular interest were the following duties of the archivists:

1. Taking measures necessary for the arrangement, description and retrieval of records
2. Providing information, consultation, research and other service related to records
3. With special emphasis on the activities designed to reach out to less-privileged sectors of society, making known information concerning records by means such as publications, exhibitions and the lending of records
4. Providing steps and acts necessary to facilitate an environment conducive to the achievement of the objectives of the National Archives
5. Providing training in archival techniques and the management of records
6. Cooperating with organisations interested in archival matters or the management of records
7. Providing professional and technical support in aid of archival activities and the archival community.

NASA therefore functions in terms of the National Archives and Records Service Act, 1996 (Act 43 of 1996). The National Archives in Pretoria including the National Film, Video and Sound Archives (NAFSA) (Government Communication and Information System 2005, p.

128; Morrow and Motshela 2005, p. 313) describes NASA as one of the most efficient official archives in Africa.

Under the previous government (prior to 1994) all government records were totally embargoed for 20 years, but currently individuals may have access to current documents if they submit a good reason for such a request. Government records generated and preserved under the Archives Act (Appendix I) form a vital part of the archival records and reflect the interaction of the government with its citizens, the internal working of the government and its interaction with other countries (Morrow and Motshela 2005). Morrow and Motshela (2005, p. 313) explain the developments of the national archives and the changes under the current democratically elected government in 1996:

NASA is a key institutional repository of official documentation, and, increasingly of documents from non-official sources, including visual and oral material. Its role has been extended from that of its predecessor, the State Archives Service, of simply storing records of the state and it now has the remit of gathering material from previously marginalised sections of the population and of proactively publicising and making available records to citizens. NASA was established in 1997 in terms of the National Archives Act of South Africa. Placed under the Department of Arts, Culture and Technology (DACST) – its mandate covers all governmental bodies at central level, including statutory bodies. NASA also has professional control over records of the South African Defence Force (SADF) previously autonomous in this sphere, even though the institution retains its custodial responsibility

## **2.7 ELECTRONIC RECORDS MANAGEMENT SYSTEMS**

The above functions are in electronic form in most national archival institutions which make it very relevant to orientate this study towards the e-records management systems in archival institutions. A brief examination of the e-records management systems in archival institutions will assist the reader in appreciating the concept and definition of service quality and the development of the service quality measurement model within the national archival context.

Historically, e-records management has been viewed as follows:

1. *Indexing*: The process of establishing access points to facilitate retrieval
2. *Classification*: Systematic identification and arrangement of business according to logically structured conventions, methods, and procedures (International Standards Organisation (ISO))
3. *Long-term archiving*: The process of creating a backup copy
4. *Storage*: The function of storing records for future retrieval and use

Until recently, e-records have only been regarded as records. Traditionally, individuals printed e-records and saved them as records. Such traditions are no longer viable, considering the large volume of e-mail and office documents generated in businesses today. With the emergence of various overlapping technologies, and records and content management systems, such practices have been replaced with contemporary e-records management systems.

For the purposes of this research, *electronic records (e-records) management* is viewed as the:

1. planning;
2. controlling;
3. directing;
4. organising;
5. training; and
6. promoting

and other activities related to the creation, maintenance and use, and disposal of records to achieve adequate and proper documentation of an organisation's policies and transactions. It further encompasses the effective, economical management of an organisation's operations. *e-records management* refers to all managing activities related to the

1. creation;
2. storage;
3. retrieval; and
4. disposal

of e-records (Xiaomi 2003).



An *e-records management system* (ERM) is a computer program (or set of programs) used to track and store records. The term is distinguished from imaging and document management systems that specialise in paper capture and document management respectively (Xiaomi 2003). What should also be noted is that e-records management is a business function, not an IT function. Electronic document and records management systems (EDRMSs) are supported and maintained by IT, but designed by the business units collaboratively to meet the corporate record classification and retention schedule standards, the same way integrated e-records management systems would be viewed.

The aim of an electronic management system is to attain optimal functionality. The activities include document

1. creation;
2. control (protection);
3. organisation;
4. retrieval (access); and
5. disposal.

An integrated electronic management system of an enterprise would invariably be a system consisting of an integrated control of documents, e-records and archives. Known as the *e-records continuum model*, this perspective employs an integrated approach to develop integrated frameworks and integrated control through document management, records and archives management, and business management (Xiaomi 2003). These activities take place throughout the life cycle of the e-records to ensure their accuracy, authenticity, reliability and integrity (Xiaomi 2003). This perspective also complements the recent trends of integrating electronic content and records management due to overlapping technologies. e-records management systems in content management systems typically focus on the active life cycles of e-records.

Although a distinction is often made between *records management* and *archives administration*, some practitioners in the archival industry have argued that the two are, in fact, aspects of the same process. Indeed, a feature of successful records and archives

development initiatives has been the establishment of systems that manage records in a continuum from their creation to their ultimate disposal by destruction or by preservation as archives. This involves embracing the concept of the life-cycle management of records and archives through the establishment of clear linkages between the agencies that create the records and the archival institution that safeguards those selected for preservation as archives.

In an environment where regulatory compliance with governmental agencies and industry regulations is crucial, the integrated e-records management systems allow organisations to create and manage a set of uniform models for the retention, security, classification, search, retrieval and alerts for changing content, hence their importance in this study. Such systems invariably include most compliance issues mandated by

1. the management of records related to the financial information for compliance with the Sarbanes-Oxley Act;
2. industry regulation such as ISO certification;
3. regulatory compliance with mandates from governmental agencies such as the South African Revenue Service (SARS);
4. compliance with recordkeeping laws or regulations, such as Department of Defence (DoD) 5015.2 Compliant Records Management; and
5. the management of records relating to human resources practices.

## **2.8 EASTERN AND SOUTHERN AFRICAN BRANCH OF THE INTERNATIONAL COUNCIL ON ARCHIVES (ESARBICA)**

The ESARBICA was utilised in this study for the data collection as described in Chapter 4. This was particularly so during the ESARBICA Conference held at the Windhoek Country Club, Windhoek, Namibia from 1 to 3 July 2009. In order to appreciate how the conference proceedings and delegates become relevant to this study, a brief outline of the ESARBICA and the objectives of such conference are analysed below.

### **2.8.1 Brief history of ESARBICA and its objectives**

The ESARBICA was established in Kenya in 1969 and had 12 active country members. The objectives of ESARBICA included the advancement of archives through regional cooperation;

provision of a forum for the exchange of professional ideals and expertise; carrying out the aims and objectives of the International Council on Archives; facilitating continuing education through professional attachments, study visits, seminars and workshops.

Publications and meetings include

1. the ESARBICA journal;
2. the ESARBICA newsletter;
3. general conference once every two years; and
4. conference once every two years; and
5. Board meeting once a year.

The 20th Bi-Annual ESARBICA General Conference on Electronic Records Management was hosted by the National Archives of Namibia from 21 to 26 June 2009. The ESARBICA Conference sought to highlight some of the challenges faced by archives, libraries, museums, historical societies and other repositories in the ESARBICA region in dealing with the digital information which were ushered in by the advent of ICTs and the knowledge economy. The aim was to develop specific techniques and policies to preserve and make accessible the wealth of information that is being generated electronically (digitally). The following broad themes were discussed at the conference:

1. Guidelines to safeguard digital information
2. Standards that support key preservation services, such as a metadata and persistent identifier schemes
3. Challenges to digitising the African heritage
4. Software and hardware for safeguarding digital information (new technologies and digital preservation)
5. Intellectual property (cyberspace and copyright of digital information)
6. Digital archives legislation and ethical issues
7. Lessons learnt from digitisation projects, especially in Africa
8. Legal deposits in the digital age; website preservation
9. Accessibility of digital material that is saved in libraries, archives and museums
10. Identification of incentives for institutions to undertake preservation
11. Cooperative collecting agreements with libraries, archives and other collecting institutions in the public and private sectors

12. Preservation of infrastructure.

## **2.9 DEFINITION OF TERMS**

### **Archives**

1. Denote recorded information accumulated in the course of official governmental activity, that is, in the case of public archives; or in the course of a private organisation's activity in the case of private archives.
2. Archives can be viewed as the information recorded or received by private individuals and employees of a governmental entity or private organisation or institution, and not created or received during the course of conducting official business. This is generally contained in what is termed *personal papers*.
3. Archives can also denote the building, part of the building or storage area in which archives are housed. These institutions are either publicly or privately funded. These institutions, whose function is the preservation and administration of archives, are known as either *archives* or as *manuscript repositories*, depending on the type of material they contain or how it is acquired.

### ***Respect des fonds or provenance principle***

1. Since archives of a particular entity are accumulated as a direct result of its functional activities, they are intended to reflect the policies, functions, and transaction of that entity alone, hence the *respect des fonds or provenance* principle, which relates to (for archival management purposes) the maintenance and grouping of the archives of one entity separate from those of others, thereby respecting the natural body of documentation left by the creating entity and reflecting its work.

### **Sanctity of the original order principle**

2. Also viewed as the organic character since as a transaction progresses, records relating to it grow naturally, it has had an impact on the archival management of records due to its emphasis on retaining their quality of reflecting accurately what has gone before, why and how. Taken out of the sequence, or arranged in a manner different from that in which they are created, archives tell an incomplete or inaccurate story.

### **The legal principle**

3. From the third characteristic, which is the official character of archives, flows the archival principle that archives must remain in the custody of their creator or its legitimate successor in order to ensure that no tampering has taken place by unauthorised individuals. The legal implications are the assurance that archives will be acceptable in a court of law as evidence of a transaction.

### **Uniqueness**

4. Unlike books, which are mass-produced for cultural and educational purposes, archives are unique in that they are essentially single-file units created or accumulated in connection with a specific business or administrative transaction. A destroyed copy of a book can easily be replaced, yet if archival file units are destroyed, other copies of the document in them might exist, but it is unlikely there would be maintained in the same sequence or context.

## **2.10 SUMMARY OF THE CHAPTER**

In this chapter a brief overview and examination of the archival industry and major issues in e-records management are given. Various issues affecting the archives industry are presented, and the ESARBICA structures and functions are also discussed. The discussion of the ESARBICA structures serves as a focal point in the examination and appreciation of the bodies governing archival institutions. It helps the reader also to understand some of the aspects of the research methodology discussed in Chapter 4 of this study. Frequently used terms in the industry are also defined in this chapter to enable the reader to appreciate the issues involved in archives and e-records management.

In the next chapter a literature review is undertaken to facilitate an analysis of the definitions and conceptualisation of service quality. This analysis also serves to identify the gaps in the literature and, among many other objectives, to extract service quality constructs to identify the vital issues of which a service quality measurement instrument for archival institutions should consist.

## **CHAPTER 3:**

### **LITERATURE REVIEW**

#### **3.1 INTRODUCTION**

This chapter undertakes a literature review in order to facilitate an analysis of the definitions and conceptualisation of service quality. Defining the theoretical meaning and conceptual domain of the construct is necessary for developing the appropriate measures of the constructs of service quality and obtaining valid results. Besides serving as a point of departure for a general discussion of service quality constructs from other relevant contexts, the analysis also serves to identify the gaps in the literature and to extract service quality constructs to identify the vital issues of which a service quality measurement instrument in archival institutions should consist.

#### **3.2 CONCEPTUAL FRAMEWORK OF SERVICE QUALITY**

##### **3.2.1 Product quality in product manufacturing**

Before the service revolution, quality was recognised as a strategic tool for attaining operational efficiency and improved business performance (Jain and Gupta 2004). Several authors have discussed the unique importance of quality to service firms (Normann 1984; Shaw 1974) and have demonstrated its positive relationship with profits, increased market share, return on investment, customer satisfaction and future purchase intentions (Anderson, Fornell and Lehmann 1994; Boulding et al. 1993; Buzzell and Gale 1987; Rust and Oliver 1994). A trend that emerged from these studies has been that firms with superior quality products outperform those that mark inferior quality products.

Of interest too is the examination of the role of quality as background information on the conceptual framework of service quality. Although many authors still regard productivity and quality as separate concepts (Heskett *et al.* 1994), several researchers (e.g., Gronroos 2000) argue that quality and productivity cannot be dealt with separately, especially in the context of service. The result has been a growing need to analyse the quality concept of the productivity concept. A summary of this analysis is captured in Garvin's identification (1984) and examination (1987) of quality in terms of eight critical dimensions (in four key areas) as

shown in Table 3.1. Garvin was one of the first researchers to focus on the qualitative output of quality and to examine quality in terms of the dimensions that are critical.

**Table 3.1: Garvin’s dimensions and operational requirements of manufacturing quality (1987)**

	<b>Dimensions of manufacturing quality</b>	<b>Operational requirements</b>
Technological advantage	<p><i>Performance:</i> The primary operating characteristics of the product.</p> <p><i>Features:</i> Attributes that supplement the performance of the product.</p>	<p>Excellence in performance requires superior product design and a strong engineering function.</p> <p>Distinction in features is achieved with exceptional marketing and design departments.</p>
Adherence to specifications	<p><i>Reliability:</i> The probability of a product failing within a specified time period.</p> <p><i>Conformance:</i> The extent to which the design and operating characteristics of a product meet predetermined standards.</p>	<p>Outstanding reliability requires careful attention to product and process design to ensure superior fits and minimal piece-to-piece variation.</p> <p>Exceptional conformance is achieved by a production function that pays careful attention to engineering and emphasises precision in product assembly.</p>
Expected performance (time- and cost-based)	<p><i>Durability:</i> The amount of use a product offers a consumer before the product deteriorates.</p> <p><i>Serviceability:</i> How fast, how easily, and with what degree of courtesy and competence repairs are performed.</p>	<p>Premium durability depends on the procurement of long-lived components, thus highlighting the importance of the purchasing function.</p> <p>Superb serviceability requires responsive and capable field support personnel, and a knowledgeable and efficiently run customer service department.</p>
Customer judgement	<p><i>Aesthetics:</i> How a product appeals to the five senses, namely sight, touch, smell, hearing and taste.</p> <p><i>Perceived quality:</i> Reputation, image, or other inferences</p>	<p>First-class aesthetics and perceived quality are usually the result of a finely tuned marketing department that is on top of customer needs and aggressive in promoting the company’s brands and desired image.</p>

	<b>Dimensions of manufacturing quality</b>	<b>Operational requirements</b>
	regarding the attributes of a product.	

Source: Garvin, 1987

### 3.2.2 The service revolution

Researchers such as Parasuraman, Zeithaml and Berry (1985), among many others, have emphatically pointed out that the concept of quality prevalent in the goods sector highlighted by researchers such as Gavin (1985) is not extendable to the services sector. A service firm therefore has no products, only interactive processes where a service is seen as a process that leads to an outcome during partly simultaneous production and consumption processes. This is significantly different from a physical product where the terms used are manufacturing-orientated concepts that do not always fit the nature of services. Over the years characteristics of the service process such as heterogeneity and inseparability of production from consumption have made it hard easily to conceptualise the service process and its outcome as a solution to customer problems and as marketing objects. This challenge has ushered in an approach of studying the quality of service as perceived by the users as a possible way of understanding the marketing situation. Such an approach not only addresses questions such as how the quality of a solution to problems or needs is perceived by customers or users of a service, but also provides for most researchers a customer-orientated approach on the achievement of the conceptualisation of the service process and the replacement of the missing product of service firms by a service-based, customer-based construct.

What has also been highlighted as the problem with management of service quality in service firms is that quality is not easily identifiable and measurable due to the inherent characteristics of services which make them different from goods. Thus, although initial efforts to define and measure service quality emanated largely from the goods sector, Parasuraman, Zeithaml and Berry (1985) laid a solid foundation for research work in the area in the mid-1980s. They were among the early researchers to point out that the concept of quality prevalent in the goods sector was not extendable to the services sector.



Sasser *et al.* (1978), Zeithaml *et al.* (1985) and Fisk *et al.* (1993, p. 10) basically all argued that there were four characteristic differences between services and products, namely (1) intangibility, (2) perishability, (3) heterogeneity and (4) simultaneity. They defined *services* on the basis of this delineation of services from products as “a set of intangible and perishable benefits to an entity that are subject to variation in performance and rendered and consumed during the same period of time” (Fisk *et al.* 1993, p. 12). This marked the first wave of service quality.

The second service quality wave, which also started in the 1980s and is still ongoing, is the period of debate that has counteracted the delineation of services from products. At the forefront in initiating this debate was Rathmell as early as 1966 by pointing out that all economic offerings can be arranged along a products-to-services continuum. This debate has resulted in many well-documented characteristics used to differentiate products from services considered as inaccurate. It is against this background that the conceptual framework of service quality is examined.

### **3.2.3 The construct of service quality**

Although the four features of services namely (1) intangibility, (2) perishability, (3) heterogeneity and (4) simultaneity have been recognised as significant in developing a construct of service quality, Vargo and Lusch (2004) have argued that these characteristic differences between services and products fail to delineate services from products adequately. They further argue that the delineation represents the producer’s orientation, rather than the consumer’s view. Lovelock and Gummesson (2004) viewed the traditional division between products and services as long outdated and offered to redefine services from a customer-based perspective.

Although intangibility is universally cited as the fundamental difference between products and services, the concept emerges as unambiguous to differentiate pure products from pure services. Shostack (1977) was among the first authors to propose that market offerings may be arranged on a tangibility spectrum ranging from tangible-dominant to intangible-dominant. What is universally acceptable, however, is that service quality is “intangible”

because services, as performances, are difficult to assess on a sale (Lovelock 1981; Khan 2003). As a result of this intangibility, service providers can have difficulty in ascertaining how consumers perceive their services (Parasuraman *et al.* 1985).

The case for heterogeneity or non-standardisation in services has been primarily based on variations in the performance of the producers. However, Zeithaml and Bitner (2003) have argued that no two customers are the same and hence would be defined differently because the unique demands or experiences of the service would have been offered in a unique manner. Subsequently, Solomon and Stuart (2005) argued that standardisation was undesirable for many services as most individuals preferred customisation to meet their specific needs. Thus services are viewed as “heterogeneous” because they can form day to day, from place to place, from producer to producer, and from customer to customer (Parasuraman *et al.* 1985; Markovic 2006). The involvement of the customer as a co-producer of service delivery therefore means that the service provider has less control over the consistency of the service experience.

Services are “perishable” because they cannot be stored and/or sold on another day. Services are “perishable” because many of them are simultaneously provided and consumed. It should be noted that many researchers regard “perishability” or the inability to inventory as a distinct characteristics that differentiates products from service. However, Kerin *et al.* (2003) argue that perishability and inventory can present a bigger challenge for many product manufacturers than they would for most service organisations – not least when the products themselves are perishable.

Over the years, such characteristics of the service process as heterogeneity and inseparability of production from consumption have made it hard to conceptualise the service process and its outcome as a solution to customer problems and as marketing objects. These four distinctive characteristics mean that service quality is a more elusive and abstract construct than product quality (Parasuraman *et al.* 1983, 1988).

Most researchers have not only argued that service quality should be defined and measured from a customer’s perspective (e.g., Jayasundara, Ngulube and Minishi-Majanja (2009); but

they have also posited (Ghobadian, Speller and Jones 1994; Enquist, Edvardsson and Sebhatu 2007) that most service quality definitions fall within the “customer-led” category. Juran (1992, p. 21) elaborates further by defining customer-led quality as “features of products or service” that meet customers’ needs and thereby provide customer satisfaction. Thus such an approach not only addresses questions such as how the quality of a solution to problems or needs is perceived by customers or users of a service, but also provides for most researchers a customer-orientated approach on the achievement of the conceptualisation of the service process and the replacement of the missing product of service firms by a service-based, customer-based construct.

Against this background, Gronroos (1984, p. 37), for instance, defined perceived service quality as “the outcome of an evaluation process, [whereby] the consumer compares his expectations with the service he perceives he has received, i.e. he puts the perceived service against the expected service. The result of this process will be the perceived quality of service”.

Service quality has therefore been conceptualised as the so-called gap between what consumers feel that a service should offer (i.e., their expectations) and their perceptions of the actual performance of the service (Parasuraman *et al.* 1988). Perceived quality thus differs from objective quality, which involves an objective assessment of a thing or an event on the basis of predetermined standards that are measurable and verifiable (Zeithaml 1988). By contrast, perceived service quality involves an overall impression (or “global” value judgement) of a service and, as such; it is a type of attitude (Parasuraman *et al.* 1988; Zeithaml 1988; Sureshchandar *et al.* 2002).

Thus the most widely accepted definition of service quality delineates the discrepancy between customers’ expectations and their perceptions of service performance. Accordingly, service quality refers to the comparison customers make between their expectations and their perceptions of service performance. A terse definition of service quality would be “a global judgment or attitude, relating to the superiority of the service”. An explication would be that it involves evaluations of the *outcome* (i.e., what the customer actually receives from service) and *process of service act* (i.e., the manner in which the

service is delivered) with propositions put forward by Gronroos 1982; and Smith and Houston 1982); and Parasuraman, Zeithaml and Berry (1985, 1988) who posit and operationalise service quality as the difference between consumer expectations of “what they want” and their perceptions of “what they get”.

It should be noted that Parasuraman *et al.*'s (1994) argument that the disconfirmation of perception minus expectations conceptualisation of service quality is supported by various researchers (Parasuraman *et al.* 1988; Bolton and Drew 1991b; Parasuraman *et al.* 1988). Based on empirical evidence, Parasuraman *et al.* (1988) argued that in measuring service quality, the level of comparison is what a consumer *should* expect, whereas in measuring satisfaction on the level of comparison is what a consumer *would* expect. The origin of this differentiation is their recognition that the term “expectation” as used in the service quality literature differs from the way it is used in the consumer satisfaction literature. The emphasis is that in the consumer satisfaction literature, expectations are viewed as *predictions* made by the consumers about what is likely to happen during an impending transaction. By contrast, in the service quality literature, expectations are viewed as consumers’ desires, that is, what they feel a service provider *should* offer rather than *would* offer.

Accordingly, service quality is the comparison customers make between their expectations and their perceptions of the service received (Parasuraman, Zeithaml and Berry 1985). This definition is based on the expectancy disconfirmation theory (Churchill and Suprenant 1982; Parasuraman, Zeithaml and Berry 1994), which is one of the psychological theories available in the area of consumer behaviour in service marketing. This theory is also called *expectancy confirmation theory* (Chea and Luo 2006).

The underpinning paradigm of the expectancy disconfirmation theory is termed the *disconfirmation paradigm*. As the paradigm is based on the premise that a customer compares actual (perceived) performance with a standard (expectation), disconfirmation is the discrepancy between performance and expectation. As a result,

Disconfirmation (d) = Performance (P) – Expectation (E)

In terms of mathematical representation, disconfirmation is expressed as follows:

$$d = P - E \quad (i)$$

Thus, confirmation occurs when performance matches expectations. If performance is better than expectations, it creates positive disconfirmation. In contrast, when performance is below standard, it creates negative disconfirmation (Cadotte, Woodruff and Jenkins 1987). Parasuraman, Zeithaml and Berry (1988, p.17) developed the GAP model of service quality based on the disconfirmation paradigm, and defined *service quality* as the “degree and direction of discrepancy between customers’ expectations and perceptions” with regard to the service. Accordingly,

$$\text{Service quality (SQ)} = \text{Performance of service (P)} - \text{Expectation of service (E)}$$

In a mathematical representation, it is

$$SQ = P - E \quad (ii)$$

As the disconfirmation is equal to the subtraction of performance versus expectation, as depicted in formula (i)  $SQ = (d)$ : it may be taken to mean that service quality is a function of disconfirmation (Hamer 2006; Lee, Lee and Yoo 2000).

Mathematically, it is

$$SQ = f(d) \text{ [Service quality is a function of disconfirmation] (Jayasundara et al. 2009)}$$

An examination of the combination of literature review and empirical investigation suggests that service quality and consumer satisfaction are related but distinct constructs (Oliver, 1980; Cronin and Taylor 1992). The differences between the two, according to them, are that service quality is a long-term overall evaluation, whereas consumer satisfaction is a transaction-specific measure (Parasuraman, et al. 1988; Carman, 1990; Cronin and Taylor 1992). Further analysis of service quality literature and consumer satisfaction literature not only clarifies differences between service quality and consumer satisfaction, but also resolves the confusion related to the definition and operationalisation of service quality. Thus, although early service quality researchers defined satisfaction as an antecedent of service quality, it has now been generally accepted that service quality is an antecedent of

customer satisfaction (Chandrashekar *et al.* 2007, p. 161; Dabhorlkar, Shepherd and Thorpe 2000, p. 166). Thus it demonstrates that customer satisfaction is a function of service quality, while service quality is a function of disconfirmation.

Accordingly,

$SQ = f(d)$  [Service quality (SQ) is a function of disconfirmation (d)] (Lee and Yoo 2000; Parasuraman, Zeithaml and Berry 1985)

$CS = f(SQ)$  [Customer satisfaction (CS) is a function of service quality (SQ)] (Iacobucci, Ostrom and Grayson 1995; Zeithaml, Berry and Parasuraman 1993).

Hence,

$CS = f(d)$  [Customer satisfaction is a function of disconfirmation] (Khalifa and Liu 2002; Szymanski and Henard 2001).

However, some researchers continue to vacillate between the use of disconfirmation scores and performance-only scores (Brady, Cronin and Brand 2002; Cronin, Brady and Hult 2000). That is the case because some customer satisfaction research studies have focused only on the performance of selected attributes, rather than obtaining the mathematical difference between performance and expectations, as depicted in the disconfirmation paradigm. This has led to the emergence of the “performance theory”. The theory states that satisfaction and service quality are directly related to the perceived service performance characteristics of the service. Since this theory focuses only on the performance of a given service or product, it is called the “performance-only paradigm”. Thus, this paradigm expounds that  $SQ = f(\text{Performance (P) of the service})$  (Brady, Cronin and Brand 2002; Cronin and Taylor 1992).

The mathematical representation of the above is:

$SQ = f(P)$  [Service quality is a function of Performance]

As,  $CS = f(SQ)$  [As Customer satisfaction is a function of Service quality],  $CS = f(P)$  [Customer satisfaction is a function of Performance] (Jayasundara *et al.* 2009). It should, however, be noted that according to Carman (1990) and Brown *et al.* (1993), there is not only little

theoretical evidence, if any, that supports the relevance of the perception minus expectations gaps as appropriate for assessing service quality, but there is a serious problem in conceptualising service quality as a difference score.

In the marketing literature there is support for simple performance-based measures of service quality (Mazis *et al.* 1975; Woodruff *et al.* 1983; Bolton and Drew 1991). Research conducted by Cronin and Taylor (1992) argued that an unweighted performance-based approach was a more appropriate basis for assessing service quality, and this was also supported by Babakus and Boller (1992).

Cronin and Taylor (1992), after extensively analysing the literature, concluded that perceived service quality was best conceptualised as an attitude; “adequacy–importance” model is the most effective “attitude-based” operationalisation of service quality (Mazis *et al.* 1975) and that current performance captures consumers’ perceptions of the service offered by a specific service provider (Taylor and Cronin 1992, p.58).

Teas (1993) further argued that additional comparison of weighted versus unweighted models showed that unweighted models, in terms of concurrent and construct validity, generally performed better. Indeed, many studies tended to support Cronin and Taylor’s (1992) viewpoint. It should be noted that in view of the various perspectives on service quality and of the absence of a consensus viewpoint in the definition of service quality construct, SERVPERF is adopted in this study, in accordance with the suggestion made by Churchill (1979) that the first step in the procedure for developing better measures involves specifying the domain of the construct. Thus this study adopts Cronin and Taylor’s (1992) work which locates the construct of service quality as an attitude; and postulates that an individual’s perception of service quality is only a function of its performance. What is worth noting too is that SERVPERF is not only a more concise performance-based scale, but is an alternative to SERVQUAL measurement instrument and its 22 performance items adequately define the domain of service quality and these items are included in SERVQUAL. It excludes any consideration of expectation, which makes SERVPERF a more efficient measure in comparison to SERVQUAL (Lee, Lee and Yoo 2000; Buttle 1996). SERVPERF has also been empirically tested on a number of studies and was found to explain more variance

in overall service quality than SERVQUAL (Cronin and Taylor 1992; Lee, Lee and Yoo 2000; and Quester *et al.* 1995, in Robinson 1999). Cronin and Taylor (1994) assert that since SERVQUAL seems to have little empirical and conceptual research support, therefore the real question is whether or not SERVPERF can produce valid and reliable measures of service quality. The response has been that, based on Cronin and Taylor's (1994) research, the scale can provide a reliable, valid and useful tool for measuring overall service quality levels and attitudes (Cronin and Taylor 1994).

### **3.3 SERVICE QUALITY MEASURES**

#### **3.3.1 Introduction**

In this section, an overview of the service quality measurement models is given. As background information for the discussion, the two contradicting paradigms that form the basis for measuring service quality are given. The discussion then extends to an examination of various service quality measurement instruments developed by various leading academics and the selection of items of service quality for the study under review.

#### **3.3.2 The contradicting paradigms**

As indicated in section 3.1 of this dissertation, service quality is not only an elusive construct, but it is also indistinct and difficult to define and measure (Rathmell 1966; Pirsig 1974; Crosby 1979; Garvin 1983; Parasuraman *et al.* 1992; Gronroos 2000). Over the years, researchers have made many attempts to define and measure the concept of service quality (Lewis and Booms 1983; Gronroos 1984; Parasuraman *et al.* 1985, 1988; Carman 1990; Cronin and Taylor 1992; Teas 1993; Westbrook and Peterson, 1998). Two distinct schools of thought are easily identifiable, despite the fact that operationalisation of service quality differs from researcher to researcher. One group of researchers supports the disconfirmation paradigm of perceptions minus expectations; and the other group supports the performance-based paradigm of the perceptions-only version of service quality.

##### **3.3.2.1 Disconfirmation paradigm**

Consumers evaluate (perceived) service quality by comparing expectations with experiences of the services received, according to Gronroos (1984). This viewpoint is further supported by Lewis and Booms (1983) who argue that service quality is a measure of how well the



service level delivered matches customer expectations on a consistent basis. The implication of their viewpoint is that delivering quality service means conforming to customer expectations on a consistent basis. Focus group interviews held by Parasuraman *et al.* (1985) further affirmed that service quality is derived from the comparison between a customer's expectations for service quality performance versus the actual perceived performance of service quality (perception minus expectations). Parasuraman *et al.* (1988, p. 17) also stated that "perceived service quality is viewed as the level of discrepancy between consumers' perceptions and expectations". According to Parasuraman *et al.* (1985, 1988), service quality is an overall evaluation similar to attitude, the "expectancy disconfirmation" model is an appropriate operationalisation of service quality, and service quality (as a form of attitude) results from the comparison of perceptions with expectations.

### **3.3.2.2 Performance-based paradigm**

The performance-based paradigm, which has been discussed in the preceding section, basically highlighted that there is little theoretical evidence, if any, that supports the relevance of perception-minus-expectations gaps as the appropriate basis for assessing service quality (Carman 1990). Brown *et al.* (1993) further argue that there are serious problems in conceptualising service quality as a difference score.

In the marketing literature there has been much support for simple performance-based measures of service quality (Mazis *et al.* 1975; Woodruff *et al.* 1983; Bolton and Drew 1991). Cronin and Taylor (1992) have affirmed, as indicated in some sections of this study, that an unweighted performance-based approach is a more appropriate basis for assessing service quality. The use of performance-based measures of service quality over gap measures has also been supported by Babakus and Boller (1992). The performance-based paradigm can therefore be best summarised by Cronin and Taylor's (1992) viewpoints that perceived service quality is best conceptualised as an attitude and that current performance adequately captures consumers' perceptions of the service quality offered by a specific service provider.

### **3.4 SERVICE QUALITY MEASUREMENT MODELS**

#### **3.4.1 An overview**

A model developed by Gronroos (1984) highlights how consumers compare the service as experienced with the service as expected in evaluating service quality; basically supporting the disconfirmation paradigm. This model attempts to understand how the quality of a given service is perceived by customers. The model also divides the customer's experiences of any particular service into two dimensions, namely (1) the technical quality (i.e., what the consumer receives or the technical outcome of the service delivery process) and (2) the functional quality (i.e., how the customer receives the technical outcome). In the context of services, Gronroos (1984) suggests that functional quality is generally perceived to be more important than technical quality. The assumption was that the service is provided at a technically satisfactory level. What is important about Gronroos's model is how it discusses service quality to include the way in which it is delivered.

Subsequent exploratory research conducted by Parasuraman *et al.* (1985) discussed several insights and propositions concerning consumers' perceptions of service quality. Included in their proposal is a more elaborate service quality model with various service quality determinants based on an interpretation of qualitative data generated through in-depth interviews and focus group discussions in four different service areas, namely (1) retail banking, (2) credit card, (3) securities brokerage, and (4) product repair and maintenance. In fact, the service quality measurement tool has its foundation in SERVQUAL. Parasuraman *et al.*'s (1988) conceptualisation and operationalisation are the foundation of the service quality measurement scale SERVQUAL. The SERVQUAL scale constitutes an important landmark in the service quality literature and is extensively applied in different service settings.

On the SERVQUAL scale, Parasuraman *et al.* (1985) propose service quality as a function of the differences between expectation and performance along quality dimensions. This is known as the GAPmodel. An original set of 22 dimensions or items tap into different dimensions of service quality, namely reliability, responsiveness, tangibles, assurance (communication, competence, credibility, courtesy and security) and empathy, which capture access and understanding customers. In the GAP model the emphasis is on the

relationship of satisfaction to the size and direction of a person's experiences vis-à-vis his or her initial expectations (Churchill and Surprenant 1982; Parasuraman, Zeithaml and Berry 1985; Smith and Houston 1982). As explained earlier in this section, the GAP is the difference between customer "expectations" and "perceptions" (Parasuraman *et al.* 1988). Service quality lies between a continuum ranging from "ideal quality" to "totally unacceptable quality", and some points along the continuum present satisfactory quality (Vikalpa 2004). In instances where perceived or experienced service is less-than-expected service, the implication is that less-than-satisfactory service quality has been delivered and vis-à-vis (Parasuraman *et al.* 1988). According to Parasuraman *et al.* (1988), while a negative discrepancy between perceptions and expectations ("performance gap") causes dissatisfaction, a positive discrepancy leads to consumer delight.

Later in 1994 SERVQUAL was revised to reduce the number of items, leading to the extended service quality models. The extended model interestingly includes such factors as communication and control process implementation in organisations to manage employees (Huczynski 1992). The SERVQUAL model has, however, been criticised on various conceptual and operational grounds. The criticisms are discussed in section 3.3.1 of this dissertation. What is worth noting is that arguing that the perception–expectation gap theory of service quality (Parasuraman *et al.* 1990) is supported by little theoretical and empirical evidence (Carman 1990; Cronin and Taylor 1992) developed a "performance-based" service quality measurement instrument called *SERVPERF*. According to Cronin and Taylor (1992), their unweighted performance-based *SERVPERF* instrument was a better method of measuring service quality. Their scale had a reliability rate rating from 0.88 to 0.96 (i.e., indicating a high degree of internal consistency), depending on the type of service industry, and exhibited good convergent validity and good discriminant validity.

Many other studies have developed, reflecting various aspects of the SERVQUAL measurement scale dimensions as their foundation. The SERVQUAL scale has been applied across varied service settings (Brown and Swartz 1989; Carman 1990; Kassim and Bojei 2002; Lewis 1987, 1991; Pitt, Gosthuizen and Morris 1992; Witkoski and Wolfinbarger 2002; Young, Cunningham and Lee 1994). Haywood-Farmer's (1998) attributes service quality model, for instance, dwells on the services three basic attributes, namely (1) physical

attributes and processes; (2) people's behaviour and (3) professional judgment, and tries to map different types of service settings as per degree of contact and interaction, degree of labour intensity, and degree of service customisation. Apart from being different from Brogowicz *et al.*'s (1990) synthesised model of service quality, this model attempts to integrate traditional managerial framework, service design and operations, and marketing activities, thus identifying the dimensions associated with service quality in a traditional managerial framework of planning, implementation and controlling service-marketing strategies that minimise the service quality gap. The synthesised model considers three factors, namely (1) company image, (2) external influences and (3) traditional marketing activities as the factors that influence technical and functional quality expectations. The performance-only model (Cronin and Taylor 1992) as discussed above conceptualises and measures service quality as an attitude, an antecedent of customer satisfaction. This is a different approach altogether from the ideal value model popularised by Mattsson (1992) as an outcome of the satisfaction process. As in any other field, evaluated performance and normal quality model (Tea 1993) not only challenges, but also raises a number of issues pertaining to conceptual and operational definitions of expectations, conceptual definition ambiguity and theoretical justification of expectations in the measurement of service quality.

### **3.4.2 The effectiveness of service quality measurement instruments**

As mentioned earlier, SERVQUAL scale has been criticised on various conceptual and operational grounds, in spite of its wide application. Additional examination and testing of the SERVQUAL has, for instance, not been supportive of its authors' claims. Various researchers claim that the five dimensions are not always generic and that they can vary depending on the type of service industry investigated (Carman, 1990; Babakus and Boller 1992). The major criticism has been the use of (P-E) gap scores; length of the questionnaire; the predictive power of the instrument; and the validity of the five-dimension structure (e.g. Babakus and Boller 1992; Cronin and Taylor 1992; Dabholkar, Shepherd and Thorpe 2000; Teas 1993 1994). In the (P-E) gap scores, that is, the disconfirmation model, most studies have found a poor fit between service quality measured through the Parasuraman *et al.* (1988) scale and the overall service quality measured through a single-item scale (Babakus and Boiler 1992; Babakus and Mangold 1989; Carman 1990; Finn and Lamb 1991; Spreng

and Singh 1993). Babakus and Boller (1992), and Iacobucci, Grayson and Ostrom (1994) have questioned the ability of these scores to provide additional information beyond the information already contained in the perception component of service quality (Vikalpa 2004). On further examining the conceptual, theoretical and measurement problems related to the disconfirmation model, Teas (1993, 1994) points out that a (P-E) gap of magnitude “-1” can be produced in the following six ways:

1. P=1, E=2
2. P=2, E=3
3. P=3, E=4
4. E=4, E=5
5. P=5, E=6
6. P=6, E=7

and these tied gaps cannot be construed as implying equal perceived service quality shortfalls (Vikalpa 2004). Difference scores have also been viewed as having psychometric problems and (P-E) scores should be used cautiously (Peter, Churchill and Brown 1993).

The problems associated with the conceptualisation and measurements of expectation component of the SERVQUAL scale have also been highlighted in the examination of the validity of (P-E) measurement framework. This has been in the light of the fact that while perception (P) is easily definable and measurable as the consumer’s belief about service is experienced, expectation (E) is subject to multiple interpretations and has therefore been operationalised differently by different authors and researchers such as Babakus and Inhofe (1991); Brown and Swartz (1989); Dabholkar *et al.* (2000); Gronroos (1990); and Teas (1993; 1994). Of particular interest is Parasuraman *et al.*’s (1985) initial definition of expectation and the comparison to “desires or wants of consumers” (Miller 1977), that is, what they feel a service provider *should* offer rather than *would* offer. According to Vikalpa (2004), the conceptualisation was based on the reasoning behind the term *expectation* where it has been used differently in service quality literature, as compared to the customer satisfaction literature where it is defined as a prediction of future events, that is, what customers feel a service provider *would* offer. Parasuraman *et al.* (1990) have viewed this “should be” expectation as “normative expectation” and similar to “ideal expectation” (Zeithaml and

Parasuraman 1991). For Parasuraman *et al.* (1994), the problems with this interpretation later make them propose a revised expectation ( $E^*$ ) measure, that is, what the customer would expect from “excellent” service.

