

**PRESERVING ELECTRONIC MEMORY: AN INVESTIGATION INTO THE
ROLE PLAYED BY THE NATIONAL ARCHIVES OF SOUTH AFRICA IN
THE MANAGEMENT OF ELECTRONIC RECORDS OF CENTRAL
GOVERNMENT**

By

BRAD STEVEN ABBOTT

(BA Honours, University of Natal, Pietermaritzburg, 1987)

Supervisor

Professor Andrew M. Kaniki

Submitted in partial fulfillment of the academic requirements for the degree of

Master of Information Studies (MIS) in the

Department of Information Studies,

School of Human and Social Studies,

University of Natal, Pietermaritzburg

SOUTH AFRICA

August 1999

DECLARATION

I hereby declare that this thesis is entirely my own work, except where due reference has been made. The work has not been submitted for a degree at any other university.

A handwritten signature in black ink, appearing to read "Abbott", is positioned above a horizontal line.

Brad Steven Abbott

ABSTRACT

This study sought to investigate the role of the National Archives of South Africa in terms of the management of the electronic records of central government. The research methodology selected for this study was descriptive research, utilising the case study approach. Two data gathering techniques were employed, that of the record and the interview methods. In utilising the record method extensive use was made of a variety of documents ranging from legislation to the manuals and internal circulars of the National Archives. After the documentary evidence had been analyzed, three non-scheduled-structured interviews were carried out with National Archives staff.

In the process of the investigation a number of findings were generated. It was established that the National Archives is responsible for managing the electronic records of governmental bodies. In order to fulfill this responsibility the National Archives has developed an electronic records management programme. This programme aims to involve the National Archives in the design and maintenance of electronic records systems, to allow the early transfer of electronic records into archival custody, and to facilitate the identification of those archival electronic records that should remain in the possession of the creating body.

As a result of the literature reviewed and the interviews conducted, a number of challenges were identified with regards to the National Archives' management of the electronic records of central government. Among these were issues such as the lack of staff resources that the National Archives currently faces, the perceived low status of the National Archives within the Department of Arts, Culture, Science and

Technology, and the lack of cooperation and communication between the National Archives and its client bodies or components thereof. The National Archives is attempting to deal with a number of these challenges, but it would appear as if they are adopting a reactive and overly cautious approach to the management of electronic records. While they are well informed in terms of the theory of electronic records management, they are greatly lacking in terms of practical experience.

It was recommended that the National Archives address the issue of staff resources as a priority. It was further recommended that the National Archives emphasise the business benefits to be gained by governmental bodies implementing records management practices, and that the National Archives become a more active player in the broader discipline of information management.

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS AND ACRONYMS

ACTAG	-	Arts and Culture Task Group
AERIC	-	Archival Electronic Inspection and Control
APS	-	Archival Preservation System
ASCII	-	American Standard Code for Information Interchange
CAD	-	Central Archives Depot
CD-ROM	-	Compact Disk-Read Only Memory
COMMA	-	Committee on Machine-Readable Archives
COMMER	-	Committee for the Management of Electronic Records
EDI	-	Electronic Data Interchange
ICA	-	International Council of Archives
ITEXCOM	-	Information Technology Steering Committee
LAN	-	Local Area Network
MIS	-	Management Information Systems
NARA	-	National Archives and Records Administration
ODA	-	Open Document Architecture
ODIF	-	Office Document Interchange Format
PERP	-	Philadelphia Electronic Records Project
RAS	-	Retrieval Auxiliary Services
SITA	-	State Information Technology Agency
SGML	-	Standard Generalized Markup Language
TAD	-	Transvaal Archives Depot


CHAPTER 1

Introduction

1.1 Background to the study

Since the earliest development of writing man has had the tendency of preserving the written word. This was done because the written word was a means of recording an activity, event or transaction undertaken that had meaning to those involved. This meaning varied according to the nature of the event, the individuals involved and the value, be it religious, administrative or evidentiary, attributed to the records created.

The medium upon which these records have been captured has changed greatly over the ages, ranging from the clay tablets of Mesopotamia, the parchment of Asia Minor to the paper of the modern era. What all these mediums have had in common however, was that the information they contained was in human readable form inscribed directly upon them. The medium and its contents were thus inseparable, and the preservation of records therefore entailed the preservation of the actual physical medium.

 As the collections of these records grew in volume, repositories for their safekeeping were established. Within these repositories records were preserved and arranged in order to facilitate their access and retrieval (Technikon RSA 1990). The preservation and arrangement techniques used within the repositories were largely dependent upon the nature of the record medium. It is from these early repositories that the archives of today have their origin.

1.1.1 The Meaning of “archives”

Today the word “archives” has several meanings. Firstly, it can refer to those records that have been preserved because of their long-term value. Secondly, it can mean the physical structures within which archival material are housed, and thirdly, the term can refer to the institution or agency responsible for the management of archival records (Harris 1997: 4).

For the purpose of this study “archives” will be used in the context of this latter meaning, that is, the institution responsible for the management of archival records, and the material preserved by archives will be referred to as “records”. Here records will be defined as “recorded information produced or received in the initiation, conduct or completion of an institutional or individual activity and that comprises content, context and structure sufficient to provide evidence of activity regardless of the form or medium.” (International Council of Archives (ICA), Committee on Electronic records 1997: 8)

As the unit of study in this investigation is known as the National Archives of South Africa, or more commonly the National Archives, it was felt that the above selected meaning of “archives” would be more appropriate for the purposes of this investigation and less likely to lead to confusion. The definition attributed to “records” was selected on the basis that it succinctly captures the essence of what all other definitions, encountered in the literature examined, sought to convey. It captured

the common elements of agreement. For an examination of the various definitions encountered in the literature surveyed, see chapter 2 section 2.3.1.

1.1.2 The Need for records

Records are created as a result of an activity being undertaken. In the case of an organisation or institution they are created in the process of these bodies fulfilling the function for which they were created. Organisations or institutions will thus either create the records internally or receive them from an external source, as a result of the activities or transactions they undertake.

Records are kept as a support to the continuation of organisational activities, in that they form the basis for decision making and precedent setting. They support policy formulation, are used in the management of resources, to protect the rights of individuals and organisations, and are produced in compliance with a variety of statutes and regulations.

Perhaps most importantly, accountability is documented through records. “In all accountability forums, records are consulted as proof of activity by senior managers, auditors, concerned citizens or by anyone inquiring into a decision, a process or the performance of an organisation or an individual.” (Australian Council of Archives 1996: 3) Records thus represent the “memory” of an organisation, in which is recorded the context and content of organisational activities.

1.1.3 The Archival and records management functions

Traditionally, the archival function, which encompasses the management of records of enduring (archival) value, consists of a number of components. The four major components are the functions of appraisal, accessioning, presentation, arrangement and description.

Appraisal is the process whereby the value of records are assessed in order to determine whether they are of archival value and worthy of long-term preservation, or whether they are merely of short-term value and therefore disposable after operational use. The function of accessioning entails physically transferring archival records from their offices of origin to an archival repository, which then has legal and physical custody over the records.

Preservation involves a number of processes aimed at physically protecting records against damage and deterioration, the restoration and repair of them when necessary, all with the view of ensuring that they and their contents continue to remain accessible. Finally, arrangement and description entail the “process of determining an appropriate method of organizing archival records and of developing finding aids (indexes or other lists), whether manual or automated to describe the records and to facilitate their retrieval and use.” (Robek, Brown and Stephens 1996: 513)

While the archival function has been predominantly concerned with the identifying, collecting and preserving records of enduring value, the function of managing those records still in their office of origin is known as records management. It can be

described as “ the application of systematic and scientific controls to recorded information required in the operation of an organization’s business.” (Robek, Brown and Stephens 1996: 5) These controls are applied to records as they move through their life-cycle.

Although the archival and record management functions can be described independently of each other, in practice there is a natural flow from the one function into the other in terms of managing records through their life cycle. Furthermore, both these functions can be, and often are, the responsibility of the same institution. This is particularly the case with regards to archives charged with the responsibility of managing government records. While separate sections or departments within the archives may be responsible for the respective functions, collectively they are the responsibility of the institution concerned as a whole. This is the case, for example, with the National Archives of South Africa, the National Archives of Canada, the Australian Archives and the National Archives and Records Administration of the United States, to name but a few.

1.1.4 The Record life-cycle

The concept of the record “life-cycle” has been adopted as a model in order to facilitate the management of records. In terms of this model, records are created, actively used, maintained and finally disposed of. The disposal entails either the destruction of the records or their transfer into archival custody. It is the record management function to manage the records as they progress through the various stages of this model, to ensure that the records are accurate, complete, accessible and

usable. Those records that are identified for archival custody are then handed over to the archivists for further management and preservation.

1.1.5 Recordkeeping systems

The primary means by which records managers manage the current records of an organisation is through the use of recordkeeping systems. A recordkeeping system is one that has been specifically designed to facilitate the capture and maintenance of records, and to provide for their identification and retrieval. "They are distinguished from information systems by linkages to activities they document and their ability to preserve and provide access to the content, structure and context of the records."

(Erlandsson 1996: 27) The systems can take the form of manual paper-based filing systems or automated electronic recordkeeping systems.

1.1.6 The Electronic context

The rapid development of information and communication technologies, particularly over the last two decades, has resulted in the automation of the office. This automation, whether it be in the form of word processing applications, local area networks (LAN's), intra-nets, e-mail or electronic data interchange (EDI), has heralded the arrival of the electronic record. "Within the next decade, almost all organizational records created in our society will be made and communicated electronically." (Bearman 1996: 1). As such, unless record managers and archivists start preparing for this and position themselves to deal with this potential flood of electronic records, much of our electronic memory may become unmanageable and in fact lost. It must be borne in mind however that this view of Bearman's is based

primarily on developments in the western world. While the South African situation lags significantly behind in this regard, records are increasingly being produced in electronic form in organisations and government in South Africa and this trend will continue to increase.

1.1.7 The Nature and challenges of electronic records

While the contents of paper-based records are recorded onto the medium using symbols that humans can read directly, the contents of electronic records are recorded in the form of binary code, onto a medium that is not directly accessible to the reader without the aid of computers and associated technology. In other words, the ability to access and understand electronic records is dependent upon the use of appropriate hardware and software.

As a result, archivists and records managers are forced to grapple with the challenge of ensuring that electronic records, despite their hardware and software dependency, remain accessible in the face of ever increasing technological change. The “rapidity of technological change and the instability of the media have meant that traditional approaches to archives and records management, where they have been tried, have not been satisfactory for the long term preservation of electronic records.”

(O’Shea 1996: 2)

Further challenges are presented by the fact that the content and original medium of electronic records can easily be separated, with the content being transferred to other mediums. Thus the issue of securing the reliability and integrity of electronic records

is raised. Furthermore, while paper records exist as physical entities and can be identified from their physical characteristics, electronic records exist as logical and virtual entities. The various aspects that make up the electronic record's structure, content and context may exist as separate entities that are only brought together when the record needs to be viewed.

As most records have traditionally taken the form of paper-based documents, the primary approaches, methodologies and processes that both archivists and records managers adopted, have predominantly been suited to managing records in this medium. In attempting to apply these to the management of electronic records, archivists and records managers have been faced with a number of challenges. By "the 1980's most archivists and records managers acknowledged that managing and preserving electronic records was amongst the most challenging problems facing their professions." (Hedstrom and Blouin 1996: 1)

1.1.8 The South African context

In South Africa the phenomenon of the automated office with its increasing proliferation of electronic records has become a reality as well. Here too archivists and record managers are increasingly becoming aware of the challenges that need to be faced if electronic records are to be effectively managed.

These challenges range from trying to identify appropriate approaches and methodologies to managing electronic records (such as methods of appraisal), the design of electronic recordkeeping systems, issues of record custodianship, to

organisational and resource issues. Examples of the latter being the lack of cooperation between archival/records management bodies and government information technology sections, and the lack of staff to effectively implement and monitor electronic record management programmes. These challenges and others will be dealt with in detail under the various sections in chapter 2.

Within the private sector a number of organisations have undertaken or are in the process of undertaking initiatives that are aimed at establishing the effective management of their electronic records. The work that is being done at Umgeni Water is a case in point. Umgeni Water is the largest water authority in KwaZulu-Natal, South Africa, and is involved in the supply, treatment and bulk storage of water and wastewater in this area. Many private organisations however, do not have formal archival and record management programmes and as such the challenges presented by electronic records to these disciplines, has largely gone unnoticed.

Umgeni Water, which already had a well-established paper based records management programme, initiated an electronic record management project in late 1997. The aim of the project, in which this researcher has been personally involved, was to establish the electronic record management requirements of the organisation and to identify and acquire the necessary tools to meet those requirements. Based on an organisational wide needs analysis that was carried out and existing information technology infrastructure within Umgeni, a list of specifications were drawn up against which a number of potential technological solutions were evaluated. The result was that it was decided to acquire a number of specific software packages that would

facilitate the effective management of Umgeni's electronic records. To date the project team is awaiting authorisation to go ahead with a pilot implementation.

Within the public sector, however the situation is somewhat different. Here there is a legislated requirement (National Archives of South Africa Act 1997b) to manage public records according to archival and record management principals and procedures. These requirements apply to public records regardless of their medium and thus include electronic records. In terms of the legislation, the National Archives of South Africa bears the responsibility for managing records of archival value and ensuring that correct records management practices occur within government bodies. Significant financial resources have been spent investing in technology and systems within the public sector. Information systems abound and large amounts of information are being generated and maintained in electronic form (Presidential Review Commission 1998). However the establishment and management of these information systems has not been effectively controlled within governmental bodies. This has resulted in the performance of the information technology function within government being "inadequate to the demands of economic, efficient and effective administration." (Department of Public Service and Administration 1998: 2) In an attempt to address this situation the State Information Technology Agency (SITA) has been established under SITA Act number 88 of 1998. It's objective is to act as an umbrella government information technology agency providing "information technology, information systems and related services to and/or on behalf of participating government departments." (Department of Public Service and Administration 1998: 1)

1.2 Statement of the problem

The National Archives of South Africa, given its legislated role, is being forced to confront the issue of electronic records and the challenges that the management of them presents to traditional archival and records management practices.

1.3 Purpose of the study

It is within the above context then, that this study sought to investigate the role of the National Archives of South Africa in terms of the management of the electronic records of central government. In order to achieve this goal a number of objectives were set for this study. These were as follows:

1. To gain an understanding of how the National Archives uses its record management and archival mandate to manage the electronic records of central government.
2. To identify the hurdles and challenges are that the management of electronic records presents to the National Archives.
3. To determine whether or not these are being dealt with and the means by which the National Archives is tackling these challenges.
4. To make recommendations, based on the findings of this investigation, of how the National Archives could address these challenges.

In terms of these objectives a number of case study questions were set to which answers were sought. These were as follows:

1. What is the mandated role of the National Archives of South Africa in terms of managing the electronic records of central government?

2. What mechanisms and methods does the National Archives of South Africa employ in attempting to manage the electronic records of central government?
3. What are the challenges/problems that the National Archives of South Africa faces in attempting to manage the electronic records of central government?
4. How is the National Archives of South Africa dealing with these challenges/problems?
5. How best can the National Archives of South Africa deal with these challenges/problems?

The various variables and issues that were examined in order to answer these questions will be dealt with under the research methodology in chapter 3.

1.4 Significance of the study

Although, as was evidenced in the literature review undertaken, much theoretical debate has occurred regarding the challenges that electronic records present to the archive and record management professions, there appears to be a lack of formal case studies examining these issues in the real life context. Furthermore, many of these issues are being discussed within a general context without examining the relevance of them within the specific working environments and contexts in which archivists and records managers find themselves. It is thus hoped that this investigation will be a contribution in terms of addressing these shortcomings.

Since the general elections in 1994, the South African Government has been involved in a process of transformation, endeavoring to transform the “state and its principal

executive arm, the public service, from an instrument of discrimination, control and domination to an enabling agency that would consolidate democracy and empower communities in ways that were demonstrably accountable and transparent.”

(Presidential Review Commission 1998 ch.1: 2) One of the main ways of achieving this demonstrable accountability and transparency is through the creation, management and preservation of government records. To this end the National Archives of South Africa plays a critical contributing role to the achievement of state and public service accountability and transparency. In this context it is hoped that this research will contribute to this process, by examining the problems and challenges the National Archives faces in terms of managing the electronic records of central government and by making recommendations for the way forward.

1.5 Summary

Abstr *short*
Records are produced as the result of the information produced or received in the initiation, conduct or completion of institutional or individual activities being captured upon a variety of mediums. These records are considered of value to the individuals and institutions that produce them for a variety of reasons. Among these are that the information contained in records can be used to support decision making and policy formation, can be used to document and protect the rights of individuals and organisations, and can be used to ensure accountability.

The recognition of the value of records and the necessity to effectively manage and preserve them has resulted in the development of strategies, methodologies and procedures to facilitate this. The strategies, methodologies and procedures that this

investigation is concerned with fall into two functional areas, that of the archival and the records management functions. The archival function is concerned with identifying those records of “archival” or enduring value and ensuring that these records are preserved, arranged and described in a manner that will facilitate their retrieval and use. Typically such records are removed from their offices of origin and maintained in an archival repository. The records management function, on the other hand, has concentrated on managing records still being actively used in their offices of origin. Here record managers have been concerned with establishing recordkeeping systems in order to facilitate the capture and maintenance of records, and to provide for their identification and retrieval.

With the rise of office automation, records are increasingly being produced in electronic form. The unique nature of electronic records has presented archivists and records managers with a number of challenges, in their endeavors to manage and preserve these records. Archivists and records managers around the world are being forced to address these issues. Here in South Africa the situation is much the same, particularly in the arena of government records. It is the legislated responsibility of the National Archives of South Africa to manage and preserve those public records of central government that are deemed to be of archival value. In terms of this, the National Archives of South Africa needs to address the issue of effectively dealing with electronic records and needs to develop strategies, policies and procedures for meeting the electronic challenge. Against this background then, this study sought to investigate the role of the National Archives of South Africa in terms of the management of the electronic records of central government.

CHAPTER 2

Literature Review

2.1 Introduction

In undertaking the literature review the researcher had two primary objectives in mind. Firstly to identify and examine literature that dealt with general archival and record management issues pertaining to the management of electronic records.

Secondly, to examine material dealing with the historical development of the National Archives of South Africa's role in managing the records of central government and the current state of this function.

Literature was reviewed from a range of sources such as published books, conference proceedings and journal articles. Extensive use was made of material published on the Internet, as much of the latest research findings and many papers dealing with electronic records management are being published here. A number of research projects examining various issues surrounding the management of electronic records have established web sites, various record management and archive associations also have a presence on the Internet and a number of National Archives have developed detailed web sites.

This review will be divided into four main sections. Firstly, we will briefly examine how paper based records have traditionally been managed. This will enable us in the course of this review, to demonstrate some of the areas of similarity and difference between the management of paper records and the management of electronic records. Secondly, we will examine literature dealing with general archival and record

management issues pertaining to the management of electronic records. For this purpose issues will be divided into four areas:


- Those issues pertaining to the creation and capture of reliable and authentic records.
- Issues related to the preservation of electronic records of archival value.
- The impact of the above issues on the role of archivists; and
- Recordkeeping programmes as a means of addressing the above issues

Thirdly, we will examine what strategies and methodologies other agencies similar to the National Archives of South Africa have adopted. Finally, we will examine the historical development of the National Archives role in terms of managing the records of central government, up until the enactment of the 1996 National Archives of South Africa Act. The Act itself and the current state of affairs will be discussed in detail in chapter 4, where the answers to the case study questions posed in chapter 1 (see section 1.3) will be dealt with.

2.2 Management of paper records

Traditionally paper-based records have been managed within the framework of the records life-cycle. As stated in chapter 1, section 1.1.4, this model has held that records move through various phases in their life. According to Penn, Pennix and Coulson (1994) the “theory is that recorded information has a life similar to that of a biological organism in that it is born (creation phase), it lives (maintenance and use phase), and it dies (disposition phase).” (1994: 12) Within each of these phases specific actions are undertaken in order to manage the records concerned.

1, In the creation phase the records manager's primary responsibility is to ensure that the records that an organisation needs in terms of administrative, legislative and operational requirements are created and captured. The records manager thus needs to decide which of the information an organisation produces, should have record management principles and procedures applied to it. During the stage of maintenance and use, it is the records managers responsibility to ensure that effective records storage and retrieval systems are designed, implemented, utilised and maintained. Typically this involved the design of filing systems, the training of users in the use of such systems and file management. File management refers to activities such as ensuring records are placed in the correct files and that new files are carefully controlled in order to "ensure that they will always fit into the correct place in the general pattern of the system and that duplication does not take place...". (Technikon RSA 1990: 247) A further important function carried out at this stage, is the allocation of retention periods to records. The retention periods determine how long a record will be retained after the period of active use.

The disposition phase of the record's life-cycle, entails making decisions as to whether the record should be destroyed or whether it should be transferred into archival custody. Those records deemed to be of archival value are transferred into an archival facility, and this is when, traditionally, the role of the records manager has ended and that of the archivist begins. It is the archivist's responsibility to appraise the records and to determine which should be permanently archived and which could be destroyed. (See section 2.4.1 for a discussion of appraisal) 

2.3 Creation and capture of records

2.3.1 Information and records

In order for reliable and authentic records to be captured one needs to have a clear understanding of what records are, and in the electronic environment it is essential to distinguish between information and records. While a record can be considered to be a class of information, not all information can be classified as records.

In the course of conducting this review a number of definitions for a record were encountered. (Bearman 1994, Cook 1995, ICA: Committee on Electronic Records 1997) While most differed superficially in terms of their wording, at the center of most of them were two fundamental concepts. The first was that records are produced as a result of activities or transactions being undertaken. That is, as a result of an individual, agency or organisation performing a function, a transaction occurred that resulted in a record being produced. The second concept was that records serve as evidence of the transactions or activities that produce them.

Thus according to Bearman records “are recorded transactions created in the course of organizational activities that have continuing evidential value.” (1994: 147) The concepts of “transaction” and “evidence” are also contained in the definition proposed by the Australian Archives. Here a record is defined as “that which is created and kept as evidence of agency or individual functions, activities and transactions.”(O’Shea 1995: 5) Records are thus in essence evidence of business transactions and as such are linked to the business functions and activities associated with the transactions. “The

attributes of evidential purpose and transactional context distinguish records from other types of organisational information...” (Roberts 1997: 4)

In order for a record to have evidentiary value three additional criteria must be met. A record must possess content, structure and context. The context of a record is the ^{CONTENT} ~~the~~ information it contains in the form of words, numbers or symbols. Structure refers to its form, layout and means of presentation, and the context is a record’s “linkages to its creators, users, animating mandates, functions, business activities, et cetera...”.

(Cook 1995: 80) The information about structure and context is collectively known as ‘metadata’ and in order for reliable and authentic records to exist, this metadata must be created, captured and preserved together with content.

In a nutshell then the essential ingredients making up a record consist of evidence, transaction, structure, content and context. These elements are clearly captured in the definition of a record developed by the ICA’s Committee on Electronic Records. This definition is as follows: A “record is recorded information produced or received in the initiation, conduct or completion of an institutional or individual activity and that comprises content, context and structure sufficient to provide evidence of the activity regardless of the form or medium.” (ICA, Committee on Electronic Records 1997: 8)

2.3.2 Information and recordkeeping systems

In the electronic environment, records and their associated metadata need to be captured and maintained in recordkeeping systems. Just as it was necessary to distinguish between information and records, so too is it essential to understand that

not all information systems are recordkeeping systems. Roberts (1995) in his paper “Documenting the Future” attributes this insight to Bearman.

According to Bearman (1994), while recordkeeping systems are a special category of information systems, information systems are not recordkeeping systems and were not designed to be so. Information systems deal with information used in current business activities, and provide a means of storing, accessing and manipulating information that is timely and non-redundant. Recordkeeping systems on the other hand, store and retrieve “time-bound, non-manipulable, and highly redundant information.” (Yorke 1995: 234) Furthermore as records play an evidential role, a critical feature of recordkeeping systems is that they capture and maintain a record’s associated metadata along with the record itself.