Further criticism of the SERVQUAL scale is related to its reliability and validity (Cronin and Taylor 1990; Teas 1993). Cronin and Taylor (1992) argued that the conceptualisation and operationalisation of the SERVQUAL scale was inadequate and this has been confirmed by the failure of most researchers to replicate SERVQUAL’s five distinct dimensions (Carman 1990; Babakus and Boller 1992; Cronin and Taylor 1992) and validity (Cronin and Taylor 1992; Teas 1993). Cronin and Taylor (1992) reiterated that the perception–expectation gap theory of service quality was barely supported by theoretical and empirical evidence as an appropriate basis for measuring service quality. The criticisms also emanated from the notion that expectations are based on experience norms (Woodruff *et al.* 1983) and that consumers form expectations on the basis of prior experience with a certain service delivery firm, and that these experiences affect their expectations (Oliver 1980). Oliver argued that expectations should ideally be formed before any service encounter. There is also considerable support for the superiority of simple performance-based measures of service quality (Mazis *et al.* 1975; Woodruff *et al.* 1983; Bolton and Drew 1991). According to Cronin and Taylor (1992), this indicates preference for the use of performance-only perceptions as a measure of service quality. Cronin and Taylor (1992) assessed three alternatives to the original SERVQUAL scale. As a result of their examination of this scale, an importance-weighted SERVQUAL scale, a performance-based approach to the measurement of service quality called *SERVPERF* and an importance-weighted version of the *SERVPERF* scale in the four types of service firms (i.e., (1) retail banking, (2) pest control, (3) dry cleaning and (4) fast food) was developed. The result of their oblique rotation analyses suggested that the five-dimensional structure proposed by Parasuraman *et al.* (1988) was not confirmed in any of the four research samples and that all 22 attributes loaded on one single factor. The stepwise regression analyses affirmed that the unweighted performance-based approach (*SERVPERF*) was the most appropriate basis for measuring service quality. In all four service industries examined, the unweighted *SERVPERF* scale explained more of the variation in the global measure of service quality than any of the other three scales.

The vagueness of the expectation concept has, among many reasons, persuaded researchers such as Babakus and Boller (1992), Bolton and Drew (1991a), Brown, Churchill and Peter (1993), and Carman (1990) to advocate for the need to develop methodologically more precise scales. Coupled with the Internet, challenges have also been the viewpoint that prior research suggests that service quality tends to be context-bounded, service type-dependent, especially for people-delivered services (Bienstock 1997; Jun et al. 1988; van Dyke *et al.* 1997). For that reason, SERVQUAL has been considered insufficient not only for measuring service quality across industries and situations, but also for online service quality such as customer-to-website interactions, since this instrument was constructed based mainly on customer-to-employee interactions. Thus, with the growth of outsourcing, end-user-controlled information assets, joint ventures by which organisations meet their needs for information systems services, there has been a greater need to establish means of measuring service quality and strategies to improve service quality (Li, Tan and Xie 2002).

However, within the Internet environment, the argument of whether the empirical value of measuring expectations and operationalising service quality as a set of gap scores, whether the five SERVQUAL dimensions of (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibles were applicable across industries and within the Internet environment became the main reason why many researchers embarked on reconstructing the instrument in the electronic context.

### **3.5 THE NATURE OF ELECTRONIC RECORDS**

As a concept still in its infancy (Santos 2003), electronic service (e-service) has been characterised by the absence of an agreement on its definition (Rowley 2006). e-service has been defined as interactive services that are delivered on the Internet (Boylor *et al.* 2002) or web-based services (Reynolds 2000). It has been generally conceptualised as an information service or self-service (Rowley 2006). Voss (1999) has distinguished e-commerce from e-service as two ends of a continuum; the emphasis being that e-service may be delivered together with e-commerce or alone, either unconditionally or with a service contract.

e-service, as defined by Hoffman and Bateson (1997, p. 5) is “deeds, efforts or performances”. Rowley (2006) extends Hoffman and Bateson’s (1999) concept to embrace

all applications where service might be delivered with the mediation of information technology. This definition embraces all media and all kinds of interactions (Rowley 2006). For the purposes of this study, e-service is defined as “deeds, efforts or performance whose delivery is mediated by information technology (including the Web, information kiosks and mobile devices). Such e-service includes the service element of e-tailing, customer support and service, and service delivery” (Rowley 2006, p.13).

### **3.6 THE INTERFACE BETWEEN e-SERVICE EXPERIENCE AND TRADITIONAL SERVICE PERFORMANCE**

In e-service, the customer’s interaction or contact with the organisation is through technology, such as the website (Rowley 2006). Apparent in this encounter is the absence of face-to-face interaction, which is seen as central to relationship development (Zethaml *et al.* 2000). Most authors highlight the lack of support by e-service to build relationship the same way face-to-face interactions do (Schulter 2003). This is more interesting when viewed against the background that work on traditional service quality and its models are developed to capture the interpersonal nature of service encounters (Parasuraman and Grewal 2000; Bauer *et al.* 2003). Other authors have argued that e-service, unlike traditional service, delivers convenience as it is not constrained by distance and opening hours; enables customers to choose the channel through which they will acquire a product; the mode of delivery for the product and the extent to which the customer is involved in the design and delivery of the product (Rowley 2006).

What is transparent in this interface is the re-evaluation of the concepts of service and service quality measurement models as illustrated in the sections in this study.

A concept that is still in its infancy (Santos 2003), electronic service (e-service) has been characterised by the absence of an agreement on its definition (Rowley 2006). E-services have been defined as interactive services that are delivered on the Internet (Boylor *et al.* 2002) or web-based services (Reynolds 2000). It has been generally conceptualised as an information service or self-service (Rowley 2006). Voss (1999) has distinguished e-commerce from e-service as two ends of a continuum; the emphasis being that e-service



may be delivered together with e-commerce or alone, either unconditionally or with a service contract.

E-service, as defined by Hoffman and Bateson (1997, p.5), is “deeds, efforts or performances”. Rowley (2006) extends Hoffman and Bateson’s (1999) concept to embrace all applications where service might be delivered with the mediation of IT. This definition embraces all media and all kinds of interactions (Rowley 2006). In e-service, the customer’s interaction or contact with the organisation is through technology, such as a website (Rowley 2006). Apparent in this encounter is the absence of face-to-face interaction, which is seen as central to relationship development (Zeithaml *et al.* 2000). Most authors highlight the lack of support by e-service to build relationships the same way face-to-face interactions do (Schulter 2003). This is more interesting when viewed against the background that work on traditional service quality and its models are developed to capture the interpersonal nature of service encounters (Parasuraman and Grewal 2000; Bauer *et al.* 2003). Other authors have argued that e-service, unlike traditional service, delivers convenience as it is not constrained by distance and opening hours; enables customers to choose the channel through which they would acquire a product; the mode of delivery of the product, and the extent to which the customer is involved in the design and delivery of the product (Rowley 2006).

Zeithaml *et al.* (2000) identified 11 dimensions of online service quality in a series of focus group interviews, namely

1. access;
2. ease of navigation;
3. flexibility;
4. efficiency;
5. reliability;
6. personalisation;
7. security/privacy;
8. assurance/trust;
9. site aesthetic;
10. responsiveness; and

11. price knowledge.

Of particular interest has been the debate on whether extant service quality literature dominated by people-delivered services could be extended to e-service quality contexts; and what similarities and differences are there between the evaluative processes for service quality and e-service quality. Zeithaml *et al.* (2002) compare SERVQUAL and e-SERVQUAL dimensions. They demonstrate that some of the SERVQUAL dimensions apply to e-service, but that there are additional dimensions in e-service, many of which relate specifically to the technology (Zeithaml *et al.* 2002).

Among authors who have extended the SERVQUAL conceptualising to the electronic context is Gefen (2002), who collapsed the traditional service quality dimensions to the following three with online service quality (1) tangibles (2) a combined dimension of responsiveness, reliability and assurance and (3) empathy. His emphasis has been on the importance of the “tangibles” dimensions as crucial – increasing customer loyalty and trust even though items on the scale were changed for electronic context adaptation. Thus, in contrast to those studies that downplayed the human soft elements of service quality in the Internet environment, other studies have highlighted and adapted the soft issues of service quality in the electronic business contexts. In such studies, service quality constructs have been expanded to include not only dimensions that refer solely to e-commerce, but also to dimensions of traditional service constructs adapted to virtual environments (e.g., serviceability and assurance of staff).

Broderick and Vachirapornpurk (2002), on their proposed Internet banking model, have highlighted the key challenge of the Internet in the service quality field from an Internet banking perspective, as the service delivery channel, service firms management of service quality remotely and the impact of such technologies and changes on customer behaviour and interaction. The key elements considered as central influences on perceived service quality such as customer expectations of the service; the image of the service organisation; aspects of the service setting; the actual service encounter and customer participation still prevail. Areas of the management of quality are created within the service interface and the management of increased customer role. Thus the level and nature of the impact of

customer participation on the quality of service experience raises such aspects as customer's "zone of tolerance" and their degree of understanding.

Yoo and Donthu (2001) have developed a measurement instrument of online service quality, SITEQUAL, which consists of four dimensions, namely (1) ease of use, (2) aesthetic design, (3) processing speed and (4) security. It should be noted that these scales were precisely established for transactional websites, although e-retailing websites might provide some technological and communications functions to constructs to be considered in this study. Cox and Dale (2001) have noted that traditional service quality dimensions, such as competence, courtesy, cleanliness, comfort and friendliness are not relevant in the context of online retailing, whereas factors such as accessibility, communication, credibility and appearance are critical to the success of online businesses. Thus, in building a construct of service quality in e-commerce, they claimed that the lack of online human interactions means that such determinants as competence, courtesy, cleanliness, comfort and friendliness, helpfulness and care, commitment, flexibility are not particularly relevant in e-commerce but determinants such as accessibility, communication, credibility, integrity and trustfulness are equally applicable to e-commerce as in physical services. In contrast to those studies that downplayed the human, soft elements of service quality in the Internet environment, other studies have highlighted and adapted the soft issues of service quality in electronic business contexts. In such studies service quality constructs have been expanded to include not only dimensions that refer solely to e-commerce contexts (e.g., navigation, user interface) but also dimensions of traditional service quality constructs adapted to virtual environments (e.g., serviceability and assurance of staff). Madu and Madu (2002) developed a 15-dimensions scale for e-service quality based on better understanding of customer perspective and providing services to meet the needs and expectations of customers (Madu and Madu 2002). Madu and Madu (2002) include performance features, structure, aesthetic, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product/service differentiation and customisation, web store policies, reputation, assurance and empathy. Wolfinbarger and Gilly (2002), in turn, have proposed four factors of an online retailing experience, namely (1) website design, (2) reliability, (3) privacy/security and (4) customer service (this factor is primarily related to the customer-to-employee interactions).

According to Gounaris *et al.* (2005), different dimensions of perceived service quality are influenced by different antecedents (Gounaris *et al.* 2005). Yang and Fang (2004) examine the differentiation of dimensions to online service satisfaction and dissatisfaction, and the dimensions are responsiveness, reliability, credibility, competence, access, courtesy, communication, information, responsiveness and website design. According to them, there are four salient quality dimensions leading to both satisfaction and dissatisfaction and these are (1) responsiveness, (2) reliability, (3) ease of use and (4) competence (Yang and Fang 2004). Parasuraman *et al.* (2005) developed the E-S-QUAL dimensions scale for core service delivery, as follows:

1. *Efficiency*: The speed and ease of accessing and using the site.
2. *Fulfilment*: The extent to which the site's promises about order delivery and item availability are fulfilled.
3. *System availability*: The correct technical functioning of the site.
4. *Privacy*: The degree to which the site is safe and protects customer information.

An e-recovery service quality scale (E-RecS-Qual) of Parasuraman *et al.*'s (2005) E-S-QUAL for problem solution, which can only be applied to problem solving in e-service processes, has the following dimensions:

1. *Responsiveness*: Effective handling of problems and returns through the site.
2. *Compensation*: The degree to which the site compensates customers for problems.
3. *Contact*: The availability of assistance through telephone or online representatives (Parasuraman *et al.* 2005).

Kim *et al.* (2006) have extended the dimensions developed by Parasuraman *et al.* (2005) into a nine-dimensions scale in e-service quality in order to use them in for content analysis and evaluation of websites in the apparel retailing sector (Cristobal *et al.* 2007). Cristobal *et al.* (2007) developed an e-service quality model to illustrate different dimensions of e-service quality and their importance in a three-stage transaction process.

Table 3.1 shows the dimensions or features related to service quality literature. From these dimensions, the items that capture service quality are listed in Table 3.2.

**Table 3.2: Key dimensions/features related to service quality literature**

Authors	Method	Domain of study	Key dimensions/features related to service quality
Prasad et al. (1985)	Interviews with executives from four firms in four service sectors; 12 Customer focus-group interviews (three in each of the four service sectors)	Retail banking, credit cards, securities brokerage, maintenance securities	Reliability, responsiveness, competence, communication, credibility, security, understanding customer, tangibles, access
Prasad et al. (1988)	In the first stage 200 respondents recruited by a marketing research firm; In the second stage, survey, 200 respondents	In the first stage, retail banking, securities brokerage, credit cards, appliance repair or maintenance and long-distance telephone: In the second stage, bank, credit card, appliance repair or maintenance	Tangibles, reliability, responsiveness, empathy, assurance
Prasad et al. (1999)	Use secondary data of an e-mail survey	Online retailing (partially discussed)	Reliability, convenience of using online retailers' website, price competitiveness, access to information.
Prasad et al. (2000)	Six focus group online retailing interviews	Online retailing	Access, ease of navigation, efficiency, flexibility, responsiveness, personalisation, security/privacy, responsiveness, assurance/trust, site aesthetics, price knowledge
Dale (2001)	Literature review	Online retailing	Accessibility, communication, credibility, availability.
Prasad and Madu (2002)	Literature review	Online retailing	Performance, features, structure, aesthetics, capacity, serviceability, security and integrity, responsiveness, product/service differentiation, customisation, reputation, assurance, empathy
Prasad and Gilly (2002)	Online and offline focus group	Online retailing	Website design, reliability, privacy/security, and service

Authors	Method	Domain of study	Key dimensions/features related to service quality
	interviews		
Jun (2002)	Survey of 950 subscribers	Online retailing	Reliability, access, ease of use, security, personalisation, security, credibility, responsiveness, ease of use, reliability, availability, personalisation, access
et al. (2003)	Online retailing		Responsiveness, credibility, ease of use, reliability, convenience, communication, access, communication, courtesy, personalisation, security, collaboration, and aesthetics
Stoel (2004)	Online retailing		Web appearance, entertainment, information, transaction, capability, responsiveness, trust, transparency, reliability, responsiveness, empathy, assurance, communication and delivery
McMellon (2004)	Online retailing		Tangibility, reliability, responsiveness, assurance, communication and delivery
et al. (2005)	Online retailing		Website design, information, trust, responsiveness, reputation
Lin (2005)	Online retailing		Website design, reliability, responsiveness, trust, personalisation
et al. (2006)	Online retailing		Efficiency, fulfilment, system availability, privacy, graphic style, responsiveness, compensation, information
(1999)	Online survey 65 per cent retailers (999) Focused on Internet users from the channel instead of individual	Focused on Internet marketing	Communication utilities, distribution utilities, access

Authors	Method	Domain of study	Key dimensions/features related to service quality
	ClickinResearch's online Cyberleague™ online		
and Lohse (1999)	Analyse the online monthly random number of sessions regarding	Website design	Feedback sections on the retailers' websites, orga and structure of online categories
and Black (2000)	Develop dimensions based on the criteria established	Online travel agencies	Content and purpose, accessibility, na background, personalisation and customisation. and presentation, responsiveness,
arnett (2000)	Web and e-mail survey of 689	Website design	Quality of information and service, system use design quality
athy and Jones (2000)	Controlled survey of 201 students	Internet catalogue shopping	Pre-order information, post-selection info reliability, tangibility, empathy
Donthu (2001)	In the first stage , survey, 94 students in three marketing, classes	Online retailers' websites	Ease of use, aesthetic design, processing speed,
Cai (2001)	Content analysis of customers' comments	Online banking	Reliability, responsiveness, competence, c credibility, access, communication, understand customer, collaboration, continuous improvement
t al. (2001)	Two focus group interviews A survey of 400 students	Online library service	Contact, responsiveness, reliability, tangible
nd von Dran (2001)	76 students classify features into categories	CNN.com website	Information content, enjoyment, privacy, user, c and impartiality, navigation, organisation of info content, empowerment, visual appearance, t support
ar (1996)	e-service		Website design, reliability, delivery, ease



Authors	Method	Domain of study	Key dimensions/features related to service quality
<i>et al. (2002)</i>	e-service		enjoyment and control Security, communication, reliability, responsiveness, delivery
<i>a et al. (2003)</i>	e-service		Security, interaction, responsiveness, information, reliability, delivery and customisation,
<i>(2003)</i>	e-services		Ease of use, appearance, linkage, structure, efficiency, reliability, communication, security, information and customer support
<i>l. (2004)</i>	e-services		Website design, reliability, security, customer service
<i>l Fang (2004)</i>	e-service		Responsiveness, reliability, credibility, communication, access, courtesy, communication, information, responsiveness and website design
<i>man et al. (2005)</i>	e-service		Efficiency, availability, fulfilment, privacy, responsiveness, and compensation
<i>t and Koese (2006)</i>	e-service		Graphic quality, layout, reliability, attractiveness, selection, information, ease of use, technical functional benefit and emotional benefit
<i>(2006)</i>	e-services		
<i>(2007)</i>	e-services		
<i>al. (2003)</i>	Library e-services		Affect of service, personal control, access to information, library as place

### **3.7 THE EFFECTIVENESS OF ELECTRONIC SERVICE QUALITY MEASUREMENT INSTRUMENTS**

Various dimensions in electronic service quality measurement in recent research has grown (Surjadaja *et al.* 2003; Santos 2003; Yang *et al.* 2003, 2004; Field *et al.* 2004; Kim and Stoel 2004; Yang and Fang 2004; Lang and McMellon 2004; Gounaris *et al.* 2005; Lee and Lin 2005; Kim *et al.* 2006; Fassnacht and Koese 2006; Cristobal *et al.* 2007). It is evident that much of the current research work on e-service quality has been conducted in the areas of online retailing and online banking, and there has been limited attention on other service contexts (Rowley 2006). In the dimensions outlined in most of the studies analysed in this section, it has not always been easy to match the dimensions from one study to those of other studies due to the different approaches to dimensions between studies (Rowley 2006). Although some dimensions recur frequently, no dimension appears in all studies (Rowley 2006). And although some dimensions (such as reliability and responsiveness) are described with the same term in most studies, others are described with different terms in different studies (Rowley 2006). Extreme examples are “site features” variously represented by 12 other descriptors that might be sub-dimensions (namely site aesthetics, ease of use, ease of navigation, appearance, design, intuitiveness, visual appeal, ease of ordering, website performance, structure, flow and interaction and sensation), and “customer support” with different terms generally conveying the notion of customer support.

There are no well accepted conceptual definitions and models of e-service quality and its measurements (Seth *et al.* 2005). There has also been growing recognition of different variability in the outcome of e-service quality studies in terms of the dimensions of e-service quality (Waite 2006; Kim *et al.* 2006).

Some researchers have suggested that the development of the models go beyond the identification of e-service dimensions (Rowley 2006). Suggestions have also centred on the importance, not mere presence of certain attributes and dimensions (Santos 2003). This has been extended to suggestions that different dimensions of perceived service quality are influenced by different antecedents (Gounaris *et al.* 2005). Whilst they have found customer trust influences all over, they have identified four dimensions in their study; namely website design, information, trust, responsiveness and reputation (Gounaris *et al.*, 2005). Internet

familiarity only impacts on user friendliness (Gounaris *et al.* 2005). Yang and Fang (2004) suggest a differentiation between dimensions that are satisfiers and dissatisfiers. Authors such as Parasuraman *et al.* (2005) differentiate between dimensions for core service delivery and recovery service delivery.

Kim *et al.* (2006), who have identified efficiency, fulfilment, system availability, privacy, responsiveness, compensation, contact, information and graphic use dimensions, seek to operationalise and extend Parasuraman *et al.* (2005) in order to use them for content analysis, evaluation and benchmarking websites in apparel retailing sectors.

An analysis of the impact of the highlighted limitations of the current e-service quality measurement tools will be helpful in analysing the effectiveness of such scales in the integrated records and archives management field. In order to appreciate the nature of such an analysis, the section below examines the integrated electronic records management systems in the archival institutions.

The rapid development of the services industries and the rising competition amongst rival companies has resulted in an increasing need for service providers to identify gaps in the service provision and retain customers (Coulthard 2004). In the service sector, the provision of high-quality customer service has been of fundamental and paramount importance. Equally highlighted in the service quality literature as vital for attaining and retaining high-quality services have been the methods of assessing the quality of service provision. Thus service quality has become a popular area of academic investigation (Santos 2003). It has also become recognised as a key factor in differentiating service products and building competitive advantage (Ennew *et al.* 1993; Zeithaml *et al.* 1996). Until 1988, no such measurement technique had been devised in a generic form that could be applied across all service industries to identify consumers' expectations of the services proffered.

From Lozano's (2000) perspective, to become a user or customer oriented is a fundamental principle that has renewed and indeed dominates some of the current management trends, marketing included; its basis being an organisation's commitment to design and develop

products and services that meet its customer needs, especially against the backdrop that the customer is at the centre of the organisation and is the reason for its existence.

### **3.8 THE ELECTRONIC SERVICE MEASUREMENT SCALES IN ARCHIVAL INSTITUTIONS**

Within the existing electronic service quality measurement scales examined in several sections of this study, it should be noted that most of the inquiries cited and their findings do not measure service quality of archival institutions. One significant piece of work that is closer to the field of study under review is LibQUAL, an instrument specifically targeted to the evaluation of customer response to information service. The LibQUAL instrument works towards the incorporation of measures appropriate for measuring the performance of digital libraries (Heath et al. 2003). The dimensions of the LibQUAL tool are as follows:

1. *Affect of service:* The human side of the enterprise, encompassing traits of empathy, accessibility and personal competence.
2. *Personal control:* The extent to which users are able to navigate and control the information universe that is provided.
3. *Access to information:* An assessment of the adequacy of the collections themselves and the ability to access needed information on a timely basis.
4. *Library as place:* Comprising variously, according to the perspective of the user, utilitarian space for study and collaboration, a sanctuary for contemplation and reflection or an affirmation of the primacy of life of the mind in university priorities.

### **3.9 THE EFFECTIVENESS OF SERVICE QUALITY MEASUREMENTS IN ARCHIVAL INSTITUTIONS**

The LibQUAL instrument is grounded in the research library environment, which is not extendable to other services, including the extension to the unique features of the records and archives management environment highlighted on service quality delivery in public archival institutions (Sibanda 2005). Worth noting too is that service experiences associated with e-services environments is different from a service experience that is mediated through a human service agent, otherwise described as p-service (Li and Zhao 2003). The fundamental differences, for instance, between archives and libraries are based on one

central and all encompassing fact that the nature of the material collected by archives is fundamentally different from that found in libraries. ([www.collectionscanada.gc.ca/](http://www.collectionscanada.gc.ca/)). The language and customs of archives are also unique to the archival field. Archives are concerned with *archival fonds*, provenance and respect for original order, amongst many other principles. Such principles invariably affect the finding aids, that is, accessibility to archival material. As acknowledged by Gill (2006) in constructing the CIDOC Conceptual Reference Model, an object – oriented domain ontology for the interchange of rich and heterogeneous cultural heritage in information from museums, libraries and archives, these differences in descriptive schema across museums, libraries and archives are necessary for individual applications, although they seriously hinder cross-domain discovery and interoperability of cultural information resources in the global context of the Internet. Gill (2006)'s approach to a traditional compromise for providing access across heterogeneous information sources was to map everything to a simple schema with broad and universal semantic (resource discovery metadata), for the purposes of initial resource discovery. Whilst this approach has an obvious bias towards “cultural heritage collections” (mostly found in museums), which form only a small fraction of archival material, the source descriptions are “dumped down” to the broad universal semantics of the resource discovery schema, it may not provide adequate support for sophisticated queries or search precision across large datasets.

Besides the obvious bias towards the library environment, in the LibQUAL instrument, little has been done with the aggregate data in the methodology, not to mention the challenge in the ability to use the results to implement real innovations. The inherent limitations in the gap score and indeed on the study is its inability to provide a way of prioritising the gaps and identifying improvements beneficial to the user of the digital library. Moreover, historically libraries, archives and museums have separate, different catalogs and reference facilities, even where they are housed under one roof. An attempt to use variations of MARC Format for Archives and Manuscripts Control originating from the library environment has brought to the fore the need to analyse common library systems design characteristics in relation to archival materials and archival practices. Besides the very fact that the nature and intent of the material collected by archives are fundamentally different from that found in libraries, these differences have an impact on both the nature of archival bibliographic records and

the process of creating them. Consequently, retrieval of archival bibliographic records also differs ([www.collectionscanada.gc.ca](http://www.collectionscanada.gc.ca)). The archival bibliographic record has unique characteristics that are of concern in system design, especially the dynamic, complex nature of an archival bibliographic record which is subject to alterations or expansion. In addition, changes made to the original papers given to archives might take place in the process of describing and preservation of the papers. Most library bibliographic systems have not been designed intentionally to facilitate any changes to records, especially the type of changes needed by archival records. *Fonds* will contain information, for instance, about numerous diverse topics and, unlike library material, cannot be organised physically by subject. ([www.collectionscanada.gc.ca](http://www.collectionscanada.gc.ca)). These indexing problems then translate into retrieval needs that have to be accommodated in systems, but often are not as highlighted in the shortcomings of such referencing tools as CIDOC CRM. These retrieval shortcomings in turn translate into accessibility problems and obvious flaws in attempts to use measurement tools from the library environment, for, instance. As suggested by prior research, service quality tends to be context bound and service type dependent (Cai *et al.* 2003), hence such tools as LibQual are not sufficient enough to measure service quality in the archival field. Moreover, one service system and experience is different from the next in terms of its scope and nature (Rowley 2006). In fact, service quality outcome and measurement is dependent on type of service, situation, and time and need factors (Seth *et al.* 2005).

Knowledge on the LibQUAL dimensions and the ability to measure them help in yielding an insight into more effective ways of improving service quality, but for the purposes of most integrated electronic records management systems, these dimensions are very generic. The generic aspects of these dimensions become even more pronounced when one considers the following unique archives characteristics:

1. *Respect des fonds* or *provenance* principle.
2. Sanctity of the original order
3. The legal principle
4. Uniqueness

It is against the background of this analyses of the key findings in the current literature and the fact that “there is scope for further work on the measurement of e-service quality in

other contexts and specifically in information provision and digital content delivery which are both significant e-facilitated activities” (Rowley 2006, p. 17) that it becomes necessary to investigate the key dimensions and indeed develop a model to measure service quality of the integrated electronic records management systems if organisations are to strategically manage and preserve their intellectual capital-organisational knowledge.

Various dimensions in e-service quality measurement in recent research have increased (Surjadaja *et al.* 2003; Santos 2003; Yang *et al.* 2003, 2004; Field *et al.* 2004; Kim and Stoel 2004; Yang and Fang 2004; Lang and McMellon 2004; Gounaris *et al.* 2005; Lee and Lin 2005; Kim *et al.* 2006; Fassnacht and Koese 2006; Cristobal *et al.* 2007). Table 3.1 shows some of the studies in service quality and the dimensions measured. What should also be appreciated is that in the dimensions outlined in most of the studies in Table 3.1 it has not always been easy to match the dimensions from one study to those of other studies due to the different approaches to dimensions between studies (Rowley 2006). Although some dimensions recur frequently, no dimension appears in all studies (Rowley 2006). And although some dimensions, such as reliability and responsiveness, are described using the same term in most studies, others are described with different terms in different studies (Rowley 2006).

Kim *et al.* (2006), who have identified efficiency, fulfilment, system availability, privacy, responsiveness, compensation, contact, information and graphic use dimensions, seek to operationalise and extend Parasuraman *et al.* (2005).

The review and synthesis of past literature identified the dimensions of service quality listed in Table 3.3.

**Table 3.3: Service quality: Items and item sources**

Dimensions	Items	Item source
Reliability	1. Ability to perform promised service dependably and accurately (Parasuraman <i>et al.</i> 1988)	Parasuraman <i>et al.</i> (1988); Swaminatham <i>et al.</i> (1999); Santos (2003); Ziethaml <i>et al.</i> (2000); Madu and Madu (2002); Vijavasarathy and Jones

Dimensions	Items	Item source
		(2000); Wolfinburger and Gilly (2002); Yang <i>et al.</i> (2003); Long and McMellon (2004); Kim <i>et al.</i> (2006); Lee and Lin (2005); Fassnacht and Koese (2006); Jan and Cai (2001); O'Neil <i>et al.</i> (2003); Dobholkar (1996); Surjadaja <i>et al.</i> (2003); Field <i>et al.</i> (2004)
Responsiveness	1. Willingness to help customers and provide prompt services (Parasuraman <i>et al.</i> 1988)	Zeithaml <i>et al.</i> (2000, 2002); Jun and Cai (2001); Kim <i>et al.</i> (2006); Parasuraman <i>et al.</i> (1988, 2005); O'Neil <i>et al.</i> (2001); Madu and Madu (2002); Kim and Stoel (2004); Gounaris <i>et al.</i> (2005); Long and McMellon (2004); Yang and Fang (2004); Kaynama and Black (2000); Surjadaja <i>et al.</i> (2003); Yoo and Donthu (2001)
Assurance/Trust	1. Knowledge and courtesy of employees and their ability to inspire trust and confidence (Parasuraman <i>et al.</i> 1985)	Parasuraman <i>et al.</i> (1985); Zeithaml <i>et al.</i> (2000); Madu and Madu (2002); Kim and Stoel (2004); Gounaris <i>et al.</i> (2005); Kim <i>et al.</i> (2006)
Accessibility	1. The extent to which information is accessible and can be retrieved easily and quickly 2. System accessibility	Zeithaml <i>et al.</i> (2000); Swaminathan <i>et al.</i> (1999); Jun and Cai (2001); Cox and Dale (2001); Yang and Fang (2004); Li <i>et al.</i> (1999); Kaynama and Black (2000); Surjadaga <i>et al.</i> (2003)
Security/Privacy	1. The extent to which access to information is restricted appropriately to maintain its security	Parasuraman <i>et al.</i> (1985, 2005); Zeithaml <i>et al.</i> (2000, 2002); Yoo and Donthu (2001); Kim <i>et al.</i> (2006); Surjadaja <i>et al.</i> (2003); Dabholkar (1996); Wolfinbarger <i>et al.</i> (2002); Field <i>et al.</i> (2004);
Empathy	1. Caring, individualised attention the firm provides its customers (Parasuraman <i>et al.</i> 1985)	Parasuraman <i>et al.</i> (1988); Long and McMellon (2004); Vijavasathy and Jones (2000).
Integrity	1. Credibility	Cox and Dale (2001); Madu and Madu (2002); Jun and Cai (2001)
Tangibles	1. Physical facilities, equipment and presence of	Parasuraman <i>et al.</i> (1985); Gounaris <i>et</i>



Dimensions	Items	Item source
	personnel	<i>al.</i> (2005); Long and Mc Mellon (2004); Vijavasathy and Jones (2000); O’Neil et al. (2001);
Ease of use	1. Ease of manipulation of the system	Yang et al. 2003; Dabholkar (1999); Yoo and Donthu (2001); Santos (2003); Fassnacht and Koese (2006);

Tables 3.2 and 3.3 show the variables various authors have attempted to measure. There are different notions of the dimensions of service quality in various sectors as evidenced by the various definitions given to different variables and, at times, the same dimension defined differently across sectors. For instance, the variable “integrity” appears in many studies but does not define the same attribute across most of these studies. This further reinforces the viewpoint that service quality tends to be context-bounded and service type-dependent (Beinstock 1997; Jun et al, 1988).

### 3.10 SUMMARY OF THE CHAPTER

In summarising Chapter 3, it is noted that there are two groups from whose perspectives the measurement of service quality is concerned. One group of researchers supports the disconfirmation paradigm of perceptions minus expectations; and the other group supports the performance-based paradigm of a perceptions-only version of service quality. Although the perceptions minus expectations measures are widely used in the marketing literature, there is considerable support for the superiority of the simple performance-based paradigm of a perceptions-only version of service quality. There is growing support, as shown in the literature, for using the SERVPERF instrument as this method is based on a performance-based paradigm of perceptions-only measures, compared to SERVQUAL, which is based on the disconfirmation paradigm of perceptions measures.

Despite the fact that many scholars have looked at the concept of service quality, there is still lack of consensus in the conceptual definition of service quality as the literature offers diverse definitions, some of which have not been validated empirically. As pointed out earlier in this study, the use of diverse definitions found in the literature on service quality, especially if not validated empirically, impairs progress because of the challenges of

comparing and developing synthesis of what is not known. There is also no consensus about the dimensionality of service quality. Thus the lack of conceptual clarity on service quality, the divergent views on the dimensionality of service quality, and the absence of a psychometrically valid service quality measure in the archival institutions in the extant literature not only indicate a gap but also dearth in the literature on a service quality concept and a measurement instrument in the field.

Given the diverse measures in the literature, at times characterised by measurement flaws and similar dimensions measuring different aspects of the variables of service quality, this study, in setting out to develop a valid service quality measurement instrument in the archives sector using the Nunnally and Berstein (1994), Churchill (1979) and Hinkin (1978) approach of developing valid construct measures, adopted SERVPERF because of the supporting viewpoints highlighted in the chapter.

The next chapter will provide a complete overview of the research methodology; predominantly in line with the findings in the literature review and the field, using Nunnally and Berstein's (1994); Churchill's (1979) and Hinkin's (1978) approach to developing valid construct measurement instruments.

## **CHAPTER 4:**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **4.1 INTRODUCTION**

In the previous chapter, in analysing the service quality literature, the existing themes, frameworks and pertinent service quality attributes were identified and discussed. This chapter discusses the research philosophy, methods, techniques, procedures and processes including sampling, data collection and data analysis that were employed in the study. Reliability and validity, and ethical considerations are also discussed.

##### **4.1.1 The research questions**

The aim of this study was to develop and validate a service quality measurement instrument for archival institutions. The central research questions were:

###### **Research Question 1:**

What are the dimensions for the measurement of service quality in archival institutions?

###### **Research Question 2:**

How can the dimensions of service quality in archival institutions be effectively measured?

Research design can be regarded as a blue print, a master plan that specifies the methods, techniques and procedures for collecting and analysing the needed information or simply a framework or plan of action for the research (Charmaz 2003). As a set of logical steps taken by the researcher in a study, the research design invariably seeks to answer the research questions (Charmaz 2003). Research designs refer to the structure of an enquiry or investigation. Thus, every research requires a research design that is carefully tailored to the exact needs of the problem under investigation. The function of a research design is to ensure that the evidence obtained enables the researcher to answer the research questions as unambiguously as possible. Obtaining relevant evidence entails specifying the type of evidence needed to answer the research question (Hilla 2006; Bless *et al.* 2006). The research design presented in this thesis therefore flowed directly from the research problem statement and involved various issues such as the purpose of the study, the study setting, type of study, duration of the study (e.g., cross sectional or longitudinal), target population and unit of analysis, and all the methods,

techniques, protocols or procedures for doing research. It also included deciding what the sample should be, how the data would be collected, how the variables of interest would be measured, and how they would be analysed to answer the research questions (Charmaz 2003).

#### **4.2 THE RESEARCH DESIGN**

This research followed the standard psychometric procedures for developing measures of constructs as suggested by Nunnally (1978) and Hinkin (1998). Nunnally (1978), cited in Msweli (2011) defines a construct as a representation of something that does not exist as an observable dimension of behaviour. The research was divided into two phases in which a sequential mixed method was applied. In Phase 1, the qualitative method was used to collect qualitative data and in Phase 2, the quantitative method was applied to collect quantitative data as well as to analyse the data. These phases related to 7 steps, which are identified in Figure 1.1.1 in Chapter 1. The figure outlines the steps that were necessary for the development of a psychometrically valid instrument.

Phase 1 involved the generation of a sample of items. This was done qualitatively through reviewing literature, in-depth interviews and the Delphi Technique exercise of a panel of experts in the archives institutions. As the figure shows, in step 1, the domain of the construct of service quality was specified. Sample items were generated in step 2.

Phase 2 of this research was a quantitative process of data collection as already mentioned. A pre-test survey for assessing item relevance and clarity of meaning and data collection were done in steps 3 and 4 as indicated in Figure 1.1.1. Also Confirmatory Factor Analysis was done in step 4. Data collection is explained in more detail under the data collection section of this chapter. If the model fit to the data was good, the researcher would go ahead and assess the convergence and discriminant validity of the measure in step 5, otherwise, she would do Exploratory Factor Analysis (EFA) to purify the measure as step 5. After EFA, the next step 6 would be to assess the reliability and validity of the measurement instrument using confirmatory factor analysis, and convergent and discriminant validity employing SPSS AMOS in 7 of the measurement development study process).

### 4.3 POPULATION AND UNIT OF ANALYSIS

A population is a large pool of cases of elements from which the researcher draws a sample and results generalised from the drawn sample (Neuman, 2006), while a sample is a subset of the population or a small collection of units selected from the population for studying and coming up with generalisations that should be representative of the population (Cooper and Schindler 2004). The population of interest for this study comprised the professionals in the public archival institutions in the countries affiliated to the ESARBICA regional group and the researchers at the respective archival institutions in Eastern and Southern Africa. The member states of ESARBICA and the professional staff establishment are listed in Table 4.1. The respondents were experts in the public archival institutions (affiliated to ESARBICA member states). They were directors, deputy directors, archivists, researchers and records management officers.

The reasons for selecting these professionals as units of analysis were as follows:

- Directors and deputy directors have the responsibility for top management commitment at the corporate level (Webster 1992).
- Chief archivists have an understanding of the organisation's overall framework and of customer orientation at executive management level.
- Archivists or records managers and professional staff at the archives would possess good knowledge of the processes in the archival institutions.
- Researchers are users of archival systems and are viewed as the main category of clients or customers in the archives, although it should be noted that "customers" also exist in and between the archival departments outlined above. The researchers also included academics (professionals such as professors from the tertiary institutions from the ESARBICA universities). These basically became a strong source of information on the perspectives on issues under discussion from customers or researchers viewpoints.

**Table 4.1: ESARBICA member states and professional staff establishment:**

<b>Country</b>	<b>Professional staff establishment</b>
1. South Africa	43
2. Lesotho	16
3. Botswana	27
4. Namibia	21
5. Kenya	37
6. Malawi	25
7. Mozambique	32
8. Swaziland	14
9. Tanzania	24
10. Zambia	17
11. Zimbabwe	23
12. Zanzibar	15

According to Serumaga-Zake (2011), a research study's target population should be clearly defined and the unit of analysis should be identified, which is not easy sometimes. The target population consists of all the units being studied. The unit of analysis is the entity or who is being analysed (Serumaga-Zake 2011). Examples of unit of analysis are individual people, groups, organisations, divisions or departments. The unit of analysis should therefore describe the level at which the research is performed or at which data are analysed, that is, the level at which objects are researched. He defines data as facts or recorded measures of certain phenomena (things or events); and emphasizes that data is processed or summarized to give information that should be used to support decision making or define relationships between two facts or variables. From various levels of decision making, at a 'lower' level, management decisions, transactions or contracts, for instance, can also be units of analysis (Serumaga-Zake 2011). It should be noted that the unit of analysis and the kind of respondents may not be the same thing (Serumaga-Zake 2011). In this study, two types of unit of analysis were used. The primary unit of analysis was a professional in a public archival institution or archival industry. The secondary unit of analysis was the construct of "service quality" in the archival industry. The choice of unit of analysis was guided by Serumaga-Zake's (2011) assertion that the unit of analysis in research generally is related to the following three questions:

- What is your research problem and what do you really want to answer?
- What do you need to measure to answer your research problem or question?

- What do you want to do with the results of the study or whom do you address in your conclusion?

In the case of the research under review, the main objective of the research was to develop and validate a service quality measurement instrument. The research questions related to the dimensions for the measurement of service quality in archival institutions. Hence, the construct of service quality was invariably identified as the unit of analysis. The phases of this research study are explained in detail as follows:

#### **PHASE 1: QUALITATIVE METHOD**

As mentioned above, the qualitative method was employed in Phase 1 of the study. Different qualitative research methods in this study were applied in order to explore the phenomenon of service quality within the archival sector from various perspectives and in different sample groups. In the initial stages of the research, the domain of service quality was established and then a sample of items was generated. This was followed by data gathering using two qualitative techniques, namely in-depth interviews with experts in the field and a panel of experts engaged in the Delphi technique. First, background information on the qualitative research philosophy is discussed. Second, establishing the domain of service quality is presented. Third, the generation of a sample of items is discussed. Fourth, the Delphi technique tool is discussed. Fifth, the panel of experts is presented. Sixth, the sampling method used in Phase 1 is provided. Seventh, the qualitative data collection is discussed. Eighth, research instruments employed in Phase 1 are presented in detail.

#### **4.4 THE QUALITATIVE RESEARCH PHILOSOPHY**

Qualitative research constitutes one of the two major approaches to research methodology in the social sciences (Creswell 1994) and (Leedy 1997). The distinguishing characteristics of qualitative research are both methodological and philosophical (Patton, 1990). The simplest way to define *qualitative* is to state that it involves methods of data collection and analysis that are non-quantitative (Lofland and Lofland 1984). Another way of defining research is to point out that it focuses on quality – a term that refers to the essence or ambience of something (Berg 1998). Other researchers such as Adler and Adler (1987) would state that qualitative research involves a subjective methodology and that the self is used as the research instrument.

Qualitative research involves an in-depth understanding of human behaviour and the reasons why these behaviours manifest (Morgan 1979). Unlike quantitative research, qualitative research relies on the reasons underlying various aspects of behaviour. Thus, it focuses on the **why** and **how** of a topic and not on the **what**, **where** and **when** which is provided by quantitative research data (Taylor and Bodgan 1998; Patton 2002). Smaller sample groups rather than large and random samples are usually investigated. It is not straightforward to define qualitative research. Cassell *et al.* (2006) concur with Patton (1990) and highlighted reasons for the difficulties. Typically, various different approaches are clustered together under the term *qualitative*. A significant variety and range of the forms and uses of qualitative research are to be found in global literature. Furthermore, philosophical assumptions underlie quantitative research. Qualitative research acknowledges the contextual nature of inquiry. Van Maaden (1990) states that qualitative research is concerned with the meaning of a phenomenon rather than the frequency thereof, and that the phenomenon should be studied within its social context. Qualitative research entails acknowledging the difficulty of portraying and understanding the complexity of social reality on the basis of one set of data only (Irvine and Gaffkin 2006). Kirk and Miller in Irvin and Gaffkin (2006, p. 117) describe qualitative research as “watching people in their territory, interacting with them in their own language, on their own terms”. Dentin and Lincoln (1994) define qualitative research as involving a multi-method approach to make sense of things in their natural setting in terms of the meaning that people ascribe to them. Buckley and Chapman (1996) state that qualitative research seeks to understand the meaning and beliefs underlying actions and not the observable behaviour only. Qualitative research is often defined by what it is not – quantitative research. Qualitative research is not statistical analysis. Qualitative research, however, relies on the power of analysing numerical data (Irvine and Gaffkin 2005) and usually ends with either a confirmation or disconfirmation of the hypotheses tested (Leedy 1997). Whereas quantitative studies are supported mainly by a positivist or modernist paradigm, those conducting quantitative research operate from a range of different epistemological stances (Cassell *et al.* 2006). There are different meanings to the term qualitative research in different fields.

According to Creswell (1994), there are five fundamentally different assumptions that distinguish qualitative research from quantitative research:



1. *Ontological assumption:* Quantitative researchers typically assume a single objective world, while qualitative researchers typically assume that multiple, subjectively derived realities may coexist.
2. *Epistemological assumption:* Quantitative researchers assume their independence from the variables under study, whereas qualitative researchers commonly assume that they must interact with the phenomenon that they are studying.
3. *Axiological assumption:* Quantitative researchers act in a value-free and unbiased manner.
4. *Rhetorical assumption:* Qualitative researchers use impersonal, formal and rule-based text or language, whereas qualitative researchers use personalised, informal and context-based language.
5. *Methodological assumption:* Quantitative researchers apply deduction, limited cause-effect relationships and context-free methods organisations, divisions or departments, whereas qualitative researchers tend to apply induction, multivariate and multi-process interactions and context-specific methods.

Cassell *et al.* (2006) observe that the qualitative techniques may provide powerful tools for research and are found increasingly in all domains within the diverse organisational contexts. Platt (1996) stated that in qualitative research there is a greater desire to identify the unique characteristics that constitute specific cases. Mittman (2001) takes the application of qualitative research a step further than contributing only to theory formulation and testing, and describes its potential uses in deductive hypotheses testing. Howe and Eisenhart (1990) argue that the standards in respect of research should not be judged in terms of qualitative-versus-quantitative paradigms, but rather in terms of the successful investigation of problems. Patton (1990) argues that purity of method is less important than commitment to the quality of the information. Olson (2006) states that the theory or the discipline and the methodology applied are inevitably interlinked.

Although Hirsjarvi and Hurme (2001) stress the importance of planning around the order role and purpose of methods when using it in combination, they also state that studies that use mixed methods always aim at a similar end-result. The objective of the end-result is to validate research findings, to facilitate the interpretations of results and to inspire the research process.

Sofaer (1999) maintained that qualitative research is especially relevant to management research as the emphasis in qualitative research is on the understanding of complex, interrelated and/r changing phenomena. Sofaer (1999) added that a combination of qualitative and quantitative methods could lead to particularly robust and vibrant inquiries. Qualitative methods are useful only because they provide rich descriptions of complex human, cultural and organisational phenomena, but also in the construction and development of theories or conceptual frameworks, and in the generation of propositions and hypotheses to explain these phenomena (Moustakas 1994). In this thesis the researcher adopted a qualitative approach in the initial steps of the service quality measurement model with a view to building theory, and discovering themes and meaning as they related to the phenomenon of service quality in the archival institutions.

#### **4.5 ESTABLISHING THE DOMAIN OF SERVICE QUALITY**

It should be noted that in accordance with Nunnay (1978) and Hinkin (1998), in developing a psychometrically valid instrument, the domain of service quality construct had to be specified in this study. A review and synthesis of past literature not only identified the dimensions of service quality identified in Chapter three, but also provided the definitions of service quality required in specifying the domain of the construct and the items that capture it. However, in the absence of a consensus viewpoint in the definition of service quality construct, SERVPERF was adopted in this study. This further complemented the suggestion by Churchill (1979) that the first step in the procedure for developing better measures involves specifying the domain of the construct. Thus this study adopted Cronin and Taylor's (1992) work which located the concept of service quality as an attitude; and postulated that an individual's perception of service quality was only a function of its performance. SERVPERF is not only a more concise performance-based scale, but is an alternative to SERVQUAL measurement instrument and its 22 performance items adequately define the domain of service quality and these items are included in SERVQUAL. It excluded any consideration of expectation, which made SERVPERF a more efficient measure in comparison to SERVQUAL (Lee, Lee and Yoo 2000; Buttle 1996). SERVPERF has been empirically tested on a number of studies and found to explain more variance in overall service quality than SERVQUAL (Cronin and Taylor 1992; Lee, Lee and Yoo 2000; Quester *et al.* 1995, in Robinson 1999).

#### **4.6 THE GENERATION OF A SAMPLE OF ITEMS**

Phase 1 of this research also entailed the generation of a sample of items through a qualitative process. This process was done qualitatively and it included the interviews and the Delphi technique exercise conducted during the ESARBICA Conference in Namibia. This stage is identified as Step 2 in Figure 1.1.1 of the measurement development study process. Worth noting at this stage is the fact that extant literature provided information on the construct in general and that it was considered relevant in generating a broad initial set of items. According to Ghiselli, Campbell and Zedeck (1981), cited in Msweli (2011), domain sampling theory points out that it is not possible to measure the complete domain of interest. Of importance, according to Msweli (2011, p.13) is the ability to “draw a sample that represents the construct under examination”.

In order to appreciate the analysis processes undertaken in this study, brief background information on the qualitative research philosophy is given in section 4.4, and on the Delphi Technique tool and panel of experts are given respectively in sections 4.7 and 4.8.

#### **4.7 THE DELPHI TECHNIQUE TOOL**

The Delphi technique exercise was incorporated into the initial stages of the research. The exercise served not only to further explore the insights of service quality in the field under review, but also generated the sample of items coded at various levels in the exercise. The teams for the exercise were drawn from the list of experts provided in Appendix B. The Delphi technique is a widely used and accepted method for gathering data from respondents in their domain of expertise (Chia-Chien Hsu 2007). The technique is well suited as a means and method for consensus-building by using a series of questionnaires to collect data from a panel of selected subjects (Dalkey and Helmer 1963; Dalkey 1969; Linstone and Turoff 1975; Lindeman 1981; Martino 1983; Young and Jamieson 2001). The technique is designed as a group communication process which aims to achieve a convergence of opinion on a specific real-world issue. The Delphi process has been used in various fields of study such as programme planning, needs assessment, policy determination, and resource utilisation to develop a full range of alternatives, explore or expose underlying assumptions, and to correlate judgements on a topic spanning a wide range of disciplines (Chia-Chien Hsu 2007). The Delphi technique, in contrast to

other data-gathering and analysis techniques, employs multiple iterations designed to develop a consensus of opinion concerning a specific topic. As Ludwig (1994, p.55) points out:

Iterations refer to the feedback process. The process was viewed as a series of rounds; in each round every participant worked through a questionnaire which was returned to the researcher who collected, edited, and returned to every participant a statement of the position of the whole group and the participant's own position. A summation of comments made each participant aware of the range of opinions and the reasons underlying those opinions

In this study, the Delphi technique began with the initial development of a questionnaire focusing on the identified problem. The questionnaire developed is contained in Appendix B.

The advantages of the Delphi technique are the following:

- It allows participants to remain anonymous.
- It is inexpensive.
- It is free of social pressure, personality influence and individual dominance.
- It involves a mix of knowledgeable individuals on the subject matter who can provide a broad analytical perspective.
- It involves reliable judgment and forecast results.
- It is conducive to independent thinking and gradual formulation of ideas.
- The issue of confidentiality is facilitated by geographic dispersion of the respondents and the use of electronic communication such as electronic mail (e-mail) to solicit and exchange information. As such, certain downsides associated with group dynamics such as manipulation or coercion to conform or adopt a certain viewpoint can be minimised.
- The tools of statistical analysis allow for an objective and impartial analysis and summarisation of the collected data.

The disadvantages of the Delphi technique, among many others, are that there is

- a tendency to eliminate extreme positions and force a middle of the road consensus;  
and
- it is more time consuming, and requires adequate time and participant commitment.

The insights gained from the experts during the exercise were used not only in the generation of items, but also in the process of confirmation and re-confirmation of the identified dimensions.

#### **4.8 THE PANEL OF EXPERTS**

A panel of experts was used in Phase 1 of this research. As such, it is appropriate to provide a brief overview of the use of expert panels in a study. The Delphi technique's claim to credibility lies in its ability to draw on expertise (Miller 2001) and this is promoted by the purposeful selection of experts for inclusion on the panel rather than relying on random sampling. Since the term *expert* is contested (Hasson *et al.* 2000), it has been suggested that this title is misleading (McKenna 1994). In view of this debate, the term *panel of experts* was used in this study rather than *experts*. The general agreement is that key features of the respondents in the Delphi studies included both willingness and ability to make a contribution to the subject under examination (Goodman 1987). To avoid the potential for bias, diverse ways in which experts can be defined and mechanisms for identification of respondents have ranged from volunteers to nominations to acknowledgements of experience and knowledge. Exact and explicit criteria are set for inclusion in the panel for some studies (Rogers and Lopez 2002) while, for others assumptions of expertness are based on membership of a particular group (Campbell *et al.* 2000) or organisation (Snyder-Halpern 2002). In some cases it is based on practitioners in the field, professional accomplishments in the archives field, employment as practising archivists with at least some reasonable years' experience in the field or other issues such as training.

#### **4.9 SAMPLING METHOD**

Purposive sampling was used in Phase 1 of this study. Purposive sampling, also known as *judgemental, selective or subjective sampling*, is a type of non-probability technique as it relies on the judgement of the researcher when it comes to selecting the people to be studied; usually the sample being investigated is quite small. Unlike various other sampling techniques, the goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable the researcher to answer the research questions. What should also be noted is that the sample being investigated is not representative of the population, but for researchers pursuing qualitative or mixed methods research designs as in this case, this is not considered to be a weakness.

The researcher attended the 20th Biannual Conference of the ESARBICA held at the Windhoek Country Club, Windhoek, Namibia from 1 to 3 July 2009 and a pre-conference workshop, which afforded her the opportunity of interviewing the respondents. The theme of the conference was “Electronic Records Management Systems and the Management of Electronic Records”. An accessibility purposive sample of experts in the archival industry was drawn from the professionals of the delegates at the ESARBICA conference to whom the researcher administered a draft interview schedule. The delegates included directors, archivists, academics and users of archival institutions and academic institutions from Eastern and Southern Africa; and officials from the International Council of Archives. The initial small sample of five experts could be considered too small to provide a basis for sound generalisations because of what statisticians have traditionally blamed as qualitative studies’ lack of representativeness of small *n* studies (Kelle 2006). However, such perceived limitations of the findings from qualitative studies with small numbers of interviews in a limited domain may be further examined and tested in large-scale quantitative surveys (Kelle 2006) as was done under this study in Phase 2.

#### **4.10 DATA COLLECTION**

Data collection began with the conscious selection of certain subjects who could readily articulate their experiences and insights in the area under investigation (Burns and Grove 2001). A pre-test survey of items generated from the first step in the scale development process illustrated in Figure 1.1.1 was presented to a panel of experts. These experts were also later involved in Delphi technique sessions. The purpose of this pre-test was twofold. First, it was to tap into the insights of the experts at the archival institutions and to identify items that were specific to archival institutions that might not have been captured in the literature. The second purpose was to determine if the respondents felt that the items were relevant and clear in meaning (Msweli 2011). Test for clarity was performed by the panel of experts in the field. The interviewed experts and the panel of experts involved in the Delphi technique exercise were also asked to provide relevant service quality items that were not captured in the pre-test survey instrument. In-depth interviews were conducted with the purpose of gaining insights into the perspectives on service quality dimensions in the archival field.

Table 4.2 shows the research steps and data-gathering methods used in this study. These research steps also complemented the steps identified in Figure 1.1 on the recommendations

given by Nunnally (1987) and Hinkin (1998) on the standard psychometric procedure for developing measures of a construct.

**Table 4.2: Description of research steps and data collection methods**

<b>Research step</b>	<b>Purpose of research step</b>	<b>Data gathering method</b>
Literature analysis	Contextualise the research to establish domain of service quality construct as shown in Figure .1 Step 1 on the measurement development study process	Literature analysis
Panel of experts in the field	To understand the concept of service quality as viewed by experts in the field and generate a broad initial set of items	In-depth interviews of panel of experts in the field.
Panel of experts in the field	To explore the insights of service quality in the field; verify and discard the emerging concepts formulated from the above data-gathering methods	Delphi technique
Manual distribution of the survey instrument	To verify and discard the variables on the formulated instrument from the above data-gathering methods. To collect data to purify the measure	Systematic random sampling; manual distribution of the survey instrument.
Statistical analysis of collected data from survey instrument using SPSS.	Further analysis of generated items and other statistics using statistical software package SPSS.	Statistical analysis using SPSS to come up with dimensions of service quality in the archives field; test reliability and validity of the factors etc.

#### **4.11 RESEARCH INSTRUMENTS**

As already mentioned, the research instruments used in Phase 1 were the Delphi technique and the in-depth interviews of the experts in the field of interest. The overall purpose of the interviews was not only to gain some insights into the experts' perspectives, but to generate a sample of items in accordance with Step 2 of the measurement development study instrument (Churchill, 1979). The questions asked during the interviews are shown in Appendix A and included the following:

##### **i. Unstructured interviews**

The unstructured interviews questions included the following:

###### **QUESTION 1:**

Are you aware of any existing tool of measuring service quality of integrated electronic records management systems of archival institutions?

###### **QUESTION 2:**

Would a tool to measure service quality of integrated electronic records management systems of archival institutions be necessary and important in the field? Why? Why not?

###### **QUESTION 3:**

From whose perspective should service quality be measured?

###### **QUESTION 4:**

How is quality measured presently within your institution?

###### **QUESTION 5:**

How should quality be measured?

###### **QUESTION 6:**

Would service quality measurement be different from the measurements currently done in your section/department/institution?

###### **QUESTION 7:**



What do experts in the field perceive to be the key ingredients of service quality in the archival field?

Subsequent questions were based on the responses from the above questions. The advantages of these in-depth interviews were that the researcher could get a full range and depth of information and at the same time develop a relationship with the interviewees.

**ii. DELPHI technique exercise**

A single question was asked to trigger the exercise:

How should service quality in archival institutions be measured and what should be considered?

With the SERVPERF instrument being the preferred method to investigate service quality at the archival institutions, the data collected included the following:

**DELPHI TECHNIQUE EXERCISE AND THE IN-DEPTH INTERVIEWS:**

**QUESTION 1**

**Are you aware of any existing tool of measuring service quality of integrated electronic records management systems of archival institutions?**

**Excerpt A:**

..... no existing model  
..... not aware of any tool to measure service quality in the field  
..... we use LibQual which is used in libraries ... but archives material not the same as the library material ..... tool has such items as “library as the place” ..... these clearly show its bias towards libraries.  
.....hardly any.....  
..... Not that I know of.....

**QUESTION 2:**

**Would a tool to measure service quality of integrated electronic records management systems of archival institutions be necessary and important in the field? Why? Why not?**

**Excerpt B:**

....without measuring service quality you won't know where you are going....

....we need a tool appropriate to the field.....  
....been the major challenge in the archival world.....  
....we need one....  
....uniqueness of archives systems make it imperative for tool specific to archives systems to be formulated  
.... definitely  
....will be more than welcome.....

**QUESTION 3:**

**From whose perspective should service quality be measured?**

**Excerpt C:**

.....from customers who are also researchers....  
.....from customers' point of view.....  
.....researchers' viewpoint because they are the major customers....  
.....the archives staff should also be involved....  
.....researchers.....

**QUESTION 4:**

**How is quality measured presently within your institution?**

**Excerpt D:**

.....monthly reports written by respective departments ... for instance research archivist reporting on the number of researchers served at the search desk, type of records requested.....  
.....measured through comments from researchers' on visitors' book  
.....comments in the suggestion box.....  
.....use of LibQual .....

**QUESTION 5:**

**How should quality be measured?**

**Excerpt E:**

.....develop a tool that considers the unique characteristics of archives.....

.....formulate a tool with different dimensions that capture archives environment ...  
.....measure quality from archives perspective.....

**QUESTION 6:**

**Would service quality measurement be different from the measurements currently done in your section/department/institution?**

**Excerpt F:**

..... certainly.... we want to know what researchers want  
.....archival records/information is unique  
.....service quality measurement should be sector specific  
.....most systems are not records management systems hence their inability to maintain trustworthiness of records and inbuilt audit trails  
.....with document management systems one is able to manipulate the system whereas records management systems as systems will not allow you to delete....you only delete according to retention schedules ....  
.....yes.....  
.....without measuring service quality you won't know where you are going....  
.....we don't have any measurement in place.....

**Excerpt G: subsequent questions as follow up to responses from the above responses and the Delphi Technique exercise**

....trustworthiness of information very important ....should be measured  
.....trustworthiness is characterised by true record  
.....system should reflect originality of records.....  
....trustworthy records.... are authentic records....  
.....source trustworthy.....do they originate where they originate.....  
.....integrity of information and records.....  
.....records' authenticity.....  
.....reliability....."to what extent one can count on information provided at the site"  
.....accessibility.....  
.....'usability..... "a record which can be located, retrieved, presented and interpreted'

....preservation over time as essential for supporting accountability and transparency.....

#### **Excerpt H: Records Integrity**

Electronic records whose content can be trusted as a full and accurate representation of transactions, activities or facts to which it attests and can be depended upon in the course of subsequent transactions or activities

....complete and unaltered characteristic of a record...

.....not able to delete records.....

.....dependable.....

#### **Excerpt I: Authentic records**

.....prove to be what they purport to be and were sent or created by the person who purports to have created or sent them” ...

.....concern about the data migration .... results of data loss affecting records’ integrity and possible changes to the content or structure of record over time or across some migrations....

.....information should be what it claims to be....

.....should be used as evidence in any court of law ...

.....should be trusted....

.....show genuine sequence of activities....

.....events should come out clearly.....

#### **Excerpt J: other issues discussed:**

.....policies, procedure and systems and measures to prevent unauthorised access, alteration or physical damage to information,

....make sure there is no unauthorised entry in systems..

.....lot of hacking these days.....records should be secure ...

.....records include such information as birth certificates.... so should have secure systems...

.....can information from other legal sections deposited at the archives be secure to be used without any doubt.....

.... records/information should provide evidence of action.....

.....where information was captured is very important in the field.....

.....develop systems to help maintain worthiness of records....

.....good information technology and electronic records management policies...

.....good information systems.....

.....security of records important

From further discussions, interviews and clarification of points with the experts in the field, data from these excerpts and the Delphi technique were coded. The following themes and patterns started to emerge:

1. Trends and patterns of information related to people and not with the people
2. The emphasis during interviews was on quality of information, information dissemination and information integrity
3. The context or environment of information creation and movement
4. Information itself or information on the record.

These emerging patterns and themes were taken back to the experts for further clarification and discussion. From the discussions, the researcher came up with the following classifications, which eventually formed the basis of the formulation of the draft instrument:

#### **Integrity of information**

- Contents of information and whether it can be trusted
- The content of the record and whether it was representative of the transactions, activities or facts to which it attested
- The dependability of the record in relation to the course of subsequent transactions and activities
- The accuracy of the contents of the electronic record

#### **Authenticity of information**

- On whether the information on the record provided evidence of action
- On the genuineness or of the origin of the archive
- On whether the information or the record proved what it purports to be

- On whether the information on the record /the record has been sent or created by the person who purports to have created it.
- Whether the description on the record had been maintained as an archival document

**Security of information**

- In terms of the levels of security, does the record offer complete and unaltered characteristics of information
- Is the structure and content of information intact

**Reliability of archival information**

- In terms of whether the system for the electronic records delivery was technically functional most of the time
- Whether one could count on the information on the site
- Whether information on the record/site could support accountability
- Whether information on the record/record could support transparency

**Usability of Information**

- Whether information on the record/record could be easily located
- Whether information on the record or the record could be easily retrieved.

From the items generated in the extant literature, the interviews of the experts from the Conference delegates and the Delphi Technique exercise, Table 4.3 was formulated.

**Table 4.3: Items included in the pre-test expert survey instrument:**

<b>Dimensions</b>	<b>Items</b>	<b>Item source</b>
Reliability (of information)	1. The perceived service performance rating is that the system for the information is technically functional most of the time.	Parasuraman <i>et al.</i> (1988); Swaminatham <i>et al.</i> (1999); Santos 2003; Ziethaml <i>et al.</i> (2000); Madu and Madu (2002);
	2. The perceived service performance rating is that one can count on the information on the record.	Vijavasathy and Jones (2000); Wolfinburger and Gilly (2002); Yang <i>et al.</i> (2003);
	3. The perceived service performance	Long and McMellon

Dimensions	Items	Item source
	rating is that the information on the record can support transparency	(2004); Kim <i>et al.</i> (2006); Lee and Lin (2005); Fassnacht and Koese (2006); Jan and Cai (2001); O'Neil <i>et al.</i> (2003); Dobholkar (1996); Surjadaja <i>et al.</i> (2003); Field <i>et al.</i> (2004); Cronin and Taylor (1992); based on comments and suggestions solicited from the archives industry experts.
	4. The perceived service performance rating is that information on the record can support accountability.	
	5. The perceived performance rating is that the system should be able to perform as promised.	
Security/Privacy (security of information)	1. The perception that access to information is restricted appropriately to maintain its security.	Parasuraman <i>et al.</i> (1985, 2005); Zeithaml <i>et al.</i> (2000, 2002); Yoo and Donthu (2001); Kim <i>et al.</i> (2006); Surjadaja <i>et al.</i> (2003); Dabholkar (1996); Wolfenbarger <i>et al.</i> (2002); Field <i>et al.</i> (2004); based on comments and suggestions solicited from the archives industry experts.
	2. The perceived service performance rating that the record offers complete and unaltered characteristics of information.	
	3. The perceived service performance rating that the content of information on the record is intact.	
	4. The perceived notion that security refers to freedom from danger, risk or doubt during a service performance.	
	5. The extent to which access to information is restricted appropriately to maintain its security.	
Assurance of service/trust	1. Knowledge and courtesy of employees and their ability to inspire trust and confidence (Parasuraman <i>et al.</i> , 1985).	Parasuraman <i>et al.</i> (1985); Zeithaml <i>et al.</i> (2000); Madu and Madu (2002); Kim and Stoel (2004); Gounaris <i>et al.</i>

Dimensions	Items	Item source
	2. The perceived service performance rating that employees at the archives are very knowledgeable about their operations and systems.	(2005); Kim <i>et al.</i> (2006); based on comments and suggestions solicited from the archives industry experts.
	3. The perceived service rating that employees at the archives are courteous in their responses.	
	4. The perceived rating that archival institutions are able to convey trust and confidence of users.	
Responsiveness	1. Willingness to help customers and provide prompt services (Parasuraman <i>et al.</i> 1988).	Zeithaml <i>et al.</i> (2000, 2002); Jun and Cai (2001); Kim <i>et al.</i> (2006); Parasuraman <i>et al.</i> (1988, 2005); O'Neil <i>et al.</i> (2001); Madu and Madu (2002); Kim and Stoel (2004); Gouncriis <i>et al.</i> (2005); Long and McMellon (2004); Yang and Fang (2004); Kaynama and Black (2000); Surjadaja <i>et al.</i> (2003); Yoo and Donthu (2001)
Empathy	1. Caring, individualised attention the firm provides its customers (Parasuraman, 1985).	Parasuraman <i>et al.</i> (1988); Long and McMellon (2004); Vijavasathy and Jones (2000)
Integrity	1. Credibility.	Cox and Dale (2001); Madu and
Integrity of information	2. Perceived service performance rating that contents of the information/record can be trusted.	Madu (2002); Jun and Cai, (2001); based on comments and suggestions solicited from
	3. Perceived service performance rating that the record is representative of the transactions, activities or facts to which it attests.	the archives industry experts.
	4. Perceived service performance	



Dimensions	Items	Item source
	rating that the record can be depended on in the course of subsequent transactions and activities.	
	5. The perceived notion that the contents of the electronic record are accurate.	
Ease of use (Usability of information)	1. Ease of manipulation of the system. 2. The perceived performance rating that information on the record is easily retrievable. 3. The perceived notion that the record/information can be easily located. 4. The perceived performance rating that it is easy to interpret the information on the record.	Yang <i>et al.</i> (2003); Dabholkar (1999); Yoo and Donthu (2001); Santos (2003); Fassnacht and Koese (2006); based on comments and suggestions solicited from the archives industry experts.
Tangibles	1. Physical facilities, equipment and presence of personnel.	Parasuraman <i>et al.</i> (1985); Gounaris <i>et al.</i> (2005); Long and Mc Mellon (2004); Vijavasathy and Jones (2000); O'Neil <i>et al.</i> (2001)
Authenticity of information	1. The perceived service performance rating that the information on the record proves what it purports to be. 2. The perceived service rating that the information on the record provides evidence of actions. 3. The perceived service rating that the information on the record has been sent or created by the person who purports to have sent it. 4. The perceived service rating that the	

Dimensions	Items	Item source
	description of contents of the record has been maintained as an archival document.	

The statements that were derived from the extant literature, interviews of the panel of experts in the field and the Delphi Technique exercise are listed below:

**Statements derived from extant literature, interviews of experts and Delphi Technique**

**Exercise:**

1. Integrity of information at the archives is perceived by whether the contents of information/record can be trusted.
2. Integrity of information at the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which it attests.
3. Integrity of information at the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.
4. Integrity of information at the archives is perceived by whether the contents of the record can be trusted.
5. Authenticity of information is perceived by whether the information on the record provides evidence of actions.
6. Authenticity of the information is perceived by whether information on the record / the record proves what it purports to be.
7. Authenticity of the information is perceived by whether information on the record/ the record has been sent or created by the person it purports to have sent or created.
8. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document
9. Reliability of Information at the archives is perceived by whether the system for the information is technically functional most of the time.
10. Reliability of information at the archives is perceived by whether one can count on the information on the site.
11. Reliability of information at the archives is perceived by whether the information on the record/ record can be support accountability.
12. Reliability of information at the archives can be perceived by whether the

information on the record/ record can support transparency.

13. Usability of information at the archives is perceived by whether the information on the record /record can be easily located.
14. Usability of information at the archives is perceived by whether the information on the record/ record can be easily retrieved.
15. Usability of information at the archives can be perceived by whether it is easy to interpret the information on the record/record.
16. Usability of information at the archives is perceived by whether the system is able to perform as promised.
17. Assurance of service at the archives is perceived by whether the employees at the archival institution are very knowledgeable about their operations and systems.
18. Assurance of service at the archives is perceived by whether the employees at the archival institutions are courteous in their responses.
19. Assurance of service at the archives can be perceived by whether employees at the archival institution are able to convey trust and confidence of users of the archival systems.
20. Security of information at the archives can be perceived by whether the record offers complete and unaltered characteristics of information.
21. Security of information at the archives can be perceived by whether the structure and content of information on the record is intact.
22. Security of information at the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security.
23. Security of information at the archives is the perceived as the freedom from danger, risk or doubt during a service performance.

The statements above were formulated into a questionnaire, which was discussed in more detail under Phase 2 of this research.

## **PHASE 2: QUANTITATIVE METHOD**

In the second phase of the research, the researcher adopted a quantitative approach. This stage complemented Step 4 of the Measurement Development Process, in accordance

with Churchill (1979). The step indicated that the main purpose of data collection was to purify the measure using exploratory factor analysis. A cross-section survey was used in the second phase. In a bona fide survey the sample used is not selected haphazardly or only from persons who volunteer to participate. If it is scientifically chosen so that each person has a measurable chance of selection, the results can be reliably projected to the larger population. The sample used must be a good representation of the target population in each and every respect in order for the researcher to generalise the research results to the population. According to Saunder *et al.* (2007), surveys can be used to find out respondents' opinions, behaviours and attitudes. The size of the sample is also crucial, and time and cost factors must be considered. First, the sampling method applied in Phase 2 is discussed. Second, data collection is presented. Third, the measuring instruments used are provided. Fourth, data analysis and validation procedures are discussed.

#### 4.12 SAMPLING METHOD

In Phase 2 the systematic random sampling method was employed. The **linear systematic sampling scheme was used**. In systematic sampling, the first unit is selected using random numbers and the rest are selected according to a definite pattern. Suppose the object is to select a sample of size  $n$  from a population  $U$  of size  $N$  where  $N/n = k$  is an integer. In linear systematic sampling (ISS), first one unit is selected  $r$  (say) at random from 1 to  $k$ , then every  $k^{\text{th}}$  unit will be selected. The initial selected unit  $r$  is called the "random start" and  $k$  is called the "sampling interval". Thus, for the selection of a random start  $r (=1, \dots, k)$  a systematic sample  $s_r = \{r, r+k, r+2k, \dots, r+(n-1)k\}$  is selected with a probability,  $1/k$ . Systematic samples partition the population  $U$  into mutually exclusive and disjoint samples

$$\text{i.e. } \bigcup_{r=1}^k s_r = U \text{ and } s_i \cap s_j = \emptyset \text{ for } i \neq j.$$

On the first day of the conference the researcher gave researchers visiting the NASA in Pretoria the survey to complete. The survey instruments were also distributed to the archives employees who used the research section for various research activities. The researcher waited for the completed survey instruments. On day two and subsequent days,

the researcher distributed the survey instrument to researchers who visited the research section of the archives for research purposes and had not completed the survey instrument. This was the procedure followed for three months. An arrangement was made by the researcher and the research staff at the archives that the survey instrument be distributed only to new researchers who visited the archives. The completed forms were deposited in a box which the researcher would collect every week.

#### **4.13 DATA COLLECTION**

The survey method with a questionnaire was used to collect quantitative data. The Likert scale was employed to measure the variables. Besides getting information quickly and easily, the surveys could be completely anonymous; they are inexpensive to administer and can be administered to many people. However, the downside of the survey design was the possibility of not getting careful feedback from the respondents and the wording can easily bias the respondents' responses.

#### **4.14 MEASURING INSTRUMENTS**

The developed survey instrument was as a result of the statements that had been derived from the extant literature, interviews of the experts that were used in the study in the field and the Delphi technique exercise. The instrument is shown in Appendix C. The sample size was based on the number of questions in the instrument. The sample was of the size 207 therefore a minimum of nine times the number of questions in the instrument.

On the first page the questionnaire started with the demographic information section of the respondent. The survey dimensions were transformed into statements and measured against "perceived service performance" on a five-point Likert scale from "strongly disagree" = 1 to "strongly agree" = 5. Eighty per cent of the statements were worded positively, in accordance with recommended procedure for scale developments (Churchill, 1979). Note that the "perceived" worded statements were in line with the perspective (Cronin and Taylor, 1992) of service quality adopted in this study. In October 2010 the customer survey was validated for comprehension and completeness in advance through three structured interviews with researchers at the NASA.

To assess the structure of the scale, all the items generated were factor analysed using the principal component analysis. The choice of principal component analysis instead of common factor analysis was based on its appropriateness when the concern is about summarising data in a minimum number of factors (Hair *et al.* 1998). This was followed by varimax rotation. According to Hair *et al.* (1998), quoted by Msweli (2011), the frequent use of orthogonal rotational approaches necessitated by the limited development in analytical procedures for performing oblique rotation.

#### **4.15 DATA ANALYSIS AND VALIDATION PROCEDURES**

In step 5 of the Measurement Development Process suggested by Hinkin (1998), data in this study were collected for assessing reliability and validity of the measure using Confirmatory. Data were collected through the instrument administered at the NASA in Pretoria. Data analysis in a blended approach of methodologies would relate to the type of research strategy chosen for the procedures (Creswell 2003, p.220). Analysis occurs both within the quantitative (descriptive and inferential numeric analysis) approach and the qualitative (descriptive and thematic text or image analysis) approach and often between these approaches (Creswell 2003, p. 220). Themes and specific statements were obtained from participants in an initial qualitative data collection (Creswell 2003, p.221). In the next phase, these statements were used as specific items for scales to create a survey instrument that was grounded in the views of the participants (Creswell 2003, p. 221).

Data were entered into the statistical software package SPSS and checked for incorrect entries and missing data. A two-step data analysis was employed in this study. First, descriptive statistics were used to present the basic facts of all the variables involved. The preliminary analyses examined whether basic characteristics of the data set, that is, means, standard deviations, percentages, skewness and kurtosis were acceptable for further analyses. This also included the assessment of reliability coefficients and relationships between the variables and of the factor structure of the service quality measure. The purpose of examining estimates of internal consistency from the sample was to determine if the measures that were used had acceptable reliability levels or reliability estimates. Bivariate relation between the factors of service quality was conducted to determine how each variable associate itself with other variables.

#### 4.15.1 FACTOR ANALYSIS

A typical factor analysis suggests answers to four major questions:

- How many different factors are needed to explain the pattern of relationships among these variables?
- What is the nature of those factors?
- How well do the hypothesised factors explain the observed data?
- How much purely random or unique variance does each observed variable include?

*Exploratory Factor Analysis (EFA)* is used to uncover the underlying structure of a relatively large set of variables. This is the most common form of factor analysis. It is normally used when there is no prior theory and one uses *factor loadings* to know the factor structure of the data. *Factor loadings* are the correlation coefficients between the variables (rows) and factors (columns). The squared factor loading is the percent of variance in that variable explained by the factor. To get the percentage of variance in all the variables accounted for by each factor, you add the sum of the squared factor loadings for that factor (column) and divide by the number of variables. Loadings should be .7 or higher to confirm that independent variables identified a priori are represented by a particular factor, on the rationale that the .7 level corresponds to about half of the variance in the variable being explained by the factor. Some researchers, particularly for exploratory purposes, use a lower level such as .4 for the central factor and .25 for other factors. In this study, .3 was used as the cut-off point. Factor loadings must be interpreted in the light of theory.

**Assumptions** underlying EFA are:

- Interval or ratio level of measurement
- Random sampling
- Relationship between observed variables is linear
- A normal distribution (for each observed variable)
- A bivariate normal distribution (each pair of observed variables)
- Multivariate normality.

*Limitations* of EFA are as follows:

- The correlations, the basis of factor analysis, describe relationships, and no causal inferences can be made from correlations alone.
- The reliability of the measurement instrument (the researcher avoids an instrument with low reliability)
- Sample size can affect correlations: larger sample can cause larger correlation
- Minimal number of cases for reliable results is more than 100 observations and should be at least 5 times the number of items. Since some subjects may not answer every item, a larger sample is desirable. For example, 30 items would require at least 150 cases ( $5 \times 30$ ), a sample of 200 subjects would allow for missing data
- Sample selection: the sample must be a good representation of the target population, and pooling populations is not acceptable
- Variables could be sample-specific (e.g., a unique quality possessed by a group may not generalize to the population)
- It cannot work for non-normal distribution of data.

### **Criteria for extracting factors**

Determining the number of factors to extract in a factor analytic procedure means keeping the factors that account for the most variance in the data. Criteria for determining the number of factors are:

1. Kaiser's criterion considers factors with an eigenvalue greater than one as common factors (Nunnally 1978). The eigenvalue for a given factor measures the variance in all the variables which is accounted for by that factor. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as redundant with more important factors. Eigenvalues measure the amount of variation in the total sample accounted for by each factor. In this study, the Kaiser criterion was used to drop all components with eigenvalues under 1.0 but this was not used as the sole cut-off criterion for estimated the number of factors.