What then is involved in the design and development of electronic recordkeeping systems? As is the case in developing any information system, the first step is to establish what the objectives of the system are to be. From these objectives one then develops the specific functional requirements for the system which will meet these objectives. The Australian Archives have, for example, stated that the “major objectives of electronic recordkeeping systems shall be to manage the content, context and structure of records as a whole and to ensure that records are reliable and authentic”. (Australian Archives 1995b appendix 1: 2) These major objectives would then be broken down into a number of detailed and specific recordkeeping requirements. For example, in order to ensure that reliable and authentic records are captured and managed by the system, a requirement of the system could be to allow

version control over the records and a facility to prevent records that have been captured from being altered.

Furthermore, in order to manage the context of the records, one of the specific requirements could be to capture the relevant metadata associated with the records, and the nature of the metadata and the means by which it would be captured would also need to be specified. Other types of functional requirements for an electronic recordkeeping system could be the ability to identify records, arrange or classify records and apply retention scheduling to the records concerned. For further details on recordkeeping functional requirements see section 2.3.2.1.

Once the specific requirements have been developed and detailed, a decision would need to be taken as to whether these requirements could be built into existing information systems or whether dedicated electronic recordkeeping systems would need to be developed or procured.

As one of the purposes of maintaining records is as evidence of transactions undertaken, a further component to the development of recordkeeping systems would be to identify what business functions and transactions need their associated records captured and maintained. In order to do this a functional analysis may need to be undertaken. “The functional analysis will provide a roadmap to the major activities and responsibilities of an entire business area. These activities and responsibilities will indicate where records of significance may be created, changed, or used.” (Indiana University Electronic Records Project 1998: 2) Once these activities have been

identified, those involved in the development of electronic recordkeeping systems can determine whether there are information systems already capturing these records and if so, whether they fulfill recordkeeping functional requirements.

The design and development of recordkeeping systems involves a multi-disciplinary approach. It requires input from records managers and archivists, for example in order to develop the recordkeeping requirements, and information technology professionals to ensure that the requirements are built into the required systems. Other stakeholders involved may well be auditors and legal experts to ensure that the systems meet other organisational and legal requirements.

A number of institutions have been conducting projects which have been examining issues in this area. The particular relevance of the findings from these projects with regards to this study will be brought to bear in chapter four when we deal with the findings and recommendations of this investigation.

2.3.2.1 The Pittsburgh Project

In early 1991 the National Historical Publications and Records Commission funded the Working Meeting on Research Issues in Electronic Records. The objective of the meeting was to develop a research agenda for electronic records. In response to this call for research, the University of Pittsburgh School of Library and Information Science embarked on a research project entitled “Variables in the Satisfaction of Recordkeeping Functional Requirements”. The research team was set up in an interdisciplinary fashion involving library, archival science and information experts.

The project had three main aims:

- to draft recordkeeping functional requirements;
- to understand how and why hardware and software are used in organisations; and
- to learn how recordkeeping functional requirements can be integrated with software used by organisations.(Cox 1993)

The methodology that was followed by the project involved testing a number of research hypotheses. These were as follows:

1. The functional requirements for the archival management of electronic records are the same as for traditional records, although many functional requirements will not be satisfied by traditional record systems.
2. It will be possible to satisfy each of these functional requirements following any or all of the four tactics, although many requirements will be more fully satisfied for electronic records than they could for paper records.
3. Different business applications will share different sets of archival functional requirements, and differing degrees of risk are associated with the non-satisfaction of these requirements in different business applications.
4. Different software applications will not dictate different recordkeeping functional requirements, but different packages within the applications categories will satisfy the recordkeeping functional requirements to different degrees.
5. Recordkeeping functional requirements will be the same for each business sector, and different sectors will not determine the choice of tactics as much as different corporate cultures.
6. The best way to satisfy functional requirements will depend heavily on an organization's corporate culture, but the technological capabilities of the archives and its agents will be less critical in satisfying archival requirements than will be

the acceptance of archival responsibility by managers throughout an organization.”
(Cox 1995: 2)

A set of recordkeeping functional requirements was developed based on a search of a wide spectrum of literature ranging from the fields of law, standards and professional best practices. Experts in the field of electronic archiving and other related fields reviewed these requirements. According to the project methodology, these requirements were then to be tested in various organizational environments to determine their effectiveness in terms of archival electronic records management. Five test sites, including, manufactures, local government, a hospital, and a university” were selected. (Cox 1994: 5)

The project also proposed four tactics by means of which the functional requirements could be satisfied. These were by means of policy which would facilitate the creation of procedures for the management of electronic records; the design of the requirements into recordkeeping systems; the implementation of the requirements in electronic recordkeeping systems; and finally, the use of information technology standards to support the recordkeeping requirements. The aim of the project was also to test the validity of these four tactics in different environments.

To date the most significant output of the project has been the development of thirteen specifications regarding the capture, maintenance and use of electronic records. These specifications have been named the “Functional Requirements for Recordkeeping”. (see Appendix A for a list of these functional requirements) From these functional requirements production rules have been developed which are “logical statements of simple observable attributes which when present, ensure that a system is creating and maintaining records as evidence.” (Bearman 1996: 2) Information regarding these attributes is to be captured as metadata and linked to the record. From the functional

requirements a number of metadata specifications have also been developed in order to ensure that the above mentioned attributes are represented.

What these various outputs from the project, particularly the functional requirements, have provided us with, is a solid base from which to develop specific recordkeeping requirements or specifications for electronic systems. These may be used to evaluate existing information systems in terms of their recordkeeping abilities and serve as a blue print for the design and development of new systems.

These functional requirements of the Pittsburgh project are being tested and used by a number of projects. Among these are the Indiana University Electronics Records Project, the Philadelphia Electronic Records Project, and the work undertaken at the World Bank in order to implement an electronic document management system.

2.3.2.2 University of Indiana Project

The project being undertaken at the University of Indiana involves a comprehensive test of the functional requirements developed at the University of Pittsburgh. This is being done as part of a two-year project to develop archival requirements for electronic records in the Financial Management Services and Student Services departments of the University of Indiana. The project has constructed a four-stage methodology as an approach for developing the archival requirements.

The first stage is the functional analysis. Here project members sought to identify the functions performed by the two departments. This involved not only identifying what

functions were performed, but also developing an understanding of the nature of the various functions. The second stage of the methodology is the identification of transactions occurring as part of the functions identified. “Transactions are identified within each of the major functions of a business area (but may cross business area boundaries) and will provide a unit of comparison when evaluating the information system against the Functional Requirements.” (Indiana University Electronic Records Project 1998: 4)

Stage three of the methodology entails identifying the information content associated with the business transactions. The goal here is to establish what information is needed for each transaction that will serve as evidence that the transaction was undertaken and completed. In other words, what evidentiary metadata is needed for each transaction. Once the above three stages have been completed, the final stage involves the review of existing systems. Here the goal is to evaluate any systems that exist in terms of their abilities to meet the functional requirements for recordkeeping developed at the University of Pittsburgh.

As part of the project the project team set out to answer a number questions. The more pertinent of these in terms of the objectives of this study are as follows:

1. Does the Pittsburgh model contain all the recordkeeping requirements that are necessary for managing electronic records?
2. Does the model contain requirements that are not necessary?
3. Do the costs involved in implementing the model make it financially viable?

4. What are the skills that are required to apply the project's methodology?

The project formulated a number of findings in attempting to address these questions. In response to question one, the findings were that the Pittsburgh requirements did not specify the need for a mechanism for the regular migration of records. (See section 2.4.3 for a discussion of record migration) Furthermore, the project team felt that the Pittsburgh model contained too many requirements, however they did conclude that the model had value and committed themselves to testing and attempting to improve on it further.

In response to question two, the findings were that the model's requirements could be refined down further into a smaller core. The project produced a version of the requirements (see Appendix B) that included fewer functional and metadata requirements than the Pittsburgh model. "We believe this shorter, more concise version of the requirements is easier to use, is more cost effective, and yet does not sacrifice or compromise the integrity of the model." (Indiana University Electronic Records Project 1998: 3) If one examines the two versions of the requirements (see Appendices A and B) this would certainly seem to be the case.

The findings in relation to question three were that the Pittsburgh version of the functional requirements would not be cost effective for many organisations. The Indiana project team felt that it was too detailed to render it cost effective and that it was too complicated to be user friendly. They felt that the version of the requirements that they had produced addressed some of these problems. In terms of accurately

assessing the cost effectiveness of their methodology, the conclusion was that more extensive testing on a broader scale was required. They did however conclude that “when one considers both the time committed/cost and the quality and detail of the products produced, our methodology compares very favorably with standard records management techniques designed for paper records.” (Indiana University electronic Records Project 1998: 3)

The findings from the project in terms of the fourth question were that a wide variety of skills and experience were required. These would ideally be drawn from a team consisting at a minimum of a professional archivist, a systems analyst and an Information Technology administrator. The project team felt that it would be highly unlikely that the associated skills and experiences of the above professions would be found in one person.

2.3.2.3 Philadelphia Electronic Records Project

In response to the city of Philadelphia’s increasing investments in information technology in an attempt to streamline the provision of services, the Philadelphia Electronic Records Project (PERP) was set up. The aim of the project is to give the Records Department greater control over these systems by developing municipal standards to apply to them. The project is presently in its first phase and is being led by the Electronic Records Group. This group comprises of personnel of the Records Management Division, the Mayor’s Office of Information Services and MIS (Management Information Systems) personnel from client city agencies.

The work being undertaken during the first phase of the project is based on the model developed by the University of Pittsburgh. The project team has taken the Pittsburgh's metadata specifications and has adapted them to suit their environment. "The adaptation of the model includes a significant reduction of metadata clusters and attributes." (University of Pittsburgh Electronic records Project 1996: 5) This adapted version of the metadata requirements is to be tested by incorporating them in the new Human Resources system. Once the system has been implemented and evaluated the metadata requirements will be issued as citywide standards. As this project proceeds further down the line, it will provide another useful source of information in determining the validity and effectiveness of the various requirements that constitute the Pittsburgh model.

2.3.2.4 The World Bank

The final project to be discussed that has made use of the functional requirements developed by the Pittsburgh project, is that of the World Bank. As part of a project to implement an electronic document management system at the bank, a requirement was for the envisaged system to be evaluated in terms of its archives and records management functionality. A consultant, Richard Barry, was hired to carry out this evaluation which was based on the Pittsburgh functional requirements. Using these functional requirements together with their literary warrant the Bank's system was evaluated. The results of this evaluation were recorded on a matrix listing each of the requirements and whether the system met them fully, partially or not at all. This led to a number of findings, from the consultant's point of view, as to the usefulness of the

functional requirements. According to Barry the Pittsburgh requirements were “very useful as an assessment tool for assessment of the electronic recordkeeping system when coupled with the use of the warrants specified for each requirement.”(Barry 1996: 1) However his major criticism was that the literary warrants developed to support the functional requirements, were limited to United States jurisdictions, and as such were not necessarily applicable for international use.

In summary then, it can be seen that the model developed by the University of Pittsburgh has been adopted for testing by a number of projects in different environments. Those findings that have been released to date, on the whole, seem to be favourable, suggesting that the model forms a strong base in terms of which electronic recordkeeping systems can be evaluated and developed. In some cases, as with the Indiana project, these requirements have been stream lined and further refined into a more user friendly and functional set of tools. The Indiana University’s version of the functional requirements when taken together with the four-stage methodology they have developed appears to provide a very useful framework for electronic recordkeeping systems development and design. (See section 2.3.2 for a discussion on recordkeeping system design)

2.4 Preservation of records

As stated in section 2.2, a model was developed to act as a framework for the management of records. The last stage of this model was that of the disposal of records. This disposal either entailing the destruction of those records deemed not to have “archival value” or the continued preservation of those deemed to have “value”

in an archival facility. There are a number of issues related to the preservation of records that need to be considered. Those that we will be examining here are the appraisal of records, the stability and durability of record mediums, hardware and software dependency, intellectual control and description, physical custody of and access to records.

2.4.1 Appraisal of records

Appraisal is the process whereby the value of records are assessed in order to determine whether they are of archival value and worthy of long-term preservation, or not. From the literature reviewed (Erlandsson 1996, O'Shea 1996, Bearman 1994) it would appear that there are two predominant issues surrounding the appraisal of electronic records. The first issue is, at what stage in the record life-cycle should this process of appraisal take place. In the paper-based environment records have traditionally been appraised at the end of their life-cycle in order to determine whether they should be destroyed or placed in archival custody. However according to Erlandsson, in his literature review of electronic records, it would appear that there is "general agreement on the need to appraise electronic records prior to the creation stage of the life cycle." (Erlandsson 1996: 67)

The argument generally presented for this pre-creation appraisal is that if traditional paper-based approach was taken, there exists a large risk that many electronic records would not survive to the end of their active life and only those that did could be appraised. "Given electronic record's dependency on software and hardware and their susceptibility to inadvertent loss through technological obsolescence this would

be a huge risk.” (O’Shea 1996: 3) As a result it is argued that appraisal should ideally take place prior to the creation of records when the recordkeeping systems are actually designed. This is to ensure that retention requirements and the mechanisms needed to manage and ensure the survival of records are built into the electronic systems.

This brings us to the second issue regarding the appraisal of electronic records, and this is the appraisal methodology to be used. According to the ICA in their guide to the management of electronic records, the appraisal function at this stage should “include identifying functions and activities which will generate archival records; determining what information systems will support these functions and activities; identifying the archival records that will be captured in the systems; and designing these systems to enable retention, preservation and accessibility of archival records.” (ICA, Committee on Electronic Records 1996: 35)

Traditionally the appraisal of paper records was based on a methodology that examined them in order to determine their archival value once they had reached the end of their life-cycle. The records were appraised in terms of their content and the value that could be attributed to that content in terms of criteria such as future user needs and scholarly research. (Erlandsson 1996) Increasingly, however, archival theorists and practitioners have argued that this approach is unsuitable for the appraisal of electronic records. Firstly, as dealt with at the beginning of this section, electronic records need to be appraised at a far earlier stage than has traditionally been the case with paper records.

Secondly, it can be argued that the approach of appraising electronic records in terms of their content is also not suitable and in fact impossible if one favours the pre-creation appraisal approach. The approach that has been advocated has been alternatively called the functional approach or macro-appraisal. This approach favours appraisal based on an analysis of organisational “functions and work processes instead of appraisal of the individual records, files or series.”(Erlandsson 1996: 71) It is the importance of organisational functions, activities and transactions that are analysed and appraised, and based on this, archivists decide which of those functions’ records should be preserved or not.

In fact, while this approach has been strongly recommended in terms of appraising electronic records, a number of archivists and archival institutions have in fact been using this approach, in recent times, to appraise their paper records as well.

(Erlandsson 1996) Examples of institutions doing this are the Canadian National Archives and the Australian Archives, while archivists in the Netherlands and Germany have supported this “functional approach” in appraising paper-based records as well.

2.4.2 Stability and durability of record media

According to Carmichael (1995), in a paper written on the preservation of electronic records, a record medium is deemed suitable for long term preservation if it meets two important criteria; that of durability and stability. Durability refers to the physical life

span of the actual record medium, while stability is seen in terms of the mechanisms used to create and read the records not changing significantly over periods of time.

The issue of durability and stability of electronic records are areas of concern for those involved in the preservation of these records. The durability of two of the major forms of electronic storage media, that is magnetic and optical media, is questioned.

According to Roberts (1995) magnetic storage devices are susceptible to damage and deterioration during handling and use. Furthermore fluctuations in temperature and humidity, the presence of dust and magnetic fields can also irretrievably damage

records captured on magnetic storage devices such as tapes or cassettes. It is estimated that magnetic tapes have a 10 to 20 year readable life span if they are stored under optimal climatic condition, are tensioned correctly and then retensioned every few years, and are not damaged by crimping, accidental erasure or through chemical reactions. While optical discs are considered to be far more durable than magnetic media, they nevertheless can easily be damaged through mishandling. As data is so densely recorded on an optical disc even a mild scratch on the disc's surface can erase large amounts of information.

However, while there are justifiable concerns regarding the long-term durability of electronic record media, this does not mean that they should be ruled out as preservation media. It must be borne in mind that our current level of expertise in preserving non-electronic media, has been the result of hundreds of years of trial and error and continual refinement. In comparison, the preservation of electronic media is still in its infancy and no doubt with time and further technological advances our

ability to deal with the issues of stability and durability will improve. Turning our backs on electronic media is tantamount to burying our heads in the ground and hoping the problems will go away. Nevertheless, while issues of durability are of concern to records managers and archivists, they are increasingly being seen as “a secondary issue in the light of the issue of hardware and software dependency.” (Kirkwood 1994:12)

2.4.3 Hardware and software dependency

Electronic records are, by nature, dependent upon hardware and software for their existence and their ability to be read. This dependency presents, in the face of continuing technological obsolescence, record managers and archivists with a major challenge in ensuring the long-term preservation and continued accessibility of electronic records.

According to Bearman (1994) the rapid rate of technological development has resulted in a hardware and software generation being less than five years in duration. Very often records created and maintained by one generation of software and hardware cannot be accessed by later generations, or if they can, the records original structure and the associated contextual metadata cannot be recreated. O’Shea (1996) points out that hardware can change in terms of the machinery and capacity on an annual basis. This applies equally to storage media. He provides a number of examples of these changes, such as: “...upgrades to newer versions of operating systems or application programmes; upgrades of hardware platforms and changes in storage device density and compression algorithms”. (O’Shea 1996: 3)

In order to deal with this issue of software and hardware dependence and technological obsolescence a number of options have been considered. Firstly the technology on which records depend could be preserved. This would, simply put, entail the creation of museums of technology maintained purely to access records dependent upon obsolete technology. This option, however, seems generally to be regarded as too impractical and costly. For as the ICA guide on electronic records states, preserving “accessible electronic records on obsolete technology would entail not only repairing, but eventually also fabricating complex hardware which is no longer available from commercial sources. It would also entail an expanding requirement for expertise for increasingly arcane software.” (Erlandsson 1996: 55)

A second and seemingly more feasible option presented is that of records migration. Hedstrom (1996: 1) defines migration as the “periodic transfer of digital materials from one hardware/software configuration to another, or from one generation of computer technology to a subsequent generation.” In other words, as the technology upon which records are dependent become obsolete, the records are migrated to new technology which will ensure their continued accessibility and readability. However Hedstrom does point out that some loss of information is inevitable during the migration process and as such the whole process should be well documented. “Robust protocols for documenting migration are needed so that subsequent users of records can determine specifically which characteristics of the document were lost in each transformation, why a specific migration strategy was chosen, and under whose authority it was carried out.” (Hedstrom 1997: 3)

Hedstrom (1996) further presents eight of the most common migration options. These are the transfer of electronic records to paper or microfilm; the storage of electronic records in software-independent format; the retention of records in their native software environments; the migration of records to open standards compliant systems; storage of records in a number of formats; the creation of surrogates for the original records; saving the original software needed for accessing and retrieving the records; and developing software emulators.

There are a number of advantages and disadvantages associated with each of the above options and it is up to individual institutions to decide what the best migration options will be in their given circumstances. Let us however consider some of the more generic advantages and disadvantages of each option.

2.4.3.1 Transfer of electronic records to paper or microfilm

The first migration strategy that Hedstrom (1997) proposes is that of the transfer of electronic records to paper or microfilm. This is one of the first tactics that many archives used when confronted with the issue of technological obsolescence. It's major advantage is that once electronic records have been transferred to paper or microfilm, no further migration is needed if these mediums are properly preserved. In both cases the content of the records are in characters that are readable to the human eye and thus independent of technological intervention. (See section 1.1.7) The disadvantages of this option are that the ability to make use of the original technology, which was used to create the records, to rapidly retrieve the records, extract

information from them and reuse it , is lost. Further more with some types of records, for example records containing hyper text links or multi-media records, the conversion into paper will not accurately capture their original structure, context and content.

2.4.3.2 Storage of electronic records in software-independent format

The second option proposed was storing electronic records in software-independent format. What this option basically involves is the removal of any software specific codes that delimit fields, formats or records and storing the records as flatfiles or ASCII (American Standard Code for Information Interchange) text. These records can then be imported or reloaded into current systems for reuse. The disadvantage here is that generally special programmes need to be written either in order to convert the records into software independent format if their original systems are unable to do so, or to import the records into the current system. Information and functionality associated with the original record may also be lost and certain complex records such as multi-media records cannot be stored in a software independent format. The only real advantage of this option is that it reduces the need for specific software to access and use records.

2.4.3.3 Retention of records in their native software environments

Retaining records in their native software environments is the third option presented by Hedstrom (1997). What this entails is leaving and maintaining the records in the systems in which they were originally created. The idea here is that when the original systems eventually become redundant or need to be upgraded, the records will then be

migrated to the new system or upgraded version. The immediate advantages of this are that the systems functionality in terms of the records, for example the ability to retrieve and manipulate, is retained. However this would seem to be only a short-term advantage as at some stage the system will become redundant and the records will have to be migrated to newer software and/or hardware platforms.

2.4.3.4 Migration of records to open standards compliant systems

An alternative approach to those mentioned above may be to migrate records across to an open standards compliant system. This involves migrating records across to systems that capture and create records in formats that comply with international standards. For example records which are created in WordPerfect or Microsoft Word can be converted into formats such as ODA/ODIF (Open Document Architecture/Office Document Interchange Format) or SGML (Standard Generalized Markup Language). Both of these are international software independent standards that facilitate the interchange of records between systems that are compatible with such standards. The advantage of standards such as these is that they are able to preserve the original structure of the records. While such standards will also be subjected to change, Hedstrom (1997) argues that these changes are likely to occur at a slower pace than software and hardware changes. There are basically three disadvantages that are associated with this option. These are the cost involved in converting records to these open standard formats, the potential loss of information and functionality associated with the conversion, and the fact that organisations often do not give considerations to issues such as the need for open standards when they select or develop new systems.

2.4.3.5 Storage of records in a number of formats

A further option presented was that of storing records in more than one format. The idea behind this option is that by storing records in more than one format the risk of a record not being accessible due to technological obsolescence is reduced. The example that Hedstrom (1997) presents, is that text based records can be kept in two different word processing format, and that if one package becomes obsolete the records can still be read using the other package. The problem with this is that it is based on the assumption that organisations will, for example, be using two different packages performing a similar function such as word processing. In this researchers experience this is certainly not necessarily the case, and in fact the tendency increasingly seems to be to standardise on one package performing a particular function. If however, two or more software packages are used, the cost of storing and maintaining multiple copies of a record becomes expensive. Furthermore, this option does not address the issue of the hardware underlying the software becoming obsolete.

2.4.3.6 Creation of surrogates for the original records

The sixth option of creating surrogates for original records, is an option that has a number of disadvantages associated with it. Surrogates are “documents that represent the original but that do not reproduce its original structure or content.” (Hedstrom 1997: 6) An example of a surrogate would be a summary or abstract of a textual record. The content and functionality of original records are often lost when surrogates are created. Hedstrom holds that in “some cases it may be necessary to create a “surrogate” for original records if the software dependencies are so extensive

that the records cannot be migrated to a different system.” (Hedstrom 1997: 6)

However, the question that needs to be asked is whether there is any value in doing this, as it would appear that the surrogate would lose a lot of its defining characteristics as a record. If the original content and structure of the record are no longer the same can it still be considered a record and used for evidentiary purposes. In these circumstances it would seem to be a better alternative to print the electronic record out and retain it as a paper-based record.

2.4.3.7 Saving the original software

The penultimate option for dealing with software and hardware dependency in the face of technological obsolescence, is that of saving the software needed for access and retrieval of the records concerned. However as many software packages are operating system and often hardware specific this would also entail saving all three. This could be an extremely complex and costly process and would amount to establishing museums of technology.

2.4.3.8 Developing software emulators

The final migration option dealt with is that of developing software emulators. This tactic involves developing programmes that are able to emulate the functionality of the original software. These emulators are able to operate on different hardware platforms than the original software used, and as such could be a more cost-effective option in the long run than the previous option. However, the development of these emulator programmes can be time consuming, require particular skills and expertise and can be costly as well.

In the end, as stated earlier in this section, the option taken will very much depend on the particular circumstances of the organisations concerned, and it is quite conceivable that a combination of options may need to be used by a particular institution. At this stage much of the debate is theoretical and we need to wait for the various options to be tested in real operational circumstances before we can assess the true viability of the options discussed.

Regardless of the options taken, however, clear policies and procedures need to be established for migration. The migration policy “should specify the objectives of migration, the circumstances under which migration will be carried out, the decision making and approval process, how the process will be documented, the responsible party or individual, and the quality control measures.” (Hedstrom 1996: 8)

In the paper environment, once records have been appraised as being of archival value they have traditionally been placed under the intellectual and physical control of archival institutions. When subjecting electronic records to these aspects of control a number of challenges have arisen.

2.4.4 Intellectual control and description

Intellectual control refers to the establishment and control of data about records which is used to ensure that the records are accessible, understandable and usable. The main mechanism whereby intellectual control is gained over records is through “description”. The descriptive data about records should contain “contextual

information describing the creators of the records, the purposes for which the records were created, the activities and business transactions which resulted in the records.” (ICA, Committee on Electronic records 1997: 60)

Archivists have developed mechanisms, such as descriptive inventories, guides and indices, for capturing descriptive data for paper records. These are traditionally developed after the records to which they refer have been transferred into archival custody and typically take the form of a narrative description. They provide details regarding, for example, the context in which the records were created, such as the department or section that created the record, the function to which it related, as well as providing other information such as where the record could be found and what media they have been written on.

It has been argued that such traditional methods of description “cannot rigorously describe the myriad links of records with each other or transactions that are supported in automated systems.” (Erlandsson 1996: 71) Firstly, if description of electronic records only takes place after they have been placed in archival custody, then much of the records associated metadata needed for descriptive purposes may already be lost or unavailable. Secondly, the prose narrative descriptive method may not be able to accurately capture in detail, crucial links between records or aspects of records such as in the case of multi-media records or records containing hypertext links.

As an alternative to using the traditional descriptive methods, a number of theorists and practitioners in the archival field, such as Hedstrom, Wallace and Bearman, have

suggested that description can be achieved through the management of metadata produced in electronic systems. (Erlandsson 1996) Wallace however argues that the majority of metadata systems do not contain all the information needed for archival description, and therefore emphasises the need for archivists and records managers to be actively involved in the design of such systems.

There is however some opposition to this view. MacNeil, for example, argues that “adding artificial metadata for archival description purposes would mean corruption of the metadata record itself and compromise its value as evidence.” (Erlandsson 1996: 75) She argues that metadata systems are created in order to serve the record creators administrative needs for the records created, and by including archival required metadata into the systems, the records metadata is no longer impartial and thus the value of the record as evidence of a transaction is compromised.

The debate at this stage seems to be very much theoretical. Before a decision can be made as to whether metadata systems can be made to meet archival descriptive needs and whether we should do away completely with traditional descriptive methods, further research needs to be undertaken. For now the solution would seem to be a combination of both methods. That is to make use of the metadata that is available in electronic systems and to supplement it with traditional descriptive narrative where necessary. Metadata here includes “the material that identifies and describes the data elements of a record, such as data dictionaries, and it includes the documentation that explains what has been done to the data in the system, such as the system business rules.” (Yorke 1995: 18)

2.4.5 Physical custody of archival records

Traditionally records deemed to be of archival value have been placed in the physical custody of archival institutions. Archives have thus functioned as institutions based on the principal of the physical control of records. This has traditionally been done for a number of reasons. The preservation of paper records has necessitated the preservation of the actual media, that is the paper itself, and this expertise has lain with the archives and not with the bodies generating and actively using the records. Furthermore, it was also regarded as being more cost effective and efficient in terms of retrieval, to store the paper records centrally as opposed to storing them in decentralised office environments. (Bearman 1994)

With regards to electronic records however, it is being argued that the advantage of centralised archival physical custody is no longer a given fact. Bearman (1994), in particular, argues that electronic records should remain in the recordkeeping systems in which they were created and maintained during their active use, under the physical control of information systems departments which are already responsible for maintaining the relevant equipment. He argues that a cost/benefit analysis favors this scenario. If electronic records were to be placed in an archive they would either have to be software independent, but still maintain evidential value (context, content, structure), which at this stage according to him is impossible, or archives would have to provide equivalent electronic recordkeeping systems and “possess the capability to migrate data and systems to subsequent generations of software.” (Bearman 1994: 86) This he considers being too costly.

The Australian Archives and the Archives Authority of New South Wales have in fact adopted this approach in Australia. According to O'Shea and Roberts the basis for the decision to adopt this stance was the inability of the two institutions to "maintain software dependent electronic records outside the computing environment in which they were generated." (Erlandsson 1996: 87) Neither archival institutions felt that they could ensure the integrity or continued access of electronic records over time if they took physical custody of them. The Australians argue that they have had years of experience in working with electronic records, and this experience has taught them that archival institutions cannot preserve electronic records on their own. They have thus adopted a strategy of shared responsibility where electronic records of archival value will, where possible, be maintained in their offices of origin. The archival institutions will provide policies, procedures with regards to their maintenance and retain intellectual control over the records concerned. For more details regarding the Australian Archives approach see section 2.6.1.

Cook (1997) however argues against this non-custodial approach as being a complete solution to the problem. Cook argues that no non-archival body or department of government has ever been interested in carrying the costs and responsibilities of maintaining archival records once the records no longer have relevance to them. Rather he suggests that a "mixed approach of utilizing both archival custody and shared or distributed custody may be more realistic, with experimentation in both, at least until the advantages and disadvantages of all approaches have been assessed in the light of real operational experience." (Cook 1997: 33)

Cook's arguments could however be countered in a number of ways. Firstly, if it is legislated policy that archival records will be maintained by the government agencies that create them, as is the case in Australia, then it is a matter of ensuring that these agencies comply with the legislation. Secondly, it need not be a case of the government agencies carrying the responsibilities and cost on their own, for if a strategy of shared responsibility is adopted, these can be carried by both the agencies concerned and the relevant archival institutions. This concept of shared responsibility can also be used to counter a third possible argument against leaving archival records in the custody of the office of origin. This is the argument that record creating agencies do not have the necessary expertise to manage electronic records of archival value. In the scenario of shared responsibility, the records would be maintained in the electronic systems that created them by both the information technologist responsible for maintaining the systems themselves, and the records managers and archivists of the associated archival institutions.

One of the chief opponents to the non-custodial approach, as represented by the Australians, has been Luciana Duranti and the electronic records research team at the University of British Columbia. They maintain that records of archival value, regardless of whether they be paper or electronic, need to be physically taken into the custody by an archival institution. (Erlandsson 1996)

They believe that all records should be managed in terms of a two-phase life cycle approach. (Erlandsson 1996) The first stage runs from record creation to the inactive

phase when records are no longer actively used. Here it is the responsibility of the records creators to manage the records. Once the records have reached the inactive phase, they enter the stage of preservation, and this needs to become the responsibility of archivists. This separation is based upon the belief that a complete different set of competencies is needed to manage the records in each of the two phases. While records are still in the first stage and being actively used, different methods are used to ensure reliable records are created and their authenticity maintained, as opposed to the methods used for preserving the long-term authenticity of records in the inactive phase.

In the first stage, Duranti and a colleague, MacNeil, hold that technology and procedures are used, while in the second phase “the authenticity of inactive records traditionally have been protected by physically transferring them to an archival institution or programme and, once transferred, by arranging and describing them.” (Erlandsson 1996: 85) It is on this basis that the non-custodial approach is rejected. The assumption seems to be that if archivists do not have physical custody of the records they will be unable to ensure that they are preserved. This seems to be an extremist’s view and does not appear to acknowledge that archivists could still exercise control over the records and determine the conditions and dictate procedures for their preservation in the creator’s office. These records could still be subjected to the arrangement and description functions of the archivists. Archivists could enter into formal agreements with the client offices to ensure that their requirements were complied with and could play an active monitoring role to ensure that this was the case.

2.4.6 Access to archival electronic records

Let us now consider the issue of access to archived electronic records. In order to ensure that electronic records can be accessed it is necessary to ensure that preservation actions are undertaken to ensure that records remain available, accessible over time and that they are understandable. In other words, records need to be maintained on a medium and in a system that will retain their context, content and structure, and permit their continued access over long periods of time. Furthermore, they need to be accurately identified and described in order for those wishing to access them to know their location, context and subject matter. These issues have been discussed in preceding sections.

Other than the above there are a number of issues regarding access to records that need to be addressed. Firstly, as is the case with all records regardless of medium, organisations and archival institutions need to decide who is going to be given access to the records and “what uses they will be permitted to make of records which they have seen.”(Bearman 1994: 21) In circumstances where records are retained in electronic systems, these issues need to be borne in mind when the systems are actually designed. Access controls need to be built into these systems and levels of security need to be established to prevent general access to records, which for confidentiality and security reasons cannot be made public.

Security considerations are of particular importance when on-line or direct access is given to records contained within electronic systems. Here safeguards need to be

implemented to prevent illegal intrusion into the systems by unauthorised individuals and anti-virus measures need to be implemented. Security plans need to be developed for records that are considered to contain sensitive information and accountability for the implementation and monitoring of these plans needs to be allocated. Finally, consideration also needs to be given to the type of search and display tools that will be used to access the records, so as to facilitate easy access to them and having them displayed in a way that is meaningful to the user.

According to Bearman, electronic records “are most useful in electronic form and in the software environment in which they were created.” (1994: 91) Records that are migrated to new software may not have the same degree of usability as they originally had, due to a decrease in the degree of functionality of the new software. Furthermore, the new software may make different use of the records structure and context and thus present the record in a way that differs from its original presentation. This may affect the user’s understanding of the record.

Access to electronic records can be given in a number of ways. For those records still maintained in their original electronic systems access can be given to users in the same way in which the creators were given access. In other words via the systems built in means of access. For records that are no longer reside in their original systems, access can be achieved in three ways. According to the ICA (1997), access can be providing by furnishing users with copies of the records on physical media, by providing delivery of the records through telecommunications and by providing on-line access to the records.

In terms of access via copies on physical media, this can be provided in a number of forms. Ideally the media used should be one that is accessible and suits the needs of the user. Where the user has access to suitable hardware and software, the ICA (1997) recommends that the records be provided on a digital media, whether this be magnetic tape, disk or CD-ROM (Compact Disk-Read Only Memory). Paper and microfilm media should only be used when the user is unable to access digital media. The reason for this is that many forms of records, such as database and multimedia records cannot be accurately presented on a non-digital medium.

Alternatively records can be delivered to the users by making use of telecommunication infrastructure such as the Internet, dial-up communications and e-mail. The advantages of this as opposed to the former method is generally greater speed of delivery and archival institutions need not acquire and store quantities of delivery media. Similar to the above method, users can be provided with direct on-line access to the records themselves, again via the Internet or dial-up digital communications. This is, however, dependent upon the archival institutions having in place the necessary technology to facilitate the searching for, retrieval of and presentation of relevant records. This entails a considerable financial investment in technology and such systems need to be continually managed to keep abreast of technological change.

The ICA (1997), however, holds that archives should anticipate increased demands from users for direct electronic access to records because of the advantages mentioned

above. Increasingly archival institutions, organisations and governmental agencies are providing access to their record holdings on-line and users are coming to expect this service.

2.4.7 Changing role of archivists

In order to successfully address the electronic challenge presented to archivists and records managers, it is argued that archival institutions need to change their traditional approach to the management of records.

A predominant viewpoint evident in the literature surveyed is that archivists can no longer sit back and wait for records to arrive on their doorstep for preservation and safekeeping. In order to ensure that authentic, reliable and preservable electronic records are produced, archivists need to become involved in the earlier stages of the record life-cycle. The focus needs to shift to the pre-creation and creation stages of the record life-cycle. According to Cox (1996) records professionals need to be involved in the design and monitoring of record systems. David Bearman (1994) holds that as electronic records are created and managed in electronic information systems, records managers and archivists need to be involved in the design of those systems either by playing part of the role of systems designer, or by developing close partnerships with the designers. For a discussion of what is entailed in the design of electronic information systems see section 2.3.2.

According to Hedstrom and Blouin (1996) archival institutions cannot insure the long-term preservation of archival electronic records on their own. In order to have an input

into policy and systems design they need to forge working partnerships with line, support and information technology management. This view is supported by Bearman (1994) who believes that it is in fact essential that the management of electronic records be one of distributed responsibility, particularly as he feels that the skills and knowledge required to manage the information are seldom found among archivists and record managers. However, for distributed responsibility to work effectively, it is essential that other players in the field such as system designers and data administrators are convinced of the value of recordkeeping and have an understanding of what it is that records managers and archivists are trying to achieve. Records managers and archivists, therefore, need to educate their potential partners as to the value of recordkeeping and demonstrate what their contribution can be to the overall information management of the organisation. In order to facilitate this they have to learn to speak the language of technologist so that they can put across archival and records management concepts in terms that the technologists can understand.

The advantage to an organisation of distributed responsibility is that it can reduce the costs of records management and archival programmes. If the records are being left in the systems that originally created them then the “burden of continually migrating archival information systems will then become part of the requirement to upgrade active information systems, which is a necessary business expense for which the expertise and technologies will be provided.”(Bearman 1994: 107) If however, archival records were removed from their original systems after active use and maintained in separate systems in archival institutions, then the organisation would have the additional cost of migrating those systems as well as their associated

hardware and software became obsolete. Distributed responsibility, involving a team based approach, will also reduce the costs to organisations of retraining and reskilling archivists and records managers in information technology.

It is also argued that in order to effectively address the challenge of managing electronic records, archivists need to move from a reactive to proactive orientation. They need to become the originators of policy and standards and provide services such as education, training, guidelines, and technical services. (Hedstrom and Blouin 1996) According to O'Shea (1997) recordkeeping professionals need to move their focus away from the actual records themselves and rather establish recordkeeping programmes and set and monitor policies and standards. He believes that they should thus play the role of consultants rather than making decisions "about specific records in specific record keeping systems...". (O'Shea 1997: 3) For a discussion of what a recordkeeping programme entails and what issues policies should address, see section 2.5.

Finally, there also seems to be agreement on the fact that archivists and records managers need to supplement their archival skills, in order to be effective in the electronic arena. They need to have greater technological awareness, to keep abreast with technological developments and be able to communicate meaningfully with technologists. (Cain and Millar ?) This does not imply that they need to become technologist, business and systems analysts, but rather that they have an understanding of the processes and methodologies involved in these areas. They should acquire at least a basic understanding of how information systems are designed

and implemented, how information systems operate, what is involved in data administration and how functional analysis and data modeling are carried out.

2.5 Recordkeeping programmes

While there are various individual solutions to the issues discussed in the preceding sections, such as technological solutions for hardware and software obsolescence, and distributed responsibility to deal with custody and skills issues, if the issues presented by electronic records are to be dealt with effectively and not in isolation from each other, they need to be tackled within the framework of a recordkeeping programme. This programme will consist of a number of policies and procedures addressing the activities and responsibilities associated with managing the electronic records of an organisation.

The establishment of a recordkeeping programme should ideally comprise of four stages. According to Bearman (1994) these should be the establishment of goals and objectives for the programme, defining the scope of the programme, identifying the strategies and tactics to be used, and securing staff support and resources. In establishing the goals and objectives for the programme, records managers and archivists need to take cognisance of organisational goals and objectives, and attempt to link the goals of their programme to those of the organisation. In this way the value and importance of the programme will be more demonstrable and more likely to elicit support. In terms of establishing the scope for the programme issues that need to be considered are what types of electronic information systems, which organisational

functions or functional areas are going to be included in the programme and what responsibilities are going to be assigned to the various role players.

The third stage of setting up the programme is to identify what strategies and tactics are going to be employed in order to achieve the goals and objectives of the programme. Here management “needs to provide some guidance, in the form of administrative requirements, to shape action.” (Bearman 1994: 112) This can be achieved, for example, by including in all policy statements defined responsibilities and providing examples of methods of how policy can be met. Finally, in order to establish an effective programme it is essential to gain organisational staff support for it. The programme and associated policies will have to be disseminated throughout the organisation and archivists and records managers have the responsibility in seeing that it is understood and that the value of it is recognised.

What issues then should a recordkeeping programme’s policies address? Firstly, they should at the very least address all the issues that we have examined under sections 2.3 to 3.4. In other words, issues such as record appraisal, description, custody, access and migration, to name but a few examples, must be covered. Bearman has proposed a number of issues which recordkeeping policies should address, and these seem suitable to serve as a template of issues to be covered when organisations draw up their own policies. All these issues have been covered in the preceding sections of this literature review and as such will merely be listed here. The issues that policy must address are as follows:

1. The concepts of what comprise a record must be defined in a policy in a way that is understandable and implementable by people and systems.
2. Policy must assign responsibility for the management of electronic records to the various organisational units concerned.
3. Policy must define what actions need to be taken in order to safeguard the legality of records.
4. Policy must cover the issue of the retention and disposal of records.
5. Policy must state the appraisal methodology to be used.
6. Policy must state the standards to be used for intellectual control and record description.
7. Policy must deal with the issue of custody, stating who should have physical custody.
8. Policy must include care and storage standards for electronic records.
9. Policy must cover migration issues in order to ensure the continued access of records.
10. Policy must deal with issues such as the security of information, the rights of individuals and organisational confidentiality.
11. Policy must deal with how access is to be achieved to records.

Undoubtedly there are other issues that policy can address, but many of them will vary according to the nature of the organisation, in terms of its functions, legislative frameworks and organisational culture. This list above, however, does seem to offer generic basis from which to start. These policies would then need to be supported by associated procedures and guidelines.

2.6 Approaches adopted by archival institutions

Archival institutions around the world are having to tackle the issue of managing electronic records and deal with the related issues reviewed in the previous sections of this chapter. In this section we will review the approaches adopted by the Australian Archives and the National Archives and Records Administration (NARA) of the United States. These two institutions have been selected as they have both developed comprehensive recordkeeping programmes, have had substantial experience in the management of electronic records, and represent the two main opposing approaches to the management of electronic records. The Australian Archives having adopted a programme based upon the non-custodial approach, while NARA has elected to follow the custodial approach. (See section 2.4.5 for a discussion on record custody)

2.6.1 Australian Archives

The Australian Archives has developed a recordkeeping programme based on the strategy of shared responsibility. It is not only records managers and archivists that will be responsible for managing the electronic records of government agencies, but rather all individuals in these agencies will be involved in the recordkeeping process. This concept of shared responsibility is clearly demonstrated in the Australian Archives policy regarding the custody of electronic records of enduring value.

The Australian Archives have adopted an approach which they term “distributed responsibility”. In terms of this, electronic records will not be taken into physical custody by the Archives, except in special circumstances, but rather remain in the

custody of the creating agencies. Special circumstances would for example be, when an agency closed down and no other agency would be taking over its functions or be in a position to take custody of its records.

The Australian Archives believes that distributed custody is the most logical and economic method of dealing with electronic records, as they do not have the technology nor the resources to take physical custody of and manage all the electronic records generated by government agencies. They feel that this is the best way to deal with the issue of technological obsolescence and associated costs. Electronic records are generated in agency computer systems during normal operational use and therefore maintaining access to records of archival value over time in these systems, it is argued is not much more than the programming and hardware resources normally needed to maintain such systems. (Australian Archives 1995b) As the systems undergo upgrades and changes during their normal operational use, the records they contained would be migrated as part of the project plan.

Although the records will remain in the custody of the creating agencies they are still subject to the Archives Act. Therefore for example, the control procedures for public access as contained in the Act are still be applicable and records still need to be described and registered in the Archive control systems.^{*} The Australian Archives, assists the agencies in appraising their records, determines how long the records need to be maintained, provides help in identifying metadata that needs to be captured along with the records, sets policy and provides advice on access issues, and assists with the development of recordkeeping systems. They furthermore have produced and

will continue to produce policy guidance standards and guidelines to be issued to government agencies on a range of topics such as desktop management and managing e-mail messages.

The appraisal strategy of the Australian Archives is based upon the process of functional analysis, ideally at the design or redesign phase of electronic systems (see section 2.4.1 for a discussion of this process). Records are not appraised at an individual level, but rather information systems that contain records are appraised in terms of the functions that they support. The functions of the agencies themselves are also appraised as part of this process. The administrative, legal evidential and informational value of the functions and information systems are weighed up against the costs of maintaining access to the records over time. The Australians take a very pragmatic approach to appraisal by including a cost benefit analysis into the process.

The Australian's strategy for managing electronic records is thus centered on the concept of distributed custody and an involvement in the whole life-cycle of electronic records. While there is much debate in international archival and records management circles to the merits of this (see section 2.4.5), the Australians remain firmly committed to this concept and the associated roles and responsibilities that spring from it.

2.6.2 National Archives and Records Administration (NARA)

The electronic recordkeeping programme of NARA is based on a strategy of taking into physical custody, the electronic records of enduring value produced by agencies

of the federal government of the United States. As such NARA has established the Center for Electronic Records, which has the responsibility for appraising, preserving and providing access to these records. The Center however does not issue policy or any guidelines to government agencies as it merely functions as a repository for records. These policy and guideline functions, as well as providing assistance to agencies, is the responsibility of NARA's Office of Records Administration and the Office of Federal Records Center. NARA in managing the records of federal government operates in terms of a separation of functions and is structured according to these functions.

The Center for Electronic Records then, being the repository for electronic records, is responsible in terms of preservation for creating master and backup copies of the records that it receives. They undertake statistical sampling on a yearly basis of their record holdings to determine whether any loss of data has occurred and they are responsible for ensuring that the records are migrated onto technologically current media every ten years.

NARA's preservation techniques are based on a strategy of "developing systems and procedures which standardise and automate the performance of archival functions, while protecting the integrity and record character of the information preserved". (Yorke 1995: 47). As such they have developed and utilise two electronic systems to achieve this end. The first system handles the physical preservation of electronic records and is known as the Archival Preservation System or APS, while the second

system, the Archival Electronic Records Inspection and Control system or AERIC, stores the records associated metadata.

APS performs a number of functions. It transfers records from the media used by record creators to the chosen medium for archival preservation. The system has been designed to receive records on magnetic tape, open-reel or tape cartridges or CD-ROM, which it then transfers onto 3480 magnetic tape cartridges for preservation. It copies the files according to NARA standards for physical recording and labeling and records the processes it has undertaken, including what files it has copied and the media volumes it writes. Finally, the system also facilitates the migration of records to new preservation media.

The AERIC system, as stated, stores the metadata associated with the records. This metadata represents the logical structure of the records, in terms of the way in which the information contained within the record is structured, and the conceptual structure, in terms of the way the information is presented to the user. The system together with traditional archival descriptive methods serves as a descriptive system for the holdings of the Center for Electronic Records.

As stated previously, the Center for Electronic Records is also responsible for the appraisal of the records that it receives. The Center still appears to use the more traditional archival approach of appraising records, which focuses on the records themselves and their content in particular. Their appraisal methodology is thus based on content analysis that is supplemented with a technical analysis. The content

analysis involves determining the research, legal, administrative and evidential value of the information contained within the records in the context of the functions of the creating agency. The technical analysis involves determining the usability of the information contained in the records, in terms of the technology that was used to produce them and the media they are stored on.

NARA, it can therefore be seen, has clearly adopted the custodial approach to managing electronic records and has, by virtue of the functions it has allocated to the Center for Electronic Records, concentrated its focus on dealing with the records in the last phase of their life-cycle, that is once they have been accessioned into a repository. However, it would seem as if they are open to alternative scenarios.

NARA acknowledges that due to a lack of resources and physical capacity they are being forced to withhold from accepting electronic records from some agencies. As such they have, as part of their strategic vision for the period 1997 to 2007, committed themselves to developing methodologies and standards for “allowing NARA to leave physical custody of archival material, particularly electronic record material, outside of our own facilities when feasible and when both the generating agency and NARA, in consultation with users, agree that it is in the public interest.” (National Archives and Record Administration 1997: 9)

Furthermore, in the same document they acknowledged the need to become involved in the management of records from the start of their life-cycle, by being involved in the design of recordkeeping systems and undertaking appraisal at the beginning of the record life-cycle. The implication of moving appraisal to the front end of the life-

cycle, is that NARA will have to reassess its appraisal methodology in terms of its focus on record content, and possible move to adopting the functional analysis methodology. This methodology, for reasons discussed in section 2.4.1, is more effective for the appraisal of electronic records.