2. Cattell's (1966) scree test: On a scree plot, because each factor explains less variance than the preceding factors, an imaginary line connecting the markers for successive factors generally runs from the top left of the graph to the bottom right. If there is a point below which factors explain relatively little variance and above which they explain substantially more, this usually appears as an "elbow" in the plot. Cattell's guidelines call for retaining factors above the elbow and rejecting those below it. The scree plot (which plots the components as the X-axis and the corresponding eigenvalues as the Y-axis) was also used. All further components after the one starting the elbow were dropped. This rule is sometimes criticised for being amenable to researcher-controlled fudging (i.e., as picking the "elbow" can be subjective because the curve has multiple elbows or is a smooth curve, the researcher may be tempted to set the cut-off at the number of factors desired by his or her research agenda).
3. Proportion of variance accounted for keeps a factor if it accounts for a predetermined amount of the variance (e.g., 5%, 10%). The variance explained criterion was also applied. The cut-off point was 60 per cent of the variation in the data, as the researcher's goal was also to emphasise **parsimony** (i.e., explaining total variance with as few factors as possible).

### **Interpretability criteria**

- 1) Are there at least 3 items with significant loadings ( $>0.30$ )?
- 2) Do the variables that load on a factor share some conceptual meaning?
- 3) Do the variables that load on different factors seem to measure different constructs?
- 4) Does the rotated factor pattern demonstrate simple structure? Are there relatively:
  - i. high loadings on one factor?
  - ii. low loadings on other factors?
- 5) EFA decomposes an adjusted correlation matrix. Variables are standardized in EFA, e.g., mean=0, standard deviation=1, diagonals are adjusted for unique factors,  $1-u$ . The amount of variance explained is equal to the trace of the

matrix, the sum of the adjusted diagonals or communalities. Squared multiple correlations (SMC) are used as communality estimates on the diagonals. Observed variables are a linear combination of the underlying and unique factors.

- 6) Factors account for common variance in a data set. The amount of variance explained is the trace (sum of the diagonals) of the decomposed adjusted correlation matrix. Eigenvalues indicate the amount of variance explained by each factor.

The EFA model is:

$$Y = X\beta + E$$

Where

$Y$  is a matrix of measured variables

$X$  is a matrix of common factors

$\beta$  is a matrix of weights (factor loadings), and

$E$  is a matrix of unique factors, error variation.

Communality is computed for each variable. Communality is the variance in that variable accounted for by all the factors. It measures the percentage of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the variable. In other words, each observed variable's communality is its estimated squared correlation with its own common portion, that is, the proportion of variance in that variable that is explained by the common factors. It is computed by summing squares of factor loadings for all factors for a given variable (row). A large communality value indicates a strong influence by an underlying construct. If the communality exceeds 1.0, there is a spurious solution, which may reflect too small a sample or the researcher has too many or too few factors. If you perform factor analyses with several different values of  $m$ , as suggested above, you will find that the communalities generally increase with  $m$ . But the communalities are not used to choose the final value of  $m$ . Low communalities are not interpreted as evidence that the

data fail to fit the hypothesis, but merely as evidence that the variables analysed have little in common with one another.

When the factor model is fit to the data, the factor loadings are chosen to minimise the discrepancy between the correlation matrix implied by the model and the actual observed matrix. The amount of discrepancy after the best parameters are chosen can be used as a measure of how consistent the model is with the data. The most commonly used test of model adequacy, the chi-square test was applied in this study. The null hypothesis for this test was that the model adequately accounted for the data, while the alternative was that there was a significant amount of discrepancy. Unfortunately, this test is highly sensitive to the size of the sample, such that tests involving large samples will generally lead to a rejection of the null hypothesis, even when the factor model is appropriate. The sample size of 208 was adequate, since the rule of thumb for SEM is that modelling requires at least 10 observations per indicator (Nunnally 1967). The exact sample size varies with the number of variables or indicators and factors in the model, but typically you require around 200 subjects for a standard model. Some researchers suggest a minimum sample size of between 100 and 200 for factor analysis to be conducted.

The measurement model contains the relationships between two or more factors and their indicators. The factors can either be correlated or not. Usually, each indicator loads on one factor, but models with one indicator loading on different factors are possible. The chi-square statistic is very sensitive to sample size, rendering it unclear in many situations whether the statistical significance of the chi-square statistic is due to poor fit of the model or to the size of the sample. This uncertainty has led to the development of many other statistics to assess overall model fit (Stevens 1996). Alternatively, the chi-square goodness-of-fit statistic tests the null hypothesis that there is no statistically significant difference in the observed and theoretical covariance structure matrices. Goodness-of-fit index (GFI) is a “measure of the relative amount of variances and covariances jointly accounted for by the model” (Joreskog and Sorbom 1986, p.41). It is roughly analogous to the multiple R squared in multiple regression. A model is considered to have a better fit when “it has a lower ratio computed as the noncentrality parameter divided by degrees of freedom” (Thomas and Thompson 1994, p.10). The closer the GFI is to 1.00, the better is the fit of the model to the

data. The adjusted goodness of fit statistic is based on a correction for the number of degrees of freedom in a less restricted model obtained by freeing more parameters. Both the GFI and the AGFI are less sensitive to sample size than the chi-square statistic. The values of GFI, AGFI, NFI, and CFI should exceed 0.9 for a good model fit.

The parsimony ratio is important when interpreting the data because the statistic takes into consideration the number of parameters estimated in the model. The fewer number of parameters necessary to specify the model, the more parsimonious is the model and the simpler the interpretation of the model will be. It should be noted that more than one model may accurately describe the data and that a number of fit indices should be used to determine the fit of the various models (Biddle and Marlin 1987; Thompson and Borrello 1989). Therefore, finding a model with a good fit does not mean that the model is the only or optimal model for that data. In addition, because there are a number of fit indices with which to make comparisons, "fit should be simultaneously evaluated from the perspective of multiple fit statistics" (Campbell, Gillaspay and Thompson 1995, p.6). When a confirmatory analysis fails to fit the observed factor structure with the theoretical structure, the researcher can evaluate ways to improve the model by exploring which parameters might be freed that had been fixed and which might be fixed that had been freed. Computer packages can be utilised to change parameters one at a time in order to determine what changes offer the greatest amount of improvement in the fit of the model. The model is needed to be modified in order to improve the fit, thereby estimating the most likely relationships between variables.

**Confirmatory Factor Analysis (CFA)** is the next step after exploratory factor analysis to determine the factor structure of the dataset. In the EFA we *explore* the factor structure (how the variables relate and group based on inter-variable correlations); in the CFA we *confirm* the factor structure we extracted in the EFA. **CFA** seeks to determine if the number of factors and the loadings of measured variables on them conform to what is expected on the basis of a theory. The variables are selected on the basis of the theory and factor analysis is used to see if they load as predicted (by the theory) on the expected number of factors. The clearer the true factor structure, the smaller the sample size needed to discover it. But it would be very difficult to discover even a very clear and

simple factor structure with fewer than about 50 cases, and 100 or more cases would be much preferable for a less clear structure. You perform factor analyses with different numbers of factors, complete with rotation, and choose the one that gives the most appealing structure. **Rotation** allows you to identify meaningful factor names or descriptions. In this study, **Principal Component Analysis (PCA)**, which seeks a linear combination of variables such that the maximum variance is extracted from the variables used. It is called the principal axis method because it results in **orthogonal** (uncorrelated) factors, which is necessary for discriminant validity. Principal axis factoring (PAF) seeks the least number of factors which can account for the common variance (correlation) of a set of variables.

### **Rotation**

Rotation serves to make the output or results more understandable and is usually necessary to facilitate the interpretation of factors. The orthogonal rotation method, Varimax method, which requires the factors to remain uncorrelated was used. *Varimax rotation* is an orthogonal rotation of the factor axes to maximise the variance of the squared loadings of a factor (column) on all the variables (rows) in a factor matrix, which has the effect of differentiating the original variables by extracted factor. The tendency of this type of rotation is that each factor will have either large or small loadings of any particular variable. A varimax solution yields results which make it as easy as possible to identify each variable with a single factor. This is the most common rotation option.

### **Model fit**

Model fit refers to how well the proposed factor model accounts for the correlations between variables in the dataset. If one is accounting for all the major correlations inherent in the dataset (with regard to the variables in the model), then there will be a good fit; if not, then there is a significant "discrepancy" between the correlations proposed and the correlations observed, and thus one has poor model fit, meaning that the proposed model does not "fit" the observed or "estimated" model (i.e., the correlations in the dataset). There are specific measures that can be calculated to determine the goodness of fit. The Kaiser-Meyer-Olkin (KMO) test measures sampling adequacy. It is an index that is used to compare the magnitudes of the observed correlation coefficients to the magnitudes of the

partial correlation coefficients (see *SPSS User's Guide*). The KMO value should be greater than 0.5 for a satisfactory factor analysis to proceed. Large values for the KMO measure indicate that a factor analysis of the variables is justified. Bartlett's test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. The metrics that ought to be reported are listed below, along with their acceptable thresholds. Goodness of fit is inversely related to sample size and the number of variables in the model. Thus, the thresholds below are simply a guideline. For more contextualized thresholds, see Table 12-4 in Hair *et al.* (2010, p. 654).

Measure	Threshold
Chi-square/df (CMIN/df)	3<Good; 5< sometimes permissible
P-value for the model	>0.05
CFI	>.95 Great; >.90 traditional; sometimes permissible
GFI	>.95
AGFI	>.80
SRMR	<.09
RMSEA	<.05 Good; .05 - .10 moderate; >.10 bad
PCLOSE	>.05

However, structural equation modelling (SEM and CFA specifically rely on several statistical tests to determine the adequacy of model fit to the data. The chi-square test indicates the amount of difference between expected and observed covariance matrices. A chi-square value close to zero indicates little difference between the expected and observed covariance matrices. In addition, the probability level must be greater than 0.05 when chi-square is close to zero; this is where the model is acceptable.

In this study, the GFIs used included the chi-square test, chi-square–degrees of freedom ratio, the Bentler comparative fit index (CFI) (Bentler 1990), the parsimony ratio, and the GFI (Joreskog and Sorbom 1989), and the *root mean square error of approximation* (RMSEA) (which is an estimate of discrepancy per degree of freedom in the model). Acceptable model fit is indicated by a chi-square probability greater than or equal to 0.05. GFI and AGFI were not used for the computer software (SPSS AMOS) does not compute them. As for

exploratory factor analysis (EFA), in the case of CFA, a researcher should have at least two or three variables for each factor in his or her model. Unlike EFA, however, he or she should choose variables that are strongly associated with the factors in the model.

The CFI is equal to the discrepancy function adjusted for sample size. CFI ranges from 0 to 1, with a larger value indicating better model fit. Acceptable model fit is indicated by a CFI value of 0.90 or greater (Hu and Bentler 1999). RMSEA is related to residual in the model. RMSEA values range from 0 to 1 with a smaller RMSEA value indicating better model fit. According to Hu and Bentler (1999), acceptable model fit is indicated by an RMSEA value of 0.06 or less. If model fit is acceptable, the parameter estimates are examined. The ratio of each parameter estimate to its standard error is distributed as a z statistic and is significant at the 0.05 level if its value exceeds 1.96 and at the 0.01 level if its value exceeds 2.56 (Hoyle 1995). Unstandardised parameter estimates retain scaling information of variables and can only be interpreted with reference to the scales of the variables. Standardised parameter estimates are transformations of unstandardised estimates that remove scaling and can be used for informal comparisons of parameters throughout the model. Standardized estimates correspond to effect-size estimates.

### **Modification indices**

Modification indices offer suggested remedies to discrepancies between the proposed and estimated model (Schumacker and Lomax 1996). In a CFA there is not much one can do by way of adding regression lines to fix model fit, as all regression lines between latent and observed variables are already in place. Therefore, in a CFA, the researcher looks to the modification indices for the covariances. Error terms cannot be covaried with observed or latent variables, or with other error terms that are not part of the same factor. Thus, the only modification available is to covary error terms that are part of the same factor. CFA is a statistical technique used to verify the factor structure of a set of observed variables. CFA allowed the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. In this study, the researcher used knowledge of the theory, literature review and experts to the archives institution to postulate the relationship pattern a priori and then tested the hypothesis statistically. A blueprint was developed, questions were drafted, a scale that would measure service

quality in the archival institutions was determined, which was pilot tested before data were collected to perform CFA. The blueprint identified the factor structure. However, some questions did not measure what the researcher thought they should and the hypothesis was rejected. The factor structure was therefore not confirmed, and EFA was the next step.

Before CFA was done, the factor structure model was specified (using theory, literature review as indicated above and interviews of panels of experts in the archival field); model identification was determined and preliminary descriptive statistical analysis (e.g., scaling, missing data, collinearity issues, outlier detection) was conducted. Then the parameters in the model were estimated and model fit was assessed. The SPSS AMOS program was used. EFA was used to determine what the factor structure looked like according to the participant responses. Exploratory factor analysis was essential to determine underlying constructs for a set of measured variables. After the EFA, CFA was again used to allow the researcher to test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) existed. For the use of CFA, the requirement of sufficient sample size of between 5 and 20 cases per parameter estimate was adhered to. The requirement of normality of the variables used was also met. Outliers were excluded using the Mahalanobis distance criterion. The data did not have missing data.

Second, confirmatory factor analysis (CFA) was investigated using structure equation modelling (SEM) that uses maximum likelihood estimation (MLE). This was followed by an assessment of model fit to determine the degree to which the measurement model fits the data (Joreskog and Sorbom 1989). In evaluating the fit of the model recommendations by Schermelleb-Engel, Moobrunner and Miller (2003) were followed. Their recommendations are such that for an acceptable model fit, the ratio of chi-square should be less than 5, the Root RMSE should be less than or equal to .08, the standardised root mean square should be less than .05, the Tucker-Lewis Index (TLI) should be greater than or equal to .95 and the Comparative Fit Index (CFI) should also be greater than or equal to .90 (Schermellen-Engel, et al. 2003). The RMSEA, TLI, and CFI were chosen because they were found to be less affected by the size of the sample when compared to the Normative Fit Index (NFI), the GFI, and the Adjusted Goodness of Fit Index (AGFI) (Schermellen-Engel *et al.* 2003).



### **Justification for using Confirmatory Factor Analysis**

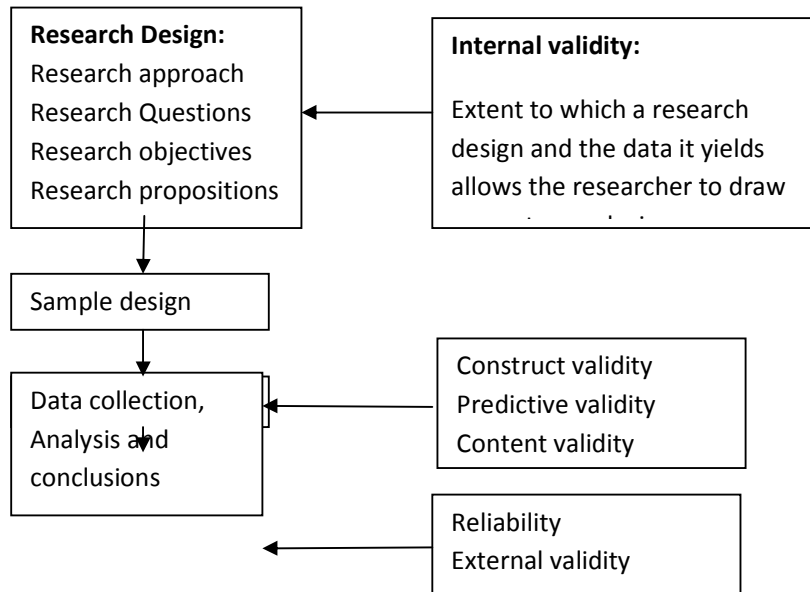
CFA was selected to refine and validate the measurement scale. CFA was identified as an appropriate statistical test as the researcher had reasonably sound knowledge of the observed variables that were likely to be reliable indicators of a particular factor (Sureshchander *et al.* 2002). Given the fact that the proposed instrument is based on logic, previous empirical research and theoretical findings, the CFA approach was considered the most appropriate method to confirm the proposed factors of dimensions statistically in an instrument measuring the service quality of integrated electronic records management systems in archival institutions. The primary objective of a CFA, according to Serumaga-Zake (2011), is to determine the ability of a predefined factor model to fit an observed set of data. There are other common uses of CFA and these include the following:

- Evaluating a measurement instrument. When a measure accurately reflects the concept it is intended to measure, it is considered to be valid (Serumaga-Zake 2011). The validity of a measure is assessed through quantifying convergent validity and discriminant validity. It should be noted that content validity is addressed in the development stage of a measurement tool. Expert views on the clarity comprehensiveness and redundancy of the measurement tool are some of the commonly used approaches of assessing content validity (Serumaga-Zake 2011). For quantifying convergent and divergent validity, the Pearson correlation coefficient has been the most used statistic; and a coefficient of 0.4 has been used as evidence (Cappelleri *et al.* 2004).

### **4.16 RELIABILITY AND VALIDITY**

Reliability and validity tests are important in standardising the proposed measurement scale, and to demonstrate whether it truly measures what it is supposed to measure. It should also be noted that validation of findings occurs throughout the steps in the process of research (Creswell, 2003). Thus a series of steps taken to check the validity of both the quantitative data and the accuracy of qualitative findings is an important objective in the data analysis of various research methods that needs to be described (Creswell, 2003:221). According to Thorndike *et al.* (1991), quoted in Serumaga-Zake (2011), reliability refers to the accuracy and precision of a measurement procedure. Reliability can also be viewed as a function of properties of the underlying construct being measured, the test itself, the groups being assessed and the purpose

of assessment. Reliability answers the question: how well does the instrument measure what it purports to measure (see Serumaga-Zake 2011)? Figure 4.1 illustrates the phases of research when validity and reliability are determined in research.



**Figure 4.1: Phases of research when validity and reliability are determined**

Source: Prof. Msweli lectures: Unisa Graduate School for Business Leadership

When studies use different data collection and analysis methods, the researcher’s goal is often to triangulate to increase validity (Koro-Ljungberg 2004, p.604). It should be noted that use of different strategies approaches and methods in this research also introduced the triangulation issues in this study. Denzin (1970) identified four forms of triangulation:

1. *Data triangulation:* The gathering of data through several sampling strategies, so that different data sets at different times, social situations on different people are collected.
2. *Investigator triangulation:* Where more than one researcher in the field gathers data and interprets the data.
3. *Theoretical triangulation:* Where more than one theoretical position is used in interpreting data.
4. *Methodological triangulation:* Where more than one method for gathering data is used.

Within qualitative research practices, collecting data from multiple sources (data triangulation); analysing data through different analysis methods (methodological triangulation) or using multiple theoretical perspectives (theoretical triangulation) are often seen as a means of increasing trustworthiness (Denzin and Lincoln 2005). Validity does not, for instance, carry the same connotations as it does in quantitative research, nor is it a companion of reliability (examining stability or consistency of responses) or generalisability (the external validity of applying results to new settings, people or samples). In a limited way, qualitative researchers can use reliability to check for consistent patterns of theme development among several investigators in a team (Creswell 2003). Overall, however, reliability and generalisability play a minor role in qualitative inquiry (Creswell 2003). It should also be noted that the mixed methods approach, however, does not focus on promoting validity through triangulation as triangulation is not the reason for combining multiple theoretical perspectives, for instance (Lenzo 1995). However, the qualitative data strategies that was used to check the accuracy of the findings was the triangulation of data sources, member checking, and detailed description (Creswell 2003). Validity is, in fact, seen as a strength of qualitative research, but used to suggest determining whether the findings were accurate from the researcher's standpoint, the participant or the readers of an account (Creswell and Miller 2000). Trustworthiness, authenticity and credibility (Creswell and Miller 2000) are terms used on validity in the literature and which is a highly debated topic (Lincoln and Guba 2000).

Triangulated research strategies research strategies were used to ensure the quality of research and make it credible by the scientific community the researcher gave due care to both validity and reliability issues of the data, the research process as well as the output. The need for triangulation arises from the ethical need to confirm the validity of the processes. This could be done by using multiple sources of data (Yin 1984). Triangulation increases the reliability of the data and the process of gathering it. In the context of data collection, triangulation serves to corroborate the data gathered from other sources.

In terms of measurement procedures, validity is the ability of an instrument to measure what it is designed to measure. "Validity is defined as the degree to which the researcher has measured what he has set out to measure" (Kumar 2005). In this study, following the

guideline by Yin (1994) Construct validity was achieved by the use of multiple sources of evidence during data collection and having key informants review the draft case study report at composition phase. Internal validity will be tested by doing pattern-matching. explanation building and time-series analysis at the data analysis phase of the study. To insure external validity the researcher used both sufficient sample size and the systematic random sampling procedure. In addition, the content validity was checked by ensuring that the data collection instruments (i.e., questionnaire and interview schedule) were designed very carefully to include all the necessary questions related to answer the problem statement. All the principles of constructing a questionnaire were strictly followed. This includes length of the questionnaire, the structure, format, the length and clarity of questions, etc.

The validity of the research instruments were therefore, established by following the logic in which the questions was checked and rechecked against the objectives of the study both by the researcher and by asking the support of experts. Pre-testing of the data collection instruments was also done to increase the validity of the instrument. The actual questionnaires will be distributed incorporating feedbacks from the pilot studies.

If a research tool is consistent and stable, and, hence, predictable and accurate, it is said to be reliable. The greater the degree of consistency and stability in an instrument, the greater is its reliability. The question whether the instrument is reliable is judged by the ability of an instrument to produce consistent measurements. There are various types of reliability test; the most common method used in many studies is internal consistency reliability (Litwin 1995). The Cronbach's alpha coefficient (which is an index of reliability associated with the variation accounted for by the true score of the "underlying construct.") test was conducted to measure the internal consistency reliability. The issue of reliability was also assured by sticking to the research results to be concluded only from the gathered data. The random selection of the sample from the target population, using a good representative sample of the target population and the right sample size ensured a high reliability of the study.

In this research, different validity terms were used to demonstrate various aspects of construct validity. This research utilized convergent, discriminant and criterion related

validity to indicate the ability of the measurement items to measure accurately the constructs of this study (Hair *et al.* 1995).

#### **4.17 ETHICAL CONSIDERATIONS**

Respondents must be asked for their consent to participate in the study, no one should be forced or tricked to participate in the survey unwillingly, and free to pull out at any time during the study. Privacy and rights must be observed and no physical or emotional harm should be caused to the respondent and the interviewer. Respondents must be asked for their consent to participate in the study. , No one would be forced or tricked to participate in the survey unwillingly, and free to pull out at any time during the study. The researcher must be honest when reporting the results. Information must be collected by means of a standardized procedure so that every individual is asked the same question in more or less the same way.

Individual respondents should never be identified in reporting survey findings; completely anonymous summaries, for example, in terms of tables and charts should be given. Ethically, confidentiality concerns must be observed, for e.g., using only number codes to link the respondent to a questionnaire and storing the name –to- code linkage information separately from the questionnaire, and refusing to give the names of respondents to anyone outside the research project.

Given the stages of the study, a proposal for process consent was requested. Process consent offered the opportunity to actualize a negotiated view and to change arrangements where necessary. Process consent encouraged mutual participation (Munhall 1991). The process consent was discussed with all potential participants at the ESARBICA Conference and on meetings or correspondence. Arrangements that were negotiated included:

- Lines of communication between the researcher, participants and archival institutions hierarchy
- Location of interviews
- Length of time for interviews

- How information will be treated (confidentiality and anonymity)
- Taping of interviews
- What will be done with unanticipated findings
- When and how progress of study will occur and will be reported

All participants were informed verbally and in writing that the study participation was on voluntary basis. Options on written consent to participate were obtained from those who volunteered to withdraw from the study at any time. At all times the provision of any information collected and/or analyzed was communicated to participants as is reasonable practicable, especially prior to any publications of the study.

The researcher was honest when reporting the results. Individual respondents were assured that they should never be identified in reporting the survey findings and that completely anonymous summaries would be given, for example, in terms of tables and charts should be given. All confidentiality concerns were observed, including using only number codes to link the respondent to a questionnaire and storing the name –to- code linkage information separately from the questionnaire, and refusing to give the names of respondents to anyone outside the research project.

#### **4.18 SUMMARY OF THE CHAPTER**

This chapter covered the research design, population and sample size, sampling, sampling frame, sampling method, data collection plan, ethical considerations, and data analysis. The measurement development study process for this study is outlined in the chapter. This research followed the standard psychometric procedures for developing measures of constructs. The study was divided into two parts, namely Phase 1 and Phase 2. These phases relate to the steps identified in Figure 1.1 in Chapter one which outlines the steps necessary for the development of a psychometrically valid instrument. Phase 1 is shown in Figure 1.1 as the generation of items. This was done qualitatively through interviews of a panel of experts and the Delphi technique exercise undertaken with experts in the archives industry. Step 2 of Figure 1.1 involved the generation of sample items from extant literature and the insights and observations obtained from the experts in the field during the ESARBICA Conference in Namibia in 2009. A pre-test

survey was conducted for assessing item relevancy and clarity of meaning. Data were then collected to purify the measure. The measurement purification was done through an iterative sequence of analysis which included (1) factor rotation analysis to verify the dimensionality of the service quality measurement scale; (2) computation of reliability coefficients to each component as well as item-to-item component correlations for each item; (3) deletion of components consisting of less than three items and/or deletions of items whose item to components correlations are low, and (4) restructuring of components and reassignment of items where it was necessary. This process was repeated.

As pointed out in this study, the researcher used knowledge of the theory, literature review and panel of experts to postulate the relationship pattern a priori and then tested the hypothesis statistically. A blueprint was developed, questions were written, a scale that would measure the service quality of information in archival institutions was determined, which was pilot tested before data were collected to perform CFA. The blueprint identified the factor structure. However, some questions did not measure what the researcher thought they should. The factor structure was therefore not confirmed, and EFA was the next step.

Before CFA was done, the factor structure model was specified (using theory, literature review, interviews and the Delphi technique exercise on the panels of experts in the archival field), model identification was determined and preliminary descriptive statistical analysis (e.g., scaling, missing data, collinearity issues, outlier detection) was conducted. Then the parameters in the model were estimated and model fit was assessed. The SPSS AMOS program was used. EFA helped to determine what the factor structure looked like according to the participant responses. Exploratory factor analysis was essential to determine underlying constructs for a set of measured variables. After the EFA, CFA was again used to allow the researcher to test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) existed.

The total result revealed a clear factor pattern for service quality dimensions containing service quality attributes. The next step was the assessment of the reliability and validity of the service quality measurement instrument. The next chapter is on the presentation and the analysis of the findings of this research.

## **CHAPTER 5:**

### **DATA ANALYSIS AND PRESENTATION OF RESEARCH FINDINGS**

#### **5.1 INTRODUCTION**

The purpose and focus of this study was to develop and subsequently test a service quality measurement instrument in archival institutions. This chapter provides data analysis and a presentation of the research findings. The chapter is divided into two main sections. The first section provides the results of Phase 1 and the second section provides the results of Phase 2 of this study. Since the results in Phase 1 fed into the proceedings of Phase 2, the analysis of each step of the development of the measurement instrument in the respective phases was done concurrently/sequentially. In analysing and interpretation of the results in these phases, the research questions of this study were used as the guide. The research questions were:

##### **Research Question 1:**

What are the dimensions for the measurement of service quality in archival institutions?

##### **Research Question 2:**

How can the dimensions of service quality in archival institutions be effectively measured?

In answering the above research questions, the data analysis and presentation of the findings of this study also followed the various steps in the measurement development study process illustrated in Chapter 1. Phases 1 and 2 related to the steps identified in Figure 1.1 (Chapter 1); and outlined the steps necessary for the development of a psychometrically valid instrument. Phase 1 related to the generation of a sample of items. This was done qualitatively through in-depth interviews and the Delphi technique exercise of a panel of experts in the archival industry who attended the ESARBICA conference in Windhoek, Namibia. This was in essence step 2 of Figure 1.1. Phase 2 of this research related to a quantitative process of data collection and Confirmatory Factor Analysis (CFA) as highlighted by steps 3 and 4 of Figure 1.1. Step 5 was purification of the measure by using Exploratory Factor Analysis (EFA). Step 6 entailed assessment of reliability and validity using CFA again. It should be noted that instead of collecting new data in step 6, the researcher



divided the original dataset into two - the first dataset being used to conduct the EFA and the second dataset being used for performing the second CFA. Convergent and discriminant validity assessment of the measure was done in step 7 (of Figure 1.1) in accordance with Nunnally (1978) and Hinkin (1998).

The statistical results of the study were produced in Phase 2 of the study. The first section of Phase 2 provided the descriptive statistics (tabular and graphical) for the dimensions of service quality at the archival institutions. The second section of Phase 2 presents the results of factor analysis (- in reducing the number of dimensions and variables associated with service quality at the archival institutions).

## **PHASE 1: QUALITATIVE DATA ANALYSIS**

### **5.2 Step 1: Specification of domain of construct**

In developing a psychometrically valid measurement instrument, the domain of the service quality construct in the archival institutions was specified in accordance with Nunnally (1978) and Hinkin (1998). A review and synthesis of past literature in the field of service quality not only identified the dimensions of service quality discussed in Chapter 3 of this study, but it also provided the definitions of service quality required in specifying the domain of the construct and the items that capture it. In the absence of a consensus viewpoint in the definition of the service quality construct, SERVPERF was adopted in this study. The construct adopted from the work of Cronin and Taylor (1992) located the concept of service quality as an attitude; and postulated that an individual's perception of service quality was only a function of its performance. As a performance-based measurement it was also viewed as an alternative to SERVQUAL measurement instrument and its 22 items. It excluded any consideration of expectations; which made it more efficient in comparison to SERVQUAL (Lee and Yoo 2000; Buttle 1996). SERVPERF has also been tested empirically in a number of studies and found to explain more variance in overall service quality than SERVQUAL (Cronin and Taylor 1992; Lee and Yoo 2000; Quester *et al.* in Robinson 1999).

The interviewees on the panel of experts reached the general consensus that service quality was a function of perceptions only during the Delphi technique exercise. The viewpoint confirmed the service quality perspective adopted in this study (Cronin and Taylor 1992). It should be noted that some of the interviewees in the archives field were only familiar with the SERVQUAL methodology. After careful explanation of the difference between the two methodologies, the experts unanimously preferred the use of SERVPERF to investigate service quality measurement in the archival institutions.

### **5.3 Step 2: Generation of a sample of items**

The generation of a sample of items was done qualitatively through the analysis of extant literature, in-depth interviews of experts and the Delphi technique exercise at the ESARBICA Conference in Namibia. Listed below are the findings from the interviews of the panel of experts and the Delphi technique exercise.

#### **DELPHI TECHNIQUE EXERCISE AND IN-DEPTH INTERVIEWS**

##### **QUESTION 1:**

**Are you aware of any existing tool of measuring service quality of integrated electronic records management systems of archival institutions?**

##### **Excerpt A:**

1. ... no existing model
2. ... not aware of any tool to measure service quality in the field
3. ... we use LibQual which is used in libraries...but archives material not the same as the library material...tool has such items as “library as the place” ...these clearly show its bias towards libraries.
4. ...hardly any...
5. ... Not that I know of...

##### **QUESTION 2:**

**Would a tool to measure service quality of integrated electronic records management systems of archival institutions be necessary and important in the field? Why? Why not?**

##### **Excerpt B:**

1. ...without measuring service quality you won't know where you are going...
2. ...we need a tool appropriate to the field...
3. ...been the major challenge in the archival world...
4. ...we need one...
5. ...uniqueness of archives systems make it imperative for tool specific to archives systems to be formulated
6. ... definitely
7. ...will be more than welcome...

**QUESTION 3:**

**From whose perspective should service quality be measured?**

**Excerpt C:**

1. ...from customers who are also researchers...
2. ...from customers' point of view...
3. ...researchers' viewpoint because they are the major customers...
4. ...the archives staff should also be involved...
5. ...researchers...

**QUESTION 4:**

**How is quality measured presently within your institution?**

**Excerpt D:**

1. ...monthly reports written by respective departments...for instance research archivist reporting on the number of researchers served at the search desk, type of records requested...
2. ...measured through comments from researchers' on visitors' book
3. ...comments in the suggestion box...
4. ...use of LibQual...

**QUESTION 5:**

**How should quality be measured?**

**Excerpt E:**

1. ...develop a tool that considers the unique characteristics of archives...
2. ...formulate a tool with different dimensions that capture archives environment...
3. ...measure quality from archives perspective...

**QUESTION 6:**

**Would service quality measurement be different from the measurements currently done in your section/ department/institution?**

**Excerpt F:**

1. ... certainly.... we want to know what researchers want
2. ...archival records / information is unique
3. ...service quality measurement should be sector specific
4. ...most systems are not records management systems hence their inability to maintain trustworthiness of records and inbuilt audit trails
5. ...with document management systems one is able to manipulate the system whereas records management systems as systems will not allow you to delete....you only delete according to retention schedules ...
6. ...yes...
7. ...without measuring service quality you won't know where you are going...
8. ...we don't have any measurement in place...

**Excerpt G: subsequent questions as follow up to responses from the above responses and the Delphi Technique exercise**

1. ...trustworthiness of information very important ...should be measured
2. ...trustworthiness is characterised by true record
3. ...system should reflect originality of records...
4. ...trustworthy records.... are authentic records...
5. ...source trustworthy...do they originate where they originate.....

6. ...integrity of information and records...
7. ...records' authenticity...
8. ...reliability... "to what extent one can count on information provided at the site"
9. ...accessibility...
10. ...'usability... "a record which can be located, retrieved, presented and interpreted"
11. ...preservation over time as essential for supporting accountability and transparency...

**Excerpt H: Records Integrity**

1. Electronic records whose content can be trusted as a full and accurate representation of the transactions, activities or facts to which it attests and can be depended upon in the course of subsequent transactions or activities
2. ...complete and unaltered characteristic of a record...
3. ...not able to delete records...
4. ...dependable...

**Excerpt I: Authentic records**

1. ...prove to be what they purport to be and were sent or created by the person who purports to have created or sent them"...
2. ...concern about the data migration...results of data loss affecting records' integrity and possible changes to the content or structure of record over time or across some migrations...
3. ...information should be what it claims to be...
4. ...should be used as evidence in any court of law ...
5. ...should be trusted...
6. ...show genuine sequence of activities...
7. ...events should come out clearly...

**Excerpt J: other issues discussed:**

1. ...policies, procedure and systems and measures to prevent unauthorised access, alteration or physical damage to information,

2. ...make sure there is no unauthorised entry in systems...
3. ...lot of hacking these days...records should be secure ...
4. ...records include such information as birth certificates...so should have secure systems...
5. ...can information from other legal sections deposited in the archives be secure to be used without any doubt...
6. ...records/information should provide evidence of action...
7. ...where information was captured is very important in the field...
8. ...develop systems to help maintain worthiness of records...
9. ...good information technology and electronic records management policies...
10. ...good information systems...
11. ...security of records important

**Discussion on excerpts A–J and the Delphi technique exercise:**

Discussions on how to measure service quality revealed it as complex. The literature review identified perceptions on how best to measure service quality as discussed in Chapter three. There was a general consensus that service quality is a function of the perceptions only, a viewpoint held by some of the interviewees and participants in the Delphi Technique exercise.

From further discussions, interviews and clarification of points with the panel of experts in the field, data from excerpts A–J and the Delphi technique was coded. The following themes and patterns started to emerge:

1. Trends and patterns of information related to people and not with the people
2. The emphasis during interviews was on quality of information, information dissemination and information integrity
3. The context/environment of information creation and movement
4. Information itself or information on the record.

These emerging patterns and themes were taken back to the panel of experts for further clarification and discussion. From the subsequent discussions, the researcher came up with

the following classifications, which eventually formed the basis of the identification of variables in the formulation of the draft measurement instrument:

### **Integrity of information**

- Contents of information and whether it can be trusted
- The contents of the record and whether it was a representative of the transactions, activities or facts which it attested
- The dependability of the record in relation to the course of subsequent transactions and activities
- The accuracy of the contents of the electronic record

### **Authenticity of information**

- On whether the information on the record provided evidence of action
- On the genuineness of or the origin of the archive
- On whether the information or the record proved what it purported to be
- On whether the information on the record/the record has been sent or created by the person who purports to have created it.
- Whether the description on the record had been maintained as an archival document.

### **Security of information**

- In terms of the levels of security, does the record offer complete and unaltered characteristics of information
- Is the structure and content of information intact.

### **Reliability of archival information**

- In terms of whether the system for the electronic records delivery was technically functional most of the time
- Whether one could count on the information on the site
- Whether information on the record/site could support accountability
- Whether information on the record/record could support transparency.

### Usability of information

- Whether information on the record/record could be easily located
- Whether information on the record or the record could be easily retrieved.

The above emerging trends and themes from the interviews of the panel of experts, the Delphi technique exercise, together with the dimensions and items emerging from the literature synthesis and examination were analysed. Table 5.1 shows the resultant dimensions and items.