2.6.3 Lessons to be learned

On the whole, it is difficult at this stage to assess which of the two opposing strategies presented above will prove to be the most effective means of dealing with electronic records in the long run. NARA which has been following its approach for over ten years now, the Center for Electronic Records having been created in 1988, is clearly starting to reassess its established strategies in the light of problems it is starting to experience by adopting the custodial approach and focusing its electronic management activities at the end of the record life-cycle. The strategy adopted by the Australian Archives, which in the light of the issues discussed in this chapter seems to lend itself to a more effective approach to managing electronic records, is still too young in terms of its implementation to provide conclusive results.

2.7 South African National Archives

The National Archives of South Africa Act, Act 43 of 1996 (see Appendix C) established the South African National Archives on the 1st January 1997, when the Act was passed into law. With this Act a new public archives service was established in South Africa, consisting of a National Archives at central government and nine provincial archive services. The Act also provided for the establishment of a National Archives Commission. The Commission will, among other things, assist the National

Archives in the performance of its functions, “promote the coordination of archival policy formulation and planning at national and provincial levels” and approve and monitor the implementation of appraisal policy. (National Archives of South Africa 1997b: 4)

Prior to the passing of this Act, the State Archives Service was responsible for managing the records of the public sector under the Archives Act of 1962. The State Archives Service was responsible for the custody of all archival records of central, provincial and local government offices, excluding those of the former homelands. The State Archives Service was under the centralised control of the Chief Archivist with decentralised archival repositories in each of the provinces. For a detailed discussion of the Service and its archival and records management functions see section 2.8.1.

In terms of the Archives Act, the National Archives is empowered to collect and make available, to both the public and government, records deemed to be of national archival importance. It is mandated with the care and management of the records of central government, including those still in the custody of government bodies. Central government being defined as “ all governmental bodies at the national level of government, a governmental body being defined as any legislative, executive, judicial or administrative organ of state (including a statutory body).” (National Archives of South Africa 1997b: 1) The National Archive is also tasked with the identification and collect of non-public records of national significance that have long term value and cannot be preserved by a more suitable organisation. It is further given the function of

establishing and maintaining “national registers of non-public records with enduring value and (promoting) cooperation and coordination between institutions having custody of such records”. (National Archives of South Africa 1997b: 3)

From a custody and preservation perspective, the Act stipulates that public records identified as having archival value are to be transferred into the custody of the National Archives when they have reached twenty years of age. The National Archivist may however, after consultation with the relevant government department, determine that records should be transferred into archival custody before the twenty-year period has been reached, or that records should in fact remain in the custody of a government body.

With regards to the National Archive’s management of public records, the Act (Section 13) gives the National Archivist the power to determine the records classification system to be used by government bodies, the conditions under which records may be electronically reproduced or microfilmed, and the conditions for the management of electronic records systems. The National Archivist is further given the power to carry out inspections of the records in government department custody, and to authorise the destruction, erasure or other disposal of public records. Finally in terms of records management provisions, government bodies are required to appoint records managers, whose responsibility it is to ensure that their respective governmental bodies comply with the Act.

2.8 State Archives Service

In the following sections we will examine the development of the archival and records management functions of the State Archives Service, including a brief review of the Archives performance in terms of managing paper records, and then conclude with charting the rise of electronic records and the State Archive Service's response to this.

2.8.1 The Development of record management and archive services

Prior to the formation of the Union of South Africa in 1910, archival services had developed independently of each other in the then four colonies, the Cape, Natal, Transvaal and Free State. The Union of South Africa brought these four separate services together under the control of a Chief Archivist. With the passing of the Public Archives Act of 1922 the State Archives Service was created and placed under the responsibility of the Department of the Interior. In terms of this Act, the Chief Archivist was “ charged with the care, custody and control of the documents in the archives depots (and he) was to assist government offices with advice in connection with current documents.” (Technikon RSA 1990: 83)

Thirty-one years later this Act was replaced with the Archives Act of 1953. It was in this period that the staff of the State Archives Service started carrying out appraisals of material and this led to the formation of the Liaison Section for this specific purpose. Prior to the passing of the 1953 Act this appraisal function had been carried out on an ad hoc basis by the Archives Commission. Although the main function of the Liaison Section was records appraisal, they increasingly became involved in advising government offices with regards to their filing systems. In 1960 the Liaison

Section formally took onboard the role of providing guidance and advice regarding filing systems and at the same time changed its name to Record Management Section. This role rapidly became more extensive and more important.

As a result of the growth and expansion of the State Archives Service during the fifties, the Archives Act of 1953 was repealed and replaced with the Archives Act of 1962. This new Act replaced the designation of the head of the State Archives Service from that of “Chief Archivist” to that of “Director”. The Act also formally placed the responsibility for the care and preservation of records of archival value, which were still in their offices of origin (that is, records management), with the Director. In terms of this the Archive Act defined archives as “any documents or records received or created in a government office or an office of a local authority during the conduct of affairs in such office...” (Kirkwood 1994: 8) The State Archive Service’s records management role continued to grow through out the sixties. This was given impetus by the commencement of inspections of records still in the custody of government offices in 1966.

While the State Archives Service has thus had a long established role in managing the records from government, this role has not been without its problems. According to a report produced by the Archives Sub-Committee of the Arts and Culture Task Group (ACTAG) the work of the State Archive Service was adversely affected by a “chronic lack of funds, staff, overall vision as well as its relatively low status within the bureaucratic pecking order.” (Callinicos and Odendaal 1996: 40) As a result of this some government departments and agencies were able to ignore the provisions of the

Archives Act. This has particularly been evidenced by the unauthorised destruction of records by, for example, the former South African Police and the State Security Secretariat. This lack of resources and the low status of the State Archives Service have continued with the change of the Service into the National Archives. While the State Archive Service had the necessary policies and procedures in place to effectively manage the paper records of central government, the efficiency of actually managing the records was adversely affected by the aforementioned lack of resources.

2.8.2 The Rise of electronic records

In the early 1970's computers started being introduced into government offices. These were main frame computers and used primarily for support functions such as human resources and finance. (Kirkwood 1991) The State Archives responded to this development by issuing a circular (no. 1 of 1974) to government offices pointing out the fact that records in electronic form, as well as source documents and printouts, were public records and as such should be dealt with in terms of the Archives Act.

Accordingly, disposal authorities had to be applied for, for electronic records as well. All government offices using computers were therefore required to compile a list or schedule of computer archives (see Appendix D). The schedule contained details regarding each utilization (purpose for which it was used) of the computer. For example, details were required regarding input and output documents, programmes used, format of records, and document media et cetera. This schedule was then used during appraisal to help allocate a disposal instruction to the electronic records. This system was originally designed for “ mainframe computer utilisations dealing with

specific, mainly administrative functions in which uniform, structured record formats were used.” (Kirkwood 1994: 10)

In a paper published in 1994, Kirkwood (the then State Archive Service Regional Chief for the Transvaal region) took cognizance of the rapid development of computer technology and the introduction of the personal computer in the 1980’s, and conceded that “the current form of the schedule may not be suitable to provide an overview of e.g. an integrated office system or database.” (Kirkwood 1994: 10) He however insisted that the nature of the information gathered from the schedules remained relevant, and be used “as a basis for the archival appraisal of integrated electronic systems, each according to its own nature.”(Kirkwood 1994: 10)

Issues such as hardware and software obsolescence, incompatibility, maintenance and conversion costs resulted in the Archive Service requiring that any electronic records appraised as being worthy of preservation be transferred to paper or microfilm. It was only in 1993 that the decision was taken by the State Archive Service to allow records in electronic form to be accepted into archival custody. This was conditional upon the determination that the electronic format was the most appropriate storage format and that “adequate guidelines and facilities could be provided for their archival preservation and retrieval.” (Kirkwood 1997a: 13) In the light of the discussion regarding hardware and software dependency presented in section 2.4.3, this conditional acceptance of records in electronic form was an advisable policy. The Archive Service needed to ensure the continued accessibility of those electronic records they took into custody. As such, they needed to take cognizance of their

ability to do this, in terms of their technological infrastructure and expertise in preserving records in electronic formats, which at that stage was fairly limited.

Furthermore, according to Kirkwood (1991), during the 1970's and early 1980's computers in government offices were chiefly used for support or housekeeping functions, such as staff, finance and supplies. He continues that in terms of archival value, the records associated with these functions are generally not of enduring value, and as such for this period there were few electronic records that were identified for preservation. This resulted in a lack of pressure on the State Archive Services to tackle the issue of electronic records, and as such the Archives Service delayed "taking active steps regarding the long-term preservation and retrieval of material."

(Kirkwood 1991: 30)

For the period 1989 to 1993, according to the "Lists of Computer Archives" submitted to the State Archives Service for disposal authority, only 5 electronic systems were implemented in state departments. According to Kirkwood these statistics are not accurate and in fact "provide a disturbing indication of a lack of systematic records management in the sphere of electronic records." (1994: 12) This he largely attributes to the fact that from an administrative and operational perspective, traditional registries and records management structures are completely separate from the computer divisions. He continues that there have also been indications of a lack of cooperation from some computer professionals in terms of contributing the needed detail for the "List of Computer Archives". He concludes that what is needed is proactive identification of electronic applications by the State Archives Service to

ensure that the requirements of the Archives Act are fulfilled, but this is hampered by a lack of resources.”(Kirkwood 1994: 12)

This above situation was problematic and certainly, in terms of the future, needs to be addressed, particularly in the light of the discussion in section 2.4.7 regarding the changing role of archivists. Here we saw that there was a strong argument for the concept of a partnership between archivists and those involved in the information technology field, if electronic records are to be effectively managed and preserved.

In January 1993 the Committee on Machine-Readable Archives (COMMA) was established in order to formulate an electronic records policy for the State Archives Service. The committee produced a number of reports, recommendations and guidelines, which were used as a working policy for the management of electronic records by the Archives Service. As well as this policy formulation role, COMMA also came to play an active role in managing the electronic records programme of the State Archives Service.

The work undertaken by COMMA culminated in a submission made to the Director of Archives in 1996 where a number of proposals regarding the Service’s electronic records management programme were made and subsequently accepted. These were as follows: That COMMA be formally assigned responsibility for managing the electronic records management programme of the State Archives Service, and that the Committee be renamed the Committee for the Management of Electronic Records (COMMER), to reflect its formalised role.

In terms of this proposal COMMER would assume overarching responsibility for the programme, continue to undertake policy development and formulation, and co-ordinate and monitor other players involved in the Services electronic records programme. The Committee would report directly to the Directorate and membership would be made up of formal representation from Transvaal/Central Archives Depot (TAD/CAD), Records Management, Retrieval Auxiliary Services (RAS) and Bureau Nucleus. Records Management would be responsible for the issuing of related directives, providing guidance and advice to client offices, monitoring records in the custody of government offices and handling the transfer and acquisition of electronic records. Bureau Nucleus would provide technical advice and be responsible for the preservation of the working copies of records. The preservation of the master copies would be the function of TAD/CAD, which would also prepare finding aids for the records and provide assistance to users. Finally RAS would monitor the services provided by Bureau Nucleus and also provide technical support to the other members of COMMER.

2.9 Summary

What is clear from the preceding literature review is that there are a number of critical issues that need to be addressed if electronic records are to be effectively managed and preserved. Firstly a clear distinction needs to be made between information and records. In terms of the discussion in section 2.3.1, it can be seen that records are a class of information that contain structure, content and context, and serve as evidence of transactions.

These defining characteristics of a record, consequently distinguish electronic recordkeeping systems from other information systems in that the former need to be specifically designed in order to capture the record's metadata along with the record's content. In order to ensure that recordkeeping requirements are built into electronic systems, it is essential that archivists and records managers are involved in the process of systems design along with information technologists.

A number of institutions have been involved in work in this area, with the Pittsburgh project having drafted a useful set of recordkeeping requirements. These can be used as a template for electronic recordkeeping system specifications. These requirements have and are in the process of being tested by a number of other projects. One of these projects, the University of Indiana Project, has in the process of doing this, developed a four stage methodology as an approach for developing systems which meet recordkeeping and archival requirements.

From the perspective of the long-term preservation of electronic records, it is clear that a number of key issues also need to be addressed. In section 2.4.1 dealing with record appraisal, it is argued that the conventional appraisal methodology as applied to paper records cannot be applied to electronic records. The appraisal of electronic records needs to take place at the beginning of the records life-cycle as opposed to at the end, which was traditionally the case with paper records. The appraisal methodology also needs to move away from the appraisal of content (of the records) to the appraisal of the functions or activities that produce the actual records.

The stability and durability of record media were also issues that needed to be taken into account. The record media need to be durable in terms of their physical life span and stable in terms of the technology used to create and access the records. This issue of stability is directly linked to the concept of hardware and software dependency. Electronic records, by their nature, are dependent upon hardware and software for their creation, preservation and access. Methods thus need to be found to ensure that, given the rapid rate of technological development and obsolescence, electronic records of archival value continue to remain accessible. The main means of achieving this that the literature review identified, was that of migration and eight migration options were presented and assessed.

The means by which intellectual control is gained over electronic records and the means by which they should be described also emerged as issues of concern. A conclusion was reached that traditional descriptive narrative needed to be supplemented with the metadata, associated with the records concerned, contained in electronic systems. Access to electronic records was also identified as an area that needed to be given attention by archivists and records managers. Here the issue revolved around the means by which access should be given and the importance of ensuring that this access suited the needs and purposes of the users.

The issue of physical custody of electronic records was also identified as being of importance. Two opposing viewpoints emerged from the literature reviewed. On the one side there were theorists and archivists (see section 2.4.5) that argued for the non-

custodial approach, while others argued that archival institutions need to take the records into physical custody if they are to be effectively preserved and managed. These two opposing views were also evidenced by the strategies adopted by the Australian Archives and NARA respectively.

In order to deal with the above issues it emerged that archivists need to change the way they have traditionally played their role. They need to be far more proactive and become involved in the early stages of the records life-cycle. In particular they need to become involved in the design of electronic information systems if these systems are to function as recordkeeping systems. They need to enter into partnerships with information technologists and convey the importance of recordkeeping to them. Archivists need to supplement their skills and knowledge base with an understanding of the processes and methodologies used by information technologists in designing and managing business information systems.

It was further established that recordkeeping programmes need to be established in order to address the issues dealt with above effectively. These programmes need to consist of policies and procedures guiding and regulating the activities and responsibilities associated with managing electronic records. The establishment of such programmes involves setting the goals and objectives of the programme, defining the scope of the project, identifying the strategies and tactics to be used, and securing staff support and resources.

Having identified and examined the key issues involved in the management of electronic records, the literature review examined how two archival institutions, namely the Australian Archives and NARA, have attempted to deal with a number of these issues. We saw that the two institutions adopted fundamentally different strategies in the management of electronic records. The Australian Archives approach being based on a strategy of distributed responsibility and non-custodianship, while NARA followed the more traditional paper-based approach of taking full responsibility and physical custody of electronic records. However it would seem that in the future the possibility exists that NARA may move to a more distributed responsibility approach.

The literature review concluded with an examination of the situation in South Africa. An overview of the National Archives of South Africa Act, Act 43 of 1996, was given and the development of the government archival and records management services preceding the establishment of the South African National Archives was detailed. The key issues that emerged here were that while the State Archives Service had a long and established tradition of managing the paper records of government, they had been hampered in terms of their effectiveness by a lack of resources. In the arena of electronic records, the State Archives Service first started addressing the issue of electronic records back in the mid 1970's. However, again, these attempts had been hampered by a lack of resource and additionally, a lack of cooperation from information technologists in government agencies. A notable achievement was, nevertheless, the establishment of COMMA in 1993 in order to formulate an

electronic records policy for the State Archives Service and the subsequent establishment of COMMER to assume responsibility for the programme.

CHAPTER 3

Research Methodology

In order to address the objectives of this investigation, as discussed in chapter 1 section 1.3, the research methodology selected for this study was descriptive research utilising the case study approach.

3.1 The Case-study method

The case study has been defined as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.” (Yin 1984: 23) The case study focuses on a single unit or case, seeking to describe the situation in order to achieve a “comprehensive understanding of the event under study.” (Glazier and Powell 1992: 32) It makes use of a number of methods of data collection utilising a number of sources of evidence such as documents and archival records, interviews, observations and physical artifacts. As the investigation into the National Archives of South Africa involved a focus on the aforementioned institution and sought to arrive at a comprehensive understanding of its electronic records management role, this methodology was deemed appropriate.

According to Sarantakos (1994) the design of the research in case studies is contained in the case-study protocol. This protocol sets out the “main steps of the research process, offering details about the decisions that need to be made and the techniques that must be employed in the control of the study.” (Sarantakos 1994: 261) In brief it

consists of an overview of the study, (that is, what is the unit of analysis, what are the studies objectives et cetera), the field procedures used in the study, and case-study questions which are used to direct the study.

The objective of this investigation then, as stated in chapter one, was to arrive at an understanding of the role that the South African National Archives plays with regards to managing the electronic records of central government. In terms of this, the study sought to identify and document the processes and procedures used by the National Archives in managing the records, the associated problems and challenges, and whether these were recognised and being dealt with by the National Archives. These objectives were formulated into the five case study questions presented in chapter one.

In order to arrive at answers to these questions two data gathering techniques were utilised, that of the record method and the conducting of interviews.

3.2 The Record method

The record method is a non-reactive method of research whereby information about the event under study is gathered from public documents. (Bless & Higson-Smith 1995) In this study extensive use was made of a variety of documents ranging from legislation such as the National Archives of South Africa Act, manuals and internal circulars of the National Archives to papers authored and presented by members of the National Archives.

As the National Archives is a statutory body, in that it was created by the National Archives of South Africa Act, this piece of legislation was examined in order to determine the aims, functions and powers of the National Archives, in relation to the management of central government's electronic records.

In order to address the question of what mechanisms and methods are used by the National Archives, the Archives was requested to provide the researcher with all manuals, circulars and directives et cetera, dealing with said subject matter. The following documents were specifically examined in depth: The "National Archives of South Africa Archives Instructions", the "National Archives of South Africa Appraisal Manual" and the "Draft Guide to the Management of Electronic Records in Government Bodies". A number of papers written by members of the National Archives and the former State Archives Service were also consulted (see bibliography).

The data necessary to answer case study questions 3 and 4, dealing with the issue of challenges and problems, was also partly gathered using the record method. Again the above mentioned list of documents were consulted, although extensive use was made of the broader literature reviewed (see chapter 2) in order to identify generic problems and challenges presented by the management of electronic records.

3.3 Interviews

After the documentary evidence had been analyzed, three non-scheduled-structured interviews were carried out (see Appendix E for schedule of interview questions).

(Bless and Higson-Smith 1995) These interviews are so named as they are structured in that a list of issues to be investigated, in the form of questions, is made prior to the interview. They are non-structured by virtue of the fact that the questions have no specific order and new questions can be formulated, by the interviewer during the interview itself, as the need arises. The objective of the interviews was to clarify issues identified during the document analysis phase and to gain additional information, specifically about the methods and mechanisms used (question 2), and the challenges and problems presented by electronic records and how these were being dealt with (questions 3 and 4).

With regards to question 2, the issues dealt with centered on the following:

Mechanisms of communication to client offices regarding policies and procedures;

- identification and appraisal of records;
- the use of electronic recordkeeping systems;
- role of record managers in government bodies;
- training of personnel in government bodies;
- design and implementation of electronic recordkeeping and information systems;
- identification of non-compliance with policies and procedures.

In terms of questions 3 and 4, the interviewees were initially asked to identify what they saw as being the main challenges facing the National Archives. This was followed up by a series of questions focusing on specific potential challenges and how they were being dealt with, some of which were identified prior to the interview

during the document analysis phase, and others arising out of the interviewees responses during the actual interviews. Issues that were focused on were as follows:

The resources (financial, staff and skills) available to the National Archives;

- the status and positioning of the National Archives within the public sector and within the Department of Arts, Culture, Science and Technology;
- constraints in terms of the National Archives of South Africa Act;
- the ability to National Archives to fulfill its legislated duties and responsibilities;
- appraisal of electronic records;
- involvement in design and maintenance of electronic recordkeeping systems;
- custody of records appraised as having archival value;
- storage media and record migration.

Initially four potential interview candidates were identified on the basis of a recommendation by a Deputy Director at the National Archives responsible for Planning, Coordination and Transformation. The four candidates were the aforementioned Deputy Director, the Director of the National Archives, the Deputy Director responsible for Records Management and Information Systems and the Principal Archivist working in the electronic record management arena.

Having established what their areas of responsibility entailed and their involvement in the management of electronic records, the researcher accepted these candidates as being suitable subjects in terms of the data required. Unfortunately, on the day scheduled for conducting the interviews, the Director of the National Archives was unavailable and due to various constraints this researcher was unable to set up another

personal interview. However, personal correspondence via e-mail was entered into with the Director and the data gathered this way was used to supplement the findings of the personal interviews conducted with the other candidates. The interviews conducted with the Deputy Director of Records Management and Information Systems and the Principal Archivist particularly yielded data regarding the issues directly related to the management of electronic records. The reason being that the management of all records, including electronic records in their offices of origin is the responsibility of the records management section of the National Archives. The Deputy Director of the section was thus identified as a key source of information. Furthermore he is also the chairperson of the Committee for the Management of Electronic Records (COMMER) which functions as the management component of the National Archives electronic records programme. In order to clarify a number of responses received from the Deputy Director during the interview e-mail correspondence was entered into with him on a number of subsequent occasions.

The Principal Archivist is a member of Records Management section, whose responsibilities include the appraisal of electronic records, client office liaison regarding the management of electronic records and the development of the National Archives' "Guide to the Management of Electronic Records". As such this person was also able to make a valuable contribution in terms of providing data relevant to the issues listed above. Data received from the Deputy Director of Planning, Coordination and Transformation was also pertinent with regards the above listed issues. He too, has had experience in dealing with electronic records, most recently in advising the Truth and Reconciliation Commission on the management of their electronic records.

He was further able to provide data regarding resource availability and the National Archives status and position within the Public Service as a whole and within the Department of Arts, Culture, Science and Technology in particular. On the basis of the responses received from the Director of the National Archives much of the data gathered from the other interviews conducted, was confirmed and placed into context.

3.4 **Limitations of the study**

From the above it should be clear that the majority of the data gathered for this investigation had its origins from within the National Archives itself, whether it be derived from the documents and records produced by the National Archives or from the interviews conducted. This investigation was concerned with understanding the workings of the National Archives in terms of the management of electronic records, the issues and challenges that the Archives itself perceived in terms of this function and how they have, or are intending to deal with them. As such, no substantial use was made of data originating from any other central government personnel or bodies, and this bias, therefore, needs to be clearly recognised. Although the data gathered was limited in terms of the above, it nevertheless was able to contribute to an understanding of the issues involved in the National Archives role in managing the electronic records of central government, particularly when examined in the light of the data gathered from the literature reviewed relating to the international context.

3.5 Summary

As this investigation involved a single unit and sought to gain a comprehensive understanding of the case involved, the case-study methodology was applied. In terms

of this, a number of case-study questions were set, which this investigation subsequently attempted to address. Two methods of data collection were applied in order to gather the required data, these being the record and the interview methods. Utilising the record method a number of publications, documents, manuals and papers were examined for relevant data. Three non-scheduled-structured interviews were carried out with staff members of the National Archives. The information gathered from these two sources was supplemented with data gathered from a number of personal communications entered into with staff members of the National Archives, conducted via the telephone and e-mail. A limitation of this study was acknowledged in terms of substantial data being gathered from within the National Archives itself as opposed to data being gathered from other central government bodies.

CHAPTER 4

Findings and Interpretative Discussion

4.1 Questions posed

In chapter 1, section 1.3, it was stated that in order to achieve the objectives of this study, five questions needed to be answered. This chapter then, serves to address the first four of these questions in turn and present the relevant findings. The fifth question will be dealt with in chapter 5, which deals with the recommendations and conclusions of this study. The first four questions formulated in chapter 1 were as follows:

1. What is the mandated role of the National Archives of South Africa in terms of managing the electronic records of central government?
2. What mechanisms and methods does the National Archives of South Africa employ in attempting to manage the electronic records of central government?
3. What are the challenges/problems that the National Archives of South Africa faces in attempting to manage the electronic records of central government?
4. How is the National Archives of South Africa dealing with these challenges/problems?