**Table 5.1: Items included in the pre-test expert survey instrument**

Dimensions	Items	Item source
Reliability (of information)	<ol style="list-style-type: none"> <li>1. The perceived service performance rating is that the system for the information is technically functional most of the time.</li> <li>2. The perceived service performance rating is that one can count on the information on the record.</li> <li>3. The perceived service performance rating is that the information on the record can support transparency.</li> <li>4. The perceived service performance rating is that information on the record can support accountability.</li> <li>5. The perceived performance rating is that the system should be able to perform as promised.</li> </ol>	Parasuraman <i>et al.</i> 1988; Swaminatham <i>et al.</i> 1999; Santos, 2003; Ziethaml <i>et al.</i> 2000; Madu and Madu 2002; Vijavasathy and Jones 2000; Wolfinburger and Gilly 2002; Yang <i>et al.</i> 2003; Long and McMellonm 2004; Kim <i>et al.</i> 2006; Lee and Lin 2005; Fassnacht and Koese 2006; Jan and Cai 2001; O'Neil 2003; Dobholkar 1996; Surjadaja <i>et al.</i> 2003; Field <i>et al.</i> 2004; Cronin and Taylor 1992; based on comments and suggestions solicited from the archives industry experts.
Security /privacy (security of information)	<ol style="list-style-type: none"> <li>1. The perception that access to information is restricted appropriately to maintain its security.</li> <li>2. The perceived service performance rating is that the record offers complete and unaltered characteristics of information.</li> <li>3. The perceived service performance</li> </ol>	Parasuraman <i>et al.</i> 1985, 2005; Zeithaml <i>et al.</i> 2000, 2002; Yoo and Donthu 2001; Kim <i>et al.</i> 2006; Surjadaja <i>et al.</i> 2003; Dabholkar 1996; Wolfinbarger <i>et al.</i> 2002; Field <i>et al.</i> 2004; based on comments and suggestions solicited from the archives



Dimensions	Items	Item source
	<p>rating that the content of information on the record is intact.</p> <p>4. The perceived notion that security refers to freedom from danger, risk or doubt during a service performance.</p> <p>5. The extent to which access to information is restricted appropriately to maintain its security.</p>	industry experts.
Assurance of service/trust	<p>1. Knowledge and courtesy of employees and their ability to inspire trust and confidence (Parasuraman <i>et al.</i>, 1985).</p> <p>2. The perceived service performance rating that employees in the archives are very knowledgeable about their operations and systems.</p> <p>3. The perceived service rating that employees in the archives are courteous in their responses.</p> <p>4. The perceived rating that archival institutions are able to convey trust and confidence of users.</p>	Parasuraman <i>et al.</i> 1985; Zeithaml <i>et al.</i> 2000; Madu and Madu 2002; Kim and Stoel 2004; Gounaris <i>et al.</i> 2005; Kim <i>et al.</i> 2006; based on comments and suggestions solicited from the archives industry experts.
Responsiveness	<p>1. Willingness to help customers and provide prompt services (Parasuraman <i>et al.</i>, 1988)</p>	Zeithaml <i>et al.</i> 2000, 2002; Jun and Cai 2001; Kim <i>et al.</i> 2006; Parasuraman <i>et al.</i> 1988, 2005; O'Neil <i>et al.</i> 2001; Madu and Madu 2002; Kim and Stoel 2004; Gounaris <i>et al.</i> 2005; Long and McMellon 2004; Yang and Fang 2004; Kaynama and Black 2000; Surjadaja <i>et al.</i> 2003; Yoo and Donthu 2001
Empathy	<p>1. Caring, individualised attention the firm provides its customers (Parasuraman <i>et al.</i> 1985).</p>	Parasuraman <i>et al.</i> 1988; Long and McMellon 2004; Vijavasathay and Jones 2000.
Integrity Integrity of information.	<p>1. Credibility</p> <p>2. Perceived service performance rating</p>	Cox and Dale 2001; Madu and Madu 2002; Jun and Cai 2001;

Dimensions	Items	Item source
	<p>that contents of the information/record can be trusted.</p> <p>3. Perceived service performance rating that the record is representative of the transactions, activities or facts to which it attests.</p> <p>4. Perceived service performance rating that the record can be depended on in the course of subsequent transactions and activities.</p> <p>5. The perceived notion that the contents of the electronic record are accurate.</p>	<p>based on comments and suggestions solicited from the archives industry experts.</p>
Ease of use (Usability of information)	<p>1. Ease of manipulation of the system</p> <p>2. The perceived performance rating that information on the record is easily retrievable.</p> <p>3. The perceived notion that the record/information can be easily located.</p> <p>4. The perceived performance rating that it is easy to interpret the information on the record.</p>	<p>Yang <i>et al.</i>, 2003; Dabholkar 1999; Yoo and Donthu 2001; Santos 2003; Fassnacht and Koese 2006; based on comments and suggestions solicited from the archives industry experts.</p>
Tangibles	<p>1. Physical facilities, equipment and presence of personnel.</p>	<p>Parasuraman <i>et al.</i> 1985; Gounaris <i>et al.</i> 2005; Long and Mc Mellon 2004; Vijavasathay and Jones 2000; O'Neil <i>et al.</i> 2001;</p>
Authenticity of information	<p>1. The perceived service performance rating that the information on the record proves what it purports to be.</p> <p>2. The perceived service rating that the information on the record provides evidence of actions.</p> <p>3. The perceived service rating that the information on the record has been sent or created by the person who purports to have sent it.</p>	

Dimensions	Items	Item source
	4. The perceived service rating that the description of contents of the record has been maintained as an archival document.	

The information in Table 5.1 was first used through confirmation and reconfirmation of the group of experts involved in the initial interviews and the Delphi technique exercise to confirm and reconfirm the dimensions and items to be included in a draft survey instrument, and, secondly, statistically to gather data for factor analysis. After a rigorous exercise of confirmation and reconfirming the dimensions and items in Table 5.1, statements or items of each dimension were defined as illustrated in Table 5.2. These were used to design the questionnaire (Appendix C) that was distributed to the NASA in Pretoria.

**Table 5.2: Statements derived from extant literature, interviews of experts and Delphi technique exercise**

<ol style="list-style-type: none"> <li>1. Integrity of information in the archives is perceived by whether the contents of information/record can be trusted.</li> <li>2. Integrity of information in the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which it attests.</li> <li>3. Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.</li> <li>4. Integrity of information in the archives is perceived by whether the contents of the record can be trusted.</li> <li>5. Authenticity of information is perceived by whether the information on the record provides evidence of actions.</li> <li>6. Authenticity of the information is perceived by whether information on the record/the record proves what it purports to be.</li> <li>7. Authenticity of the information is perceived by whether information on the record/the record has been sent or created by the person it purports to have sent or created.</li> <li>8. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document</li> <li>9. Reliability of information in the archives is perceived by whether the system for the information is technically functional most of the time.</li> </ol>
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10. Reliability of information in the archives is perceived by whether one can count on the information on the site.
11. Reliability of information in the archives is perceived by whether the information on the record/record can support accountability.
12. Reliability of information in the archives can be perceived by whether the information on the record/record can support transparency.
13. Usability of information in the archives is perceived by whether the information on the record/record can be easily located.
14. Usability of information in the archives is perceived by whether the information on the record/record can be easily retrieved.
15. Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record.
16. Usability of information in the archives is perceived by whether the system is able to perform as promised.
17. Assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems.
18. Assurance of service in the archives is perceived by whether the employees archival institutions are courteous in their responses.
19. Assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey trust and confidence of users of the archival systems.
20. Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information.
21. Security of information in the archives can be perceived by whether the structure and content of information on the record is intact.
22. Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security.
23. Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance.

A draft survey measurement instrument formulated was administered to the researchers in the National Archives of South Africa to collect quantitative data.

## **5.4 DISCUSSION OF PHASE 1 QUALITATIVE RESEARCH FINDINGS**

The first research question in this study was: What are the dimensions for the measurement of service quality in archival institutions?

### **5.4.1 Gap in the literature on conceptualisation and dimensionality of service quality construct in the archives field**

The responses from the interviewed panel of experts and the Delphi technique exercise indicated that there was currently no service quality measurement instrument in the archives field. The respondents stated the imperativeness of such a measurement instrument in the industry. This was further confirmed by the findings from the literature review where the researcher indicated that although the service quality concept had been researched and adapted in the context of information systems (IS) services, business-to-customer (B2C) websites and libraries, and, indeed, into many service industries including the healthcare sector (Carman 1990; Headley and Miller 1993; Lam 1997; Kilbourne *et al.* 2004); banking (Mels *et al.* 1997; Lam 2002; Zhou *et al.* 2002); fast food (Lee and Ulgado 1997); telecommunications (van der Wal *et al.* 2002); retail chains (Parasuraman *et al.* 1994); library services (Cook and Thompson 2007); these extensions and adaptations of service quality have not dealt with corporate electronic records and archives or the measurement of these systems. The closest existing service quality measurement models range from E-S-QUAL and E-RecS-QUEL instruments (Parasuraman *et al.* 2005), for example, solely measure service quality of websites to information quality assessment frameworks (Stvilia 2006); while LibQUAL specifically dwells on the incorporation of measures appropriate for measuring the performance of digital libraries (Heath *et al.* 2003). Thus, there was currently a gap in the literature on service quality measurement instruments of electronic records management systems in archival institutions.

### **5.4.2 Identification of variables/dimensions and items unique to the archives field**

During the various exercises of data collection and analysis in Phase 1, dimensions were identified in the field and are exhibited on the draft survey instrument in Appendix C. What is particularly outstanding about the formulated dimensions is how they are centred on

information on the record/or record; and the inclusion of the following unique archives characteristics:

- sanctity of the original order;
- “*respect des fonds*” or “*provenance*” principle;
- the legal principle; and
- uniqueness

as expressed in the respondents’ statements in the excerpts and the characteristics of archives discussed in the archives industry chapter of this research.

What is also apparent is how researchers in archival institutions conceptualised service quality in terms of the most important component, which was the quality of the record or information received as viewed from the unique characteristics of archives. This invariably makes information/record dimensions unique to archives as confirmed by the following characteristics:

- “*Respect des fonds*” or “*provenance*” principle
- Sanctity of the original order
- The legal principle
- Uniqueness.

#### **5.4.2.1 “*Respect des fonds*” or “*provenance*” principle**

This principle states that the archives of a particular entity are accumulated as a direct result of its functional activities and as such are intended to reflect the policies, functions, and transactions of that entity alone; hence the “*respect des fonds*” or “*provenance*” principle, which relates to (for archival management purposes) the maintenance and grouping of the archives of one entity separate from those of others, thereby respecting the natural body of documentation left by the creating entity and reflecting its work. The following statements that were extracted from Table 5.2 in this chapter identify with the “*provenance*” principle as described in this section.

1. Integrity of information in the archives is perceived by whether the contents of information/record can be trusted.
2. Integrity of information in the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which they attest.
3. Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.
4. Integrity of information in the archives is perceived by whether the contents of the record can be trusted.
5. Authenticity of information is perceived by whether the information on the record provides evidence of actions.

#### **5.4.2.2 Sanctity of the original order principle**

Sanctity of the original order principle pertains to the organic character of records (Sibanda, 2005). As a transaction progresses, records relating to it grow naturally. This principle has had a tremendous impact on the archival management of records because of its emphasis on retaining their quality in reflecting accurately what has gone before, why and how. Taken out of the sequence, or arranged in a manner different from that in which they are created, archives tell an incomplete or inaccurate story (Sibanda 2005).

The following statements that were extracted from Table 5.2 in this chapter identify with the *sanctity of the original order principle* as described in this section.

1. Assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey the trust and confidence of the users of the archival systems.
2. Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information.

#### **5.4.2.3 The legal principle**

From the third characteristic, which is the official character of archives, flows the archival principle that archives must remain in the custody of their creator or its legitimate successor in order to ensure that no tampering takes place by unauthorised individuals (Sibanda,

2005). The legal implications are the assurance that archives will be acceptable in a court of law as evidence of a transaction.

The following statements that were extracted from Table 5.2 in this chapter identify with the *legal principle* as described in this section.

1. Reliability of information in the archives is perceived by whether the information on the record/record can be support accountability.
2. Reliability of information in the archives can be perceived by whether the information on the record/record can support transparency.

#### **5.4.2.4 Uniqueness**

Books are mass produced for cultural and educational purposes, unlike archives. Archives are therefore unique in that they are essentially single-file units created or accumulated in connection with a specific business or administrative transaction. If a copy of a book is destroyed, it can easily be replaced, yet if archival file units are destroyed, other copies of the document in them might exist, but it is highly unlikely that they would be maintained in the same sequence or context (Sibanda 2005).

The maintenance of archives according to these basic principles not only ensures the provision of evidence about the nature of their creator; but also assists in preserving the values arising from their organic characteristics and in providing evidence as to how and why they were created and used; the protection of their integrity and allows them to be arranged, described and administered efficiently and effectively.

The following statements that were extracted from Table 5.2 in this chapter identify with the *principle on uniqueness* as described in this section.

1. Integrity of information in the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which it attests.
2. Authenticity of the information is perceived by whether information on the record /the record proves what it purports to be.



3. Authenticity of the information is perceived by whether information on the record/the record has been sent or created by the person it purports to have sent or created.
4. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document.

In Phase 1 of this study, the dimensions/variables and items of the service quality construct that were subsequently factor analysed were identified. The unique characteristics of the information and systems in the archives were also identified from extant literature, the panel of experts in the archives field and the Delphi Technique exercise. Phase 1 research findings partially answered the research question 1 on: What are the dimensions for the measurement of service quality in archival institutions? Phase 2 research findings of this study follow.

## **PHASE 2: QUANTITATIVE DATA ANALYSIS**

In the second phase of the research, the researcher adopted a quantitative approach and used a questionnaire in a research survey to collect data. This stage complemented Step 4 of the Measurement Development Process, in accordance with Churchill (1979). The step indicated that the main purpose of data collection was to purify the measure using exploratory factor analysis. Phase 2 involved using the systematic random sampling to select a sample of experts in the archival industry at the NASA to be interviewed – using the draft survey instrument (shown in Appendix C).

The developed survey instrument was a result of the statements that were derived from the extant literature, interviews of the experts in the field and the Delphi technique exercise. As pointed out in the introductory section of this chapter, section one in Phase 2 of the research findings presents the preliminary statistical results of the study. Descriptive statistics (tabular and graphical) for the dimensions of service quality in the archival institutions are detailed. Section two discusses the results of factor analysis.

## SECTION 1 DESCRIPTIVE STATISTICS

Data analysis was conducted using SPSS statistical package. The descriptive statistics were used for the dimensions of service quality to compare and interpret means, standard deviations, percentages, frequencies, skewness, and kurtosis as a preliminary analysis. Descriptive statistical analysis was done to also find out whether the data were fit for factor analysis to be done. Data would be fit for the analysis to be done only when the distributions of the measured variables were not highly skewed (higher than 2) and the level of kurtosis was not too high (higher than 6). The results below show the responses from the second phase of the study where the measurement instrument (i.e., questionnaire) was administered at the NASA in Pretoria. Descriptive statistical results consist of two sets of results, (5.5) demographic and measured variables information and (5.6) measures of central tendency, variability, skewness and kurtosis of the measured variables.

### 5.5 Demographic/Background and outcome variables information

First, data on the background variables are analysed and presented using frequency tables and diagrams. These include gender, age and the sector in which a respondent worked. Second, frequency and percentage distributions of the outcome variables are presented and analysed. These outcome variables are the measurement variables that correspond to the questions (in the questionnaire), which were practically posed to the respondents. The Likert scale was used to measure the outcome variables. On this scale, 1 = Strongly disagree, 2 = Disagree, 3 = Not sure, 4 = Agree and 5 = Strongly agree.

#### 5.5.1 Demographic/Background information

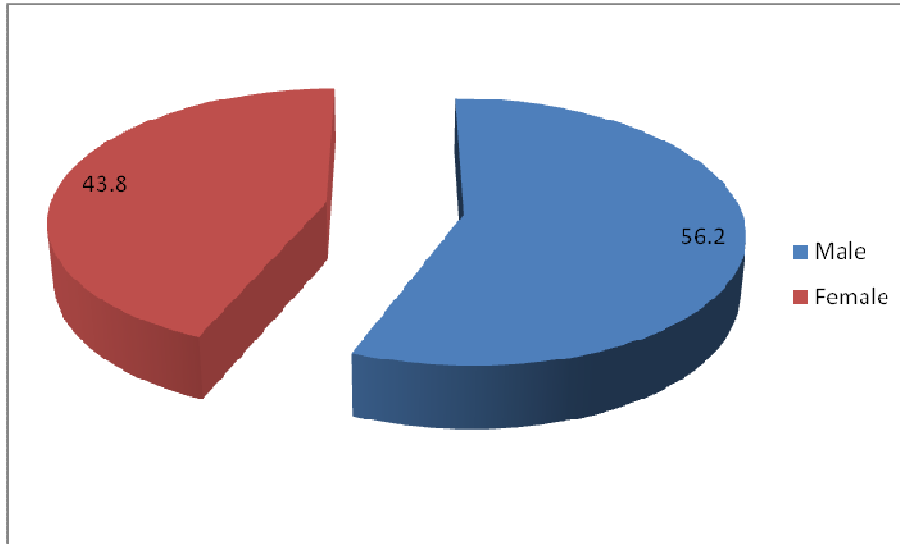
##### i. Gender

Table 5.3 presents the results on gender.

**Table 5.3: Gender**

Gender	Frequency (F)	Percentage (%)
Male	117	56.2
Female	91	43.8
Total	208	100.00

According to Table 5.3, for the research survey, 43.8 per cent of the respondents were female, compared to 56.3 per cent male. Figure 5.1 illustrates this more clearly.



**Figure 5.1: Gender**

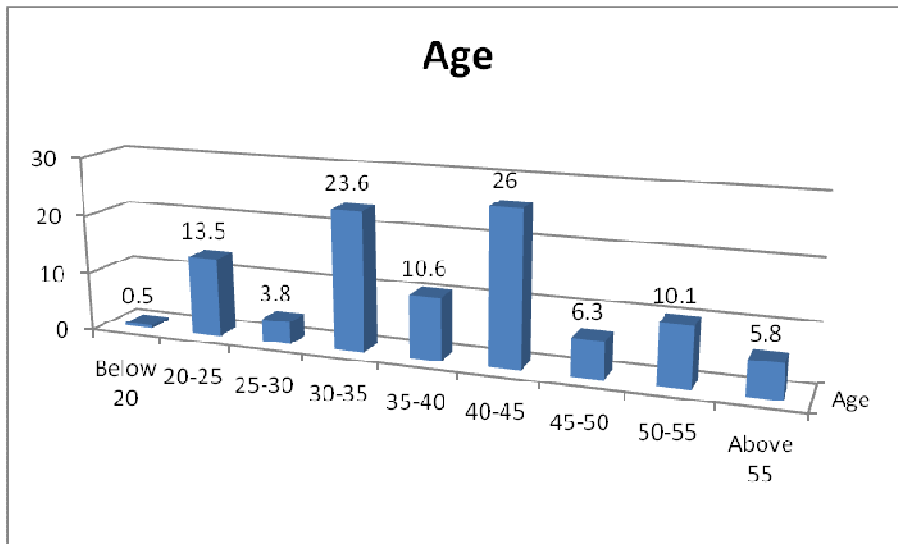
**ii. Age**

Age distribution of the respondents is shown in Table 5.4.

**Table 5.4: Age**

Age (yrs)	Frequency (F)	Percentage (%)
Below 20	1	.5
20–25	28	13.5
25–30	8	3.8
30–35	49	23.6
35–40	22	10.6
40–45	54	26.0
45–50	13	6.3
50–55	21	10.1
Above 55	12	5.8
Total	208	100.0

The information in Table 5.4 shows that the largest age group of respondents was between 40 and 45 years (26%). Figure 5.2 illustrates this more clearly.



**Figure 5.2: Age**

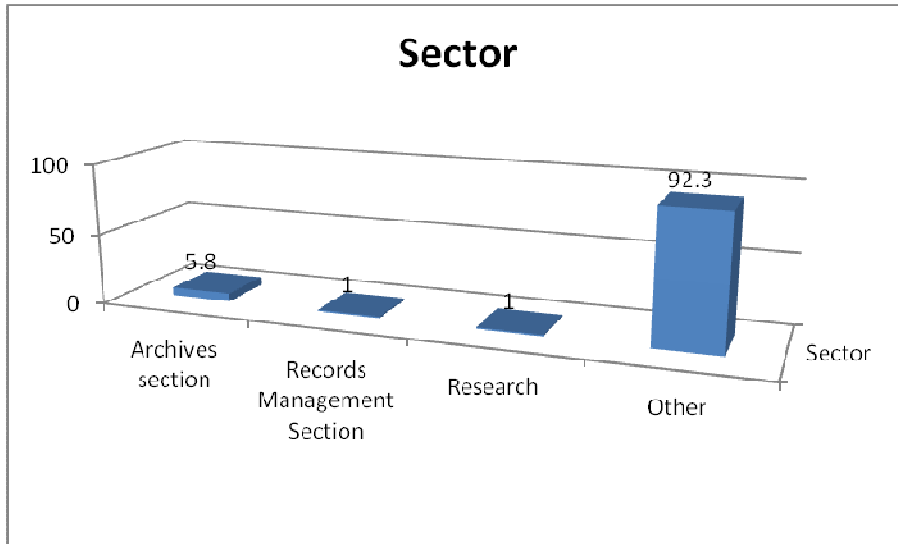
**iii. Sector**

Table 5.5 shows the percentage distribution of the sectors in which the respondents worked.

**Table 5.5: Sector**

Section	Frequency (F)	Percentage (%)
Archives section	12	5.8
Records management section	2	1.0
Research	2	1.0
Other	192	92.3
Total	208	100

Table 5.5 shows that 92 per cent of the respondents were from the “other” category which included other researchers, lecturers and writers. In essence this category is the “customers” who are the major category in the service quality studies. See Figure 5.3.



**Figure 5.3: Sector**

### 5.5.2 Outcome variables

#### i. Frequency and percentage distributions

Table 5.6 shows the frequency and percentage distributions of the answers to the following statement:

**Integrity of information in the archives is perceived by whether the contents of the record representative of the transactions, activities and facts to which it attests. (Dependability).**

**Table 5.6: Dependability**

	Frequency	Percentage
1	1	.5
2	2	1.0
3	38	18.3
4	136	65.4
5	31	14.9
Total	208	100.0

The ratings on the statement “integrity of information in the archives is perceived by whether the contents of the record are preventative of the transactions, activities and facts on it” were high at 65 per cent compared with other ratings on the same statement.

Table 5.7 shows the frequency and percentage distributions of the answers to the following statement:

**Integrity of information in the archives is perceived by whether the contents of the record are accurate. (Accuracy)**

**Table 5.7: Accuracy**

	<b>Frequency</b>	<b>Percent</b>
1	1	.5
2	3	1.4
3	29	13.9
4	139	66.8
5	36	17.3
Total	208	100.0

The ratings on the statement “integrity of information in the archives is perceived by whether the contents of the record are accurate” were high at 66 per cent compared to other ratings on the same statement.

Table 5.8 shows the frequency and percentage distributions of the answers to the following statement:

**Reliability of information is perceived by whether the system for the information is technically functional most of the time. (Functionality)**

**Table 5.8: Functionality**

	<b>Frequency</b>	<b>Percent</b>
1	1	.5
2	1	.5
3	26	12.5
4	138	66.3
5	42	20.2
Total	208	100.0

The statement “reliability of information is perceived by whether the system for the information is technically functional most of the time” was rated at 66 per cent, the highest percentage on the same rating by the respondents.

Table 5.9 shows the frequency and percentage distributions of the answers to the following statement:

**Reliability of information in the archives is perceived by whether information on the record/record can support accountability. (Accountability)**

**Table 5.9: Accountability**

	<b>Frequency</b>	<b>Percent</b>
1	1	.5
3	32	15.4
4	144	69.2
5	31	14.9
Total	208	100.0

The respondents rated the statement “reliability of information in the archives is perceived by whether information on the record/record can support accountability’ at 69 per cent, which was higher than all the ratings on the statement.

Table 5.10 shows the frequency and percentage distributions of the answers to the following statement:

**Reliability of information in the archives is perceived by whether one can count on the information on the site. (Factual)**

**Table 5.10: Factual**

	<b>Frequency</b>	<b>Percentage</b>
1	1	.5
2	3	1.4
3	27	13.0
4	134	64.4
5	43	20.7
Total	208	100.0



“Reliability of information at the archives is perceived by whether one can count on the information on the site” as a statement was favourably rated at 64%, compared to other ratings on the same statement.

Table 5.11 shows the frequency and percentage distributions of the answers to the following statement:

**Reliability of information at the archives can be perceived by whether the information on the record/ record can support transparency. (Transparency)**

**Table 5.11: Transparent**

	Frequency	Percent
1	1	.5
2	2	1.0
3	34	16.3
4	138	66.3
5	33	15.9
Total	208	100.0

The majority of respondents rated the statement “Reliability of information at the archives can be perceived by whether the information on the record/ record can support transparency” favourably at 66%.

Table 5.12 shows the frequency and percentage distributions of the answers to the following statement:

**Usability of information in the archives is perceived by whether the information on the record/ record can be easily retrieved. (Retrievable)**

**Table 12: Retrievable**

	<b>Frequency</b>	<b>Percentage</b>
2	2	1.0
3	33	15.9
4	146	70.2
5	27	13.0
Total	208	100.0

With a frequency of 146 and a rating of 70.2 per cent, the majority of respondents rated the statement “usability of information in the archives is perceived by whether the information on the record/record can be easily retrieved” highly, compared to other ratings on the same statement:

Table 5.13 shows the frequency and percentage distributions of the answers to the following statement:

**Usability of information at the archives is perceived by whether the system is able to perform as promised. (Performance)**

**Table 13: Performance**

	<b>Frequency</b>	<b>Percent</b>
1	1	.5
2	2	1.0
3	35	16.8
4	142	68.3
5	28	13.5
Total	208	100.0

The respondents rated the statement “usability of information in the archives is perceived by whether the system is able to perform as promised” at 68 per cent, the highest rating on the statement.

Table 5.14 shows the frequency and percentage distributions of the answers to the following statement:

**Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record. (Interpretable)**

**Table 14: Interpretable**

	Frequency	Percentage
1	1	.5
2	2	1.0
3	34	16.3
4	142	68.3
5	29	13.9
Total	208	100.0

Table 5.15 shows the frequency and percentage distributions of the answers to the following statement:

**Usability of information in the archives is perceived by whether the information on the record/record can be easily located. (Locatable)**

**Table 5.15: Locatable**

	Frequency	Percentage
2	1	.5
3	34	16.3
4	130	62.5
5	43	20.7
Total	208	100.0

The respondents rated the statement “usability of information in the archives is perceived by whether the information on the record/ record can be easily located” at 62 per cent, a rating higher than the other categories on this statement.

Table 5.16 shows the frequency and percentage distributions of the answers to the following statement:

**Assurance of service in the archives is perceived by whether the employees in the archives are courteous in their responses. (Courtesy)**

**Table 16: Courtesy**

	Frequency	Percent
2	1	.5
3	28	13.5
4	154	74.0
5	25	12.0
Total	208	100.0

Compared with other categories on the same statement, “assurance of service in the archives is perceived by whether the employees in the archives are courteous in their responses” was high at 74 Per cent.

Table 5.17 shows the frequency and percentage distributions of the answers to the following statement:

**Assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems. (Knowledgeable)**

**Table 5.17: Knowledgeable**

	Frequency	Percent
1	1	.5
2	1	.5
3	34	16.3
4	155	74.5
5	17	8.2
Total	208	100.0

The respondents rated the statement “assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems” high at 75 per cent.

Table 5.18 shows the frequency and percentage distributions of the answers to the following statement:

**Assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey trust and confidence of users of the archival systems. (Confidence)**

**Table 5.18: Confidence**

	<b>Frequency</b>	<b>Percentage</b>
2	2	1.0
3	21	10.1
4	163	78.4
5	22	10.6
Total	208	100.0

The respondents rated the statement “assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey trust and confidence of users of the archival systems” highly at 78 per cent.

Table 5.19 shows the frequency and percentage distributions of the answers to the following statement:

**Security of information in the archives can be perceived by whether the structure and content of information on the record is intact. (Intact)**

**Table 5.19: Intact**

	<b>Frequency</b>	<b>Percent</b>
2	2	1.0
3	25	12.0
4	142	68.3
5	39	18.8
Total	208	100.0

The statement “Security of information in the archives can be perceived by whether the structure and content of information on the record is intact” was rated at a favourable percentage of 68 per cent by the respondents.

Table 5.20 shows the frequency and percentage distributions of the answers to the following statement:

**Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information. (Completeness)**

**Table 5.20: Completeness**

	Frequency	Percent
1	1	.5
2	2	1.0
3	31	14.9
4	134	64.4
5	40	19.2
Total	208	100.0

The statement “Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information” was rated favourably by respondents at 64 per cent.

Table 5.21 shows the frequency and percentage distributions of the answers to the following statement:

**Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security. (Accessibility)**

**Table 5.21: Accessibility**

	Frequency	Percent
2	2	1.0
3	25	12.0
4	152	73.1
5	29	13.9
Total	208	100.0

A high rating of 73 per cent was given to the statement “Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security” by the respondents.

Table 5.22 shows the frequency and percentage distributions of the answers to the following statement:

**Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance. (Secure)**

**Table 5.22: Secure**

	<b>Frequency</b>	<b>Percent</b>
1	1	.5
2	3	1.4
3	26	12.5
4	143	68.8
5	35	16.8
Total	208	100.0

At “agree” (4), the respondents rated the statement “security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance” at 69 per cent with a frequency of 143 out of a total of 208.

Table 5.23 shows the frequency and percentage distributions of the answers to the following statement:

**Authenticity of information is preserved by whether the description of context of the record has been maintained as an archival document. (Preserve)**



**Table 5.23: Preserve**

	Frequency	Percent
1	1	.5
2	2	1.0
3	37	17.8
4	129	62.0
5	39	18.8
Total	208	100.0

The statement “Authenticity of information is preserved by whether the description of context of the record has been maintained as an archival document “rated at 62 per cent, by the respondents.

**Authenticity of information is perceived by whether information on the record/ the record proves what it purports to be. (Credibility)**

**Table 5.24: Credibility**

	Frequency	Percent		
1	2	1.0	1.0	1.0
2	1	.5	.5	1.4
3	46	22.1	22.1	23.6
4	123	59.1	59.1	82.7
5	36	17.3	17.3	100.0
Total	208	100.0	100.0	

The statement “authenticity of information is perceived by whether information on the record/ the record proves what it purports to be” had a relatively low rating of 59 per cent, when compared with the overall ratings by the respondents in this study.

Table 5.25 shows the frequency and percentage distributions of the answers to the following statement:

**Authenticity of information is perceived by whether the information on the record provides evidence of actions. (Traceability)**

**Table 5.25: Traceability**

	<b>Frequency</b>	<b>Percent</b>
2	2	1.0
3	37	17.8
4	132	63.5
5	37	17.8
Total	208	100.0

The respondents rated the statement “authenticity of information is perceived by whether the information on the record provides evidence of actions” at 63 per cent.

Table 5.26 shows the frequency and percentage distributions of the answers to the following statement.

**Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities. (Dependability)**

**Table 5.26: Dependability**

	<b>Frequency</b>	<b>Percent</b>
2	2	1.0
3	39	18.8
4	139	66.8
5	28	13.5
Total	208	100.0

The respondents rated the statement “Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities” at 67 per cent.

Table 5.27 shows the frequency and percentage distributions of the answers to the following statement:

**Integrity of information in the archives is perceived by whether the contents of information/record can be trusted. (Trustworthy)**

**Table 5.27: Trustworthy**

	<b>Frequency</b>	<b>Percent</b>
2	6	2.9
3	51	24.5
4	110	52.9
5	41	19.7
Total	208	100.0

The statement “Integrity of information in the archives is perceived by whether the contents of information/record can be trusted” was rated relatively low at 53 per cent by the respondents in this study.

**ii. Measures of central tendency, variability, skewness and kurtosis of the measured variables**

Table 5.28 shows the measures of central tendency, variation, skewness and kurtosis of the measurement variables.

**Table 5.28: Measures of central tendency, variation, skewness and kurtosis**

Item/Variable	Mean	Standard deviation	Skewness	Kurtosis
1. Integrity of information in the archives is perceived by whether the contents of the information/record can be trusted.	3.89	.741	-.260	-.221
2. Integrity of information in the archives is perceived by whether the contents of the records are representative of transactions, activities and facts to which it attests.	3.93	.641	-.607	1.988
3. Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.	3.93	.598	-.250	.604
4. Integrity of information in the archives is perceived by whether the contents of the record are accurate.	3.99	.644	-.757	2.501
5. Authenticity of information is perceived by whether the information on the record provides evidence of actions.	3.8	.629	-.221	.288
6. Authenticity of information is perceived by whether the information on the record/ the record proves what it purports to be.	3.91	.703	-.634	1.823
7. Authenticity of information is perceived by whether the information on the record has been sent or created by the person it purports to have sent or created it.	3.99	.618	-.240	.450
8. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document.	3.98	.670	-.557	1.535
9. Reliability of information in the archives is perceived by whether the system for the information is technically functional most of the time.	4.05	.623	-.640	2.570
10. Reliability of information in the archives is perceived by whether one can count on information on the site.	4.03	.662	-.742	2.241

Item/Variable	Mean	Standard deviation	Skewness	Kurtosis
11. Reliability of information in the archives is perceived by whether the information on the record/record can support accountability	3.89	.589	-.568	2.806
12. Reliability of information in the archives is perceived by whether the information on the record/record can support transparency.	3.96	.636	-.651	.169
13. Usability of information in the archives is perceived by whether the information on the record / record can be easily located.	4.03	.625	-.143	.008
14. Usability of information in the archives is perceived by whether the information on the record / record can easily be retrieved	3.95	.571	-.320	1.102
15. Usability of information in the archives is perceived by whether it is easy to interpret the information on the record/record.	3.94	.619	-.704	2.597
16. Usability of information in the archives is perceived by whether the system can is able to perform as promised.	3.93	.618	-.702	2.571
17. Assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems.	3.89	.546	-.965	4.251
18. Assurance of service in the archives is perceived by whether the employees in the archives are courteous in their responses.	3.98	.524	-.234	1.444
19. Assurance of service in the archives is perceived by whether the employees in the archival institution are able to convey trust and confidence of users of archival institutions.	3.99	.496	-.511	3.045
20. Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information.	4.01	.652	-.643	2.059
21. Security of information in the archives can be perceived by whether the structure and content of information on the record is intact.	4.05	.588	-.296	1.013

Item/Variable	Mean	Standard deviation	Skewness	Kurtosis
22. Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security.	4.00	.547	-.357	1.723
23. Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance.	4.00	.629	-.822	2.977

The mean values of the measurement variables range between 3 (Not sure) and 4 (Agree). This means that, on average, the respondents agreed with the statements regarding the phenomenon of service quality in the archives industry. None of the values of the skewness of the variables was above the acceptable level of skewness of 2, and none was above the acceptable level of kurtosis of 6 for valid factor analysis. These results indicate that it was acceptable for the researcher to perform factor analysis on the data. The following section presents the Confirmatory factor Analysis that was done.

## **SECTION 2 FACTOR ANALYSIS**

### **5.6 FIRST CONFIRMATORY FACTOR ANALYSIS**

According to Daniel (1989, p.2), factor analysis is “designed to examine the covariance structure of a set of variables and to provide an explanation of the relationships among those variables in terms of a smaller number of unobserved latent variables called factors”. Twenty-two items derived from the three sources of data, theories and literature review, qualitative interviews, and the Delphi technique exercise of a panel of experts in the archives were used as indicators of the six latent variables in a confirmatory factor analysis. Structural equation model (SEM) played the confirmatory role as it allows for a statistical test of specific hypotheses about the structure of the factor loadings and inter-correlations of observed variables. Confirmatory factor analysis seeks to determine if the number of factors and the loadings of measured variables on them conform to what is expected on the basis of a theory (Hair *et al.* 1988). Hair *et al.* (1988) point out that confirmatory factor analysis is particularly useful in the validation of scales for the measurement of specific constructs.

As a step of Confirmatory Factor Analysis, the researcher cleaned up the data of inconsistencies and errors, and then she conducted preliminary descriptive statistical analysis, namely, scaling, collinearity analysis and outlier detection. The dataset did not have missing observations. Outliers were excluded using Mahalanobis distances. CHISQ/DF was used to give the Mahalanobis distances from each case to the centroid of all cases in the space defined by the original variables, the three factors, and their difference. The calculation uses the inverse of the correlation (or covariance) matrix and the standard scores. Correspondingly, the degrees of freedom are the number of variables used and number of factors. Mahalanobis distances were distributed approximately as chi-square divided by degrees of freedom because the sample was large and from a multivariate normal distribution.

According to Table 5.29, the KMO measure is 0.705, and the Bartlett's test of sphericity is significant as its corresponding probability is less than 0.05. This means that the correlation matrix is not an identity matrix and it was a good idea to proceed with factor analysis. The significance level of .000 means that the null hypothesis should be rejected indicating that the strength of the relationship among variables is strong, which again justifies factor analysis.

**Table 5.29: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin	Measure of sampling adequacy	.705
Bartlett's test of sphericity	Approximate Chi-Square	441.992
	Df	36
	Sig.	.000

The correlation matrix is shown in Table 5.30.

5.30: Correlation matrix

	I1	I2	I3	I4	T1	T2	T3	T4	R1	R2	R3	R4	U1	U2	U3	U4	A1	A2	A3	S1	S2	S3	S4
I1	1																						
I2	.27**	1																					
I3	.27**	.24**	1																				
I4	.24**	.27**	.36**	1																			
T1	.22**	.23**	.25**	.20**	1																		
T2	.25**	.07	.24**	.17**	.22**	1																	
T3	.19**	.24**	.26**	.34**	.36**	.23**	1																
T4	.20**	.20**	.23**	.30**	.24**	.27**	.37**	1															
R1	.14*	.22**	.24**	.28**	.36**	.15*	.25**	.18**	1														
R2	.07	.21**	.15	.28**	.26**	.20**	.31**	.32**	.35**	1													
R3	.17**	.24**	.19**	.14	.33**	.12	.25**	.27**	.33**	.36	1												
R4	.18**	.23**	.29	.18**	.40**	.17**	.25**	.19**	.30**	.24	.42	1											
U1	.22**	.19**	.16	.16	.19**	.08	.24**	.27**	.26**	.31**	.25**	.11	1										
U2	.21**	.16**	.15	.12	.12	.04	.10	.21**	.16	.12	.18**	.08	.41	1									
U3	.20**	.14	.21**	.27**	.27**	.34**	.29**	.17**	.18**	.25**	.29**	.11	.38	.24	1								
U4	.20**	.15	.21**	.27**	.28**	.32**	.26	.19	.20	.25**	.34**	.13	.38	.24	.94	1							
A1	.24**	.19**	.18**	.20**	.11	.09	.12	.14	.14	.17**	-.04	.17**	.15	.14	.07	.05	1						
A2	.16	.24**	.30**	.23**	.17**	.11	.19**	.19**	.24**	.30**	.20**	.23**	.25	.22	.26	.25**	.35**	1					
A3	.21**	.35**	.32**	.20**	.25**	.18**	.19**	.19**	.27**	.22**	.30**	.24**	.19	.15	.30**	.28**	.17	.39**	1				
S1	.27**	.21**	.40**	.30**	.26**	.24**	.19**	.33**	.19**	.12	.21**	.28**	.28	.18**	.22**	.19**	.22**	.26**	.24**	1			
S2	.17**	.21**	.29**	.30**	.32**	.27**	.28**	.30**	.24**	.17	.24**	.28**	.22**	.15	.26**	.24**	.15	.21**	.19	.55**	1		
S3	.17**	.17**	.33**	.27**	.24**	.23**	.30**	.29**	.24**	.13	.26**	.31	.25**	.14	.23**	.20**	.21**	.25**	.14	.64**	.81**	1	
S4	.21**	.20**	.32**	.26**	.26**	.23**	.24**	.29**	.26**	.19**	.20**	.25**	.21**	.16	.25**	.22**	.17	.19	.17	.72**	.80**	.67**	1



For factor analysis to be performed one needs inter-correlations among the measurement variables. According to Table 5.30, many of the variables are significantly correlated. For example, I2 is highly correlated with I3 (.24\*\*) and it is also significantly correlated with I\$ (.20\*\*).

The first step in the model test was to estimate the path coefficients relating observed (outcome) variables to latent constructs using SPSS AMOS and the correlation matrix shown in Table 5.30. Next, the variance extracted by each dimension was compared to the variance due to measurement error. The use of the maximum likelihood method permits tests of hypotheses to be performed if a multivariate normal distribution can be assumed. However, when the maximum likelihood method was used to fit the factor model the analysis failed to converge and was terminated after 100 iterations without reaching a local minimum. The researcher resorted to using another good method, the Principal Component Method. The Principal Component Method (PCM) was used to assess the structure of the measurement scale analyzing all the 22 items. This method is more appropriate than the Maximum Likelihood Method when the primary concern is to summarise data in a minimum number of factors (i.e., parsimony) (Hair *et al.* 1998). PCM, which is also referred to as Principal Axis Method seeks a linear combination of variables such that the maximum variance is extracted from the variables. After removing this variance, it seeks a second linear combination which explains the maximum proportion of the remaining variance, and so on - resulting in uncorrelated factors.

Principal Component Analysis was followed by Varimax rotation, which is an orthogonal rotation approach. While oblique rotations create correlated factors, Varian rotation is an orthogonal rotation of the factor axes that maximizes the variance of the squared loadings of a factor on all the variables in a factor matrix and has the effect of differentiating the original variables by extracted factor (see Hair *et al.* 1998). With rotation, each factor tends to have either large or small loadings of any particular variable. This therefore makes it possible and easy for the researcher to identify each variable with a single factor. Keiser's criterion was used to decide which

factors should be eliminated (Bryman and Cramer 1994). The analysis converged and then the factor model was evaluated for model adequacy.