4.1.1 Mandated role of the National Archives

In establishing what the mandated role of the National Archives of South African is, the piece of legislation by which the National Archives was established, Act 43 of 1996, was examined. This Act was the primary source from which the data was

gathered in order to answer the first question, as it forth the role and responsibilities of SANA in terms of the management of the electronic records of central government.

The National Archives was established by means of the National Archives of South Africa Act (Act 43 of 1996), and as such derives its functional mandate from this piece of legislation. Article 13 of the National Archives of South Africa Act charges the National Archivist with the responsibility for the “proper management and care of public records in the custody of governmental bodies.”(National Archives of South Africa 1997b: 8) In terms of the Act, article 1 (xv), a record is defined as “recorded information regardless of form or medium” ; a “public record” is defined as “a record created or received by a governmental body in pursuance of its activities”, and in terms of article 1 (viii), a governmental body is defined as “any legislative, executive, judicial or administrative organ of state (including a statutory body) at the national level of government”.(National Archives of South Africa 1997b: 1-2)

While the definition of a record contained in the Act does not specifically mention electronic records, it is clear that they are nevertheless included in this definition by virtue of the statement “regardless of form or medium”. All provisions of this Act regarding “records” are thus equally applicable to electronic records. One criticism of the definition provided is that it is too generic in terms of describing a record as “recorded information”. This is particularly the case in the light of the discussion in chapter 2 section 2.3.1 regarding the difference between information and records. It would have been more meaningful to have defined a record, at the very least, in terms of its evidentiary and transactional nature as discussed in that section.

In terms of the provisions regarding public records in general, the Act, articles 3 (a), 3 (b), 3 (c), sets the objectives and functions of the National Archives as follows:

- To preserve public records with long term value for use by the public and the State;
- To make sure that records are accessible and to promote their use by the public;
- and
- To ensure that all public records are properly managed and cared for.(National Archives of South Africa 1997: 2)

The Act sets out a number of specific conditions for public access to records, such as the period of time, since the records came into being, that needs to elapse before access will be granted. These and other conditions will be discussed in section 4.1.2.5. The National Archivist is furthermore assigned powers and duties (articles 5 (a), 5(b), 5 (e)) to ensure that records are properly managed in terms of their arrangement, description and retrievability; to “provide information, consultation, research and other services related to records generally”, and to “take such other steps and perform such other acts as may be necessary for or conducive to the achievement of the objectives of the National Archives”. (National Archives of South Africa 1997b: 3-4)

The Act does however make specific reference to electronic records on two occasions. These are in articles 13 (2) (b) (i) and 13 (2) (b) (ii), where the National Archivist is given the powers to determine the conditions under which electronic records can be produced, and to “determine the conditions subject to which electronic records systems should be managed.”(National Archives of South Africa 1997b: 9) Electronic records systems here being defined as “any record system in which information is

generated electronically and stored by means of computer technology.”(National Archives of South Africa 1997b: 1)

From the above two mentioned articles of the Act, we can see that the National Archives, through the National Archivist, is given full control regarding the creation of electronic records and their subsequent management. In terms of this it would appear that no governmental body should be producing records in electronic format ✕ without acquiring the permission of the National Archives, and abiding by the conditions laid down, should this permission be granted. Similarly any governmental body using or intending to utilise electronic information systems for recordkeeping purposes would need to discuss this with the National Archives. In terms of the discussion in chapter 2, section 2.3.2, regarding electronic recordkeeping systems, this would be essential in order to ensure that the electronic information systems have the necessary recordkeeping functional requirements built into them.

With respect to the electronic records of central government then, the National Archives has been assigned responsibilities in three main functional areas. It is responsible for the management of those records still in the possession of governmental bodies, for the preservation and archival custody of these records, and for ensuring their continued access and use. At central government level there are 52 governmental bodies, including departments and ministries that the National Archives is responsible for. However many of these bodies also have offices at a regional level, which also fall under the National Archives in terms of records management and archival control. Added to this is a vast number of statutory bodies, approaching

approximately 3000 in number, for which the National Archives is also responsible in terms of the above. (Kirkwood 1999) The detailed implications of these three broad areas of responsibility will be spelt out further as we progress in addressing the remainder of the four questions.

4.1.2 Mechanisms and methods employed

In gathering data for this section and its subsequent subsections, extensive use was made of publications and documents produced by the National Archives. Specifically, use was made of the “Archives Instructions” (National Archives of South Africa 1997a), “Appraisal Manual” (National Archives of South Africa 1998a), and the “Draft Guide to the Management of Electronic Records in Governmental Bodies” (National Archives of South Africa 1998b). Data was also gathered by means of a number of interviews conducted and by means of e-mail correspondence entered into with members of the National Archives of South Africa.

In endeavoring to effectively manage the electronic records of government the National Archives has established an electronic records management programme that is based on three central strategies. The first is the involvement of the National Archives in the design and maintenance of electronic records systems. The second is to transfer, at the earliest opportunity, those electronic records deemed to be of archival value into archival custody; and the third is to identify electronic records of archival value that should remain in the possession of the creating body.

As discussed in section 2.6 of the literature review, the recordkeeping or records management programme forms an essential framework for the management of records. Within this framework strategies and tactics are identified and policies and procedures established. The National Archives has by establishing their programme, a firm base from which to address the various issues associated with the management of electronic records.

In order to obtain a clear understanding of what this programme entails, this section will firstly examine the roles and responsibilities with regards to the electronic records management programme. Secondly, it will identify the mechanisms used by the National Archives to communicate its policies and procedures to its client offices, and thirdly it will examine the methods and mechanisms used by the National Archives to manage the electronic records still in the possession of governmental bodies, to ensure the preservation and archival custody of electronic records, and facilitate access and use of these records.

4.1.2.1 Roles and responsibilities of the National Archives

The management of the electronic records of central government involves all components of the National Archives. Each component performs specific functions depending upon their areas of responsibility. However, the Committee on the Management of Electronic Records (COMMER) carries the overall responsibility for the National Archives electronic records management programme. It is responsible for monitoring the programme, ensuring that it is implemented and for policy development.

The Records Management component is responsible for direct liaison with the various client governmental bodies. It is responsible for providing guidance and advice regarding the development of record classification systems as well as approving such systems. The appraisal of all electronic records and the management of records in client offices fall within its area of responsibility as well. The National Archives Repository's function is to provide for the storage of electronic records transferred to it, as well as facilitating access and use of these records. For further comments on the storage of electronic media see section 4.1.2.4.

The Information Systems Division provides technical advice regarding electronic record systems and the National Archives' "capabilities with regard to preservation, management, making available and migration" of electronic records. (National Archives of South Africa 1998b: 11) The Information Systems Division would on request, for example, provide information regarding appropriate storage media and media density to be used in a given situation, as well as advise on possible migration strategies for particular media. Finally, the preservation of the electronic media, data migration to subsequent media and ensuring that the data contained by the media is accessible to users, is the responsibility of Bureau Nucleus II. This is a computer service bureau that falls under the Public Service's Central Computer Service.

From the above, it is clear that the South African National Archives has not, as is the case with NARA (see chapter 2, section 2.7.1), established a separate department or section specifically focusing on the management of electronic records. They have

rather used the concept of distributed responsibility within the National Archives itself drawing Bureau Nucleus II from the Public Service to supplement their skills and functionality. While this has the advantage of drawing on a wider pool of resources, one needs to question whether it would not have been wiser, at this early stage in the programme's development, to have established a section specifically dealing with electronic records.

Given the lack of staff resources, as detailed in section 4.1.3, point 6, more focus and effective action could possibly be achieved by staffing a particular section with staff dedicated to electronic records management. By allocating electronic records management responsibilities to staff already responsible for paper records, the risk is run that paper records will receive priority over the electronic ones. This risk is particularly real for the records management component which is already stretched in terms of available resources for managing paper records and has a serious lack of experience in dealing with electronic records.

4.1.2.2 Methods of communication

The National Archives presently makes use of a number of documents in order to communicate its policies and procedures to client governmental bodies. Firstly it publishes the "Archives Instructions" which stipulate the "obligations of government bodies in terms of the National Archives of South Africa Act." (National Archives of South Africa 1998b: 11) This document contains instructions and guidelines regarding for example, the custody and control, disposal and transfer of records in general, and contains a section specifically dealing with the management of electronic records.

Secondly the National Archives also publishes an “Appraisal Manual” which contains instructions regarding the principles and procedures of appraisal. Appraisal Instruction No. 36 (see Appendix F) specifically deals with the appraisal of electronic records. Two circulars have also been issued which deal with aspects of electronic records management (see Appendix G). Circular no. 1 of 1974 drew attention to the fact that electronic documents should also be regarded as records and that their destruction, therefore needed to be authorised. Circular no. 3 of 1984 dealt with the use of word processors for the editing storage and transmission of information. The National Archives is also currently working on a comprehensive guide to the management of electronic records. This guide has now been approved by the National Archivist and is awaiting publication and issue to governmental bodies.

4.1.2.3 Management of records in client offices

In terms of article 13 of the National Archives of South Africa Act “no public record under the control of a governmental body shall be transferred to an archives repository, destroyed, erased or otherwise disposed of without the written authorisation of the National Archivist...”. (National Archives of South Africa 1997b: 9)

While these requirements are legislated in the National Archives Act, one needs to question whether these can be fully enforced. Firstly, in order to ensure that these provisions are abided by, the National Archives would need to constantly monitor the activities of their client offices in regards to this. However as stated in section 4.1.3, point 6, the National Archives is under resourced in terms of personnel and is unable

to conduct even an annual inspection of each of the client government bodies.

Furthermore, according to the Director of the National Archives (Olivier 1998a), there is a general lack of cooperation from client government bodies with regards to compliance with archival legislation and instructions regarding electronic evidence (see section 4.1.3).

In addition to the above, there is evidence, as mentioned in chapter 2, section 3.9.1, that even under the Archives Act of 1963 which contained similar restrictions, records were indeed destroyed without authorisation by certain government bodies. Thus while legal provision exists to ensure that records are not destroyed or disposed of without the consent of the National Archives, in reality it appears impossible for the National Archives of South Africa to ensure complete compliance.

- ① The means by which the National Archives determines which records are of archival value and should be retained, and which can be destroyed is the appraisal process. The appraisal methodology utilised can be described as macro-appraisal and has as its foundation the archival principle of provenance. This principle holds that records “have meaning within the contextual circumstances of their creation and contemporary use.” (National Archives of South Africa 1998a: 175) Records are produced as a result of processes and functions undertaken and these involve “complex interactions between creators of records (structures, agencies, people), socio-historical trends and patterns (functions, activities, programmes), and clients/customers/citizens.” (National Archives of South Africa 1998a: 175) These functions, processes and interactions form the contextual background in which records

are created. The National Archives thus has as the objective of its appraisal programme, the identification of those records which provide the best evidence of this contextual background. Such records are deemed to be of archival value.

The appraisal process therefore involves firstly the identification and appraisal of those processes and functions that result in the production of records (that is, the context of record production), and secondly, the appraisal of the records produced by those processes and functions deemed to be of archival value. Using this methodology the National Archives objective is to “identify for acquisition the richest 5% (archivally) of public records.” (National Archives of South Africa 1998a: 179) It must be borne in mind that this is 5% of all public records, which includes both electronic and non-electronic records.

③ The macro-appraisal approach, is in fact the approach that was recommended in section 2.4.1 of the literature review. The National Archives appears to supplement this appraisal of record producing functions with the appraisal of the records themselves. If appraisal of electronic records, as argued in section 2.4.1, should ideally take place prior to the creation of electronic records, at the design phase of electronic systems, this additional appraisal of the records would not be possible. The National Archives does however acknowledge this, as in their “Draft Guide to the Management of Electronic Records in Government Offices” (National Archives of South Africa 1998b) they state that the appraisal of electronic records should ideally take place during the design phase of electronic systems.

The means by which the National Archives specifically controls which records are to be transferred into archival custody and which can be disposed of, is through the use of disposal authorities. These authorities set out the disposal instructions for records. They will for example, stipulate whether records are to be destroyed after active use and the time period that must elapse before they are to be destroyed, or whether they are to be transferred in to archival custody for permanent retention. There are three types of authorities. The first is the general disposal authority which covers categories of records which are common to more than one government office, for example staff personnel files. The second and third types apply to specific government offices and are issued upon application by the specific offices. These are the standing authorities and the limited authorities. The former apply to records systems or categories of records that are in current use, while the latter apply to records systems or categories of records that are no longer in use.

While all issues regarding disposal authorities should be channeled through the records manager of the office concerned, the lack of cooperation and communication between the information technology and the records management components often makes this problematic. In many cases the records managers are bypassed and the information technology components are approached directly regarding disposal authorities for electronic records and systems. (Kirkwood 1999)

A general disposal authority, number AE1 (see Appendix H), specifically applicable to electronic records with no archival value (ephemeral records) has been drawn up by the National Archives, and will be issued to governmental bodies when the current

moratorium on the destruction of public records is lifted. This is due to occur when the Commission for Truth and Reconciliation has completed its work. (National Archives of South Africa 1998b)

A further tool that is central to the management of electronic records is the “Schedule for Electronic Records”. This schedule, which in the “Draft Guide to the Management of Electronic Records in Governmental Bodies” has been effectively redesigned to include more detail (see Appendix I), to be completed by all government bodies making use electronic record systems, is the mechanism by which the National Archives identifies which electronic systems are being utilised by who, and for what purpose. This information is used to determine the archival value of the records in the particular systems. The schedule requires detailed information regarding each electronic system, including information such as the purpose for which the system is used, “the data sets and files included in the system; hard copy input and output; the processing, subsets, and special format files created and used in the system; and the documentation that describes and defines the system and the data in it.”(National Archives of South Africa 1998b: 28)

While this schedule certainly can act as a valuable tool for the management of electronic records, as with the earlier discussion of the unauthorised destruction of records, the question remains as to how the National Archives can ensure that government offices comply with this requirement. Again the issue of the lack of resources affects the National Archives ability to effectively monitor this and even

under the State Archives Service these requirements were not adhered to (see chapter 2, section 2.8.2).

The National Archives also makes use of its power to determine and approve the classification systems used by governmental bodies, in order to manage the electronic records in their offices more effectively. A classification system being defined by the National Archives as a “classification plan for the identification, arrangement, storage and retrieval of records.” (National Archives of South Africa 1998b: 53) With regards the use of electronic record systems for the generation and storage of correspondence, governmental bodies intending to use such systems are obliged to make use of a records classification system approved by the National Archivist. Government bodies must also inform the National Archives of their intention to use electronic recordkeeping systems before they do so. These requirements certainly empower the National Archives to become actively involved in the approval and design of electronic recordkeeping systems. Again the question needs to be asked as to how the National Archives can effectively ensure the cooperation of government bodies in this regard.

4.1.2.4 Preservation and archival custody

One of the three functional areas for which the National Archives has responsibility is the custody and preservation of records. These responsibilities are set out in article 11 of the National Archives of South Africa Act. In terms of this, records that have been determined, via a disposal authority, to be of archival value are to be transferred to an archives repository when they have reached the age of 20 years. There are, however, a

number of exceptions to this requirement. These are when another Act requires the records remain in the custody of a particular government body or person; when the National Archivist, having consulted with the head of the relevant government body decides that the records should remain with that body, or alternatively should be transferred to an archives repository prior to reaching their twentieth year of existence; or when the National Archivist defers the transfer of records to an archival repository. (National Archives of South Africa Act, article 11 (2)). Finally the Act empowers the National Archivist to “take such measures as are necessary to preserve and restore records.” (National Archives of South Africa Act, article 11 (4))

In terms of the existing archival legislation then, the National Archives of South Africa predominantly follows an approach of taking into physical custody those records deemed to be of archival value. This would appear to be the case in terms of electronic records as well, as one of the stated strategies of the National Archives is to transfer, at the earliest opportunity, those records deemed to be of archival value into archival custody. While the National Archives custody policy is still strongly based on physical custody this is tempered by the third strategy of the National Archives’ electronic records management programme, which is to identify electronic records of archival value that should remain in the possession of the creating body. However it is this researchers opinion that based on the various arguments presented in chapter 2 section 2.4.5 dealing with the issue of physical custody of electronic records, and given the lack of resources that the National Archives has, that a non-custodial approach would be a better option.

With regards to the acquisition of electronic records for archival custody and preservation, the National Archives requires that the records be in a format specified by them. When electronic records have been identified as having archival value, the procedure that the National Archives follows is firstly to determine whether the records concerned can be taken into archival custody in an archival medium such as paper or microfilm. Secondly the National Archives also investigates the option of requiring the records' office of origin, to preserve and maintain the records concerned. Only if these two above options are not possible should the electronic records be taken into archival custody in an electronic format. These procedures would seem to indicate that the National Archives is still largely operating from a "paper" mindset and is uncomfortable with the concept of receiving records in an electronic format. This could be the result of a lack of expertise and experience in handling electronic records and a reluctance to face the electronic challenge head on.

In terms of receiving electronic records into custody, the National Archives only accepts open reel or cassette magnetic tapes as an electronic archival medium. Two copies of the electronic records are required, the one set serving as a master copy and stored at Bureau Nucleus II, and the other set acting as a backup copy and stored at the National Archives. The metadata "(data describing data and their systems; that is, the structure of databases, their characteristics, location and usage)" associated with the records must be documented and sent along with the records when they are transferred into archival custody. (National Archives of South Africa 1998b: 16) The National Archives further requires that registers of electronic media be kept and that all tapes be labeled in a specified manner.

When it is decided that it would be more suitable to leave electronic records in the permanent custody of their office of origin, an agreement to this effect is drawn up between the National Archives and the governmental body concerned. The National Archives has identified a number of categories of electronic records as being examples of potential candidates for permanent custody by their office of origin. The following being two examples: “Cumulative, longitudinal systems and records, where by definition no data deletion, erasure or replacement occurs. Cases where it is not technically feasible or cost effective to acquire a version of the record for archival custody.” (National Archives of South Africa 1998b: 16)

The National Archives has also established a number of guidelines for the actual physical preservation of electronic records. According to these guidelines the storage environment must be conducive to the long-term preservation of electronic records. For example, the guidelines stipulate that the storage environment must be climatically controlled in terms of temperature and humidity and that it should be free of electrical and magnetic fields. The guidelines continue that in order to detect any loss of data, a statistical sample of all the electronic records should be read on an annual basis. Furthermore tapes should be rewound at regular intervals (every one to three years) in order to ensure proper tensioning and data should be recopied to “new or recertified tapes once every ten years, or more frequently when necessary, to prevent loss of data or technological obsolescence of the medium.” (National Archives of South Africa 1998b: 27) All these measures are of particular importance in the light of the discussion in chapter 2 section 2.4.2 regarding the stability of

electronic media. Here it was pointed out magnetic storage devices are susceptible to damage as a result of fluctuations of temperature and humidity and the presence of magnetic fields. Furthermore, the recommendation that magnetic tapes are recopied once every ten years and retensioned on a regular basis is supported by the discussion in the section 2.4.2.

4.1.2.5 Access and Use of archival records

The access and use of electronic records by the public is governed by article 12 of the National Archives of South Africa Act. In terms of this article the public may have access to a record in the custody of the National Archives, once a period of twenty years has passed since the record was created. Furthermore access to a record which has been in existence for less than the twenty-year period, may be granted by the National Archivist upon request. Each request will be weighed up on its individual merits taking into consideration such issues as the protection of confidentiality, individual privacy and national security. The National Archivist does however have the right, in terms of article 12 (3) of the Archives Act, to deny access to a record “on the grounds of its fragile condition, provided that there shall be a right of appeal to the Commission against the refusal.” (National Archives of South 1997: 8)

In order to protect the privacy of individuals, access to records may be subject to the removal of personal identifiers from the records concerned. Finally in terms of the access and use of electronic records, where necessary, the data contained in electronic records may be provided on-line to users at the National Archives, but generally, copies of the data would be provided to the users for external use. In terms of the

above, there are no access issues here that are in conflict with discussions contained in the literature reviewed. While it is recommended in chapter 2 section 2.4.6 that archives should ideally provide access to electronic records online, the fact that the National Archives provides copies of data for external use by users is at this stage acceptable. The National Archives electronic records management programme is still relatively young and there are more important issues at this stage such as the lack of resources and the lack of cooperation from information technologists, that need focusing on.

4.1.3 Challenges and problems

As a result of the literature reviewed and the interviews conducted a number of challenges and problems were identified with regards to the National Archives' management of the electronic records of central government. These will be listed below and discussed:

1. As discussed in chapter 2, section 2.4.3, electronic records are dependent upon hardware and software for their creation, storage and ability to be accessed and read. In the light of the rapid development of new technologies and the resultant obsolescence of older versions of software and hardware, this presents a serious challenge to the long-term preservation and continued access of electronic records.
2. The medium on which electronic records of archival value are to be stored is an issue of concern to archivists (see chapter 2, section 2.4.2). The challenge revolves around selecting a medium for the records that will be suitable for long term

preservation and access. One of the problems here is that many forms of electronic media, such as optical disks, are dependent on specific software for access and readability, and again given the reality of technological obsolescence this presents problems in the long term. Furthermore the life expectancy of some mediums has not been proven, while the lifespan of magnetic tape (the medium used by the South African National Archives) is relatively short in archival terms (10 to 20 years). Electronic media are also generally extremely susceptible to physical damage as the result of incorrect handling, use and storage conditions.

3. The appraisal of electronic records as discussed in chapter 2, section 2.4.1, is another challenge that must be dealt with. Traditionally paper-based records are appraised after they are no longer needed for active use. If one applies this approach to electronic records however, there exists the very real risk that such records may no longer be accessible due to their hardware and software having become obsolescent. Furthermore the records' metadata may not have been documented or retained thus resulting in the records being without context and thus meaningless in terms of archival value.
4. In chapter 2, section 2.3.1, we stated that a defining feature of a record is that it has content, structure and context, and that in order to fulfill its evidentiary role the structure and context must be captured as metadata along with the content. The challenge faced here by the National Archives is in terms of ensuring that the electronic systems used by the various governmental bodies have mechanisms built into them that capture this metadata. One of the problems that the National

Archives continues to face here, is identifying what electronic systems are being used by governmental bodies for the creation and storage of electronic records.

5. According to the Archives Instructions, issued in terms of article 13 (4) of the _____ National Archives of South Africa Act, government bodies are required to appoint a member of staff as a Records Manager. This position being responsible for the management of all the public records in that office. The instructions further stipulate that such a person must hold a “relevant university or technikon qualification and/or the necessary professional experience;”. (National Archives of South Africa 1997a: 4) Despite these provisions, however, a problem identified from the interviews conducted was that the Records Managers in client offices are appointed at a relatively low level. Normally record management is just one of their responsibilities and it was felt that often not a high priority. Furthermore, two of the interviewee’s stated that governmental bodies generally ignored the qualification criteria contained in the Archives Instructions when appointing Records Managers. This low level of the Records Managers and the fact that they are unable to focus on records management issues, due to carrying other responsibilities, will certainly impact negatively on their ability to manage the records of their offices effectively, let alone trying to tackle the issues presented by electronic records.
6. One of the major constraints to the effective management of the electronic records of central government that all the interviewee’s identified, was the lack of staff resources. According to the Deputy Director for Planning, Coordination and

Transformation out of a total establishment of 230, the National Archives, at the time the interview was conducted, was carrying 57 vacancies. This was the result of the freezing of posts in the public service, from the late 80's, as they fell vacant. This has effected the National Archives' ability to manage not only electronic records, but paper-based ones as well. The National Archives should ideally, according to him, inspect each governmental body once a year, yet last year (1997) they were only able to undertake eight routine inspections. Presently there is only one staff member, a Principal Archivist, who is actively involved in electronic records management. He has been given the responsibility of driving the electronic records management programme. This is however, only one of his areas of responsibility as he is also responsible for the appraisal of paper-based records. According to the National Archivist, these staff limitations have impeded the development of the records management programme. "There is consequently a lack of practical expertise, although the theory is well-developed" (Olivier 1998)

7. The National Archives is subordinated under the Department of Arts, Culture, Science and Technology as a directorate. The National Archivist and both Deputy Directors felt that this placed the National Archives at a disadvantage in terms of perceived status, power (in terms of implementing the relevant legislation) and independence. Furthermore it was felt that the National Archives was a low priority within the department. One is forced to question whether the lack of resources experienced by the National Archives is not linked to a degree to its low status within the Department of Arts, Culture, Science and Technology. If this is the case then it is critical that something is done about raising its status and power base.

8. From the data gathered it appears that the relationship between the National Archives and its client government bodies with regards to electronic records management is problematic. To quote the National Archivist, “in the field of electronic records, few governmental bodies have taken the necessary steps to comply with archival legislation, despite instructions being embodied in the published Archives Instructions, which are distributed to all bodies. In this respect, it could be argued that there is a lack of cooperation.” (Olivier 1998a) This is certainly a critical problem that the National Archives faces. The National Archives is unable to effectively manage the records of central government without the cooperation of governmental bodies. As we saw in the literature review (chapter 2), many of the challenges presented by electronic records can only be dealt with on a cooperative basis, involving archivists, records managers, and the information technologists and line managers in the various client offices sharing the responsibility of dealing with the records.
9. Allied to the above, but more specifically focused on a particular target group, is the lack of communication and cooperation experienced by the National Archives from the computer divisions and information technologists in governmental bodies at central government. This can be attributed to a variety of reasons. Firstly, according to Kirkwood (1994), as mentioned in chapter, section 2.8.2, registries and records management structures are completely separate from computer divisions in client offices. As such, the computer divisions lack an understanding of the operational importance of records management activities. This perceived

lack of importance is further exacerbated by the low status, as mentioned above, that records management staff hold in government offices. This has resulted, according to Olivier (1998a), in the Information Technology environment not being geared to archival considerations.

Having stated the above, however, there is an initiative been undertaken by the Department of Public Service and Administration in the form of the Government Information Project. This project has as its aim the promotion and facilitation of “effective information management in the Government in order to enable responsive service delivery and sound administration.” (Government Information Project ?a: 2) One of the outputs of this project has been the creation of an information management methodology that is set out in a guideline regarding information management. This methodology consists of three tasks. These are to create an awareness of the importance of information management, to establish an information management structure and define responsibilities, and to develop an information plan.

What is of significance to note, is that in terms of an establishing an integrated information structure, the guideline promotes a structure for governmental bodies which “incorporates all information related functions, for e.g. the information systems and information technology, the communications function, the records management function, the library as well as archives.” (Government Information Project ?b: 4) Furthermore, with regards to developing an information plan and managing information through its life-cycle, the guideline stipulates that during the

storage and disposal phase of information, government departments must conform with the archives regulations as contained in the National Archives of South Africa Act. The fact that these guidelines specifically mention records management and archives in terms of information management is very welcoming and hopefully will present an opportunity to improve relations between the National Archives and the information technology components of client offices.

4.1.4 Response to the challenges and problems

In this section we will take each of the eight challenges detailed in the previous section (4.1.3) and discuss how the National Archives has dealt with them.

1. The National Archives' response to the challenge of hardware and software dependency, to date has been to draw attention to the existence of the problem and provide a few guidelines on how to deal with it. In Appraisal Instruction no. 36 the National Archives refers to this dependency of electronic records and points out that it is not feasible to preserve all the hardware and software of records deemed to be of archival value. It continues that in order to preserve the functionality of electronic records systems of archival value, the archivist appraising the system must "determine the most appropriate means of preserving functionality. In some cases data may be acquired in software independent form, together with full documentation specifying inter alia record lay-out, codes et cetera. In other cases, for example relational databases, it may be necessary to acquire the software as well." (National Archives of South Africa 1998a: 186) Where records are software dependent, the National Archives will consider, as a viable option, preserving of

the relevant records in the client office rather than in an archives repository. The National Archives also intends to try and develop an awareness of this problem in its client offices, and to this end the “Guide to the Management of Electronic Records” (National Archives of South Africa 1998b) draws attention to this issue. While the possibility of records migration is mentioned as a potential solution to this problem, the National Archives has no formally documented migration strategies, policies or procedures in place. It would seem that at this stage the National Archives is still dealing with the whole issue of hardware and software dependency at a predominantly theoretical level and other than drawing attention to the fact, very little concrete action has been taken. The lack of a formalised migration strategy, one of the main ways of dealing with this dependency (see chapter 2, section 2.4.3), bears testimony to this observation.

2. In terms of the medium in which electronic records are to be stored, the National Archives has responded as follows. They have stated that the only electronic medium that will be accepted is the open reel magnetic tape or cassette. This is understandable and presently an acceptable practice, as this is the medium suited to the technological infrastructure that the National Archives makes use of to preserve and access records. Furthermore, to date electronic tape is internationally the most accepted archival preservation medium. They have further specified a number of requirements for the physical storage of electronic record in order to guarantee optimal long-term preservation. The importance of these requirements can be seen in chapter 2, section 2.4.2. For example, they have specified that the records must be stored in a climatically controlled environment where the temperature is kept

between 17 and 20 degrees Celsius and the relative humidity between 35 and 45 percent. Furthermore records are not automatically accepted in electronic form , rather each case is assessed on merit to determine whether or not the records will be required to be produced in hard copy format for archival preservation. Where imaging systems are used to produce and store records, the National Archives has stipulated that such records need to be reproduced in hard copy format for archival preservation. In terms of the fact that imaging systems typically utilise optical disks as a storage medium, and given the fact the these disks are highly susceptible to damage (see chapter 2, section 2.4.2) and thus a loss of data, the request to produce the records in another media is understood. However, these images rather than being reproduced in hardcopy format (paper) could be reproduced onto magnetic tape which the National Archives recognises as an archival preservation medium for electronic records.

3. With regards to the appraisal of electronic records, the National Archives has adopted the macro-appraisal approach to deal with the challenge (see section 4.1.2.3 for an explanation of this approach), and the principle of the earliest possible appraisal of electronic records. “Ideally archival appraisal should take place during the design phase of electronic systems. Appropriate procedures for timely provision of archival copies can then be built into systems. Moreover archival involvement at an early stage can ensure that the contextual information required to give validity to the records is included...”. (National Archives of South Africa 1998a: 186) In terms of its appraisal methodology the National Archives is in line with the current thinking regarding the appraisal of electronic records (see

chapter 2, section 2.4.1). It does need to be questioned however whether the National Archives has the skills and resources available to be involved in appraisal during the design of electronic recordkeeping systems. Added to this is the question as raised in section 4.1.2.3, of whether the National Archives will be made aware of a client offices intention to introduce an electronic system for recordkeeping purposes, so that they can become involved at the design phase.

4. In order to try and ensure that the electronic systems used by client offices capture the records associated metadata, the National Archives have, as mentioned above, adopted the principle of the earliest possible appraisal of electronic record systems. The National Archives ideally seeks to be involved in the actual design phase of electronic systems to be used in central government, in order to ensure that suitable archive provisions are taken into account and built into the systems concerned. This goal is supported by articles 13 (2) (b) (ii) and 13 (2) (b) (iii) of the National Archives of South Africa Act, which stipulate that the National Archivist shall “determine the conditions subject to which records may be microfilmed or electronically reproduced; and determine the conditions subject to which electronic records systems should be managed”. (National Archives of South Africa 1997: 9) These articles are carried forward into the “Archives Instructions” (National Archives of South Africa 1997a) which state that if a governmental body has the intention of making use of electronic records systems, the head of the body must notify the National Archivist in writing before hand. To date the National Archives has not been involved actively in the design of any electronic systems. They have however been accepted as a role player in the South African National Defence

Force project to establish an electronic document management system and a representative is attending all the planning meetings. Again the question raised under the preceding point, regarding whether or not the National Archives will be made aware of the introduction of electronic systems into client offices, needs to be borne in mind.

5. Based on statements made by the staff interviewed, the National Archives appears to be turning a blind eye to the issue of the low level of Records Managers in client offices, and is not enforcing the qualification requirements for the position as set out in the Archives Instructions. This is an unacceptable situation and if the National Archives is to advance its cause in terms of its records management and archival functions, this needs to be addressed immediately. By accepting this situation, the National Archives is undermining the importance and value of its records management programme.
6. In an attempt to address the issue of the lack of staff resources, the National Archives requested a work study investigation to determine staff needs. According to the Director of the National Archives the investigation “was requested in an attempt to align the provision of human resources with the functional obligations in the area of electronic records management.” (Olivier 1998b) It is hoped by the National Archives, that this investigation will result in the unfreezing of existing posts and the creation of additional posts which could be dedicated to electronic records management. It is clearly evident from the preceding discussions in this chapter, that the National Archives ability to perform its mandated functions is

severely hampered by the lack of staff and as such addressing this issue should be seen as the main priority.

7. According to the National Archivist, the National Archives is attempting to address the issue of its low status in a number of ways. Firstly, by making use of the National Archives Commission, established in terms of article 6 (1) of the National Archives of South Africa Act (National Archives of South Africa 1997b), which functions to advise the Minister of Art, Culture, Science and Technology on matters pertaining to the operation of the Act. Secondly, they are attempting to raise the “public profile of the institution through support of government-wide transformation endeavors, for example assisting the TRC and the Commission for the Restitution of Land Rights”. (Olivier 1998b) Furthermore, they hope that their involvement in developing a national heritage system for South Africa will also contribute to increasing their perceived status within the public sector and within the Department of Art, Culture, Science and Technology in particular.
8. The means of dealing with the lack of compliance and cooperation of client bodies, according to both the National Archivists and the Deputy Director of Records Management and Information Systems, is for National Archives staff to carry out inspections of governmental bodies and to monitor the management of the electronic records in those offices. However, at this stage such inspections and effective monitoring are not possible due to the lack of staff. The National Archives has thus to date, been unable to respond in an effective manner to this

challenge. This merely strengthens the call made in under point 6 above to prioritise the issue of a lack of staff.

9. In response to a question posed via e-mail to the Deputy Director responsible for Records Management and Information Systems, regarding the lack of archival considerations in the information technology environment, the following response was received: Documentation has been prepared “that focuses on the legal obligations of government bodies in connection with electronic records. It is intended to use this to launch an active programme to gain cooperation. It is envisaged that once contact has been made in individual discussions, the need to build archival considerations into systems will be negotiated in those cases in which the systems are appraised as having archival value” (Kirkwood 1998) What this seems to suggest is that the National Archives intends to adopt a proactive stance in gaining the cooperation of the information technology sectors. This is in keeping with the viewpoints expressed in literature review under section 2.4.7, which dealt with the changing role of archivists. Here it was argued that archivists need to take on a more proactive orientation and need to educate their potential partners as to the value of recordkeeping. The ability of the National Archives to act proactively does very much depend upon having the resources available to do so.

4.1.5 Summary

In this chapter the findings relating to the first four case study questions posed in

chapter 1, section 1.3, of this investigation were presented and discussed. The National Archives Act, Act 43 of 1996 was examined in order to establish the mandated role of the National Archives in terms of managing the electronic records of central government. It was established that the National Archives derives its legal mandate from this piece of legislation, which charges the National Archives with the “management and care of public records in the custody of governmental bodies.” (National Archives of South Africa 1997b: 8) While all the provisions of the Act encompass electronic records when making reference to “records”, on two occasions electronic records are specifically referred to. These related to the National Archivist’s powers to determine the conditions under which they could be produced, and to determine the conditions under which electronic records systems should be managed. The National Archives then, is assigned full control over the creation and subsequent management of the electronic records of central government.

The National Archives utilises a number of mechanisms and methods in order to exercise this control. These fall within the framework of an electronic records management programme, which aims to involve the National Archives in the design and maintenance of electronic records systems, to allow the early transfer of electronic records into archival custody, and to facilitate the identification of those electronic records of archival value that should remain in the possession of the creating body.

In terms of the electronic records programme, the responsibility for managing electronic records is divided among the various components of the National Archives, each focusing on their specific area of expertise. It was suggested that this may not be

the best approach to follow, and that a more effective solution would be to establish a section within the National Archives, specifically dedicated to dealing with electronic records.

In dealing with the management of records in client offices, a number of issues were examined. These were the appraisal methodology applied by the National Archives, the use of disposal authorities and the “Schedule for Electronic Records”. Regarding the appraisal methodology, it was noted that the National Archives uses the macro-appraisal or functional approach, which is the technique suggested for the appraisal of electronic records as discussed in chapter 2, section 2.4.1. The National Archives also supported the view held, as discussed in the same section, that electronic records should ideally be appraised during the electronic recordkeeping system’s design. In terms of this it was questioned whether the National Archive would in fact be aware of client offices’ intentions of introducing such systems, and therefore being able to put this view into practice.

The disposal authorities are used by the National Archives to control which records should be transferred into archival custody and which may be destroyed. It was pointed out that the effectiveness of these might be affected by the lack of cooperation and communication between the records management and information technology components of client offices. The mechanism by which electronic records and systems are identified in governmental bodies is the “Schedule for Electronic Records”. While this schedule has been redesigned to include more detail than the older version

allowed, the issue of the National Archives ability to monitor that client office were in fact completing it, was raised.

The custody approach that the National Archives follows, is based on accepting into physical custody the records of central government. However, the electronic records management programme does make provision for allowing the creating body to maintain custody of electronic records in certain circumstances. These were discussed in section 4.1.2.4. In terms of archival media, the National Archives will first investigate the possibility of requiring electronic records to be converted to paper or microfilm. If it decides to accept the records in an electronic medium then it requires that the medium be that of open reel or cassette magnetic tapes for which it has established a number of physical preservation guidelines.

Drawing on the literature review and interviews conducted, nine main challenges were identified with regards to the National Archives management of the electronic records of central government. The first was the issue of electronic records' hardware and software dependency. It was concluded that the National Archives had predominantly attempted to deal with this issue on a theoretical level, by drawing attention to the existence of the problem. The second challenge was the use of electronic media as a preservation medium. Here the National Archives has responded by stipulating that electronic records will only be accepted, as mentioned above, on open reel magnetic tape or cassettes. This is the medium that their facilities are presently geared to support.

The third challenge was that of records appraisal and here the National Archives has responded appropriately, by adopting and advocating the strategy currently being favoured for the appraisal of electronic records. Ensuring that the electronic record systems, being used by government bodies, are able to capture a record's associated metadata, was also identified as an area of concern. The National Archives hopes to address this by being involved in the design of the systems, thereby ensuring that mechanisms are built into them to ensure that the metadata is in fact captured. Dealing with the low level of records managers in client offices, was the fifth challenge identified. From the data gathered it appeared as if the National Archives was not endeavouring to accept this challenge and this was considered to be a serious shortcoming on their part.

One of the major constraints presently facing the National Archives is a lack of staff. This not only has consequences for the management of electronic records, but for paper records as well. In an attempt to start remedying this situation, the National Archives has requested a work study investigation. However, in the light of the seventh challenge facing the National Archives in the form of its perceived low status within the Department of Arts, Culture, Science and Technology, one wonders whether the results of this investigation will in reality bear fruit. The final two issues identified as being of significance, were related in that they both dealt with a lack of cooperation, compliance and communication between the National Archives and its client bodies or components thereof. Specifically the issue of the relationship between the National Archives and the information technology components of government

bodies was of serious concern. Attention was however drawn, to a seemingly positive development regarding the Government Information Project's inclusion of records management and archival functions into its information management strategy. The suggestion was made that the National Archives should capitalise upon this in order to promote its cause with the information technologist of central government.

CHAPTER 5

Conclusion and recommendations

5.1 Conclusion

The purpose of this study, as set out in chapter one, was to investigate the role of the South African National Archives in terms of managing the electronic records of central government. In order to achieve this stated objective, a number of questions were posed and data gathered in order to address them. This has served to provide a clear picture of where the National Archives presently stands in relation to the management of electronic records. From the literature examined and the interviews conducted it is clear that the National Archives is responsible for ensuring that the electronic records of central government are managed in order to ensure that those of archival value are identified, preserved and remain accessible for future use.

This study further identified the means by which the National Archives seeks to achieve this end and the challenges they face in attempting to do so. Nine main challenges or problems related to the effective management of the electronic records of central government were identified. These were as follows:

- the issue of electronic records' hardware and software dependency;
- the media on which electronic records are to be preserved;
- the appraisal of electronic records;
- the capturing of metadata in electronic systems;
- the status of records managers in government bodies;
- the lack of staff resources;
- the subordination of the National Archives in the Department of Arts, Culture, Science and Technology;
- the relationship between the National Archives and its client offices; and

- the relationship between the National Archives and the information technology components of central government.

It must be made clear that these are not necessarily the only challenges that exist, but rather are that came to the fore in the course of this investigation.

While it is clear that the National Archives is well informed in terms of the theory of electronic records management, they are greatly lacking, self-admittedly so, in terms of practical experience. This can be attributed to a number of reasons. The National Archives has been severely hampered in their efforts to address electronic records management by a lack of resources. This has meant that they have been unable to have staff members solely dedicated to electronic records management and consequently, limited internal experience has been built up. The situation is further aggravated by the fact that in South Africa as a whole, there exists a lack of people experienced in this field.

It would furthermore appear that to date, the National Archives has in action adopted a reactive, and in the researcher's opinion, an overly cautious approach to the management of electronic records. Rather than approaching the whole issue proactively and boldly, they seem more inclined to react to issues as they occur, and to wait and see how other players in the international archives community are dealing with similar situations. Consequently, a lack of decisive action has occurred and as a result few learning experiences have presented themselves. It could however be argued that given the lack of resources, this reactive approach is presently the only feasible option available to the National Archives.

With regard to the National Archives response to the challenges, it is clear that they are attempting to address those that they can. To date a number of policies and

procedures have been drawn up and a strategy for the management of electronic records has been developed. However as the electronic records management programme is still in its infancy and no substantial implementation of it has occurred, it remains to be seen whether the strategy and associated policies and procedures will be effective in the long run when put to the test.

5.2 Recommendations for future action by the National Archives

So what is the way forward? Let us finally address the last of the five questions posed in chapter 1. How best can the National Archives of South Africa deal with the challenges and issues presented by the management of the electronic records of central government?

Clearly one of the main priorities for the National Archives should be to address the issue of the lack of resources, particularly in terms of staff resources. There are two aspects to this, firstly they need to increase the number of staff that can provide dedicated time to the electronic records management programme, and secondly they need to ensure that they have staff with skills that are relevant to electronic records management. As part of the National Archives strategy is involvement in the planning and design of electronic systems that will contain records, this would suggest that as well as the traditional archival skills, the pool of skills available within the National Archives will also need to include information system and management skills (see chapter 2, sections 2.3.2 and 2.4.7).

According to Bearman (1994) while these additional skills are essential in the arena of electronic records management, they do not need to be found in the archivists themselves. He believes that archives can employ professionals specialised in these fields who would work alongside archivists in a team. Before the National Archives

increases its staff resources then, a careful analysis of what skills are required to supplement those that already exist, needs to be undertaken. As mentioned in chapter 4, at present a work study investigation is being conducted into the issue of staff resources and it can only be hoped that this will result in this situation being satisfactorily addressed. In the interim however, the National Archives needs to make use of contacts at their disposal, such as the National Archives Commission, to pressure for action on this matter.

As part of its programme the National Archives needs to place strong emphasis on the business benefits to be gained by governmental bodies implementing and adhering to record management practices. The National Archive needs to move away from its image as a repository of cultural memory, and needs to emphasise its role as an *Achieving Accountability* essential instrument in achieving accountability and securing evidence of governmental business transactions. Emphasis should also be placed on the tangible benefits that can be gained by complying with the requirements. The National Archives of Australia, for example, emphasises the business and operational costs associated with non-compliance such as uncontrollable accumulation of records, the loss or destruction of records, and security breaches.

The National Archives, furthermore, needs to become a more active player in the broader discipline of information management. Here information management is defines as a “holistic, integrated process whereby all the information assets of an organisation are identified, defined, maintained, secured and optimally utilised in support of organisational objectives”(Government Information Project ?b: 2) This is particularly necessary if the National Archives wants to ensure that electronic records are created, captured, correctly managed and ultimately preserved. Furthermore if they exercise the option of allowing records of archival value to remain in the custody of

government bodies, it is critical that they ensure that correct information management practices are applied.

There are a number of ways in which they can do this. Firstly, they can develop or acquire information management skills internally within the National Archives and include information management in the services that they provide to governmental bodies. Secondly, they can develop close working ties with other sectors of the public service currently involved in providing information management services, for example the Department of Public Service Administration, the CSIR, or thirdly, they could use a combination of both.

It would be to the National Archives advantage particularly to develop ties of cooperation with the Department of Public Service and Administration. The reason being that in terms of the Public Service Law Amendment Act, section 30 (a) (e), the Minister of this department may make regulations regarding the “management of information and the utilisation of information technology” in government “departments, subdepartments, branches, offices and institutions” (Department of Public Services and Administration 1997: 44). Furthermore, as dealt with in the preceding chapter in section 4.1.3, point 9, under the auspices of this department, the Government Information Project is in progress. Given its focus on information management and the recognition of records management and archival functions in the process, the National Archive should strive to become closer involved in the project. It would be an ideal means to reach out to the various information technology sectors in central government and a vehicle for sharing the valuable work done by both the University of Pittsburgh and Indiana electronic records projects. The functional requirements developed by the Pittsburgh project and refined by the Indiana project, along with the methodology developed by the latter (see chapter 2, sections 2.3.2.1)

and 2.3.2.2), could be included as part of the information management strategy being developed by the Government Information Project.

The recommendations of this project with regards establishing an information management structure in government departments, is that this structure should be headed by a dedicated Information Manager, who would report directly to the head of the department concerned. The positioning of departmental records management and archival functions within this structure should add credibility to these functions and hopefully go a long way to increasing the status of these two functions. This structure would also enable the sharing of ideas, issues and concerns between the various sections. As such, this initiative should be actively encouraged and supported by the National Archives.

Another vehicle that the National Archives should utilise in order to promote their electronic records programme and to educate government bodies about the various issues involved, is the Information Technology Steering Committee (ITEXCOM). This committee is created in terms of the Public Service Regulations and functions as an advisory body to the Minister of the Department of Public Service and Administration. All government departments are to be represented on this committee, which will provide the Minister with advice regarding information management and technology particularly in regards to “policy, norms, standards, guidelines and best practices.” (Department of Public Service and Administration 1997: 27)

The above recommendations could also help to increase the status of Records Managers in its client offices. By promoting recognition of the business benefits derived from a records management programme in governmental bodies, and by becoming actively involved in the broader arena of information management the role

played by records managers in governmental bodies could become more important and appreciated. This is particularly the case if these records managers become increasingly involved in the management of electronic records and demonstrate a tangible contribution to the overall information management strategy of government. However before this can happen these records managers need to become skilled in terms of managing electronic records. This is an issue that the National Archives needs to address if their electronic records management programme is to be taken seriously. Given the National Archives present lack of staff resources it is doubtful whether they are in a position to undertake this training themselves and as such they need to investigate other alternatives such as external training sources.

In order for the National Archives to accurately assess what electronic systems are being utilised by governmental bodies to produce and manage electronic records, they need to undertake an audit of these bodies. To date the National Archives has relied upon governmental bodies to provide them with this information by means of the Schedule for Electronic Records. However according to the Deputy Director of Records Management and Information Systems “most electronic systems for which disposal authority is applied, do not possess archival value, while systems that might have archival value are seldom reported.” (Kirkwood 1997: 6) Given the present lack of available staff resources to the National Archives, such an endeavor will need to wait until this issue is satisfactorily addressed, unless they can identify and link into other initiatives in this area.

Further work needs to be done in terms of developing policies and procedures. To date no formal documented strategy exists with regards to the migration of electronic records from one hardware or software configuration to another. At present the National Archives is relying upon a computer service bureau to deal with these issues.

The National Archives also needs to give consideration to their input into the planning of electronic systems in order to ensure that proper records are indeed created, captured and maintained by such systems. They need to document what their requirements of such systems will be and endeavor to present mechanisms for achieving these. Here it is suggested that they take as their point of departure the work done by the Pittsburgh and Indiana Projects referred to in chapter 2, sections 2.3.2.1 and 2.3.2.2. The functional requirements and the methodology produced by the University of Indiana's electronic records project would form an ideal basis for this.