The normality of the measured variables was assessed (see Table 5.31). It appears that the normality assumption of the factor analysis was not violated since the levels of skewness and kurtosis of the distributions of the variables are less than the maximum acceptable levels of 2 (for skewness) and 6 (for kurtosis) (Bryman and Cramer 1994). The maximum value for skewness is -.816 and that of kurtosis is 4.121.

**Table 5.31: Assessment of normality**

Variable	skew	c.r.	kurtosis	c.r.
Traceability	-.219	-1.291	.253	.744
Trustworthy	-.258	-1.519	-.245	-.720
Preservation	-.553	-3.254	1.470	4.327
Accuracy	-.751	-4.422	2.412	7.101
Authentic	-.238	-1.402	.411	1.210
Credibility	-.630	-3.707	1.751	5.155
Dependability	-.248	-1.460	.561	1.651
Representative	-.602	-3.546	1.912	5.630
Secure	-.816	-4.803	2.877	8.471
Accessibility	-.355	-2.087	1.653	4.868
Intact	-.294	-1.732	.960	2.826
Completeness	-.639	-3.760	1.981	5.831
Confidence	-.507	-2.987	2.944	8.666
Courtesy	-.232	-1.365	1.381	4.065
Knowledgeable	-.958	-5.643	4.121	12.132
Performance	-.697	-4.104	2.481	7.304
Interpretable	-.699	-4.116	2.507	7.379
Retrievable	-.318	-1.873	1.047	3.083
Locatable	-.142	-.838	-.021	-.062
Transparency	-.647	-3.808	2.166	6.377
Accountability	-.564	-3.320	2.710	7.978

<b>Variable</b>	<b>skew</b>	<b>c.r.</b>	<b>kurtosis</b>	<b>c.r.</b>
Factual	-.737	-4.338	2.159	6.356
Functionality	-.636	-3.743	2.480	7.300
Multivariate			115.717	24.607

Table 5.32 indicates that the factor model explains 59.214 per cent of the variation in the data.

**Table 5.32: Total variation explained by the factor model**

Component	Extraction Sums of Squared								
	Initial Eigenvalues			Loadings			Rotation Sums of squared loadings		
	Total	% Variance	% of Cumulative	Total	% Variance	% of Cumulative	Total	% Variance	% of Cumulative
1	6.397	27.813	27.813	6.397	27.813	27.813	3.217	13.987	13.987
2	2.021	8.788	36.602	2.021	8.788	36.602	2.492	10.833	24.820
3	1.564	6.802	43.403	1.564	6.802	43.403	2.294	9.972	34.792
4	1.364	5.930	49.333	1.364	5.930	49.333	2.187	9.511	44.303
5	1.195	5.194	54.527	1.195	5.194	54.527	1.836	7.983	52.286
6	1.078	4.686	59.214	1.078	4.686	59.214	1.593	6.928	59.214
7	.997	4.333	63.547						
8	.895	3.892	67.439						
9	.834	3.625	71.064						
10	.779	3.386	74.450						
11	.736	3.200	77.650						
12	.685	2.977	80.627						
13	.609	2.649	83.276						
14	.577	2.509	85.785						
15	.567	2.465	88.250						
16	.531	2.308	90.558						
17	.491	2.135	92.693						
18	.474	2.060	94.754						
19	.409	1.778	96.531						

Component	Extraction Sums of Squared								
	Initial Eigenvalues			Loadings			Rotation Sums of squared loadings		
	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative
20	.394	1.712	98.244						
21	.254	1.103	99.347						
22	.092	.402	99.748						
23	.058	.252	100.000						

Table 5.33 shows the rotated factor loadings. According to the results, many factor loadings are smaller than the cut-off point of .3, some are negative, others are positive and some indicators load on more than one factor. For example, the loading for the first indicator of the dimension of Integrity (trustworthy) is -.020, which is very small and insignificant and the second indicator (representative) loads heavily on two factors, factors 2 and 3. This makes the interpretation and labelling of the factors difficult, and a researcher has to resort to eliminating such indicators from the analysis completely, if no other good rotation method can achieve a better and simpler factor structure. The other main issue of the factor structure is that some indicators, instead of loading heavily on the theorised factor as expected, they load heavily on another factor all together.

**Table 5.33: Rotated factor loadings**

	Component					
	1	2	3	4	5	6
Integrity of information in the archives is perceived by whether the contents of information/record can be trusted	.106	-.020	.511	.165	.262	.034
Integrity of information in the archives is perceived by whether the contents of the record are representative of the transactions, activities and facts to which it attests	.057	.319	.497	-.025	.120	.096
Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities	.289	.179	.539	.157	.155	-.126
Integrity of information in the archives is perceived by whether the contents of the record are accurate	.181	.063	.388	.145	.486	-.021
Authenticity of information is perceived by whether the information on the record provides evidence of actions	.172	.567	.121	.180	.250	-.076
Authenticity of information is perceived by whether information on the record/the record proves what it purports to be	.190	.018	.145	.458	.425	-.257

	Component					
	1	2	3	4	5	6
Authenticity of information is perceived by whether information on the record has been sent or created by the person it purports to have sent or created	.117	.289	.099	.138	.655	.027
Authenticity of information is preserved by whether the description of context of the record has been maintained as an archival document	.208	.147	.091	-.005	.672	.236
Reliability of information is perceived by whether the system for the information is technically functional most of the time	.116	.577	.163	.019	.177	.145
Reliability of information in the archives is perceived by whether one can count on the information on the site	-.047	.483	.067	.064	.429	.295
Reliability of information in the archives is perceived by whether information on the record/record can support accountability	.115	.728	-.033	.199	.056	.181
Reliability of information in the archives can be perceived by whether the information on the record/record can support transparency	.230	.670	.212	-.044	.045	-.123
Usability of information in the archives is perceived by whether the information on the record/record can be easily located	.145	.145	.097	.222	.180	.723
Usability of information in the archives is perceived by whether the information on the record/record can be easily retrieved	.101	.024	.189	.100	.023	.717
Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record	.119	.128	.102	.903	.105	.222
Usability of information in the archives is perceived by whether the system is able to perform as promised	.089	.171	.082	.895	.102	.229

	Component					
	1	2	3	4	5	6
Assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems	.109	-.082	.634	-.148	.129	.186
Assurance of service in the archives is perceived by whether the employees in the archives are courteous in their responses	.096	.242	.580	.112	-.051	.284
Assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey trust and confidence of users of the archival systems	.025	.407	.553	.265	-.118	.030
Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information	.763	.086	.286	.070	.104	.099
Security of information in the archives can be perceived by whether the structure and content of information on the record is intact	.861	.184	.058	.108	.148	.055
Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security	.854	.158	.100	.052	.131	.092
Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance	.868	.128	.113	.089	.108	.075



Component						
1	2	3	4	5	6	

Consider the Usability dimension, that is, dimension No. 4. Theoretically, the four indicators, namely, locatable, retrievable, interpretability and performance should, and are expected to load heavily on Usability and load lightly on others. But what we see in the table is that only “interpretability” (.903) and “performance” (.895) load heavily on Usability. Locatable (.723) retrievable (.717) load heavily on unidentifiable dimension No. 6. Their controversial loads on the Usability dimension are .222 and .100 respectively.

Table 5.34 shows the factor loadings and construct reliability measured using Cronbach’s Alpha.

**Table 5.34: Factor loadings and standardised Cronbach’s Alpha**

Dimension	Items	Loading	Standardised Cronbach’s Alpha
Reliability	1. Reliability of information is perceived by whether the system for the information is technically functional most of the time <b>[Functionality]</b>	.577	.67
	2. Reliability of information in the archives is perceived by whether one can count on the information on the site <b>[Factual]</b>	.483	
	3. Reliability of information in the archives is perceived by whether information on the record/record can support accountability <b>[Accountability]</b>	.728	
	4. Reliability of information in the archives can be perceived by whether the information on the record/ record can support transparency <b>[Transparency]</b>	.670	
Security	1. Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information <b>[Completeness]</b>	.763	.90

Dimension	Items	Loading	Standardised Cronbach's Alpha
	2. Security of information in the archives can be perceived by whether the structure and content of information on the record is intact <b>[Intact]</b> 3. Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security <b>[Accessibility]</b> 4. Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance <b>[Secure]</b>	.861  .854  .868	
Assurance	1. Assurance of service in the archives is perceived by whether the employees in the archival institution are very knowledgeable about their operations and systems <b>[Knowledgeable]</b> 2. Assurance of service in the archives is perceived by whether the employees in the archives are courteous in their responses <b>[Courtesy]</b> 3. Assurance of service in the archives can be perceived by whether employees in the archival institution are able to convey trust and confidence of users of the archival systems <b>[Confidence]</b>	.186  .284  .030	.57
Integrity	1. Integrity of information in the archives is perceived by whether the contents of information/record can be trusted <b>[Trustworthy]</b> 2. Integrity of information in the archives is perceived by whether the contents of the record representative of the transactions, activities and facts to which it attests <b>[Representative]</b> 3. Integrity of information in the archives is perceived by whether the record can be depended upon in the course of subsequent	.511  .497  .539	.60

Dimension	Items	Loading	Standardised Cronbach's Alpha
	transactions and activities <b>[Dependability]</b> 4. Integrity of information in the archives is perceived by whether the contents of the record are accurate <b>[Accuracy]</b>	.388	
Usability	1. Usability of information in the archives is perceived by whether the information on the record/record can be easily located <b>[Locatable]</b> 2. Usability of information in the archives is perceived by whether the information on the record/record can be easily retrieved <b>[Retrievable]</b> 3. Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record <b>[Interpretable]</b> 4. Usability of information in the archives is perceived by whether the system is able to perform as promised <b>[Performance]</b>	.222 .100 .903 .895	.75
Authenticity	1. Authenticity of information is perceived by whether the information on the record provides evidence of actions <b>[Traceability]</b> 2. Authenticity of information is perceived by whether information on the record/ the record proves what it purports to be <b>[Credibility]</b> 3. Authenticity of information is perceived by whether information on the record has been sent or created by the person it purports to have sent or created <b>[Authentic]</b> 4. Authenticity of information is preserved by whether the description of context of the record has been maintained as an archival document <b>[Preservation]</b>	.250 .425 .655 .672	.61

The table indicates that Cronbach's Alpha ranges from .57 to .90. Security has the highest internal consistency of .90 and Assurance has the least of .57. The strongest indicator for Reliability, Security, Assurance, Integrity, Usability and Authenticity are respectively, accountability (.728), secure (.868), courtesy (.284), dependability (.539), interpretable (.903) and preservation (.672). According to Table 5.34, because the Security dimension, the first dimension, extracts and explains the largest amount of variation from the data of 13.987 per cent, it is the most important dimension for the measurement instrument.

Table 5.35 shows the regression weights. The results indicate that all except the estimate of transparency in the case of the Reliability factor are highly significant (at the 0.01 level). The weights of some indicators such as functionality, locatable and knowledgeable were fixed at 1.000 to make the model identifiable.

**Table.5.35: Regression weights**

		Estimate	S.E.	C.R.	P
Functionality	<--- Reliability	1.000			
Factual	<--- Reliability	1.054	.218	4.832	***
accountability	<--- Reliability	1.225	.236	5.195	***
Transparency	<--- Reliability	1.088	.217	5.010	***
Locatable	<--- Usability	1.000			
Retrievable	<--- Usability	.580	.184	3.155	.002
Performance	<--- Usability	2.398	.397	6.039	***
knowledgeable	<--- Assurance	1.000			
Courtesy	<--- Assurance	1.738	.466	3.732	***
Confidence	<--- Assurance	1.233	.314	3.928	***
Completeness	<--- Security	1.000			
Intact	<--- Security	1.011	.087	11.584	***
Accessibility	<--- Security	.790	.084	9.447	***
Secure	<--- Security	1.007	.090	11.168	***
representative	<--- integrity	.865	.237	3.656	***

		<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>
Dependability	<--- integrity	.756	.236	3.207	.001
Interpretable	<--- Usability	2.433	.405	6.011	***
Credibility	<--- Authenticity	.923	.219	4.213	***
Authentic	<--- Authenticity	1.063	.216	4.911	***
Accuracy	<--- integrity	.819	.255	3.214	.001
Preservation	<--- Authenticity	1.171	.237	4.945	***
Trustworthy	<--- integrity	1.000			
Traceability	<--- Authenticity	1.000			

Table 5.36 shows the standardised weights. Standardised parameter estimates are transformations of unstandardised estimates that remove scaling and can be used for informal comparisons of parameters throughout the model. Standardised estimates correspond to effect-size estimates. It is indicated that accountability, performance, courtesy, intact, representative and trustworthy, and preservation are the most important indicators of the factors of Reliability, Usability, Assurance, Security, Integrity and Authenticity respectively.

**Table 5.36: Standardised regression weights**

			<b>Estimate</b>
Functionality	<--- Reliability		.532
Factual	<--- Reliability		.527
accountability	<--- Reliability		.689
Transparency	<--- Reliability		.567
Locatable	<--- Usability		.397
Retrievable	<--- Usability		.252
Performance	<--- Usability		.962
knowledgeable	<--- Assurance		.399
Courtesy	<--- Assurance		.728
Confidence	<--- Assurance		.543
completeness	<--- Security		.827

			Estimate
Intact	<---	Security	.928
Accessibility	<---	Security	.778
Secure	<---	Security	.863
representative	<---	integrity	.519
dependability	<---	integrity	.487
interpretable	<---	Usability	.974
Credibility	<---	Authenticity	.432
Authentic	<---	Authenticity	.569
Accuracy	<---	integrity	.489
preservation	<---	Authenticity	.578
Trustworthy	<---	integrity	.519
Traceability	<---	Authenticity	.525

Table 5.37 shows the correlation coefficients between the factors.

**Table 5.37: Correlations**

			Estimate
Usability	<-->	Assurance	.343
Authenticity	<-->	Assurance	.194
Authenticity	<-->	Security	.543

The highest correlation exists between Authenticity and Security (.543) – meaning that either factor explains the other about 30 per cent. The lowest correlation is between Authenticity and Assurance (.194). These results indicate that discriminate validity is poor.

Figure 5.4 shows the path diagram.

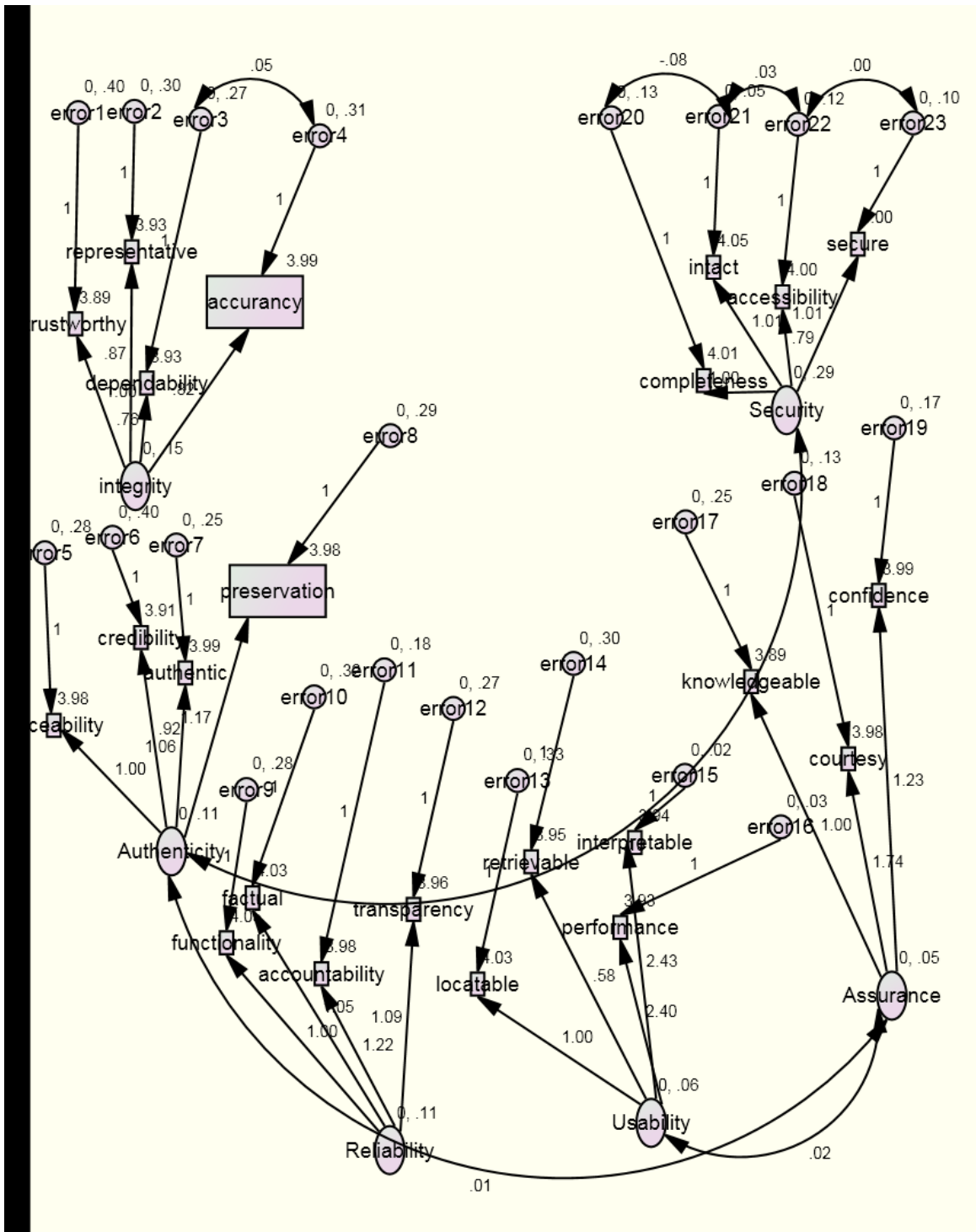


Figure 5.4: Path diagram

### **Fit Statistics**

Fit statistics test how well the competing models fit the data. Mulaik (1987, p. 275) noted, "a goodness-of-fit test evaluates the model in terms of the fixed parameters used to specify the model, and acceptance or rejection of the model in terms of the over identifying conditions in the model". As already mentioned, the chi square tests the hypothesis that the model is consistent with the pattern of covariation among the observed variables. In the case of the chi-square statistic, smaller rather than larger values indicate a good fit.

Some of the criteria (used assessing a factor model fit) indicated acceptable model fit while others were not even close to meeting values for acceptable fit. For the CFA model, the chi-square value was significantly greater than zero, with a P-value of 0.0478, which meant that the model fit was not good. The value of CMIN/DF (542.225/225) was 2.410 with a P-value of .000. This suggested that there was no similarity between the observed and expected frequencies of measured variables. The value of RMSEA of .081 also indicated significant discrepancies. The value was larger than the 0.06 or less criterion. The PCLOSE (.000) of less than 0.05 (the threshold of a good model fit) however showed a good fit. CFI (0.831) and NFI (0.742) values did not meet the criteria (0.90 or larger) for acceptable model fit. The parsimony – Adjusted measures of PNFI (0.742) and PCFI (0.732) also indicated that the model was not acceptable. So, 4 fit statistics indicated an unacceptable fit and only one (1) fit statistic indicated an acceptable fit. The CFA analysis therefore did not confirm the factor structure. The hypothesis that service quality in the Archival environment is adequately explained by 6 information dimensions, namely, Security, Reliability, Authenticity, Usability, Assurance, and Integrity was rejected. Since the CFA did not indicate an acceptable model fit, the factor structure was not confirmed, and the next step was to conduct an exploratory factor analysis.

### **5.7 EXPLORATORY FACTOR ANALYSIS (EFA)**

In order to conduct an EFA and later another CFA, the dataset was divided into two random samples using the SPSS Software. The first sample contained 112 cases, while the second sample consisted of 96 cases. Preliminary descriptive statistics resulted in eliminating 3 cases as outliers ending up with 93 cases in the second sample to be used in the second



CFA. The Exploratory factor solution resulted in 3 factors with Eigenvalues of greater or equal to 1, accounting for 65 per cent of the total variation in the data. The scree plot was also used to decide on the number of factors (see Figure 5.5). The plot starts to change the direction slowly after dimension No. 3.

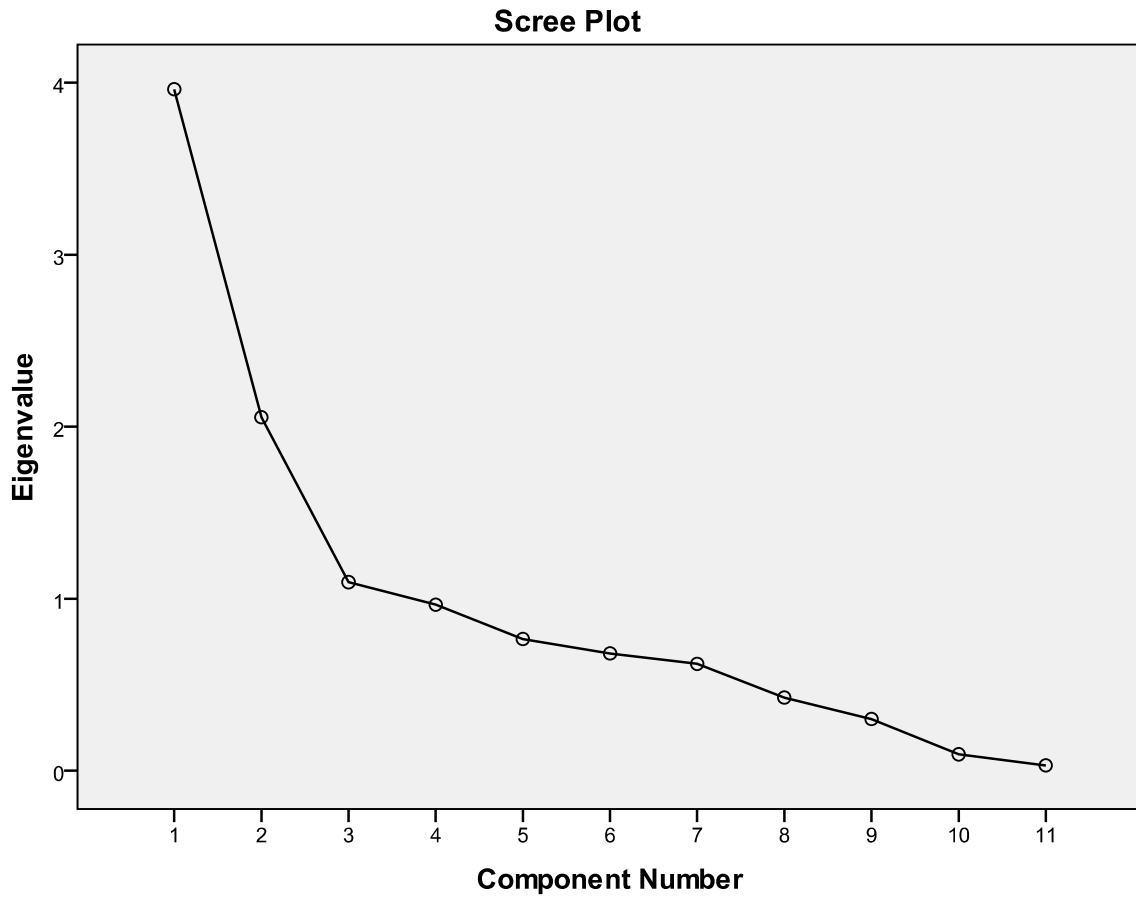


Figure 5.5: Scree Plot (EFA)

In order to purify the list of the measured variables, all items with loadings of less than .3 were eliminated. Factor loading is the correlation between an observable variable and the factor. Items that correlated high with more than one factor were also eliminated to ensure that true discriminant validity was established among the factors. This resulted in removing items from the factors and remaining with some as shown in Table 5.38.

**Table 5.38: Items left in the model (EFA)**

<b>Item</b>	
<b>Security</b>	
Completeness	Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information
Intact	Security of information in the archives can be perceived by whether the structure and content of information on the record is intact
Accessibility	Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security
Secure	Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance
<b>Integrity</b>	
Trustworthy	Integrity of information in the archives is perceived by whether the contents of information/record can be trusted
Representative	Integrity of information in the archives is perceived by whether the contents of the record representative of the transactions, activities and facts to which it attests
<b>Usability</b>	
Retrievable	Usability of information in the archives is perceived by whether the information on the record/record can easily be retrieved
Interpretable	Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record
Performance	Usability of information in the archives is perceived by whether the system is able to perform as promised

It should be noted that all the items of Assurance were eliminated and all the items of Security were retained. The retained factors in the model were: (1) Security (with 4 items), (2) Integrity (with 2 items), and (3) Usability (with 3 items). Table 5.39 shows the total variation explained by the exploratory model. A simpler and clearer factor model was obtained. According to Table 5.39, the factor model explains 65 per cent of the total

variation in the data, with the first factor of Security accounting for 27, the second one of Usability explaining 21 per cent and the third of Integrity explaining about 16.5 per cent.

**Table 5.39: Total Variation Explained (EFA)**

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
	Component Total	% Variance	% of Cumulative	Total	% Variance	% of Cumulative	Total	% Variance	% of Cumulative	
	1	3.962	36.017	36.017	3.962	36.017	36.017	3.014	27.404	27.404
	2	2.055	18.680	54.697	2.055	18.680	54.697	2.287	20.793	48.196
	3	1.096	9.967	64.664	1.096	9.967	64.664	1.811	16.468	64.664
	4	.965	8.775	73.440						
Dimension 0	5	.766	6.960	80.400						
	6	.682	6.199	86.599						
	7	.622	5.650	92.249						
	8	.428	3.885	96.134						
	9	.425	3.866	100.000						

Table 5.40 shows the rotated factor loadings associated with the Exploratory Factor Structure.

**Table 5.40: Rotated factor loadings (EFA)**

	Component			Communalities
	1	2	3	
Trustworthy	.110	.066	.804	.692
Representative	-.034	.163	.719	.545
Retrievable	.011	-.076	.465	.234
Interpretable	.141	.958	.024	.938
Performance	.091	.961	.073	.937
Completeness	.816	.065	.152	.693
Intact	.914	.145	.008	.857
Accessibility	.903	.102	.016	.826
Secure	.913	.023	-.048	.836

According to the results, many factor loadings are smaller than the cut-off point of .3, some are negative others are positive, and indicators load heavily only on one dimension. For example, the very first loading for the first indicator of the dimension of Integrity (trustworthy) is .110, which is very small and insignificant for the first dimension (Security) and the second indicator (representative) loads heavily only on the third dimension (Integrity). This makes the interpretation and labelling of the factors easier. A researcher has to eliminate indicators from the analysis completely, if they load heavily on more than one dimension and there is no other good rotation method that can achieve a better and simpler factor structure. The other main issue concerning the factor structure is that some indicators, instead of loading heavily on the theorised factor as expected, they may load heavily on another factor all together.

All the communalities are less than 1 indicating that there is no spurious solution. Retrievable has a very low communality indicating that it has little in common with others.

### 5.8 SECOND CONFIRMATORY FACTOR ANALYSIS

Table 5.41 indicates that the distributions of the measured variables did not seriously violate the normality assumption of the factor analysis. The thresholds for normality are that the value for skewness should not be greater or equal to 2 and that of kurtosis must not be greater or equal to 6. The table indicates that all the values of skewness and kurtosis are below the corresponding cut-off points of 2 for skewness and 6 for kurtosis therefore the assumption was not violated.

**Table 5.41: Assessment of normality**

Variable	skew	c.r.	Kurtosis	c.r.
Secure	.000	.000	.875	1.722
Accessibility	.015	.059	.719	1.416
Intact	.026	.104	.317	.624
Completeness	.048	.191	.569	1.120
Retrievable	-.207	-.814	.239	.471
Representative	-.316	-1.245	.917	1.804
Trustworthy	-.261	-1.027	-.049	-.097
Performance	-.357	-1.405	1.290	2.539
Interpretable	-.335	-1.321	1.137	2.238
Multivariate			47.277	16.200

Table 5.42 shows the total variation explained by the confirmatory factor model. The model explains 72 per cent of the total variation in the data, with the first factor of Security accounting for 35.5 per cent, the second one of Usability explaining 21 per cent and the third of Integrity explaining about 16 per cent. The explained variance of the confirmatory factor model (72%) is higher than that for the rotated factor loadings (EFA) in table 5.40 (65%) because a different method of rotation was used.

**Table 5.42: Total Variance Explained (CFA)**

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.409	37.880	37.880	3.191	35.459	35.459
2	1.792	19.911	57.790	1.914	21.266	56.725
3	1.316	14.627	72.417	1.412	15.692	72.417
4	.971	10.787	83.204			
5	.624	6.933	90.137			
6	.405	4.503	94.640			
7	.245	2.722	97.363			
8	.137	1.523	98.886			
9	.100	1.114	100.000			

According to Table 5.43 (a), the factor loadings of the Security factor range from .816 (Completeness) to .914 (intact). Usability factor consists of “interpretable” (.958) and “completeness” (.961) and the items loading heavily on the Integrity factor are “trustworthy” (.804), “representative” (.719) and “retrievable” (.465). Using a cut-off loading point of 0.3, the Final factor, the Final factor model for this study consists of 3 factors, namely, Security (with 4 items), Usability (with 2 items) and Integrity (with 3 items including retrievable an item which was originally listed under the Usability factor).

**Table 5.43(a): Rotated factor loadings**

	Component		
	1	2	3
Trustworthy	.110	.066	.804
Representative	-.034	.163	.719
Retrievable	.011	-.076	.465
Interpretable	.141	.958	.024
Performance	.091	.961	.073
Completeness	.816	.065	.152
Intact	.914	.145	.008
Accessibility	.903	.102	.016
Secure	.913	.023	-.048

Table 5.43(b) indicates that Cronbach's Alpha ranges from .41 to .94. Usability has the highest internal consistency of .94 and Integrity has the least of .41. The strongest indicators for Security, Integrity and Usability are Respectively, Intact (.914), Trustworthy (.804) and performance (.961). According to Table 5.43, the first dimension of Security extracts and explains the largest amount variation from the data of 35.5 per cent, Security is confirmed to be the most important dimension for the measurement instrument.

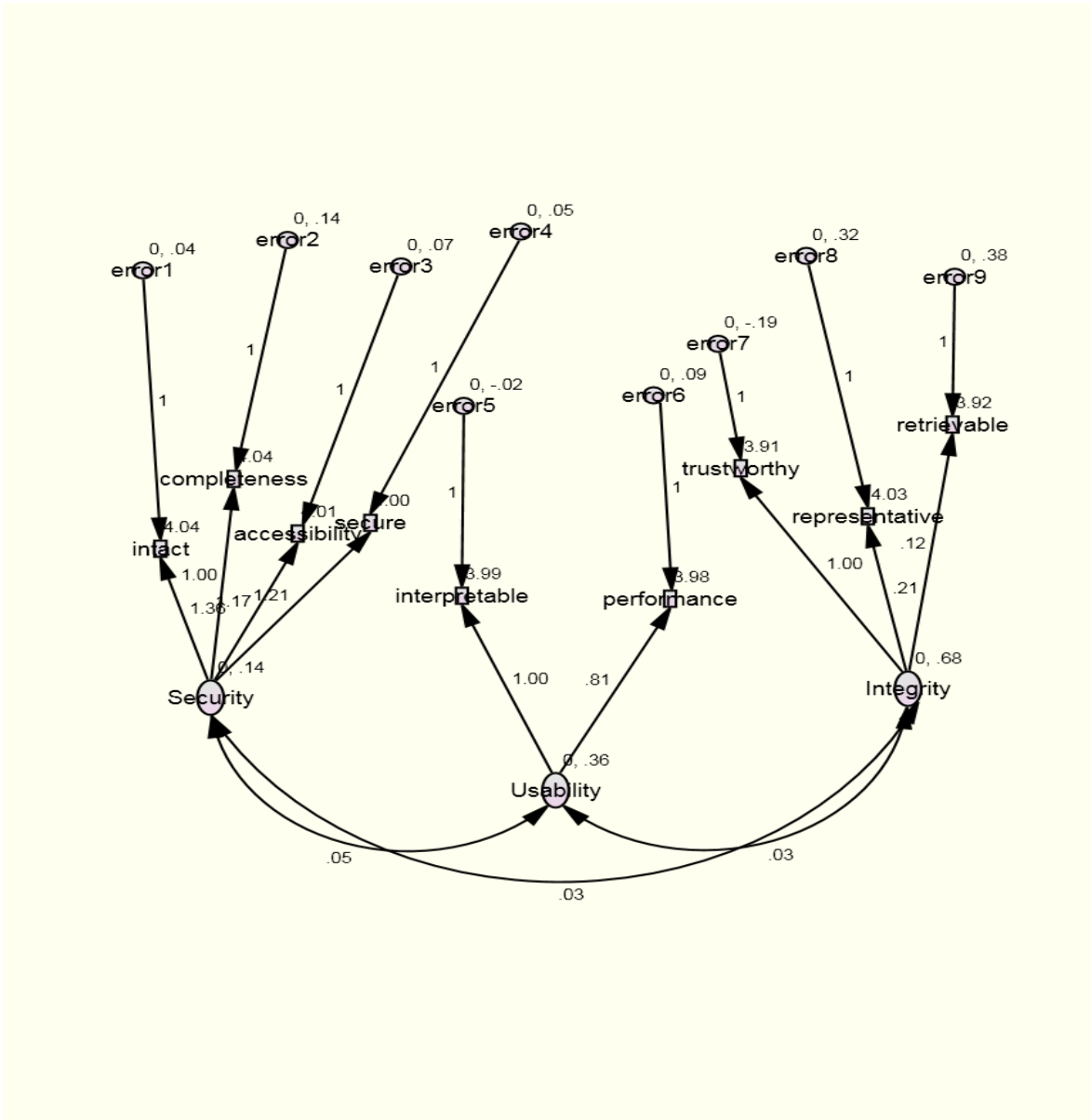
**Table 5.43(b): Rotated Factor Loadings and Cronbach's Alpha**

Dimension	Items	Loading	Standardised Cronbach's Alpha
Security	1. Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information <b>[Completeness]</b>	.816	.91
	2. Security of information in the archives can be perceived by whether the structure and content of information on the record is intact <b>[Intact]</b>	.914	
	3. Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its Security <b>[Accessibility]</b>	.903	
	4. Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance <b>[Security]</b>	.913	
Integrity	1. Integrity of information in the archives is perceived by whether the contents of information/record can be trusted <b>[Trustworthy]</b>	.804	.41
	2. Integrity of information in the archives is perceived by whether the contents of the record representative of the transactions, activities and facts to which it attests <b>[Representative]</b>	.719	



Dimension	Items	Loading	Standardised Cronbach's Alpha
	3. Usability of information in the archives is perceived by whether the information on the record/ record can be easily retrieved <b>[Retrievable]</b>	.465	
Usability	1. Usability of information in the archives can be perceived by whether it is easy to interpret the information on the record/record <b>[Interpretable]</b> 2. Usability of information in the archives is perceived by whether the system is able to perform as promised <b>[Performance]</b>	.958  .961	.94

The path diagram is shown in Figure 5.6.



**Figure 5.6: Path Diagram**

**Fit statistics for the second Confirmatory Factor Analysis (CFA)**

The chi-square value divided by the degrees of freedom (i.e.,  $CMIN/DF = 26.286/24 = 1.095$ ) was less than 3 and the corresponding probability level (.34) was greater than 0.05. This indicates that the amount of difference between expected and observed covariance matrices was not significant. However,  $CMIN/DF$  measure is a fit-index which does not deserve the qualification, “fit statistics because the quantity Chi-square/df has no known distribution so probabilities cannot be computed” (SPSS South Africa). Furthermore,

according to the authors, there is no consensus about what a reasonable value for the index is, in order to reject or accept a model but in any case, the ratio should be close to 1 for correct models. The NFI was .943 > .9 and Comparative Fit Index (CFI) was .995 which also indicated a good model fit. Both RMSEA of .032 (< .06) and PCLOSE (.621) also indicated an acceptable model fit. The parsimony-adjusted measures were: PRATIO value was .667, PNFI value was .629 and PCFI value was .663. All these fit statistics indicated a good model fit. The parameter estimates were then examined.

Tables 5.44 and 5.45 show parameter estimates and standardised parameter estimates respectively. According to the results, all the coefficients except those of representative and retrievable are significant indicating a good model fit at the level of significance of 0.05. It is surprising to find that retrievable item is not significantly loading on the Integrity factor because it belonged to the Usability factor initially.

**Table 5.44: Regression weights (CFA)**

		Estimate	S.E.	C.R.	P
Interpretable	<--- Usability	1.000			
Performance	<--- Usability	.811	.193	4.200	***
Trustworthy	<--- Integrity	1.000			
Representative	<--- Integrity	.210	.356	.589	.556
Retrievable	<--- Integrity	.118	.212	.557	.577
Completeness	<--- Security	1.000			
Intact	<--- Security	1.360	.157	8.684	***
Accessibility	<--- Security	1.172	.147	7.973	***
Secure	<--- Security	1.206	.144	8.360	***

**Table 5.45: Standardized Regression Weights (CFA)**

			Estimate
Interpretable	<---	Usability	1.036
Performance	<---	Usability	.855
Trustworthy	<---	Integrity	1.181
Representative	<---	Integrity	.291
Retrievable	<---	Integrity	.155
Completeness	<---	Security	.715
Intact	<---	Security	.937
Accessibility	<---	Security	.852
Secure	<---	Security	.894

As standardised regression weights help a researcher to assess the importance of an independent variable or an item in the case of factor analysis, the results indicate that for the factor of Usability, “Interpretable” is most important; for Integrity, it is “Trustworthy” and in the case of the Security factor, it is “Intact” followed by Secure.

## **5.9 CONVERGENCE AND DISCRIMINANT VALIDITY**

Construct validity is the extent to which an assessment actually measures the proposed trait or construct in the population of interest. Regarded from a convergent and discriminant validity perspective, convergent validity is good if there is a good correlation between results of an existing measure from theory or an existing instrument and that of the newly designed instrument. Indication of discriminant validity is evidence that the construct is separated from other constructs that could potentially obfuscate the construct under consideration.

Typical reasons why results may not be valid include the following:

- Inappropriate selection of constructs or measures
- Insufficient data collected to make valid conclusions
- Measurement done in too few contexts
- Measurement done with too few measurement variables

- Too great a variation in data
- Inadequate selection of target subjects or small sample size
- Complex interaction across constructs
- Subjects giving biased answers or trying to guess what they should say
- Experimental method not valid
- Research lacking rigour.

Table 5.46 shows the correlation coefficients among the variables that were used in the second Confirmatory Factor Analysis. The correlation coefficients indicate good convergence and discriminant validity of the factor structure. The variables or indicators that load highly on a particular factor do correlate significantly whereas those loading heavily on different factors are not significantly correlated. For example, for the Security factor, all the corresponding correlation coefficients are significant.