5.3 Recommendations for future research

In terms of the South African context in particular, a number of areas for future research suggest themselves. In chapter three, section 3.4, it was pointed out that a limitation of this study was that the data gathered was from the National Archives perspective. In order to supplement this data, a future study could focus on an external perspective. That is looking at the issue of electronic records management from the client governmental bodies perspective, and from other public service role players in the information management and technology arena. Further areas of study could examine the ideal internal structure of the National Archives of South Africa and its placement within the public sector in general in order to facilitate its functions; the relationship between records and archival management and the broader field of information management in the South African context, and indeed in an international context.

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APPENDIX A

University of Pittsburgh

Functional Requirements for Evidence in Recordkeeping

The following are a statement of requirements needed to ensure the preservation of evidence in electronic form and not the application requirements for archival or records management systems. Although specifically related to electronic recordkeeping systems, they are also applicable to manual or hybrid systems.

Organization: Conscientious

1. **Compliant:** Organizations must comply with the legal and administrative requirements for recordkeeping within the jurisdictions in which they operate, and they must demonstrate awareness of best practices for the industry or business sector to which they belong and the business functions in which they are engaged.
 - 1a. External recordkeeping requirements are known.
 - 1a1. Laws of jurisdiction with authority over the record creating organizations are known.
 - 1a2. Regulatory issuances of entities with administrative authority over the record creating organizations are known
 - 1a3. Best practices of recordkeeping established by professional and business organizations within the industry and business functions of the organization are known.
 - 1b. Records created by organizational business transactions which are governed by external recordkeeping requirements are linked to an internal retention rule referencing the documented law, regulation, or statement of best practice.
 - 1c. Laws, regulations, and statements of best practice with requirements for recordkeeping are tracked so that changes to them are reflected in updated internal recordkeeping instructions.

Recordkeeping Systems: Accountable

2. **Responsible:** Recordkeeping systems must have accurately documented policies, assigned responsibilities, and formal methodologies for their management..
 - 2a. System policies and procedures are written and changes to them are maintained and current.
 - 2b. A person or office is designated in writing as responsible for satisfying recordkeeping requirements in each system.
 - 2c. System management methods are defined for all routine tasks.
 - 2d. System management methods are defined for events in which the primary system fails.

3. **Implemented:** Recordkeeping systems must be employed at all times in the normal course of business.
 - 3a. Business transactions are conducted only through the documented recordkeeping system and its documented exception procedures.
 - 3b. No records can be created in the recordkeeping systems except through execution of a business transaction.
 - 3c. Recordkeeping systems and/or documented exception procedures can be demonstrated to have been operating at all times.
4. **Consistent:** Recordkeeping systems must process information in a fashion that assures that the records they create are credible.
 - 4a. Identical data processes permitted by the system must produce identical outcomes regardless of the conditions under which they are executed.
 - 4b. Results of executing systems logic are demonstrable outside the system.
 - 4c. Results of executing systems logic are demonstrable outside the system. All operational failures to execute instructions are reported by the system.
 - 4d. In the event of system failures, processes under way are recovered and re-executed.

Records: Captured

5. **Comprehensive:** Records must be created for all business transactions.
 - 5a. Communications in the conduct of business between two people, between a person and a store of information available to others, and between a source of information and a person, all generate a record.
 - 5b. Data interchanged within and between computers under the control of software employed in the conduct of business creates a record when the consequence of the data processing function is to modify records subsequently employed by people in the conduct of business.
6. **Identifiable:** Records must be bounded by linkage to a transaction which used all the data in the record and only that data.
 - 6a. There exists a discrete record, representing the sum of all data associated with a business transaction.
 - 6b. All data in the record belongs to the same transaction.
 - 6c. Each record is uniquely identified.
7. **Complete:** Records must contain the content, structure, and context generated by the transaction they document.
 - 7a. **Accurate:** The content of records must be quality controlled at input to ensure that information in the system correctly reflects what was communicated in the transaction.

- 7a1. Data capture practices and system functions ensure that source data is exactly replicated by system or corrected to reflect values established in system authority files.
- 7b. **Understandable:** The relationship between elements of information content must be represented in a way that supports their intended meaning.
 - 7b1. Meaning conveyed by presentation of data are retained or represented.
 - 7b2. System defined views or permissions are retained and the effects are reflected in the record represented.
 - 7b3. Logical relations defined across physical records are retained or represented.
 - 7b4. Software functionality invoked by data values in the content of the record are supported or represented.
- 7c. **Meaningful:** The contextual linkages of records must carry information necessary to understand correctly the transactions that created and used them.
 - 7c1. The business rules for transactions, which minimally locate the transaction within a business function, are captured.
 - 7c2. A representation of the source and time of the transaction which generated a record is captured.
 - 7c3. Links between transactions which comprised a single logical business activity are captured.
- 8. **Authorized:** An authorized records creator must have originated all records.
 - 8a. All records have creators which are documented.
 - 8b. Records creators must have been authorized to engage in the business that generated the record.

Records: Maintained

- 9. **Preserved:** Records must continue to reflect content, structure, and context within any systems by which the records are retained over time.
 - 9a. **Inviolate:** Records are protected from accidental or intended damage or destruction and from any modification.
 - 9a1. No data within a record may be deleted, altered, or lost once the transaction which generated it has occurred.
 - 9b. **Coherent:** The information content and structure of records must be retained in reconstructible relations.
 - 9b1. If records are migrated to new software environments, content, structure, and context information must be linked to software functionality that preserves their executable connections or representations of their relations must enable humans to reconstruct the relations that pertained in the original software environment.

- 9b2. Logical record boundaries must be preserved regardless of physical representations.
- 9c. **Auditable:** Record context represents all processes in which records participated.
 - 9c1. All uses of records are transactions.
 - 9c2. Transactions which index, classify, schedule, file, view, copy, distribute, or move a record without altering it are documented by audit trails attached to the original record.
 - 9c3. Transactions which execute a records disposition instruction, whether for retention or destruction, are documented by audit trails to the original record.
- 10. **Removable:** Records content and structure supporting the meaning of content must be deletable.
 - 10a. Authority for deletion of record content and structure exists.
 - 10b. Deletion transactions are documented as audit trails.
 - 10c. Deletion transactions remove the content and structural information of records without removing audit trails reflecting context.
- Records: Usable**
- 11. **Exportable:** It must be possible to transmit records to other systems without loss of information.
 - 11a. Exporting protocols should be reversible.
 - 11b. Functionality should be represented in a fashion that produces the same result in the target system as in the originating environment.
- 12. **Accessible:** It must be possible to output record content, structure, and context.
 - 12a. **Available:** Records must be available.
 - 12b. **Renderable:** Records must display, print, or be abstractly represented as they originally appeared at the time of creation and initial receipt.
 - 12b1. The structure of data in a record must appear to subsequent users as it appeared to the recipient of the record in the original transaction or a human meaningful representation of that original rendering should accompany the presentation of the original context.
 - 12c. **Evidential:** Record's representations must reflect the context of the creation and use of the records.
- 13. **Redactable:** Records must be masked when it is necessary to deliver censored copies and the version as released must be documented in a linked transaction.
 - 13a. The release of redacted versions of a record is a discrete business transaction.

- 13b. The fact of the release of a redacted version of a record is an auditable use of the original record and therefore results in creation of an audit trail with a link to the transaction which released the redaction.

APPENDIX B

Indiana University Electronic Records Project

Functional Requirements

Organization: Conscientious

A. *Compliant:*

Questions:

Does the unit comply with current laws, regulations, and statements of best practice?
Are the laws, regulations, and statements of best practices appropriately cited and readily available?
Are references to these laws, regulations, and statements of best practice kept current?

Record Keeping Systems: Accountable

A. *Responsible:*

Questions:

Are documented policies, assigned responsibilities, and formal methodologies for this record system in place?
Are these policies, etc., routinely implemented?
Do these policies and procedures conform to common practices in the industry for this transaction type?

Records: Captured

A. *Comprehensive:*

Question:

Do the records representing this transaction type faithfully reflect and represent the business-relevant facts resulting from this business transaction?

B. *Accurate and Consistent:*

Question:

Are quality control mechanisms used to ensure that consistent and accurate records are created?

C. *Authorized:*

Question:

Was each record for this transaction type originated by an authorized records creator?

D. Understandable:

Question:

Can the virtual records representing this transaction type be reassembled such that the transaction can be reconstructed, and its meaning can be understood?

Records: Maintained

A. Inviolable:

Question:

Do policies and procedures exist which protect the record from being deleted, altered or lost once the transaction which generated it has occurred?

B. Migrated: Records are routinely transferred from one hardware/software configuration to another, or from one generation of computer technology to a subsequent generation.

Question:

Are policies and procedures in place which ensure that records of this transaction type are routinely and regularly migrated?

C. Exportable:

Question:

Is it possible to migrate the records representing this transaction type, while continuing to reflect their content, structure and context?

D. Removable:

Question:

Can records of this transaction type be removed while leaving intact the appropriate metadata?

Records: Useable

A. Accessible:

Questions:

*Is the existence of records for this transaction type known to potential, authorized users?
Do access policies exist which define who can access these records and under what conditions?
Are procedures in place for implementing access policies?*

B. *Renderable:*

Question:

Is it possible to render or display records of this transaction type as they appeared to creators?

C. *Redactable:*

Question:

Is it possible to deliver redacted, summarized or censored copies of the records of this transaction type in accordance with applicable laws, regulations, and best practices, and to document this transaction?

APPENDIX C

NATIONAL ARCHIVES OF SOUTH AFRICA

NATIONAL ARCHIVES OF SOUTH AFRICA ACT 1996 (ACT NO. 43 OF 1996)

JANUARY 1997

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: -

1. DEFINITIONS

In this Act, unless the context otherwise indicates -"

- i. "appraisal" means the archival function of determining the eventual disposal of records;
- ii. "archives" means records in the custody of an archives repository;
- iii. "archives repository" means any archives repository contemplated in section 11;
- iv. "Commission" means the National Archives Commission contemplated in section 6;
- v. "custody" means the control of records based upon their physical possession;
- 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;
- vii. "electronic records system" means any records system in which information is generated electronically and stored by means of computer technology;
- viii. "governmental body" means any legislative, executive, judicial or administrative organ of state (including a statutory body) at the national level of government;
- ix. "head of a governmental body" means the chief executive officer of a governmental body or the person who is acting as such;
- x. "Minister" means the Minister responsible for the administration of this Act;

- xi. "National Archives" means the National Archives of South Africa established by section 2;
- xii. "non-public record" means a record created or received by a private individual or a body other than one defined as a governmental body in terms of this Act or a provincial law pertaining to records or archives;
- xiii. "prescribe" means prescribe by regulation;
- xiv. "public record" means a record created or received by a governmental body in pursuance of its activities;
- xv. "record" means recorded information regardless of form or medium;
- xvi. "recording" means anything on which sounds or images or both are fixed or from which sounds or images or both are capable of being reproduced, regardless of form;
- xvii. "records classification system" means a classification plan for the identification, arrangement, storage and retrieval of records;
- xviii. "regulation" means any regulation made under this Act
;
- xix. "this Act" includes the regulations.

2. ESTABLISHMENT OF NATIONAL ARCHIVES OF SOUTH AFRICA

There is hereby established a branch of the public service of the Republic to be known as the National Archives of South Africa.

3. OBJECTS AND FUNCTIONS OF NATIONAL ARCHIVES

The objects and functions of the National Archives shall be to -

- a. preserve public and non-public records with enduring value for use by the public and the State;
- b. make such records accessible and promote their use by the public;
- c. ensure the proper management and care of all public records;
- d. collect non-public records with enduring value of national significance which cannot be more appropriately preserved by another institution, with due regard to the need to document aspects of the nation's experience neglected by archives repositories in the past;
- e. maintain a national automated archival information retrieval system, in which all provincial archives

- services shall participate;
- f. maintain national registers of non-public records with enduring value, and promote co-operation and co-ordination between institutions having custody of such records;
 - g. assist, support, set standards for and provide professional guidelines to provincial archives services;
 - h. promote an awareness of archives and records management, and encourage archival and records management activities;
 - i. generally promote the preservation and use of a national archival heritage.

4. NATIONAL ARCHIVIST AND STAFF

1. The National Archives shall be managed by a National Archivist appointed by the Minister on the basis of relevant professional experience and an appropriate archival qualification.
2. The National Archivist shall in the performance of his or her functions be assisted by officers and employees appointed in terms of the Public Service Act, 1994 (Proclamation No. 103 of 1994).
3. (a) The National Archivist may, subject to any conditions, delegate a power or assign a duty to a member of the staff and may at any time cancel such delegation or assignment.

(b) A delegation or assignment shall not divest the National Archivist of the power delegated or duty assigned and he or she may at any time amend or set aside any decision made thereunder, or exercise the power or perform the duty concerned.

5. POWERS AND DUTIES OF NATIONAL ARCHIVIST

1. The National Archivist shall -
 - a. take such measures as are necessary to arrange, describe and retrieve "records;
 - b. provide information, consultation, research and other services related to records;
 - c. with special emphasis on activities designed to reach out to less privileged sectors of society, make known information concerning records by means such as publications, exhibitions and the lending of records;

- d. require of a person who has made use of records in the custody of the National Archives while researching a publication or dissertation to furnish a copy of the publication or dissertation to the National Archives;
 - e. generally, take such other steps and perform such other acts as may be necessary for or conducive to the achievement of the objects of the National Archives.
2. The National Archivist may -
- a. provide training in archival techniques and the management of records;
 - b. co-operate with organisations interested in archival matters or the management of records;
 - c. provide professional and technical support in aid of archival activities and the archival community;
 - d. with the concurrence of the Minister and the Commission exempt a governmental body from any provision of this Act.

6. ESTABLISHMENT, CONSTITUTION AND FUNCTIONS OF NATIONAL ARCHIVES COMMISSION

- 1. The Minister shall by notice in the Gazette establish a commission to be known as the National Archives Commission.
- 2. The Commission shall consist of the National Archivist and not more than nine other members appointed by the Minister from among persons who are knowledgeable of or have an interest in archival matters.
- 3. The procedures and other conditions for appointment as a member of the Commission shall be as prescribed.
- 4. The functions of the Commission shall be to -
 - a. advise the Minister on any matter related to the operation of this Act;
 - b. advise and assist the National Archivist in carrying out the objects and functions of the National Archives;
 - c. promote the co-ordination of archival policy formulation and planning at national and provincial levels;
 - d. exercise the powers contemplated in section 5(2)(d) and 12(3) of this Act;

- e. approve the appraisal policy of the National Archives and monitor its implementation;
 - f. maintain a national list of non-public records in South Africa which, in the opinion of the Commission have enduring value.
5. The Commission may appoint committees from amongst its members and may assign to any committee so appointed such of its functions as it may deem fit: Provided that the Commission shall not be divested of any function which it has so assigned and may amend or revoke a decision of such a committee.
 6. The procedure at meetings of the Commission and of a committee shall be as prescribed. The Commission or any committee may co-opt any person to serve on the Commission or on a committee, as the case may be, in an advisory capacity, but such a co-opted member shall not have any voting rights.
 7. An ordinary member, or a co-opted member referred to in subsection (7), who is not in the full-time service of the State shall be paid from the funds of the Commission such travel and other expenses incurred by him or her in connection with the activities of the Commission as the Minister may determine with the concurrence of the Minister of Finance.

7. SECRETARY AND STAFF OF COMMISSION

1. The work incidental to the performance of the functions of the Commission shall, subject to the directions of the Commission, be performed by a secretary appointed by the Commission on such conditions of service and at such remuneration and service benefits as the Minister, with the concurrence of the Minister of Finance, may determine.
2. The Secretary shall be assisted in the performance of his or her functions by persons appointed by the Commission on such conditions of service and at such remuneration and subject to such service benefits as the Commission may, with the approval of the Minister, granted with the concurrence of the minister of Finance, determine.

8. FUNDS OF COMMISSION

1. The funds of the Commission shall consist of -
 - a. money appropriated by Parliament;
 - b. money accruing to the Commission from any other source.
2. The Secretary of the Commission shall open an account in the name of the Commission with an institution registered as a bank in terms of the Bank Act, 1990 (Act No. 94 of 1990), and shall deposit in that account all money received in terms of this section.
3. The Commission shall utilise its funds for the defrayment of expenses incurred in the performance of its functions under this Act.
4. The Commission shall in each financial year, at a time determined by the Minister, submit a statement of the Commission's estimated income and expenditure during the following financial year to the Minister for approval, granted with the concurrence of the Minister of Finance.
5. The expenses of the Commission in a given financial year shall not exceed the total amount approved under subsection (4).

9. ACCOUNTABILITY

1. The Secretary of the Commission shall be the accounting officer of the Commission and shall be charged with the accountability in respect of all money received and payments made by the Commission.
2. The accounting officer shall -
 - a. keep full and correct record of all money received or spent by the Commission, and of the assets and liabilities of the Commission;
 - b. as soon as possible after the end of the financial year of the Commission, draw up annual financial statements which shall, with appropriate details, show money received by the Commission and expenditure incurred by the Commission and its assets and liabilities at the end of the financial year concerned.
3. The financial year of the Commission shall end on 31 March in each year.
4. The records and annual financial statements mentioned in subsection (2), shall be audited by the Auditor-General.

10. ANNUAL REPORTS

1. As soon as practicable after the end of each financial year the National Archivist shall compile a report on all the activities of the National Archives during that financial year and the Commission shall compile a report on all the activities of the Commission during that financial year.
2. The report of the National Archivist shall include
 - a. details of income and expenditure;
 - b. a complete list of disposal authorities issued;
 - c. an account of all cases of unauthorised disposal of public records investigated by the National Archives; and
 - d. an account of all governmental bodies which have failed to comply with this Act.
3. The report of the National Archivist and of the Commission, together with the audited annual financial Statements pertaining to the funds of the Commission, shall be submitted to the Minister, and the Minister shall lay them upon the Table in Parliament within 14 days after receipt thereof if Parliament is then in session, or if Parliament is not then in session, within 14 days of the commencement of the next session.

11. CUSTODY AND PRESERVATION OF RECORDS

1. The Minister may from time to time establish archives repositories under the control of the National Archivist for the custody of records.
2. Public records identified in a disposal authority as having enduring value shall be transferred to an archives repository when they have been in existence for 20 years: Provided that -
 - a. no other Act of Parliament requires such records to be kept in the custody of a particular governmental body or person;
 - b. the National Archivist may, after consultation with the head of a governmental body, identify such records which -
 - i. should remain in the custody of a governmental body; or
 - ii. should be transferred to an archives repository before they have been in existence for 20 years;
 - c. the National Archivist may defer the transfer of any public records; and
 - d. the National Archivist may grant permission for any public records to be transferred to an

archives repository before they have been in existence for 20 years.

3. The Minister may prescribe terms and conditions governing the transfer of records under subsection (2).
4. The National Archivist shall take such measures as are necessary to preserve and restore records.

12. ACCESS AND USE

1. Subject to any other Act of Parliament with access to public records -
 - a. a public record in the custody of which deals the National Archives shall be available for public access if a period of 20 years has elapsed since the end of the year in which the record came into existence;
 - b. access to a public record in respect of a period of which a period of less than 20 years has elapsed since the end of the year in which the record came into existence may be given by the National Archivist upon request.
2. A non-public record in the custody of the National Archives shall be available for public access subject to any conditions agreed upon at its acquisition in terms of section 14(1) of this Act.
3. Notwithstanding subsections (1) and (2), the National Archivist may refuse access to a record on the grounds of its fragile condition, provided that there shall be a right of appeal to the Commission against the refusal. The Minister may make regulations as to the admission of the public to archives repositories, the making available of records for public access, and the use of equipment for the making of copies of or extracts from records in the custody of the National Archives.

13. MANAGEMENT OF PUBLIC RECORDS

1. Subject to the provisions of this Act, the National Archivist shall be charged with the proper management and care of public records in the custody of governmental bodies.
2. Without limiting the generality of subsection (1) -

- a. no public record under the control of a governmental body shall be transferred to an archives repository, destroyed, erased or otherwise disposed of without the written authorisation of the National Archivist, issued subject to -
 - i. section 6(4)(e) of this Act; and
 - ii. a final ruling by, the Minister when unresolvable differences arise between the National Archivist and the Commission;
 - b. the National Archivist shall -
 - i. determine records classification systems to be applied by governmental bodies;
 - ii. determine the conditions subject to which records may be microfilmed or electronically reproduced; and
 - iii. determine the conditions subject to which electronic records systems should be managed;
 - c. the National Archivist shall inspect public records in so far as such inspection may be necessary for the performance of his or her functions under this Act: Provided that the inspection of public records which contain information the disclosure of which is restricted by any other Act of Parliament shall be done only with the consent of the head of the governmental body concerned.
3. The Minister may make regulations as to the management and care of public records in the custody of governmental bodies.
 4. The National Archivist may from time to time issue directives and instructions, which shall not be inconsistent with the regulations, as to the management and care of public records in the custody of governmental bodies.
 5. (a) The head of a governmental body shall, subject to any law governing the employment of personnel of the governmental body concerned and such requirements as may be prescribed, designate an official of the body to be the records manager of the body.
 (b) The records manager shall be responsible to see to it that the governmental body complies with the requirements of this Act.
 (c) Additional powers and functions may be prescribed to a records manager.

14. ACQUISITION AND MANAGEMENT OF NON-PUBLIC RECORDS

1. The National Archivist may on behalf of the State acquire by purchase or donation or on loan for a

temporary period or in perpetuity, either unconditionally or subject to such conditions as may be agreed upon, non-public records which, in his or her opinion, have enduring value of national significance and which cannot be more appropriately preserved by another institution.

2. Subject to any conditions, as may be applicable, non-public records acquired under subsection (1) shall be deposited in the archives repository determined by the National Archivist.
3. The producer or distributor of a recording which is a non-public record in terms of this Act shall, within six months after a request in writing is made by the National Archivist, provide the National Archivist with a copy of the recording in such form as may be specified in the request.
4. Subsection (3) shall not apply in respect of a recording that is required to be deposited in a legal deposit library, defined in section 1 of the Legal Deposit of Publications Act, 1982 (Act No. 17 of 1982), or that has not been broadcast or made public in South Africa.
5. The National Archivist shall maintain national registers of non-public records in South Africa which, in his or her opinion, have enduring value, in consultation with the institutions having custody of such records.
6. No person or institution having non-public records in their custody which are recorded on the national list contemplated in section 6(4)(f) shall destroy, export from South Africa or otherwise dispose of such records without -
 - a. reporting to the Commission their intention to so dispose of such records at least 90 days in advance of such action; and
 - b. securing the approval of the Commission for such action.

15. LIMITATION OF LIABILITY

No person, including the State, shall be liable in respect of anything done under this Act in good faith and without negligence.

16. OFFENCES AND PENALTIES

1. Any person who -
 - a. Wilfully damages any public or non-public record in the control of a governmental body; or

- b. otherwise than in accordance with this Act or any other law, removes, destroys or erases such record,

shall be guilty of an offence and liable on conviction to a fine or imprisonment for a period not exceeding two years or both such fine and imprisonment.

2. Any person who fails to comply with -
 - a. a request mentioned in section 14(3); or
 - b. section 14(6).

shall be guilty of an offence and liable on conviction -

- i. in the case of an offence contemplated in paragraph (a) of this subsection, to a fine not exceeding R5 000;
 - ii. in the case of an offence contemplated in paragraph (b) of this subsection, to a fine not exceeding R10 000.
3. The National Archivist may refuse to allow any person convicted of an offence in terms of subsection (1) access to an archives repository for such period as he or she may deem fit, subject to an appeal to the Minister.

17. TRANSITIONAL PROVISIONS

1. The person who, immediately prior to the commencement of this Act, performed the functions of the director of archives under the Archives Act, 1962 (Act No. 6 of 1962), shall continue in office as the National Archivist.
2. Every public servant who, immediately prior to the commencement of this Act, performed functions as a member of the staff of the said director, shall be deemed to be a member of staff of the National Archives.
3. Any records in the custody of the said, director on the day immediately prior to the commencement of this Act are hereby transferred to the National Archivist subject to any terms and conditions that were applicable to such records on that day.
4. Until such time as a provincial legislator promulgates provincial legislation in terms of which a provincial archives service is established for that province, every provision of this Act shall apply in

that province, and -

- a. wherever the expression "governmental body" occurs it shall mean a legislative executive, judicial or administrative organ of state (including a statutory body) in such province at the national, provincial or local level of government; and
- b. wherever the expression "public record" occurs it shall mean a record created or received by any institution contemplated in paragraph (a) in pursuance of its activities.

18. REGULATIONS

The Minister may make regulations as to any matter which in terms of this Act is required or permitted to be prescribed or done by regulation, and, generally, with reference to any matter which is necessary or expedient to be prescribed in order to achieve or promote the objects of this Act.

19. REPEAL OF LAWS

The following laws are hereby repealed:

- a. The Archives Act, 1962 (Act No. 6 of 1962);
- b. the Archives Amendment Act, 1964 (Act No. 12 of 1964);
- c. the Archives Amendment Act, 1969 (Act No. 63 of 1969) ;
- d. the Archives Amendment Act, 1977 (Act No. 54 of 1977); and
- e. the Archives Amendment Act, 1979 (Act No. 32 of 1979).

20. SHORT TITLE AND COMMENCEMENT

This Act shall be called the National Archives of South Africa Act, 1996, and shall come into operation on a date to be fixed by the President by proclamation in the Gazette.

APPENDIX D

Example Electronic Records Schedule

USER: CITY SECRETARY KROMBURG
UTILISATION NO. 3: AGREEMENT MANAGEMENT SYSTEM

CATEGORY	ITEM	OFFICE WHERE KEPT	DISPOSAL
A			
<u>INPUT DOCUMENTS</u>			
A.1 <u>Source documents</u>	1. Existing agree ments	SSR	A20 (PSK17) N
	2. Tender documents	SSR	
	3. <u>Contract docu- ments</u>	SSKA	
	3.1 Provision and delivery of goods		D
	3.2 Provision of services		A20
	3.3 Engineers' and building contracts		D.
	4. Council decisions		A20
A.2 <u>Processed input</u>	None		
B			
<u>ELECTRONIC MEDIA</u>	1. Working tapes/ discs/cassettes		DX
	2. <u>Master tapes</u>		
	2.1 History		DX
	2.2 Agreements master		DX
C			
<u>PRINTOUTS</u>	1. Agreements data		L (File 10/1/2)
D			
<u>PROGRAMMES</u>			DX
E			
<u>RELATED DOCUMEN- TATION</u>			DX

APPENDIX E

Schedule of Interview Questions

1. What do you see as being the main challenges facing the National Archives in managing the electronic records of central government?
2. Do any challenges exist in terms of the organisational structure within the National Archives and the Department of Arts, Culture, Science and Technology?
3. Does the fact that the National Archives falls under the Department of Arts, Culture, Science and Technology impact on the ability of the National Archives to perform its functions?
4. Are there any aspects of the National Archives of South Africa Act that constrains the National Archives in managing records generally, and electronic records specifically?
5. The National Archives Act seems to confer a great deal of responsibility upon the National Archives. Are you able to meet these responsibilities and deliver in terms of them?
6. Are you able to exercise the authority given to you in terms of the Act?
7. Does the National Archives have the resources in terms of finance, staff and skills to effectively manage electronic records?
8. How do you ensure the adherence to government bodies to archives legislation and instructions?
9. What are the challenges associated with each of the three strategies that form part of the National Archives' electronic records management programme? Namely archival involvement in the design and maintenance of electronic systems, the

earliest possible transfer of records to the archives, and the identification of which records should be left in the creator's custody.

10. Has the National Archives communicated its electronic records management programme to its client offices, and if so how?
11. What is the relationship between the National Archives and its client bodies?
12. Is the National Archives involved in providing training to its client bodies? If so what type of training?
13. Is a formal migration strategy in place?
14. Who is responsible for purchasing and implementing electronic information systems in central government? Do you have a relationship with them?
15. How well established is your paper based records management programme?
16. My understanding is that the schedule of electronic records is your main mechanism for establishing what electronic records and systems exist in government departments. Is this the case?
17. In the Draft Guide to the Management of Electronic Records in Governmental Departments the following is stated: "Most electronic systems for which disposal authorities are applied, do not possess archival value, while systems that might have archival value are seldom reported." Why is this and how can this situation be remedied?
18. A lot of the success in terms effective archival preservation of electronic records depends upon archival input during the active records stage. It is my understanding that this will largely occur through or be mediated by the records managers in each department. Is this correct? If so are these managers in place and do they have the required skills to fulfill their functions?

APPENDIX F

APPRAISAL INSTRUCTION NO. 36

GUIDELINES ON THE APPRAISAL OF ELECTRONIC RECORDS

1. Background

- 1.1 The mainframe computer came into use in South African government offices in the early 1970s and was utilized mainly for specific support functions, e.g. processing of salary data. The State Archives Service recognized that certain information might exist only in electronic form and that some data might have archival value. The principle was established that electronic records of governmental bodies constituted public records and were subject to the same archival control as records in other media.
- 1.2 Circular No. 1 of 1974 was issued to all offices falling under the Archives Act drawing their attention to the fact that records in electronic form as well as source documents and print-outs should be dealt with in terms of the Archives Act. Offices were required to apply for disposal authority by compiling a list for each specific utilization of the computer detailing all the information-bearing categories involved, e.g. source documents, punch cards, magnetic tapes and print-outs.
- 1.3 Directive D7 was later issued setting out instructions for the compilation of a list or schedule of computer records, which was to form an integral part of a broader list of records other than correspondence files. Such a schedule serves as a medium to manage electronic records and regulate their retention in terms of disposal instructions. This requirement is also set out in section 3 of the Archives Instructions.
- 1.4 The advancement of computer technology since the 1970s has seen the introduction of a wide range of computer facilities, including the personal computer, relational databases, electronic mail and imaging. The original form of scheduling prescribed in Directive D7 may not be applicable in all these cases. It should still be applied where appropriate. See par. 2 and especially par. 2.7 below for guidelines in other cases.

2. Guidelines

- 2.1 Electronic systems become obsolescent within a short space of time. Archival involvement can therefore not be delayed until systems are terminated. Ideally archival appraisal should take place during the design phase of electronic systems. Appropriate procedures for timely provision of archival copies can then be built into systems. Moreover archival involvement at an early

stage can ensure that the contextual information required to give validity to the records is included, especially in correspondence systems (e.g. addressee, sender, reference number, subject, date).

- 2.2 In identifying archival value in electronic records systems, the same theoretical and methodological framework is applied as for all other media. (See Appraisal Instructions 34 and 35.) However, given the unique medium, the following factors should also be considered by appraisers.
 - 2.2.1 Electronic media offer huge storage capacity and the facility to manipulate data for secondary purposes using powerful retrieval processing tools. The potential therefore exists that records documenting a particular function in electronic format may be accepted for preservation, despite similar records in paper format being rejected. E.g. the electronic version of the personal staff file may be preserved, while similar paper-based files are rejected because of their physical volume and lack of manipulability of the information they contain for secondary analysis.
 - 2.2.2 The use of electronic records is dependent upon hardware and software. It is not viable to preserve all relevant hardware and software in an archival environment, particularly as it rapidly becomes obsolescent. It is however necessary to ensure that the functionality of an electronic records system appraised as having archival value can be recreated in the archival environment. As part of the appraisal process, the archivist must determine the most appropriate means of preserving functionality. In some cases data may be acquired in software independent form, together with full documentation specifying inter alia record layout, codes, etc. In other cases, e.g. relational databases, it may be necessary to acquire the software as well.
 - 2.2.3 In cases in which the preservation of functionality is not feasible or desirable because of e.g. software dependence or the client office being better placed to provide user services, preservation in the client office rather than an archival repository should be considered.
- 2.3 In the case of electronic correspondence systems, the following guidelines apply. All correspondence should be conducted using a functional subject classification system approved by the State Archives Service. Disposal authority should be obtained on the classification system and be applied by the client office. The State Archives Service must decide on the appropriate medium or format in which records should be preserved for archival purposes.
- 2.4 Image data created by means of electronic scanning cannot be preserved archivally because of the lack of industry standards for optical storage media, their de-

pendence on specialized hardware and the high risk of errors making data unreadable. Offices may utilize electronic scanning at their own discretion, but arrangements must be made to supply the State Archives Service with copies of the records appraised as having archival value in an archival medium. E.g. in the case of correspondence, the conventional subject files including both incoming and outgoing correspondence must be maintained in chronological form.

- 2.5 In the case of databases which are continually updated and amended, the possibility of acquiring "snapshots" at specific intervals may be considered.
- 2.6 In all cases where electronic records are recommended for preservation, care should be taken to ensure that the appropriate metadata¹ is identified, documented, and transferred for archival custody together with the electronic records.
- 2.7 Given the fact that the prototype schedule in Directive D7 is not suitable for all systems, the precise manner of scheduling should be negotiated with the client office. In some cases, an explanation of the purposes of the system and the technology used may be adequate.
- 2.8 There may be cases in which electronic records which have been appraised as having archival value would best be preserved in the office of origin, rather than being transferred into archival custody. Reasons might include the high cost of transfer or technical considerations; the continuing or long-term operational need that the office of origin has for the records; the ability of the office of origin to provide better reference services than the archives repository; or the existence of statutory provisions which prevent transfer to archival custody. Where a Records Management component believes that leaving the electronic records concerned in the permanent custody of the office of origin is appropriate, it should liaise with the Committee for the Management of Electronic Records (COMMER) for advice and guidance in drafting an agreement. The following are examples of categories of electronic records which may be more appropriately preserved in the office of origin.
 - 2.8.1 Cumulative, longitudinal systems and records, where by definition no data deletion, erasure or replacement occurs.
 - 2.8.2 Bibliographic or cataloguing systems or records, where

1. Data describing data and data systems; that is, the structure of databases, their characteristics, location and usage (Compare: "meta information" = information about information).

the first point of access would never be an archives repository because the latter would only hold an incomplete version of the system.

- 2.8.3 Data where the creating institution has as its own operational requirement the provision of extensive and elaborate reference service, and has the willingness to provide such services in a manner that an archives repository cannot match.
- 2.8.4 Cases where it is not technically feasible or cost effective to acquire a version of the record for archival custody,
- 2.8.5 Data where institutions for whatever reasons (security, sensitivity) refuse to transfer the record to archival custody, at least until the expiry of a lengthy retention period. This situation should not be supported unless one of the other circumstances noted above is also present.

APPENDIX G

CIRCULAR NO. 1 OF 1974

DISPOSAL OF ARCHIVES : COMPUTER DOCUMENTATION

1974-08-15

1. Attention is drawn to the fact that all documents created and accumulated in the course of data processing for, and by means of, a computer, are archives. Authorisation for their destruction (or the erasure of information) must be obtained from this office in accordance with the Archives Act, 1962.
2. This applies not only to such tangible documents as sources, punch cards and print-outs, but also to data captured on magnetic tapes or discs which may not be erased without authorisation.
3. In order to organise the disposal of such documents in an orderly fashion and obtain the necessary disposal authority, lists should be submitted to this office of the different applications in use, or which were in use, the documents created in respect of each application and the proposed disposal instructions in respect of each item according to the following examples:-

APPLICATION 1 : SALARY SYSTEM

Description	Disposal
Source document - group No. 1 (quote name or number)	D.1
Source document - group No. 2 (quote name or number) etc.	D.2
Punch Cards	D.1
Magnetic Tapes (working tapes)	D (when processed)
Magnetic Tapes (masters)	D.5
Print-out type No. 1 (quote name or number)	D.3
Print-out type No. 2 (quote name or number) etc.	D.7

APPLICATION 2 : POPULATION REGISTRATION SYSTEM

Description	Disposal
Source document - Group No. 1 (as e.g. PR1)	A.30
Source document - Group No. 2 (as e.g. PR2) etc.	D.10
Magnetic discs	D. *
Magnetic Tapes (Masters)	A.30
Print-out type No. 1 (quote name or number)	D.1
Print-out type No. 2 (quote name or number)	A.30
Print-out type No. 3 (quote name or number)	D.3

D.1 = Destroy or erase after 1 year.

D. * = Erase as soon as data is transferred to Master.

A.30 = Retain for transfer to an Archives Depot.

4. It must be emphasised that the cases shown above are merely examples to provide offices with an idea of how to set about the task. Any problems experienced in this connection should please be brought to the notice of this office.
5. If steps are not taken as soon as possible to identify data justifying permanent retention, a real risk exists that important information may be lost beyond recall. Your urgent attention to the matter is requested therefore.
6. Should a department not make any use of a computer whatsoever and accrue no computer documentation, this office is to be informed accordingly.

(TO THE HEADS OF ALL GOVERNMENT DEPARTMENTS, PROVINCIAL ADMINISTRATIONS, THE ADMINISTRATION OF SOUTH WEST AFRICA, THE SOUTH AFRICAN RAILWAYS AND THE POSTAL ADMINISTRATION)

[Both the form of the listing and the symbols have subsequently been amended - see Appraisal Instruction No. 30 and Archives Instructions: Appendix 8]

[See Circular 3/1984 for Word Processors: Use]

CIRCULAR NO. 3 OF 1984

WORD PROCESSOR : INSTRUCTIONS FOR USE

1984-10-01

1. For archival purposes two basic applications of the Word Processor have been identified, viz.
 - (i) Primary Application : Customary editing of type written text.
 - : Storage of standard letters/forms for periodical use.
 - (ii) Secondary Application : Storage of correspondence (other than standard letters), reports etc. when copies are not placed on correspondence
 - : Transmission of information directly between inter town/city linked word processors.
 - : Linked to mainframe computer of the office.
2. All controlling offices where a word processor is in use are required to institute the following steps immediately to ensure that a complete record of all transactions is available on correspondence files:
 - (i) An office instruction directed to all offices/departments/sections that when the word processor is used a copy of each finalised item or revised finalised item be placed on correspondence files of the office. This instruction does not apply to amended drafts but to final copies only.
 - (ii) Offices employing the word processor for secondary application, as set out above, must report such usage to this office supplying full details as regards each application.

(TO HEADS OF ALL GOVERNMENT DEPARTMENTS, S.A. TRANSPORT SERVICES, POSTS AND TELECOMMUNICATIONS, PROVINCIAL ADMINISTRATIONS, DEVELOPMENT BOARDS, LOCAL AUTHORITIES, COMMUNITY BOARDS AND DECLARED INSTITUTIONS)

[See Circular 1/1974 for Computer documentation]

APPENDIX H

General disposal authority number AEl for the destruction of ephemeral electronic and related records of all Governmental bodies

1. AUTHORITY

This document grants authority to governmental bodies in terms of section 13(2)(a) of the National Archives of South Africa Act to erase or destroy ephemeral electronic and related records of all governmental bodies when no longer needed.

2. INTRODUCTION: EPHEMERAL ELECTRONIC AND RELATED RECORDS

Ephemeral electronic and related records are defined as those that are not regarded as having enduring value.

Authority to dispose of electronic records is in most cases linked to the approval of classification systems and the issuing of disposal authority on the basis of such systems. In the electronic environment there is therefore a need for a sound records management systems to be in place. This is in fact a requirement in terms of the National Archives of South Africa Act (No. 43 of 1996), section 13(2).

Erasure or destruction in terms of disposal authorities issued by the National Archivist should take place in a controlled and systematic manner under central supervision within each governmental body. Each governmental body should determine appropriate retention periods for records which do not have enduring value in terms of disposal authorities issued by the National Archivist. In determining retention periods, the governmental body's own requirements for access to information for efficient functioning should be taken into account, as well as its obligations to the public for accountability, e.g. in terms of proposed Open Democracy legislation.

3. DESCRIPTIONS

3.1 Word Processing Files

Documents such as letters, messages, memoranda, reports, handbooks, directives, and manuals recorded on electronic media such as hard disks or diskettes:

3.1.1 When used to produce hard copy that is maintained in files of a classification system.

3.1.2 When maintained only in electronic form, and duplicate the information in and take the place of records that would otherwise be maintained in hard copy providing that the hard copy has been authorized for destruction in terms of this disposal authority or another disposal authority

issued by NASA.

3.2 Administrative Data Bases

Data bases that support administrative functions such as financing, provisioning of supplies and services, and staff (EXCEPT where these are the line functions of the body), and which contain information derived from hard copy records authorized for destruction by this disposal authority or another disposal authority issued by NASA, if the hard copy records are maintained in a NASA-approved classification system. Hard copy printouts from these data bases that are made for short-term administrative purposes.

3.3 Schedules of Daily Activities

Calendars, appointment books, schedules, logs, diaries, and other records documenting meetings, appointments, telephone calls, trips, visits, and other activities by public servants while serving in an official capacity, created and maintained in hard copy or electronic form, EXCLUDING:

- 3.3.1 Records determined to be personal.
- 3.3.2 Records containing substantive information relating to official activities, the substance of, which has not been incorporated into official files.
- 3.3.3 All records kept at ministerial level.

3.4 Tracking and control records

Logs, registers, and other records in hard copy or electronic form used to control or document the status of correspondence, reports, or other records that are authorized for destruction by this disposal authority or another disposal authority issued by NASA.

3.5 Finding Aids (or indexes)

Indexes, lists, registers, and other finding aids in hard copy or electronic form used only to provide access to records authorized for destruction in a disposal authority issued by NASA, EXCLUDING records containing abstracts or other information that can be used as an information source apart from the related records.

3.6 Files/Records created in central data processing facilities to create, use, and maintain master files

- 3.6.1 Electronic files or records created solely to test system performance, as well as hardcopy printouts and related documentation for the electronic files/records.
- 3.6.2 Electronic files or records used to create or update a master file, including, but not limited to, work files and intermediate input/output records.
- 3.6.3 Electronic files and hard-copy printouts created to moni-

tor system usage, including, but not limited to, log-in files, password files, audit trail files, system usage files, and cost-back files used to access charges for system use.

3.7 Input/Source Records

- 3.7.1 Non-electronic documents or forms designed solely to create, update, or modify the records in an electronic medium and not required for audit or legal purposes (such as need for signatures) and not previously scheduled for permanent retention in a disposal authority issued by NASA.
- 3.7.2 Electronic records, except as indicated in 3.7.3 below, entered into the system during an update process and not required for audit or legal purposes.
- 3.7.3 Electronic records received from another department and used as input/source records by the receiving department, EXCLUDING records produced by another department under terms of an interdepartmental agreement, or records created by another department in response to the specific information needs of the receiving department.
- 3.7.4 Computer files or records containing uncalibrated and unvalidated digital or analogue data collected during observation or measurement activities or research and development programmes and used as input for a digital master file or data base once it has been calibrated and validated.

3.8 Master Files relating to administrative functions except where an administrative function is a line function of the body concerned

- 3.8.1 Master files that replace, in whole or in part, administrative records scheduled for destruction in a disposal authority approved by NASA.
- 3.8.2 Master files that duplicate, in whole or in part, administrative records scheduled for destruction in a disposal authority approved by NASA.

3.9 Data Files consisting of summarised information

Records that contain summarized or aggregated information created by combining data elements or individual observations from a single master file or data base that may be destroyed in terms of a disposal authority issued by NASA, EXCLUDING data files that are created as disclosure-free files to allow public access to the data; and those created from a master file or data base that is unscheduled, that was scheduled as permanent but no longer exists, or can no longer be accessed. The latter data files may not be destroyed before securing NASA approval.

3.10 Records consisting of extracted information

Electronic files consisting solely of records extracted from a single master file or data base that is disposable in terms of a disposal authority issued by NASA, EXCLUDING extracts that are: produced as disclosure-free files to allow public access to the data; or produced from a master file or data base that is unscheduled, or that was scheduled as permanent but no longer exists, or can no longer be accessed; or produced by an extraction process which changes the informational content of the source master file or data base. The latter files may not be destroyed before securing NASA approval.

3.11 Print Files

Electronic files extracted from master files or data bases without changing them and used solely to produce hard-copy publications and/or printouts of tabulations, ledgers, registers, and reports.

3.12 Technical Reformat Files

Electronic files consisting of data copied from master files or data bases for the specific purpose of information interchange and written with varying technical specifications, EXCLUDING files created for transfer to NASA.

3.13 Security Backup Files

Electronic files consisting of data identical in physical format to master files or data bases and retained in case the master files or data bases are damaged or inadvertently erased.

3.13.1 Files identical to records scheduled for transfer to NASA.

3.13.2 Files identical to records authorized for destruction in a disposal authority approved by NASA.

3.14 Special Purpose Programmes

Application software necessary solely to use or maintain a master file or data base authorized for destruction in a disposal authority issued by NASA, EXCLUDING special purpose software necessary to use or maintain any master files or data bases for which disposal authority has not yet been obtained from NASA or are scheduled for transfer to NASA in terms of a disposal authority.

3.15 Documentation regarding electronic systems

Data systems specifications, file specifications, code-books, record layouts, user guides, output specifications, and final reports (regardless of medium) relating to a master file or data base that has been authorized for destruction in a disposal authority issued by NASA, EXCLUDING documentation relating to any master file or data base for which disposal authority has not yet been ob-

tained from NASA or are scheduled for transfer to NASA in terms of a disposal authority.

dirgl0w2.dir

APPENDIX I

Example Electronic Records Schedule

DEPARTMENT OF FISHERIES

1. **System name:**
Documentary System (DOCS)
2. **System control number:**
FISH2
3. **Governmental body program(s) supported by the system:**
Communication Services
Communication channels throughout the Department of Fisheries
Publications Division
Legal Services
4. **Relevant laws and directives**
Fisheries Act of 1990 (Act No. 45 of 1990)
Directive 7 of 1992 (Disposal of records regarding deep sea fishing)
5. **Responsible personnel**

Ms B Bass Information Systems Room 101 (012) 328 5738 x 346 bass@fish.pwv.gov.za	Mr. FC du Toit Directorate Administration Room 311 (012) 328 1369 x 301 toit1@fish.pwv.gov.za
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6. **Purpose of the system**

The system supports internal communication within the Department of Fisheries. The system is used to disseminate information concerning a variety of topics including circulars, regulations and laws.

The system provides the following functionality:

The storage of documents of interest to members of the Department of Fisheries

Enquiries against the document database to identify relevant documents.

The browsing and printing of identified documents.

Printing of reports.

Printing of statistics and management information concerning documents used by the Department of Fisheries.

7. **Data input and sources:**

Information gathered through questionnaires, telephone surveys, reporting forms, etc.

All legal and/or official documents regarding the Department, its activities and functions, created by the Department.

Relevant information is also received from several wildlife organisations, universities and similar departments in foreign countries.

Information from the Weather Bureau.

8. **Major output:**

Quarterly and annual reports.

Reports/articles regarding related topics.

Information is sporadically traded/transferred with similar bodies in other countries.

9. **Information content:**

Legal and/or official documents regarding the Department, its activities and functions.

Relevant information regarding ichthyology, the fishing industry, halieutics, weather patterns, etc.

Date coverage, time span: 1980 - present

Geographic coverage: Oceans around the globe; water masses in Southern Africa

Update cycle: Every two weeks

10. **Hardware/software environment:**

As/400, Model F.

AS/400: Database software

11. **System manager:**

Ms B Bass

Information Systems

Room 101

(012) 328 5738 x 346

bass@fish.pwv.gov.za

12. **Location of documentation (metadata) needed to read and understand the files:**

Codebooks and file layouts are maintained by the Information Systems Division of the Department of Fisheries.

Contact person: Ms B Bass

Information Systems

Room 101

A file containing metadata and other relevant information on each transfer can also be found in the List of Separate Case Files at Registry.

Information regarding the transfer of the cartridges can be found on file 9/1/1/3/5/6 in registry.

13. **Disposal authority:**

2-B1NA (See attached list of disposal instructions)

Additional information on 13/2/1/4.

14. **Location and volume of any storage media containing identical information:**

Master copy: Department of Fisheries

Information Systems Division

Room 101

5 x 8mm cartridges (1.2GB per cartridge)

Work copy: Bureau Nucleus II

Centurion

Room A4

5 x 8mm cartridges (1.2GB per cartridge)

15. **Identification of the person compiling the schedule:**

Mr. PJ Pretorius

Directorate Administration

Room 413

(012) 328 2473

16. **Date prepared:**
1998-07-14