**Table 5.46: Correlation matrix (second CFA)**

	Trustworthy	Representative	Retrievable	Interpretable
Trustworthy	1.000			
Representative	.359**	1.000		
Retrievable	.198*	.061	1.000	
Interpretable	.125	.153	.024	1.000
Performance	.151	.187*	.051	.889**
Completeness	.201*	.202*	.085	.240*
Intact	.122	-.003	.042	.271**
Accessibility	.121	-.001	.003	.213*
Secure	.121	.062	.078	.214*

... Continuation of Table 5.46

	Performance	Completeness	Intact	Accessibility	Secure
Correlation	Trustworthy				
	Representative				
	Retrievable				
	Interpretable				

	Trustworthy	Representative	Retrievable	Interpretable	
Performance	1.000				
Completeness	.214*	1.000			
Intact	.209*	.543**	1.000		
Accessibility	.181*	.608**	.795**	1.000	
Secure	.185*	.738**	.731**	.629**	1.000

Note: \* Significant at the 0.05 level of significance

\*\* Significant at the 0.01 level of significance

The correlation between Intact and Completion is .543\*\*\* and that between secure and completion is .738\*\*\*. The highest correlation coefficient is .738\*\*\* and the smallest correlation is .543\*\* (between Intact and Completion. For the Usability factor, the highest is .359\*\* (between Representative and Trustworthy) and the lowest is .061 (between Retrievable and Representative), which is even not significant at the 0.05 level. For Integrity, the correlation between Interpretable and Performance is .889\*\*. The factors are well separated from each other.

For discriminant validity, the factors should not be correlated. It should be noted that just like in the case of regression modelling, the square of the correlation coefficient gives the extent to which a factor explains the variation of an indicator or another factor. According to the results in table 5.46 the strongest correlation is .242 between Security and Usability, which is very weak. This indicates that the two factors Security and Usability are correlated. However, in general, the results indicate good discriminant validity. Table 5.47 shows the correlations between the factors, and Table 5.48 shows the factors' regression weights.

**Table 5.47: Correlations between the factors**

	Estimate
Security <--> Usability	.242
Security <--> Integrity	.106
Usability <--> Integrity	.068

**Table 5.49: Factors' regression weights**

	<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>
Security <--> Usability	.055	.025	2.203	.028
Security <--> Integrity	.033	.029	1.149	.251
Usability <--> Integrity	.034	.042	.810	.418

According to Table 5.48, Usability and Security can predict each other to some extent, which indicates a weakness in the discriminant validity. Nevertheless, the measurement instrument can still be used since it manages to explain 72 per cent of the phenomenon.

## **5.11 SUMMARY OF THE CHAPTER**

In Chapter five the findings of the study under review were presented and interpreted. The analysis was guided by the purpose of this research; the research questions and the steps followed in the measurement development process in accordance with Nunnally (1978) and Hinkin (1989).

For research question 1, the identified dimensions of service quality in archival institutions were informed by the unique characteristics of

- a. *respect des fonds* or provenance principles ;
- b. sanctity of the original order;
- c. the legal principle; and
- d. uniqueness;

as expressed by the respondents on Excerpts A-J of the Delphi technique exercise; the responses from the panel of experts interviewed; the results of the extant literature and the analysis of the archives industry.

The research question 2 on how the dimensions of service quality could be effectively measured was answered through the steps discussed in the methodology chapter. The researcher resorted to using another method, the principal component method, after the use of the maximum likelihood method failed.

In assessing the factor model fit, three fit statistics indicated an acceptable fit while two were close to indicating an unacceptable fit. The CFA analysis therefore did not confirm the factor structure. Since the analysis did not indicate an acceptable model fit, the factor structure could not be confirmed and an exploratory factor analysis was done. This was followed by a second confirmatory analysis. All the parameters and measures indicated a good model fit.

The final resulting dimensions and corresponding items were as follows:

Dimension	Items
<b>Security of information</b>	<p>Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information. <b>(Completeness)</b></p> <p>Security of information in the archives can be perceived by whether the structure and content of information on the record are intact. <b>(Intact)</b></p> <p>Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security. <b>(Accessibility)</b></p> <p>Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance. <b>(Secure)</b></p>
<b>Integrity of information</b>	<p>Integrity of information in the archives is perceived by whether the contents of information/record can be trusted <b>[Trustworthy]</b></p> <p>Integrity of information in the archives is perceived by whether the contents of the record representative of the transactions, activities and facts to which it attests <b>[Representative]</b></p> <p>Usability of information in the archives is perceived by whether the information on the record/record can be easily retrieved <b>[Retrievable]</b></p>
<b>Usability of information</b>	<p>Usability of information in the archives can be perceived by whether it is easy to interpret the information on the</p>



Dimension	Items
	record/record. <b>(Interpretable)</b> Usability of information in the archives is perceived by whether the system is able to perform as promised. <b>(Performance)</b>

Therefore, the new measurement instrument for service quality that was formulated in this study for archival institutions has nine items and three dimensions, namely (1) security of information (with 4 items); (2) integrity of information (with 3 items) and (3) usability of information (with 2 items). The measurement instrument formulated in this study is called *ARCHIVqual*. The next chapter discusses the research findings, concludes this study and gives recommendations.

## **CHAPTER 6:**

### **DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1 INTRODUCTION**

Chapter 6 presents a discussion of the findings in the previous chapter, along with their implications for the practice. In addition, conclusions and the limitations of the study are addressed; and recommendations and further studies are suggested. The purpose and focus of this thesis was on the development and subsequent testing of a measurement instrument of service quality of integrated electronic records management systems in an archival setting.

#### **6.2 DISCUSSION OF THE RESEARCH FINDINGS**

The research followed the standard psychometric procedures for developing measures as suggested by Nunnally (1978) and Hinkin (1998). Data were collected in two phases. These phases also related to the steps identified in Figure 1.1.1 which outlines the necessary steps necessary for the development of a psychometrically valid measurement instrument. Phase 1 as illustrated entailed the generation of a sample of items. This was done qualitatively through interviews and a Delphi technique exercise including a panel of experts in the archives industry to gain their insights into the service quality dimensions in the field. The panel of experts was part of an accessible sample of professionals in the field who were attending the ESARBICA Conference in Namibia. A Delphi technique exercise was conducted to gain further insights on the dimensions of service quality in the archival institutions and also to generate a sample of items that were coded at various levels of the exercise; confirmed and reconfirmed with experts in the industry.

Phase 2 involved systematic random sampling in the distribution of the draft survey instrument at the NASA. The steps followed were in accordance with the measurement development process as highlighted in this research.

### **6.2.1 Discussion of the research findings: Research questions**

The discussion on the research findings of this study was guided by the research questions outlined in Chapter 5. Each research question was presented, followed by a discussion of the findings.

#### **Research Question 1**

What are the dimensions for the measurement of service quality in archival institutions?

This question was designed to ascertain whether there are any existing service quality measurement instruments in the field and to interrogate a process of conceptually and methodologically generating dimensions that would be suitable for measuring service quality in the archives field.

From the Phase 1 results, the responses from the interviewed experts and the Delphi technique exercise indicated that there is currently no service quality measurement instrument in the archives field and the respondents stated that it was imperative that such a measurement tool be derived for the industry. This was further confirmed by the findings from the literature review where the researcher indicated that although the service quality concept had been researched and adapted in the context of information systems (IS) services, (B2C) websites and libraries, and, indeed in many service industries including the healthcare sector (Carman 1990; Headley and Miller 1993; Lam 1997; Kilbourne et al. 2004); banking (Mels et al. 1997; Lam 2002; Zhou et al.2002); fast food (Lee and Ulgado 1997); telecommunications (van der Wal et al. 2002); retail chains (Parasuraman et al. 1994); library services (Cook and Thompson 2007); these extensions and adaptations of service quality have not dealt with corporate electronic records and archives or the measurement of these systems. The existing service quality measurement models range from E-S-QUAL and E-RecS-QUEL models (instruments) (Parasuraman, Ziethml and Malholtra 2005), for example, solely measure service quality of websites to information quality assessment frameworks (Stvilia 2006) ; while LibQUAL specifically dwells on the incorporation of measures appropriate for measuring the performance of digital libraries (Heath et al. 2003). Thus there is currently a gap in the literature on service quality

measurement instruments in archival institutions. During the various exercises of data collection and analysis in Phase 1, variables and items were identified in the archives field. What is particularly outstanding about the formulated dimensions is how they are centred on information on the record /record and the inclusion of the unique archives characteristics of

- sanctity of the original order
- *respect des fonds* or *provenance* principle.
- the legal principle; and
- uniqueness

as expressed in the respondents' statements in the excerpts and the characteristics of archives discussed in the archives industry chapter of this exercise. Research question one was further discussed conceptually as regards service quality in the archival field and methodologically.

In specifying the domain of the service quality, a review and synthesis of past literature not only identified the dimensions of service quality identified in Chapter 3, but also provided the definitions of service quality required in the domain and the items that capture it. This study adopted Cronin and Taylor's (1992) work that locates the concept of service quality as an attitude and postulates individual's perceptions of service quality as a function of its performance. SERVPERF is a more efficient measure compared to SERVQUAL and has been empirically tested on a number of studies; and found to explain more variance in overall service quality than SERVQUAL (Cronin and Taylor 1992; Lee and Yoo 2000; Quester et al. cited in Robinson, 1999).

What should be emphasised in this study, and indeed formulate the difference between this study and other studies is that customers "researchers" at the archival institutions define and conceptualise service quality in terms of one component; which is the quality of record or information received as viewed from the unique characteristics of archives. This invariably makes information/record dimensions unique to archives as confirmed by these unique characteristics, namely

- sanctity of the original order;

- *respect des fonds* or *provenance* principle;
- the legal principle; and
- uniqueness.

It should be pointed out that in the second phase of the study; most of the results obtained from the initial confirmatory factor analysis were poor. Some of the criteria, for instance, indicated an unacceptable model fit while others were close to meeting values for acceptable fit. For the CFA model, the chi-square value was significantly greater than zero, with a P-value of 0.0478, which meant that the model fit was not good. The value of CMIN/DF (542.225/225) was 2.410 with a P-value of .000. This suggested that there was no similarity between the observed and expected frequencies of measured variables. The value of RMSEA of .081 also indicated significant discrepancies. The value was larger than the 0.06 or less criterion. The PCLOSE (.000) of less than 0.05 (the threshold of a good model fit) however showed a good model fit. CFI (0.831) and NFI (0.742) values did not meet the criteria (0.90 or larger) for acceptable model fit. The parsimony-adjusted measures of PNFI (0.742) and PCFI (0.732) also indicated that the model was not acceptable. Thus fit statistics indicated an unacceptable fit and only one (1) fit statistic indicated an acceptable fit. The CFA therefore did not confirm the factor structure that had been derived from the earlier exercises of developing a measurement instrument for service quality in the Archival environment. Since the analysis did not indicate an acceptable model fit, the factor structure was not confirmed, and the next step was to conduct an exploratory factor analysis.

In order to conduct an exploratory factor analysis and later another confirmatory factor analysis, the dataset was divided into two random samples using SPSS software. The first sample contained 112 cases, while the second consisted of 96 cases. Preliminary descriptive statistics resulted in eliminating 3 cases as outliers ending up with 93 cases in the second sample to be used in the second CFA. The exploratory factor solution resulted in 3 factors with eigenvalues of greater or equal to 1, accounting for 65 per cent of the total variation in the data.

It should be noted that the outcome of the results was expected because of the significant inter-correlations that existed among the measured or observed variables. Many factor loadings, for instance, were smaller than the cut-off point of .3; some were negative others were positive: and some indicators loaded on more than one factor. For example, even after rotating the factor loadings using the Varimax rotation method, the loading for the first indicator of the dimension of Integrity (trustworthy) was -.020, which was very small and insignificant and the second indicator (representative) loaded heavily on two factors, factors 2 and 3. This made the interpretation and labelling of the factors difficult, and the researcher had to resort to eliminating such indicators from the analysis completely, as no other good rotation method could achieve a better and simpler factor structure. The other main issue concerning the factor structure was that some indicators, instead of loading heavily on the theorised factor as expected, loaded heavily on another factor all together. For example, theoretically, the “retrievable” item should load heavily on the Usability dimension but it instead loaded heavily on the Integrity dimension.

A second confirmatory factor analysis was carried out. The distributions of the variables did not seriously violate the normality assumption of factor analysis. The criteria are such that the thresholds for normality are: the value for skewness should not be greater or equal to 2 and that of kurtosis must not be greater or equal to 6. The values of skewness and kurtosis for all the measured variables were below the cut-off points of 2 for skewness and 6 for kurtosis - therefore not violating the normality assumption.

Regarding the model fit statistics for the second confirmatory factor analysis, the chi-square value divided by the degrees of freedom (i.e.,  $CMIN/DF = 26.286/24 = 1.095$ ) was less than 3 and the corresponding probability level (.34) was greater than 0.05. This indicated that the amount of difference between expected and observed covariance matrices was not significant. The debate on “fit statistics” should also be taken note of. CMIN/DF measure, for instance is at times viewed as not deserving the qualification of “fit statistics” because the quantity  $Chi^2/df$  has no known distribution so probabilities cannot be computed” (SPSS South Africa). Furthermore, according to the authors, there is no consensus about what a reasonable value for the index is, in order to reject or accept a

model but in any case, the ratio should be close to 1 for correct models. The NFI was .943 > .9 and Comparative Fit Index (CFI) was .995 which also indicated a good model fit. Both Root Mean Square Error of Approximation (RMSEA) of .032 (<.06) and PCLOSE (.621) also indicated an acceptable model fit. The parsimony-adjusted measures were as follows: PRATIO value was .667, PNFI value was .629 and PCFI value was .663. All these fit statistics indicated a good model fit.

Construct validity, that is, the extent to which an assessment actually measures the proposed trait or construct in the population of interest, was examined at the end of the second phase of this study. The results were good in the sense that from a convergent and discriminant validity perspective, generally there was a good correlation among the items of a particular dimension of the newly designed measurement instrument.

The correlation between intact and completion was .543\*\*\* and that between secure and completion was .738\*\*\*. The highest correlation coefficient was .738\*\*\* and the smallest correlation was .543\*\* (between intact and completeness). For the Usability factor, the smallest was .359\*\* (between representative and trustworthy) and the highest was .061 (between retrievable and representative), *which was even not significant at the 0.05 level*. For Integrity, the correlation between interpretable and performance was .889\*\*. The factors were well separated from each other, indicating good and acceptable discriminant validity.

### **6.3 CONCLUSIONS**

On many occasions institutions measure perceptions that may not be of importance to their customers, thus missing altogether the very essence of managing their institutions. This invariably has an impact on the profitability of such organisations. In fact, most service encounters are judged solely from the providers' perspectives without any prior studies on what the customers want. In today's highly competitive environment, it is therefore imperative that service quality becomes an important determinant of customers' satisfaction in archival institutions, and that which should be based on appropriate service quality measurement instruments.

The aim of this thesis was to develop and test a service quality measurement instrument in archival institutions. This research has resulted in important findings and relevant conclusions for both academics and practitioners interested in service quality in the archival environment. For practitioners associated with archival institutions, a reliable and valid instrument was developed which can be used to measure service quality within the archival environment. The measurement instrument can also serve as a tool for conducting periodic surveys, thereby identifying specific problematic areas at the archival institutions.

### **6.3.1 Limitations of the study**

The limitations referred to in Chapter 1 were dealt with by strictly observing the principles of questionnaire design including the length and structure of the questionnaire, avoiding ambiguous and leading questions, making sure that the starting questions are very straight forward to put the respondent at ease, positioning the sensitive questions at the end, etc.

The initial service quality dimensions and items in this study were based on the insights and interpretations of qualitative data generated through in-depth interviews and the Delphi technique exercise with a panel of experts in the industry. The final service quality dimensions and their attributes explain 72 percent of customer service quality. These observations indicate that there may be other dimensions and attributes important to service qualities which are not determined in this study.

In this study, the survey included a single item measure to capture customers' perceived service quality, adding to potential reliability errors. A multi item measure to capture these constructs was not determined in this study.

The ARCHIVqual measurement instrument is most probably culture specific with application in Eastern and Southern African countries. Research has revealed that culture also crucially affects the service quality construct (Imrie 2000). The implications of the research are that further validation of ARCHIVqual should also be subjected to testing in cross cultural



settings, ARCHIVqual application in different geographical regions and different environments other than the archival institutions was not determined in this study.

### 6.3.2 Summary of Findings

The newly developed measurement instrument of service quality in the Archival environment has 3 dimensions listed in Table 6.1. The dimensions and corresponding items are shown in the table.

**Table 6.1: ARCHIVqual: Dimensions and Items**

Dimension	Items
<b>Security of Information</b>	<p>Security of information in the archives can be perceived by whether the record offers complete and unaltered characteristics of information. <b>(Completeness)</b></p> <p>Security of information in the archives can be perceived by whether the structure and content of information on the record is intact. <b>(Intact)</b></p> <p>Security of information in the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security. <b>(Accessibility)</b></p> <p>Security of information in the archives is perceived as the freedom from danger, risk or doubt during a service performance. <b>(Secure)</b></p>
<b>Integrity of Information</b>	<p>Integrity of information in the archives is perceived by whether the contents of information/record can be trusted. <b>[Trustworthy]</b></p> <p>Integrity of information at the archives is perceived by whether the contents of the record are representative of the transactions, activities and facts to which it attests. <b>[Representative]</b></p> <p>Usability of information at the archives is perceived by whether the information on the record/record can easily be retrieved. <b>[Retrievable]</b></p>
<b>Usability of Information</b>	<p>Usability of information in the archives can be perceived by whether it is easy to interpret the information on the</p>

Dimension	Items
	record/record. <b>(Interpretable)</b> Usability of information in the archives is perceived by whether the system is able to perform as promised. <b>(Performance)</b>

As shown in the section above, the new instrument that was formulated had three dimensions, namely (1) security of information (with 4 items); (2) integrity of information (with 3 items) and (3) usability of information (with 2 items). The measurement instrument formulated in this study is called *ARCHIVqual* and has three dimensions and 9 items.

### 6.3.3 Validity and Reliability of Findings

As far as experiences for the respondents were concerned, the researcher adopted triangulation. In this way, validity and reliability of the data and the study as a whole were adequately addressed. The data were also cleaned up to avoid inconsistencies and mistakes that might have been made during data capturing - before the data analysis.

The dimensions /items of *ARCHIVqual* measurement instrument were tested for their clarity and appropriateness. Reliability is the degree to which the measures are free from errors and thus yield consistent results. The Cronbach's standardised  $\alpha$  was estimated to assess reliability, as this is the most commonly used reliability test in survey research. The recommended minimum acceptability value for  $\alpha$  is 0.70, although value for some studies use  $\alpha$  as low as 0.6. As the reliability varied from 0.642 to 0.863, the reliability test was passed.

### 6.3.4 Contribution to knowledge

This study makes significant theoretical and practical contributions in the archival field.

#### Theoretical Contributions:

The main theoretical contribution of this work is the development and validation of a theoretical framework for measuring service quality in the archival environment. Of noteworthy on the contributions of this study to knowledge is an extension of the existing

SERVPERF measurement instrument within the archival setting. The measurement instrument developed is called ARCHIVqual; and has three dimensions namely

1. security of information;
2. integrity of information; and
3. usability of information.

The measurement has 9 items.

### **Practical Contributions**

The business significance of the development and validation of ARCHIVqual measurement instrument is its practical application in measuring service quality at the archival institutions. The measurement instrument is not only an academic and intellectual exercise, but also a business necessity as “what cannot be measured, cannot be managed” (Lovelock 1996) given the importance of “service quality” in the current highly competitive business environment.

## **6.4 RECOMMENDATIONS**

The importance of measuring service quality in the archival industry cannot be understated. The general misconception in the archives industry has been the attempts to use LibQUAL from the library environment to measure service quality in archival institutions. The observations brought out by this study are that archival institutions are different hence the need for a specific measurement instrument for them.

There is a need to measure customers’ “researchers” perceptions on an ongoing basis, implement a customer – focused mission statement and to reward service- orientated departments and support staff in archives; and to revise policies, practices and procedures that intervene on exercises of measuring service quality in archives. Indeed continued effort is needed to re define the measure further and to understand the complex issues of service quality in the archives setting.

## **6.5 SUGGESTIONS FOR FUTURE RESEARCH**

Specific research suggestions that emerged from this empirical investigation include;

1. The initial service quality dimensions and items in this study were based on the insights and interpretations of qualitative data generated through in-depth interviews and the Delphi technique exercise with a panel of experts in the industry. The final service quality dimensions and their attributes explain 72 per cent of customer service quality. These observations indicate that there may be other dimensions and attributes important to service quality. Therefore it is highly recommended that further experts/focus group interviews be conducted, and that discussions to investigate additional variables important to service quality (cf. Zeithaml et al. 1983) be held, especially when testing the methodology in other archives service environments, for instance, corporate archives environments and service quality.
2. The survey in this study included a single item measure to capture customer perceived service quality. This adds to potential reliability errors. Consequently developing a multi-item measure to capture these constructs (cf. Cronin and Taylor 1994; Babakas et al. 1995), again to provide a more balanced assessment from researches and professionals (providers of information) is recommended.
3. Expansion or extension of the study to include other service environments. It is highly recommended that the newly developed service quality measurement instrument be tested in other archival environments, such as private and /corporate archival institutions so as to promote service quality measurement instruments that can be applied appropriately in such sectors. Furthermore, the measurement instrument is most probably culture specific with sole application in Eastern and Southern African countries. It is therefore recommended that the measurement instrument be tested in different geographical regions (e.g. America, Asia and Europe). In the application of the methodology in different environments and regions, it is important to test whether the original surveys encompass all determinants and items perceived to be important to service quality in the environment and/or region investigated. This could include an extension to develop

and test a service quality measurement model in the archival institutions of different cultural settings. The replication of the study in different contextual and business environments could therefore refine, develop and enhance current findings.

4. Further studies of the main types of service encounters, including service failures and recoveries present in the archival institutions.
5. An extension to develop and test a service quality measurement model to measures internal customer satisfaction between service providers and institutional departments.
6. An extension to develop a service quality measurement model from the service providers' perspective in the archival institutions.

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## **APPENDICES**

### **APPENDIX A:**

#### **UNSTRUCTURED INTERVIEW QUESTIONS**

##### QUESTION 1:

Are you aware of any existing tool of measuring service quality of integrated electronic records management systems of archival institutions?

##### QUESTION 2:

Would a tool to measure service quality of integrated electronic records management systems of archival institutions be necessary and important in the field? Why? Why not?

##### QUESTION 3:

From whose perspective should service quality be measured?

##### QUESTION 4:

How is quality measured presently within your institution?

##### QUESTION 5:

How should quality be measured?

##### QUESTION 6:

Would service quality measurement be different from the measurements currently done in your section/department/institution?

Subsequent questions were based on the responses from the above questions.

#### **DELPHI TECHNIQUE EXERCISE**

A single question was asked to trigger the exercise:

How should service quality in archival institutions be measured and what should be considered?

## **DELPHI TECHNIQUE EXERCISE AND INTERVIEWS**

### **Excerpt A: QUESTION 1:**

**Are you aware of any existing tool of measuring service quality of integrated electronic records management systems of archival institutions?**

1. ... no existing model
2. ... not aware of any tool to measure service quality in the field
3. ... we use LibQual which is used in libraries ... but archives material not the same as the library material ... tool has such items as “library as the place” ... these clearly show its bias towards libraries.
4. ...hardly any...
5. ... Not that I know of...

### **Excerpt B: QUESTION 2:**

**Would a tool to measure service quality of integrated electronic records management systems of archival institutions be necessary and important in the field? Why? Why not?**

- ...without measuring service quality you won't know where you are going...
- ...we need a tool appropriate to the field...
- ...been the major challenge in the archival world...
- ...we need one...
- ...uniqueness of archives systems make it imperative for tool specific to archives systems to be formulated
- ... definitely
- ...will be more than welcome...

### **QUESTION 3:**

**From whose perspective should service quality be measured?**

**Excerpt C:**

1. ...from customers who are also researchers...
2. ...from customers' point of view...
3. ...researchers' viewpoint because they are the major customers...
4. ...the archives staff should also be involved...
5. ...researchers...

**QUESTION 4:**

**How is quality measured presently within your institution?**

**Excerpt D:**

1. ... monthly reports written by respective departments ... for instance research archivist reporting on the number of researchers served at the search desk, type of records requested...
2. ...measured through comments from researchers' on visitors' book
3. ...comments in the suggestion box...
4. ...use of LibQual ...

**QUESTION 5:**

**How should quality be measured?**

**Excerpt E:**

...develop a tool that considers the unique characteristics of archives...  
...formulate a tool with different dimensions that capture archives environment ...  
...measure quality from archives perspective ...

**QUESTION 6:**

**Would service quality measurement be different from the measurements currently done in your section/department/institution?**

**Excerpt F:**

... certainly... we want to know what researchers want

...archival records /information is unique  
...service quality measurement should be sector specific  
...most systems are not records management systems hence their inability to maintain trustworthiness of records and inbuilt audit trails  
...with document management systems one is able to manipulate the system whereas records management systems as systems will not allow you to delete...you only delete according to retention schedules ...  
...yes...  
...without measuring service quality you won't know where you are going...  
...we don't have any measurement in place...

**Excerpt G: Subsequent questions as follow up to responses from the above responses and the Delphi Technique exercise**

...trustworthiness of information very important ...should be measured  
...trustworthiness is characterised by true record  
...system should reflect originality of records...  
...trustworthy records... are authentic records...  
...source trustworthy...do they originate where they originate...  
...integrity of information and records...  
...records' authenticity...  
...reliability..."to what extent one can count on information provided at the site"  
...accessibility...  
...usability... "a record which can be located, retrieved, presented and interpreted"  
...preservation over time as essential for supporting accountability and transparency...

**Excerpt H: Records integrity**

Electronic records whose content can be trusted as a full and accurate representation of the transactions, activities or facts to which it attests and can be depended upon in the course of subsequent transactions or activities  
...complete and unaltered characteristic of a record...

...not able to delete records...

...dependable...

#### **Excerpt I: Authentic records**

...prove to be what they purport to be and were sent or created by the person who purports to have created or sent them” ...

...concern about the data migration... results of data loss affecting records’ integrity and possible changes to the content or structure of record over time or across some migrations...

...information should be what it claims to be...

...should be used as evidence in any court of law ...

...should be trusted...

...show genuine sequence of activities...

...events should come out clearly...

#### **Excerpt J: Other issues discussed**

...policies, procedure and systems and measures to prevent unauthorised access, alteration or physical damage to information,

...make sure there is no unauthorised entry in systems..

...lot of hacking these days...records should be secure ...

...records include such information as birth certificates... so should have secure systems...

...can information from other legal sections deposited at the archives be secure to be used without any doubt...

... records/information should provide evidence of action...

...where information was captured is very important in the field...

...develop systems to help maintain worthiness of records...

...good information technology and electronic records management policies...

...good information systems...

...security of records important

### **Discussion on excerpts and the Delphi Technique exercise:**

From further discussions; interviews and clarification of points with the experts in the field, data from these excerpts and the Delphi Technique was coded. The following themes and patterns started to emerge:

1. Trends and patterns of information related to people and not with the people
2. The emphasis during interviews was on quality of information, information dissemination and information integrity
3. The context /environment of information creation and movement
4. Information itself or information on the record.

These emerging patterns and themes were taken back to the experts for further clarification and discussion. From the discussions, the researcher came up with the following classifications, which eventually formed the basis of the formulation of the draft instrument.

### **Integrity of information**

1. Contents of information and whether it can be trusted
2. The contents of the record and whether it was a representative of the transactions, activities or facts which it attested
3. The dependability of the record in relation to the course of subsequent transactions and activities
4. The accuracy of the contents of the electronic record

### **Authenticity of information**

1. on whether the information on the record provided evidence of action
2. on the genuineness or of the origin of the archive
3. on whether the information or the record proved what it purports to be
4. on whether the information on the record /the record has been sent or created by the person who purports to have created it.
5. Whether the description on the record had been maintained as an archival document

**Security of information**

1. In terms of the levels of security, does the record offer complete and unaltered characteristics of information
2. Is the structure and content of information intact

**Reliability of archival information**

1. In terms of whether the system for the electronic records delivery was technically functional most of the time
2. Whether one could count on the information on the site
3. Whether information on the record/site could support accountability
4. Whether information on the record/record could support transparency.

**Usability of Information**

1. Whether information on the record/record could be easily located
2. Whether information on the record or the record could be easily retrieved.

## **APPENDIX B:**

### **LIST OF EXPERTS INTERVIEWED AT THE EASTERN AND SOUTHERN AFRICA BRANCH OF THE INTERNATIONAL COUNCIL OF ARCHIVES (ESARBICA) CONFERENCE**

Panel of Experts interviewed and participants in the Delphi Technique Exercise at the ESARBICA Conference in Namibia. Institutions involved.

1. Kenya National Archives and Documentation Centre
2. University of Witwatersrand, South Africa
3. SQL View Company, Singapore
4. University of Botswana, Department of Library and Information Studies, Botswana
5. University of Namibia: Namibia
6. University of South Africa, South Africa
7. University of Zambia
8. International Archives Council
9. National Archives of Zimbabwe
10. National Archives of Botswana
11. National Archives of Mozambique
12. Namibia Library and Archives Services, Namibia
13. National University of Lesotho
14. Office of the Auditor – General of South Africa, South Africa
15. Documents Department, Germany
16. International Records Management Trust, UK
17. National Archives of South Africa.



**APPENDIX C:**  
**SURVEY INSTRUMENT**

Dear participant

I am conducting research on service quality at the archival institutions.

Kindly fill in the attached questionnaire.

Please do not enter your name on the questionnaire as all the responses will be strictly confidential. Data will be presented only in the aggregate and responses will not be attributed to a particular respondent. Completed questionnaires should be emailed to the researcher at [sibandar@yahoo.ca](mailto:sibandar@yahoo.ca) or dropped off at the National Archives (Pretoria) at your earliest convenience. Please note that you can withdraw from the survey at anytime.

For any enquiries relating to this questionnaire, please contact the researcher, Rosemary Sibanda on +27767878627 or at [sibandar@yahoo.ca](mailto:sibandar@yahoo.ca).

Your participation in this survey is highly appreciated.

Sincerely

Rosemary Sibanda

Please fill in the section on demographic information.

You are then requested to indicate the extent to which each of the items below capture the essence of each service quality dimension.

**Demographic data**

1. Gender

Female	Male
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2. Age

Below 20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	Above 55
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3. What is your job title?

Archivist
Director
Head of Section
Information Management Officer
Records management Officer
Researcher

4. In which section do you operate?

Archives Section
Records Management Section
Research Section
Other (Please specify)

5. Integrity of information at the archives is perceived by whether the contents of information/record can be trusted.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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6. Integrity of information at the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which it attests.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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7. Integrity of information at the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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8. Integrity of information at the archives is perceived by whether the contents of the record are accurate.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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9. Authenticity of information is perceived by whether the information on the record provides evidence of actions.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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10. Authenticity of the information is perceived by whether information on the record /the record proves what it purports to be.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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11. Authenticity of the information is perceived by whether information on the record/the record has been sent or created by the person it purports to have sent or created.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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12. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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13. Reliability of Information at the archives is perceived by whether the system for the information is technically functional most of the time.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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14. Reliability of information at the archives is perceived by whether one can count on the information on the site.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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15. Reliability of information at the archives is perceived by whether the information on the record/record can support accountability.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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16. Reliability of information at the archives can be perceived by whether the information on the record/record can support transparency.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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17. Usability of information at the archives is perceived by whether the information on the record /record can be easily located.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

18. Usability of information at the archives is perceived by whether the information on the record/record can be easily retrieved.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

19. Usability of information at the archives can be perceived by whether it is easy to interpret the information on the record/record.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

20. Usability of information at the archives is perceived by whether the system is able to perform as promised.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

21. Assurance of service at the archives is perceived by whether the employees at the archival institution are very knowledgeable about their operations and systems.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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22. Assurance of service at the archives is perceived by whether the employees at the archival institutions are courteous in their responses.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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23. Assurance of service at the archives can be perceived by whether employees at the archival institution are able to convey trust and confidence of users of the archival systems.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

24. Security of information at the archives can be perceived by whether the record offers complete and unaltered characteristics of information.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

25. Security of information at the archives can be perceived by whether the structure and content of information on the record are intact.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

26. Security of information at the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
-------------------	----------	----------	-------	----------------

27. Security of information at the archives is perceived as the freedom from danger, risk or doubt during a service performance.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
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**Thank you for participating in this survey.**

## **APPENDIX D:**

### **ITEMS INCLUDED IN THE PRE-TEST EXPERT SURVEY INSTRUMENT**

1. Integrity of information at the archives is perceived by whether the contents of information/record can be trusted.
2. Integrity of information at the archives is perceived by whether the contents of the record are representative of the transactions, activities or facts to which it attests.
3. Integrity of information at the archives is perceived by whether the record can be depended upon in the course of subsequent transactions and activities.
4. Integrity of information at the archives is perceived by whether the contents of the record can be trusted.
5. Authenticity of information is perceived by whether the information on the record provides evidence of actions.
6. Authenticity of the information is perceived by whether information on the record /the record proves what it purports to be.
7. Authenticity of the information is perceived by whether information on the record/the record has been sent or created by the person it purports to have sent or created.
8. Authenticity of information is perceived by whether the description of context of the record has been maintained as an archival document
9. Reliability of Information at the archives is perceived by whether the system for the information is technically functional most of the time.
10. Reliability of information at the archives is perceived by whether one can count on the information on the site.
11. Reliability of information at the archives is perceived by whether the information on the record/record can be support accountability.
12. Reliability of information at the archives can be perceived by whether the information on the record/record can support transparency.
13. Usability of information at the archives is perceived by whether the information on the record /record can be easily located.

14. Usability of information at the archives is perceived by whether the information on the record/record can be easily retrieved.
15. Usability of information at the archives can be perceived by whether it is easy to interpret the information on the record/record.
16. Usability of information at the archives is perceived by whether the system is able to perform as promised.
17. Assurance of service at the archives is perceived by whether the employees at the archival institution are very knowledgeable about their operations and systems.
18. Assurance of service at the archives is perceived by whether the employees at the archival institutions are courteous in their responses.
19. Assurance of service at the archives can be perceived by whether employees at the archival institution are able to convey trust and confidence of users of the archival systems.
20. Security of information at the archives can be perceived by whether the record offers complete and unaltered characteristics of information.
21. Security of information at the archives can be perceived by whether the structure and content of information on the record is intact.
22. Security of information at the archives is perceived by the extent to which access to information is restricted appropriately to maintain its security.
23. Security of information at the archives is the perceived as the freedom from danger, risk or doubt during a service performance.



## **APPENDIX E:**

### **GLOSSARY OF TERMS USED IN RECORDS MANAGEMENT**

**Active record** - A record or record file used frequently by the agency. Active records are not eligible for storage in the Records Center.

**Agency** - Any department, office, commission, board or other unit of state government.

**Agency records disposition schedule** - A complete listing of all records found in or under the control of an agency" office. This listing contains records retained in the agency as well as those that will be stored at the Records Center. The schedule also lists the retention period for each record series. This schedule becomes the legal authority for disposition of records.

**Alphabetic system** - Any system for arranging records which is based on the alphabet.

**CSA** - Completion of State Audit. Records so designated are to be retained until they have met audit requirements. Ninety (90) days after the audit report is received, these records can be destroyed if the audit was satisfactory.

**DCA** - Destroy in Current Area. Records so designated should be destroyed in the current office area when they no longer have reference value. These records may not be stored in the Records Center.

**Electronic Record** - A Record containing machine readable, as opposed to human readable information and consisting of character-coded electronic signals that can be processed by a computer.

**Federal requirements** - Records are to be retained to meet federal requirements, the sending agency will provide copies of the regulations that specifically indicates the retention period as required by federal regulations.

**Microfiche** - A four inch by five inch sheet of microfilm containing images in a grid pattern.

**Microfilm** - A photographic reproduction on fine grain, high-resolution film of a document greatly reduced in size from the original.

**Microfilm Jacket** - Two thin pieces of rectangular transparent polyester material that are sealed together in channels usually 16mm or 35mm wide and containing a header strip across the top for the file title. Strips of film are inserted into the channels.

**Microform** - A generic term for any medium containing microimages.

**Micrographics** - A broad term associated with aspects of microimaging and reprography.

**MF/RTA** - Microfilm and return documents to agency.

**Numeric System** - Any system for arranging records which is based on numbers.

**PR** - Permanent Retention. Records so designated are to be retained permanently because of their historical, legal, administrative or fiscal value. Permanent means permanent. Less than permanent requires use of designated years.

**Record** - Any document, book, paper, photograph, map, sound recording or other material, regardless of physical form or characteristics, made or received pursuant to law or in connection with the transaction of official business (RSMo 109.210.5).

**Records Center Box** - A corrugated cardboard box designed to hold approximately one cubic foot of records, either legal or letter size.

**Records Center** - A low-cost centralised area for housing and servicing inactive or semi-active records whose reference rate does not warrant their retention in a prime office space. Documents stored in the Record Center remain in the intellectual custody of the agency even though they are in the physical custody of the Record Center.

**Records Inventory** - A detailed listing of the volume of an organisation's records.

**Records Management** - The systematic control of all records from the creation, or receipt, through their processing, distribution, organisation, storage and retrieval to their ultimate disposition.

**Record Series** - A group of similar or related records, used or filed as a unit.

**Retention period** - The time records must be kept according to the agency record disposition schedule.

**Semi-active records** - A record or record file that would not be referred to on a daily or weekly basis.

**Special requirements** - When records are kept to meet special requirements of associations or other special groups, the sending agency will provide copies of the regulations that will specifically indicate the retention period required.

**State Archives** - The State Archives is the repository for state records of permanent value and serves as the central facility for historical research. Only permanent documents with historical value are stored in and become the intellectual custody of the State Archives.

Agencies wanting to retain intellectual custody of their records need to store documents in the State Records Center commonly referred to as off-site storage.

**Transmittal** - The document that precedes a shipment of boxes to the Records Center. This document must be sent to the records analyst before the boxes are shipped. A copy of this document will be returned to the agency, with a Records Center number assigned to each box.

**Access**

*n.* (RM) Permission and means to use records, in accordance with all applicable access restrictions. (IT) Permission to create, change, consult, or delete electronic records or data.

There can be several degrees of access privilege for users of a networked computer system or enterprise data base.

*v.* (IT) To intercept, instruct, communicate with, store data in, retrieve from, or otherwise make use of any resources of a computer, network, or data.

**Accession**

*n.* (RM) A collection of one or more boxes of records stored in the State Records Center. All records in the accession must fall under the same records series description and have the same disposition date. (Arch) A collection of records of permanent historical value transferred from the creating agency to the State Archives.

*v.* To follow the procedures for transferring records to the State Records Center for storage or to the State Archives for permanent retention.

**Active record**

A record that is regularly referred to and required to perform current operations. Is usually located near the user for ease of access. See also **Inactive record**, **Semiactive record**.

**Administrative records**

Those types of records created by most agencies in performing common facilitative functions that help the agency to operate and support the agency's mission activities, but do not directly document the performance of mission functions. Administrative records relate to activities such as budget and finance, human resources, equipment and supplies, facilities, public and legislative relations, and contracting. See also **Program records**, **Records**.

## **Administrative**

**value**

In records **appraisal**, the value of records based on their usefulness for carrying out the agency's current business. Administrative value typically derives from the information contained in the record.

## **Application**

(1) Software designed to perform a particular task: word processing or spreadsheet, for example. (2) A work process accomplished by a combination of various application software programs, such as using word processing, data base, and spreadsheet programs to merge address and statistical chart data into letters to be mailed to customers.

## **Appraisal**

The analytical process of determining the value of a record, and thereby its **retention** and **disposition**. Appraisal examines the *administrative, fiscal, legal, and historical* values of a record, by considering the record's **content, context, and structure**. Under the Missouri **Records Appraisal and Scheduling Standard for State Agencies**, records may be appraised to be either **temporary** (to be destroyed after an appropriate usage and retention period) or **permanent** (containing sufficient historical or other value to warrant continued preservation in the Missouri State Archives).

## **Archival**

**value**

See **Historical value**.

## **Archive**

v. (IT) Create a backup copy of an electronic file for non-current, but not permanent, storage. (Arch) Capture an electronic record for permanent retention. Usually requires additional indexing or relocating of records to be maintained for future reference. (RM - slang) Sometimes used inappropriately to refer to moving inactive records to off-site storage, e.g. "We *archived* last year's records down to the basement storeroom."

## **Archives**

n. (1) A collection of non-current records of an organisation or institution preserved because of their continuing **historical value**; also referred to as *archival materials* or *archival holdings*. (2) The organisation or agency responsible for selecting, accessioning, preserving, and making available records determined to have permanent or continuing value. (3) The building or portion of a building in which an archival institution is located.

**Arrangement**

The process and results of organising records in accordance with accepted principles.

**Authentication**

(1) (IT) In a communication system, a process used to verify the integrity of transmitted data, especially a message. (2) The process of confirming the asserted identity of a person with a specified or understood level of confidence. The mechanism can be based on something the user knows, such as a password, something the user possesses, such as a 'smart card,' something intrinsic to the person, such as a fingerprint, or a combination of two or more of these. Authentication is distinct from **authorisation**; authentication merely ensures that the person is who he or she claims to be, but says nothing about the access rights or permissions of the individual. (3) (RM) In legal proceedings, the act of proving that a record is true or genuine, especially so that it may be admitted as evidence; the condition of being so proved.

**Authorisation**

(1) (IT) The granting to individuals, based on their duties and responsibilities, specific levels of access rights and permissions to systems. (2) (RM) In the life cycle of records, approval to take actions on records, such as transferring inactive records to records center storage, transferring ownership and custody of permanent records to an archives, or destroying records at the end of their scheduled retention period.

**Backfile****conversion**

The process of identifying, indexing, coding, and/or inputting a large volume or backlog of documents into a newly designed recordkeeping system. Often associated with the scanning of paper documents into a digital imaging system. See also **File conversion**.

**Backup**

(1) The process of making duplicate copies of electronic data, typically for security reasons. Not the same as the process of archiving a record. Backups of electronic information are made in case of equipment failure, etc. to ensure the availability of active records for ongoing administrative purposes. (2) A substitute or alternative. May refer to a disk or tape that contains a copy of data, or to a person authorised to act in the absence of another person.

**Bit**

The smallest unit of information (normally either a 0 or a 1) recognizable by a computer. A contraction of “binary digit”.

**Block**

A grouping of data stored as a unit on an external storage medium and dealt with as a unit by the computer for input or output.

**Byte**

The group of bits that represents a character to a computer, normally 8 bits.

**Case****file**

A file type containing material related to a *specific* action, event, person, place, project, or other subject. Sometimes referred to as a *dossier* or *project file*. Usually has a unique identifier (title, name, case number, etc.), which is placed on each item in the file. See for contrast [Subject file](#).

**Closed****files**

(1) A file unit or series containing documents on which action has been completed and to which more documents are not likely to be added. See also [Cutoff](#). (2) A file unit or series to which access is limited or denied, such as classified information.

**Code**

*n.* (1) Numbers or symbols used to abbreviate lengthy text strings or file titles. In records management, also referred to as *file code*. (2) A set of rules to convert data to a form that computers can process. Also called a *computer code*. Examples include ASCII and EBCDIC. (3) A computer program. (4) A systematically arranged collection of laws or regulations, such as the *United States Code*, *Missouri Revised Statutes*, or *Missouri Code of State Regulations*. *v.* To write file codes from the [file plan](#) onto documents before sorting and filing them. See also [File \(v.\)](#).

**Codebook**

A guidebook identifying and explaining the codes used in a computer file or data base.

**Compact****disk****(CD)**

A small [optical disk](#) on which text, data, sounds, visual images, and the like can be recorded digitally and then read by a laser beam, decoded, and transmitted to a computer, television, or playback device.

**Compression** (Data **compression**)

A process that reduces computer data or images so that they occupy less storage space and can thus be transmitted faster and easier. Data compression is encountered in computer, audio, and video systems. See related terms **Lossless**, **Lossy**, and **Decompression**.

**Computer**

An electronic device designed to accept data (input), perform prescribed mathematical and logical operations at high speed (processing), and supply the results of these operations (output). A digital computer processes data as numbers and includes mainframe computers, minicomputers, and microcomputers. In contrast, an analog computer represents data by measurable quantities, such as voltages.

**Computer** **system**

A configuration, or working combination of computer **hardware**, **software**, and data communication devices.

**Content**

The information conveyed by documentary material. In **appraisal**, considered along with **context** and **structure** to determine the value of a record.

**Context**

The organisational, functional, and operational circumstances in which documentary material is created and/or received and used. In **appraisal**, considered along with **content** and **structure** to determine the value of a record.

**Convenience** **copy**

Unofficial copies of correspondence, completed forms, and other documents kept solely for ease of access and reference. In Missouri, RSMo 109.210(5) defines convenience copies to be **nonrecord** materials.

**Copy**

*n.* A reproduction of the contents of an original document, prepared either simultaneously or separately, and usually identified by function or by method of creation. Copies identified by function include *record copy*, *action copy*, *information copy*, or *stock copy*. Copies identified by method of creation include *photocopy*, *carbon copy*, *electrostatic copy*, or *ribbon* **copy**.

*v.* (1) In word processing, duplicating a portion of a document and placing it in a buffer. (2)

In electronic records management, making a duplicate of a file while leaving the source data unchanged. (3) In email applications, sending an open (cc:) or blind (bcc:) copy of an email message to recipients in addition to the primary recipient(s).

**Cutoff**

Breaking, or ending, files at regular intervals, usually at the close of a fiscal or calendar year, to permit their disposal or transfer in complete blocks and, for correspondence files, to permit the establishment of new files. The cutoff date marks the beginning of the records **retention period**. **Case files** are generally cut off at the end of the year in which the case is closed. Cutoff may be abbreviated as COFF, and is also called *file cutoff* or *file break*.

Symbols or representations of facts or ideas that can be communicated, interpreted or processed by manual or automated means. Often associated with electronic data or with statistics or measurements. Data provide the building blocks of information.

**Data base**

A set of data, consisting of at least one file or of a group of integrated files, usually stored in one location and made available to several users at the same time for various **applications**.

**Data base management system (DBMS)**

A software system used to **access** and retrieve data stored in an electronic data base.

**Data dictionary**

List of all the data elements stored in a data base, with descriptions, definitions, relationships, and information about which reports or other application programs use the data .

**Data element**

In electronic recordkeeping, a combination of characters or **bytes** referring to one separate item of information such as name, address, or age.

**Data field**

A specific area of an electronic record allocated for a particular category of data, usually one data element, such as name.

**Data file**

(1) An organised collection of related data, usually arranged into logical records that are stored together and treated as a unit by a computer. Used interchangeably with **data set**.



(2) Related numeric, textual, or graphic information that is organised in a strictly prescribed form and format, in contrast to a **text file**.

**Data migration**

The preservation of access to electronic data over time by copying it from one **medium** or format to another, preserving its content and relationships.

**Data set**

A group of related electronic records that are organised and treated as a unit. Also used interchangeably with **data file**.

**Decompression**

The process of retrieving compressed data and reassembling it so that it resembles its original form before compression. See related terms **Lossless**, **Lossy**, and **Compression**.

**Description**

(1) (RM) In inventorying records and developing **records schedules**, the process of giving a written account of the contents and characteristics of a **record series** or system. (2) (Arch) The process of preparing **finding aids** for records collections.

**Destruction**

(RM) In the **disposition** of records, the action taken on **temporary records** which have met their prescribed **retention period**. In large records centers, destruction is usually accomplished through a recycling program. Also known as *disposal*.

**Digital**

Using a binary code (ones and zeros, black and white, on and off, etc.) to represent data, which can be read, recorded, stored, processed, transmitted, or otherwise manipulated by a computer or other digital device.

**Digital image**

An electronic photograph scanned from an original document, made up of a set of picture elements ("**pixels**"). Each pixel is assigned a tonal value (black, white, a shade of gray, or color) and is represented digitally in binary code (zeros and ones). The term "image" does not imply solely visual materials as source material; rather, a digital image is simply a representation of whatever is being scanned, whether it be manuscripts, text, photographs, maps, drawings, blueprints, halftones, musical scores, 3-D objects, etc. Also called *optical image*. See also **Scanning**.

## **Digitise**

The process of converting printed or graphic materials on paper or film into digital electronic signals for reading by a computer; accomplished by **scanning** the document.

## **Direct access storage device**

A storage device, such as a computer disk, that provides direct access for write and read heads to a particular data storage location, in contrast a serial- or sequential-access storage device, such as a magnetic tape.

## **Directory**

An organisational structure of the files or electronic documents present on a computer, generally implemented as a hierarchical structure to make them easier to find. The *root* directory is the top directory in the hierarchy, from which all other directories branch out. A *shared* directory in a network environment is one to which more than one person has been granted **access**.

## **Disaster recovery plan**

A written and approved plan of actions to take when disaster strikes, ensuring an organisation's ability to respond to an interruption in services by quickly restoring the critical business functions. Also referred to as a *contingency plan*. See also **Vital records**.

## **Disposal**

See **Destruction**.

## **Disposition**

The actions taken regarding records no longer needed for current agency business operations. Disposition usually begins with records **cutoff**. These actions may include one or more of the following: transfer to agency storage facilities or **records centers**; **retention** for the period of time prescribed in the **records schedule**; **destruction** of **temporary records** which have met their retention; or transfer to an **archives** for permanent preservation and reference. Disposition is the third stage of the records **life cycle**.

## **Document**

v. To record actions, decisions, or events; to substantiate.  
n. (RM, Arch) (1) Recorded information regardless of physical form or characteristics. Sometimes used interchangeably with **record**, although not all records are documents, and not all documents are records. (2) An individual record; a single *file item* (letter, form,

memorandum, report, etc.) of one or more pages.  
*adj.* (IT) **Document file**. A type of computer file containing primarily text and imbedded objects, produced by a word processing application or unformatted text writing program. Often denoted by a *.doc*, *.wpd* or *.txt* filename extension. See also **Text file**.

### **Documentation**

(1) The act or process of substantiating by recording actions and or decisions. (2) (IT) Records concerning a computer system that are required to plan, develop, operate, maintain, and use the system's **hardware** and **software**. Included are systems specifications, file specifications, **codebooks**, record layouts, user guides, and output specifications.

### **DoD 5015.2-STD Design Criteria Standard for Electronic Records Management Software Applications**

A functional design standard for software programs that manage electronic and other records. Issued by Department of Defense to apply to all DoD activities, and endorsed by the National Archives and Records Administration for use by all Federal agencies. The Joint Interoperability Test Command (JITC) tests in-house and commercial electronic **records management applications** (RMAs) for compliance to the standard, and certifies those that pass. Compliant products and other information about DoD 5015.2-STD are listed at <http://jitic.fhu.disa.mil/recmgt/index.html>.

### **Dumping**

(1) The process of copying recorded information from internal memory to an external storage medium, such as a magnetic tape or a printout, for backup, analysis, or some other purpose. (2) The process of transferring recorded information from one storage device to another, such as from a disk to a tape.

### **Electronic documents (electronic files)**

Recorded information that is recorded in a form that requires a **computer** or other machine to process it. Includes word processing documents; **electronic mail** messages; documents transmitted via Electronic Data Interchange; **Internet** and **Intranet** postings; numerical and textual spreadsheets and **data bases**; **digital images**; **software**; and **information systems**.

### **Electronic mail (Email or E-mail)**

An application that enables users to compose, transmit, receive, and manage electronic

messages and attachments across **networks** and through gateways connecting to other local area networks throughout the world.

**Electronic** **record**

(1) (RM) Any information that is recorded in a form that only a computer can process and that satisfies the operative definition of “record”. In Missouri, this is RSMo 109.210(5). See also **Record** and **Nonrecord**. (2) (IT) Often used generally to describe electronic files in a **computer system**, regardless of their record or nonrecord status.

**Electronic** **recordkeeping**

Using a computer program to collect, organise, and categorise records to facilitate their preservation, retrieval, use, and disposition.

**Evidential** **value**

The usefulness of records in documenting the organisation, functions, and activities of the agency creating or receiving them. Considered in appraising records for permanent retention. Compare to **Informational value**.

*n.* (1) (RM) An accumulation of related or similar records arranged according to a plan. (2) A unit, such as a folder, microform, or electronic medium, containing such records. (3) Storage equipment, such as a filing cabinet. (4) (IT) A named set of records stored or processed as a unit electronically.

*v.* To place individual documents or file items into the appropriate file unit according to the file plan so that they are grouped with similar or related items and can be easily retrieved.

**File** **conversion**

The process of changing records from one filing system to another, from one medium to another, or from one software program or version to another. See also **Backfile conversion** and **Migration**.

**File** **plan**

A document containing the identifying number, title or description, arrangement pattern, and disposition authority of files held in an office. A guide and aid to filing and retrieval of files.

**File** **server**

A mass storage device that can be accessed by several computers, usually through a local

area network (**LAN**); a computer dedicated to processing and storing data and for sharing software in a **network** computing environment.

**Finding** **aid**

A descriptive tool, published or unpublished, manual or electronic, produced by the originator of the records, an archival **repository**, or **records center** to establish physical and/or intellectual control over records and other holdings. Basic finding aids include guides (general, repository, subject), inventories, **accession** registers, catalogs, calendars, card catalogs, special lists, shelf and box lists, **indexes**, descriptive **data bases**, and for electronic records, software **documentation**.

**Fiscal** **value**

In records **appraisal**, the usefulness of records in documenting an agency's financial transactions and obligations.

**Freeze** **(Hold)**

To suspend normal **disposition** activity on those records and other materials needed for legal or regulatory actions or other extraordinary circumstances.

**Functional** **classification**

The division of records into categories and subcategories to reflect the programs, activities, and transactions carried out by the organisation accumulating the records.

**Functional** **requirements**

A description of an organisation's computer processing needs to carry out its programs and satisfy its mission.

**Hard** **copy**

(1) Recorded information copied from a computer onto paper or some other durable surface, such as microfilm. To be distinguished from a temporary image on a display screen and from the electronic information on a magnetic tape or disk(ette) or in the computer's main memory. (2) Recorded information copied from microfilm onto paper and made readable without a special device. (3) A paper document that may later be filmed or digitised.

**Hardware**

A computer system's physical equipment, including the central processing unit (CPU), control unit, memory, input/output devices, and storage devices.

**Hierarchical classification system**

(RM) Any filing classification system in which records are arranged under primary (first-level) categories and then, as necessary, under secondary (second-level) and further subdivisions.

**Hierarchical storage management (HSM)**

(IT) A data storage management strategy in which special software is used to separate actively-used and inactive computer data by moving files between primary (on-line), secondary (near-line), and sometimes tertiary (off-line) storage media.

**Historical value**

In records **appraisal**, the value records have to warrant their permanent retention beyond the time they are needed for their normal **administrative**, **fiscal**, or **legal** purposes. Historical value is usually based on the **evidential** and/or **informational value** of the records.

**Hold**

See **Freeze**.

**Imaging**

See **Scanning**.

**Inactive record**

A record not in immediate use that does not have to be readily available, but which must be retained for legal, fiscal, or historical purposes. See also **Active record**, **Semiactive record**.

**Index**

*n.* (1) A separate collection of cards, extra copies of documents, cross-reference sheets, or other forms arranged differently from the related record series to make it easier to locate relevant documents. (2) A manual or automated listing arranged differently from a related record series or system to speed retrieval of relevant information, *e.g.*, a database application which locates and retrieves digital images from among a collection of images.

See also **Finding aid**.

*v.* (1) To create an index for a collection of records. (2) To add new records into an existing index.

**Information system**

The structures, processes, and technologies used to generate, process, and transmit information to support an organisation, whether automated or manual.

**Informational****value**

The usefulness of records in documenting the substance of persons, places, things, or matters dealt with by an agency. The utility of the data contained in records, such as aerial photographs, engineering drawings, scientific observation data, navigation charts, etc. Informational value is considered in appraising records for permanent retention. Compare to **Evidential value**.

**Input**

Data entered into a computer for processing.

**Input****records**

Nonelectronic documents designed and used to create, update, or modify records in an electronic medium; or electronic records containing data used to update a separate computer file. Sometimes called *source records* or **source documents**.

**Integration**

(1) Combining various pieces of **hardware** and **software**, often acquired from different vendors, into a unified system. (2) Combining computer programs into a unified software package so that all programs can share common data.

**Internet**

A worldwide **network** of computers that allows public access to send, store, and receive electronic information over public networks. It is a network of networks.

**Intranet**

A private Internet **network** set up within an organisation behind a security firewall for use, depending on access clearance, by the organisation's employees, business partners, customers, or general Internet users.

**Inventory**

(1) A survey of agency records and nonrecord materials that is conducted primarily to develop **records schedules** and also to identify various records management problems, such as improper applications of recordkeeping technology. (2) The results of such a survey. (3) (Arch) A type of **finding aid** for accessioned permanent records.

**Jukebox**

A storage device that holds **optical disks** or tapes and has one or more drives that provide automatic online access to the information contained therein.

**Legal****value**

In records **appraisal**, the usefulness of records in documenting legally enforceable rights or obligations, both those of a government agency or other organisation and those of persons directly affected by the agency's activities.

**Life****cycle****of****records**

(1) (RM) The management concept that records pass through three stages: creation or receipt, maintenance and use, and disposition. (2) (IT) The transition of documents or data from active to inactive status, which is generally coincident with the movement of the information from primary to secondary storage media. Subsequently, records or data are purged or permanently preserved as electronic archives.

**Lossless**

A compression process that reduces the storage space needed for an image file without loss of data. If an image has undergone lossless compression, when decompressed it will be identical to the image before it was compressed. See related terms **Lossy**, **Compression**, and **Decompression**.

**Lossy**

A compression process that reduces the storage space needed for an image file, but which discards some information that is “redundant” and not perceptible to the human eye. If an image that has undergone lossy compression is decompressed, it will differ from the image before it was compressed, even though the difference may be difficult for the human eye to detect. See related terms **Lossless**, **Compression**, and **Decompression**.

**Media****stability**

The extent to which a given recordkeeping medium retains its original physical or chemical properties; the ability of various records media to retain their information content in usable form over a given period of time.

**Medium****(Media)**

The physical form of recorded information. Includes paper, film, disk, magnetic tape, and other materials on which information can be recorded.

**Metadata**

Data about the data; the description of the data resources, its characteristics, location, usage, and so on. Metadata is used to identify, describe, and define user data.



**Metadata****element**

An individual part of a metadata structure.

**Migration**

Moving from one electronic system to another, usually in upgrading **hardware** or **software** without having to undergo a major conversion or reinputting of data. See also **File conversion**.

**Network**

A group of computers and related devices connected to each other by communications lines to share information and resources. A *local area network (LAN)* connects computers and resources in a limited geographical area, such as a floor, a building, a cluster of buildings, or a city. A *wide area network (WAN)* connects two or more local area networks through high-speed data communication lines, or connects computers and resources located more than one mile apart.

**Nonpermanent****record**

See **Temporary record**.

**Nonrecord**

Any documentary material or information which does not meet the definition of **record**. RSMo 109.210(5) specifically defines “Library and museum material made or acquired and preserved solely for reference or exhibit purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and processed documents” to be nonrecord materials.

**Office****of****record**

An office designated to maintain the record or official copies of a particular type of record in an organisation. See also **Record copy** and **Official record**.

**Official****record**

(1) Significant, vital, or important records of continuing value to be protected, managed, and retained according to established **records schedules**. Often, but not necessarily an original.  
(2) In law, an official record has the legally recognised and judicially enforceable quality of establishing some fact. See also **Office of record** and **Record copy**.

**Off-line**

Not under the direct control of a computer. Refers to data on a medium, such as a magnetic tape, not directly accessible for immediate processing by a computer.

**Off-site****storage**

A facility other than an agency's normal place of business where **inactive records** are stored during their **retention period** to reduce space costs. See also **Records center**.

**On-line**

Under the direct control of a computer. Refers to data on a medium, usually a disk, directly accessible for immediate processing by a computer.

**Operating****system**

**Software** controlling and directing a computer's operation.

**Optical****disk**

A high-density platter-shaped storage **medium** on which digital information is recorded by altering the light reflectance properties of selected areas. Data is written and read by laser beams, and is randomly accessible. Optical disks are available in erasable and non-erasable formats. See also **Compact disk**.

**Output**

Information transmitted from internal to external units of a computer, or to an outside **medium**. The machine-readable or human-readable data produced by a computer.

**Permanent****records**

Records appraised as having sufficient historical or other value to warrant continued preservation beyond the time they are needed for administrative, legal, or fiscal purposes. Sometimes called *archival records*. See also **Appraisal**, **Historical value**; contrast to **Temporary records**.

**Personal****papers**

Documentary materials belonging to an individual that are not used to conduct agency business. Related solely to an individual's own affairs or used exclusively for that individual's convenience. Must be clearly designated as such and kept separate from the agency's records. Also called *personal files* or *personal records*.

**Pixel**

From PICture ELeMent. The smallest unit of a digitised picture or video display. Also referred

to as *dots*, and measured in terms of *dots per inch (DPI)*. The greater the number of pixels in a square inch of a displayed image, the greater is the *resolution* or sharpness of the image to the human eye. Higher resolution image files are larger and take considerably more storage space than lower resolution image files.

### **Preservation**

(1) The provision of adequate facilities to protect, care for, or maintain records. (2) Specific measures, individual and collective, undertaken to maintain, repair, restore, or protect records.

### **Program**

*n.* (1) (RM) The collective set of functions and activities performed by a **program unit** within a government agency or other organisation that contributes to performance of the agency's overall mission; a recognisable segment of the agency mission, usually under the direction of a program manager. See also **Program records**. (2) (IT) An ordered set of coded instructions or statements which can be executed by a computer and cause the computer to take a sequence of steps and perform particular tasks. See also **Software**.  
*v.* To write and provide instructions to a computer to carry out particular functions.

### **Program records**

Those records created by each state or local government agency in performing the unique functions and activities that stem from the distinctive mission of the agency. The agency's mission is defined in authorising statute and further delineated in formal regulations.

### **Program unit**

A division, department, section, or other administrative unit of a corporation, government agency, or other organisation, responsible for carrying out one or more **program**.

### **Project file**

All records that pertain to a project, as designated by the organisation, and therefore filed together as a set under the project identifier instead of individually. Large, complex, and long-term project files may include several subsets of various types of records related to the project, which may have varying **retention periods** depending on their significance through the life of the project. See also **Case file**.

### **Proprietary**

(Referring to a computer file format) Owned and controlled by a single company and

therefore usually only readable in a certain software and hardware environment, and not necessarily exportable to another environment.

**Record**

Any document, book, paper, photograph, map, sound recording or other material, regardless of physical form or characteristics, made or received pursuant to law or in connection with the transaction of official business (RSMo 109.210.5).

**Record**

**copy**

(1) The official copy of a record that is retained for administrative, legal, fiscal, or historical purposes, sometimes the original. Duplicates of a document or multi-part form distributed to several locations may have multiple record copies, based on the purpose for which the document or form is used in each location. (2) The copy of a record that is captured and maintained in a **recordkeeping system**. See also **Office of record** and **Official record**.

**Recordkeeping**

**requirements**

Statements in statutes, regulations, or agency directives providing general and specific guidance on particular records to be created and maintained by an agency. Since each agency is legally obligated to create and maintain adequate and proper **documentation** of its organisation, functions, and activities, it needs to issue recordkeeping requirements for all activities, and to distinguish **records** from **nonrecord** materials and **personal papers**.

**Recordkeeping**

**system**

A manual or automated system in which records are collected, organised, and categorised to facilitate their preservation, retrieval, use, and **disposition**.

**Record**

**series**

File units or documents arranged according to a filing system or kept together because they relate to a particular subject or function, result from the same activity, document a specific type of transaction, take a particular physical form, or have some other relationship arising out of their creation, receipt, or use. Also called *series*. **Records schedules** typically list and describe records at the record series level of aggregation.

**Records**

**centre**

A facility, sometimes especially designed and constructed, for the low-cost, secure, and efficient storage and furnishing of reference service on **inactive records**, pending their

ultimate disposition. The Secretary of State operates the State Records Center in Jefferson City for storage of inactive records of Missouri state agencies.

**Records control schedule**

**Records disposition schedule**

See [Records schedule](#).

**Records management**

The planning, controlling, directing, organising, training, promoting, and other managerial activities related to the creation, maintenance and use, and disposition of records, to achieve adequate and proper documentation of state and local agency policies and transactions and effective and economical management of agency operations.

**Records management application (RMA)**

In [DoD 5015.2-STD](#), the term used to describe a computer program designed to store and manage an organisation's records in electronic and other formats; an electronic [recordkeeping system](#). The Joint Interoperability Test Command (JITC) conducts functional testing on RMA software programs for the purpose of determining and certifying if they comply with the DoD 5015.2 standard.

**Records retention schedule**

See [Records schedule](#).

**Records schedule**

A listing and description of the [record series](#) maintained by all or part of an organisation, prescribing the period of time that each series is to be maintained after no longer needed for current business, and when such series may be reviewed for [disposition](#). A records schedule provides for the retention of state or local records of continuing value and for the prompt and orderly [destruction](#) of state or local records no longer possessing sufficient [administrative, legal, fiscal](#) or [historical value](#) to warrant their future keeping. Also called *records control schedule, records disposition schedule, records retention schedule, records retention and disposition schedule, or schedule*.

**Reference files**

See [Technical reference files](#).

**Refresh**

To transfer digital data to new storage media at specified intervals to avoid the effects of media deterioration.

**Repository**

A place where archives, records, or manuscripts are kept.

**Retention period**

The length of time a **record series** is to be kept after no longer needed for current business. Normally expressed either as a time period (*e.g.*, 4 years), an event or action (*e.g.*, completion of audit), or a combination (*e.g.*, 6 months after completion of audit). Retention period begins at record series **cutoff** unless otherwise specified.

**Scanner**

A device that converts an image of a document or microform into digital form for electronic processing and storage.

**Scanning**

The process of converting an image of a document or microform into digital form for electronic processing and storage.

**Schedule**

*v.* To take the steps necessary to develop a **records schedule** for one or more series of records. Steps typically involve: *Inventory* of records; *drafting* of descriptions of records and proposed retentions; *discussion* and *clearance* of drafts with all concerned parties; *approval* by the authorised official; *publication*, *distribution*, and *implementation* within the organisation. See also **Appraisal**.

*n.* See **Records schedule**.

**Server**

A computer device that provides shared services to workstations over a computer network, *e.g.*, file server, print server, email server, etc.

**Semiactive record**

A record that is not regularly needed to perform current operations, but is still needed for occasional reference. See also **Active record**, **Inactive record**.

**Software**

Computer program that instructs a computer to perform specific functions.

**Source** **document**

Record on which an original transaction was captured, from which parts or all information is entered into a work process or **recordkeeping system**; can be **hard copy** or electronic. See also **Input records**.

**Structure**

The physical or logical form of documentary material or a set of documentary materials. In **appraisal**, considered along with **content** and **context** to determine the value of a record.

**Subject** **file**

A file type in which documents are placed and collected because they generally relate to the subject or topic of the file folder. Office correspondence is typically maintained in subject files. Subject files should be **cutoff** annually so that stale information may be disposed of and new subject files for more current information may be set up. Contrast to **Case file**.

**Technical** **reference** **files**

Copies of directives, procedures, articles, periodicals, reports, studies, vendor catalogs, and similar materials that are needed for reference and information, but are not properly part of the office's records. Also called *reference files*. Reference materials may be disposed of when superseded or no longer useful. They should be maintained separately from **subject files** and **case files**, which are **records**, to facilitate **disposition**.

**Temporary** **records**

Records approved for destruction on a **records schedule**, either immediately or after a specified **retention period**. Also called *disposable records* or *nonpermanent records*. See also **Appraisal**; contrast to **Permanent records**.

**Text** **file**

A computer file that contains character-coded representations of letters of the alphabet, numeric digits, punctuation marks, and other symbols encountered in keyed documents. Text files may be created by word processing programs, electronic mail programs, or other computer software, and follow a loose format. See also **Data file** and **Document**.

**Transitory** **documents**

Documents of short-term interest which have no **historical value**. They lose their **administrative value** and are disposable once the information they contain has been conveyed or the event has occurred. Examples include: (1) Routine requests for information

or publications. (2) Letters of transmittal that do not add information to the transmitted materials. (3) Quasi-official notices that do not act as the basis for official actions, such as notices of holidays, employee recognition notices, etc.

**Turnkey**

**system**

A **computer system** that is ready to use, with all **hardware** and **software** needed to perform a given **application** already installed.

**Unscheduled**

**records**

Records created or held by an agency which have not been **appraised** and for which a **retention period** has not been determined on a **records schedule**. Unscheduled records may *not* be disposed of.

**Vital**

**records**

Records essential to the continued functioning or reconstitution of an organisation during and after an emergency (emergency operating records). Also those records essential to protecting the legal and financial rights of the organisation and of the individuals directly affected by its activities (rights and interest records). Also called *essential records*. Vital records considerations are a key part of an agency's **records management** program. See also **Disaster recovery plan**.

**Weeding**

The removal of individual documents or files lacking continuing value from a collection of files. Also known as *culling, purging, stripping, or screening*.

**Working**

**Papers**

Documents such as notes, calculations, or drafts assembled or created and used in the preparation or analysis of other documents. Usually retained by the originator at the point of use with limited retention value.



## **APPENDIX F:**

### **GLOSSARY OF TERMS USED IN ARCHIVES**

#### **ACCESSION**

(v.) To transfer physical and legal custody of documentary materials to an archival institution.

(n.) Materials transferred to an archival institution in a single accessioning action.

#### **ACCRETION**

An addition to an accession.

#### **ACQUISITION**

The process of identifying and acquiring, by donation or purchase, historical materials from sources outside the archival institution.

#### **ADMINISTRATIVE VALUE**

The value of records for the ongoing business of the agency of records creation or its successor in function.

#### **APPRAISAL**

The process of determining whether documentary materials have sufficient value to warrant acquisition by an archival institution.

#### **ARCHIVAL INSTITUTION**

An institution holding legal and physical custody of noncurrent documentary materials determined to have permanent or continuing value. Archives and manuscript repositories are archival institutions.

#### **ARCHIVAL VALUE**

The value of documentary materials for continuing preservation in an archival institution.

#### **ARCHIVES**

(1) The noncurrent records of an organisation or institution preserved because of their continuing value.

(2) The agency responsible for selecting, preserving, and making available records determined to have permanent or continuing value.

(3) The building in which an archival institution is located.

## ARCHIVES ADMINISTRATION

The professional management of an archival institution through application of archival principles and techniques.

## ARCHIVIST

The professional staff member within an archival institution responsible for any aspect of the selection, preservation, or use of archival materials.

## ARRANGEMENT

The archival process of organising documentary materials in accordance with archival principles.

## COLLECTING POLICY

A policy established by an archival institution concerning subject areas, time periods, and formats of materials to seek for donation or purchase.

## COLLECTION

(1) An artificial accumulation of materials devoted to a single theme, person, event, or type of document acquired from a variety of sources.

(2) In a manuscript repository, a body of historical materials relating to an individual, family, or organisation.

## COLLECTION DEVELOPMENT

The process of building an institution's holdings of historical materials through acquisition activities.

## CONTINUOUS CUSTODY

(1) In contemporary U.S. usage, the archival principle that to guarantee archival integrity, archival materials should either be retained by the creating organisation or transferred directly to an archival institution.

(2) In British usage, the principle that noncurrent records must be retained by the creating organisation or its successor in function to be considered archival.

## CUBIC FEET (or METERS)

A standard measure of the quantity of archival materials on the basis of the volume of space they occupy.

#### DEED OF GIFT

A legal document accomplishing donation of documentary materials to an archival institution through transfer of title.

#### DEPOSIT AGREEMENT

A legal document providing for deposit of historical materials in physical custody of an archival institution while legal title to the materials is retained by the donor.

#### DESCRIPTION

The process of establishing intellectual control over holdings of an archival institution through preparation of finding aids.

#### DISPOSITION

The final action that puts into effect the results of an appraisal decision for a series of records. Transfer to an archival institution, transfer to a records center, and destruction are among possible dispositions.

#### DISPOSITION SCHEDULE

Instructions governing retention and disposition of current and noncurrent recurring records series of an organisation or agency. Also called a RECORDS CONTROL SCHEDULE.

#### DOCUMENT

Recorded information regardless of form or medium with three basic elements: base, impression, and message.

#### DONATED HISTORICAL MATERIALS

Historical materials transferred to an archival institution through a donor's gift rather than in accordance with law or regulation.

#### EVIDENTIAL VALUE

The value of records or papers as documentation of the operations and activities of the records-creating organisation, institution, or individual.

#### FIELD WORK

The activity of identifying, negotiating for, and securing historical materials for an archival institution.

#### FINDING AID

A description from any source that provides information about the contents and nature of documentary materials.

#### HOLDINGS

All documentary materials in the custody of an archival institution including both accessioned and deposited materials.

#### INFORMATIONAL VALUE

The value of records or papers for information they contain on persons, places, subjects, and things other than the operation of the organisation that created them or the activities of the individual or family that created them.

#### INTRINSIC VALUE

The archival term for those qualities and characteristics of permanently valuable records that make the records in their original physical form the only archivally acceptable form of the records.

#### LEGAL CUSTODY

Ownership of title to documentary materials.

#### LIFE CYCLE OF RECORDS

The concept that records pass through a continuum of identifiable phases from the point of their creation, through their active maintenance and use, to their final disposition by destruction or transfer to an archival institution or records center.

#### LINEAR FEET (or METERS)

A standard measure of the quantity of archival materials on the basis of shelf space occupied or the length of drawers in vertical files or the thickness of horizontally filed materials.

#### MACHINE-READABLE RECORDS

Records created for processing by a computer.

#### MANUSCRIPT

A handwritten or typed document, including a letterpress or carbon copy, or any document annotated in handwriting or typescript.

#### MANUSCRIPT

See PERSONAL PAPERS.

#### MANUSCRIPT CURATOR

The professional staff member within a manuscript repository responsible for any aspect of the selection, preservation, or use of documentary materials.

#### MANUSCRIPT REPOSITORY

An archival institution primarily responsible for personal papers.

#### NONRECORD MATERIAL

Material that is not record in character because it comprises solely library or other reference items, because it duplicates records and provides no additional evidence or information, or because its qualities are nondocumentary.

#### ORIGINAL ORDER

The archival principle that records should be maintained in the order in which they were placed by the organisation, individual, or family that created them.

#### PERSONAL PAPERS

A natural accumulation of documents created or accumulated by an individual or family belonging to him or her and subject to his or her disposition. Also referred to as MANUSCRIPTS.

#### PRIMARY VALUES

The values of records for the activities for which they were created or received.

#### PROCESSING

All steps taken in an archival repository to prepare documentary materials for access and reference use.

#### PROVENANCE

(1) The archival principle that records created or received by one recordskeeping unit should not be intermixed with those of any other.

(2) Information on the chain of ownership and custody of particular records.

#### RECORD COPY

The copy of a document which is designated for official retention in files of the administrative unit that is principally responsible for production, implementation, or dissemination of the document.

## RECORD GROUP

A body of organisationally related records established on the basis of provenance with particular regard for the complexity and volume of the records and the administrative history of the record-creating institution or organisation.

## RECORDS

All recorded information, regardless of media or characteristics, made or received and maintained by an organisation or institution. [The Federal Records Act definition of “records” can be found at: [44 USC Sec. 3301.](#)]

## RECORDS CENTER

A records storage facility established to provide efficient storage of inactive records. Legal title to records deposited in a records center is retained by the originating agency.

## RECORDS MANAGEMENT

The profession concerned with achieving economy and efficiency in the creation, use, and maintenance of current records.

## REFERENCE MATERIALS

Nonaccessioned items maintained by an archival institution solely for reference use.

## REFERENCE SERVICE

The archival function of providing information about or from holdings of an archival institution, making holdings available to researchers, and providing copies, reproductions, or loans of holdings.

## RESPECT DES FONDS

See **PROVENANCE**.

## REVIEW

The process of surveying documentary materials in an archival institution to determine whether the materials may be open for access by researchers or must be restricted in accordance with law, a donor's requirements, or an institution's regulations.

## SANCTITY OF ORIGINAL ORDER

See **ORIGINAL ORDER**.

## SCHEDULE

(v.) To establish retention periods for current records and provide for their proper disposition at the end of active use.

(n.) See DISPOSITION SCHEDULE.

## SECONDARY VALUES

The values of records to users other than the agency of record creation or its successors.

## SERIES

A body of file units or documents arranged in accordance with a unified filing system or maintained by the records creator as a unit because of some relationship arising out of their creation, receipt, or use.

## SUBGROUP

A body of related records within a record group, usually consisting of the records of a primary subordinate administrative unit or of records series related chronologically, functionally, or by subject.

## APPENDIX G:

### NATIONAL ARCHIVES OF SOUTH AFRICA (NASA) ACT

NO. 43 OF 1996: NATIONAL ARCHIVES OF SOUTH AFRICA ACT, 1996.

#### PRESIDENT'S OFFICE

No. 1595.  
2 October 1996

NO. 43 OF 1996: NATIONAL ARCHIVES OF SOUTH AFRICA ACT, 1996.

It is hereby notified that the President has assented to the following Act which is hereby published for general information-

#### ACT

To provide for a National Archives; the proper management and care of the records of governmental bodies; and the preservation and use of a national archival heritage; and to provide for matters connected therewith.

(Afrikaans text signed by the President.)  
(Assented to 27 September 1996)

BE IT ENACTED by the Parliament of the Republic of South Africa, as follows:-

#### Definitions

1. In this Act, unless the context otherwise indicates-

- (i) "appraisal" means the archival function of determining the eventual disposal of records; (viii)
- (ii) "archives" means records in the custody of an archives repository; (ii)
- (iii) "archives repository" means any archives repository contemplated in section 11; (i)
- (iv) "Commission" means the National Archives Commission contemplated in section 6; (ix)
- (v) "custody" means the control of records based upon their physical possession; (iv)
- (vi) "disposal authority" means a written authority issued in terms of section 13(2) (a) specifying records to be transferred into the custody of the National Archives or specifying records to be otherwise disposed of; (iii)
- (vii) "electronic records system" means any records system in which information is generated electronically and stored by means of computer technology; (v)
- (viii) "governmental body" means any legislative, executive, judicial or administrative organ of state (including a statutory body) at the national level of government; (xv)
- (ix) "head of a governmental body" means the chief executive officer of a governmental body or the person who is acting as such; (vii)
- (x) "Minister" means the Minister responsible for the administration of this Act; (x)
- (xi) "National Archives" means the National Archives of South Africa established by section 2; (xi)



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