THE MEDIUM IS *NOT* THE MESSAGE: APPRAISAL OF ELECTRONIC RECORDS BY AUSTRALIAN ARCHIVES

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This article focuses on the methodology being developed by Australian Archives to appraise electronic records created by agencies of the Australian Government. It gives an overview of the development of appraisal practices in the Commonwealth's archival authority over the years, and presents a case study based on a recent appraisal of the computer systems in the Department of Immigration and Ethnic Affairs. In addition, there is discussion of the thinking within Australian Archives about how intervention is needed to ensure the creation of certain records. Preliminary costs in retaining certain transactional records of archival value in an electronic environment are revealed.

Introduction

Australian Archives, along with most other archival institutions, has for many years been faced with the challenge represented by the appraisal and management of electronic records.[1] The enormity of both technological change and its resultant impact on recordkeeping and recordkeeping systems, (and therefore the potential archival 'record') has loomed large on the archival horizon for many years. The policy response to this challenge by archival institutions has been overshadowed by the drive within the marketplace for faster, smaller and smarter technology and the proprietary nature of many of the products.[2] The nature of this rapid change and of the technology has tended to disorient thinking amongst archivists generally and perhaps delayed a concerted response to the issue. This point is made knowing that there are individual archivists and archival institutions who have been responding to the challenge and attempting to develop solutions for some years now, most notably for their influence on this country are those in Canada and the USA.

Despite this, the point remains that many archivists are still wary of this new technological environment and, unfortunately, whilst many of the wary still remain so, the records have gone. Not only the records but the records about the records and the development of systems over the last thirty years. So whilst this article is about what Australian Archives has been doing and is doing, with particular reference to appraisal, it is also addressed to those who still fall into the wary category. In particular, it is dedicated to all appraisers and, if they only remember one thing from the article it should be this: '**Records is Records**'. With apologies to Marshall McLuhan, the medium is not the message, the message is the message!

Development of Appraisal Methodology

The development of Australian Archives' electronic records appraisal methodology has been significantly influenced by the development of its appraisal methodology generally. This, in turn, has been significantly influenced by the institution's historical development. Underlying this process has been one of the great paradoxes of archival practice: that is, that whilst the 'science' of appraisal has always been somewhat inexact (despite advances in procedure and practice it remains at heart a very subjective process), it is at the same time the most critical activity in all of archival practice.[3] This paradox serves to illustrate the tension between the development of appraisal policy and its implementation and appraisal policy as an evolutionary process in comparison, for example, with the 'holy writ' of intellectual control. The evolutionary and inexact nature, not to mention the criticality of appraisal, is nowhere more evident than with the appraisal of electronic records. To place the appraisal of electronic records in

context, a necessary starting point is a consideration of the origins of Australian Archives' current appraisal practices.

The origin and development of Australian Archives and its effect on disposal and appraisal process can be characterised by two of the most significant themes influencing this country in the 20th century: the two world wars, particularly the aftermath of the 1939–45 conflict and the assimilation of ideas and processes from overseas and from overseas 'experts' (in the Australian archival context our assimilation of things British and North American).

There are four significant events or periods to use by way of illustration. They are:

- the origins of Australian Archives during and after the Second World War;
- the visit of Dr T.R. Schellenberg in 1954;
- the passage of the *Archives Act* 1983; and
- the formulation of policies for the appraisal of electronic records.

The administrative history of the agency which became Australian Archives began with the establishment of the War Archives Committee in 1942. At a time when Australia was somewhat more preoccupied with issues of its very survival, an inter-departmental committee was established at the direction of Prime Minister John Curtin. Under the chairmanship of Dr. C.E.W. Bean, Australia's official war historian of the First World War, the Committee was given the responsibility to make recommendations and supervise steps for the preservation of records of the war then underway. The principal stimulus for the establishment of this committee was the memory of the loss of many valuable records at the end of the First World War and the attendant difficulties that Bean had faced in completing his assigned task.[4] Bean and many others in positions of influence were determined that this would not happen again. At this stage, it should be noted that Commonwealth archival legislation was some way off, although a proposal for a Public Archives Act had been drafted as early as 1927.

In February 1943, following the acceptance of the Committee's recommendations, the Secretary of the Prime Minister's Department (which had administrative responsibility for the Committee) issued a memorandum to all Departments. This memorandum outlined departmental responsibilities and those of the Committee as well as designating custodians for 'the archives' (the Australian War Memorial and the National Library) which would act with the advice of the Committee in connection with the destruction, collection and preservation of official records.

For its influence on the development of disposal practices in this country this memorandum's key points are worth repeating. Each

Department was to have complete responsibility for deciding how long it needed to retain its records. Departments were to destroy records only with the permission of the appropriate provisional archival authority, but archives officers were to arrange with Departments 'schedules' of those records which could be destroyed without further authorisation.

This process began in earnest after the end of hostilities in 1945 with the initial focus being on the preservation of valuable records, particularly those from the agencies set up to manage the war effort. However, by 1949, due to the large accumulations of records during the war and the post-war period (added to those already accumulated from the beginning of Federation in 1901) this emphasis began to change as the pressure on city office accommodation throughout the country, particularly in Melbourne[5] and Sydney, had became acute.

From January 1950 a joint Survey (the Records Reduction Survey) was conducted by the Public Service Board and the National Library Archives Division in all capital cities with the object of reducing the city office accommodation occupied by records.[6] This process was to be a recurring theme in subsequent years. Significantly for the appraisal process, it had the effect of focussing attention not just on the selection of the archival records but also on providing disposal coverage for all current records, and laid the basis for the Archives as it developed into an organisation with responsibility for the entire life cycle of Commonwealth records, a responsibility given legislative effect in the Archives Act in 1983.

A further influence was the visit to Australia of Dr T.R. Schellenberg between February and September 1954.[7] Dr Schellenberg, then Director of Archival Management at the National Archives and Records Service in Washington, undertook an extensive program of meetings and seminars covering the whole gamut of archives and records management primarily at the national level but also in all State capitals. During his trip he began work on what later became the seminal publication *Modern Archives*[8], a significant and continuing influence on archives and records practice in this country. The significance of the visit, apart from giving firmer foundation to the fledgling archival profession, was to reinforce the link between the creation of records and their ultimate use as archives.

The acceptance of this link did not occur without reference to 'traditional' practices nor has it been without its tensions over the years. At the time the potential conflict between the Jenkinsonian view of the archivist at arms length from the creation phase and the practice which had grown up at the national level (reinforced by Schellenberg's visit) was evident in the third Annual Report for 1953/54 of the Commonwealth Archives Committee (successor to the War Archives Committee):

> In recent months the Archives Division has co-operated actively with the Public Service Board in its drive to improve registry management ... It may be argued that work in this field is not normally within the province of an archives institution. However, the Committee firmly believes that records and archives management cannot be dissociated and that now more than ever, the quality of the archives of the future depends on the records management and disposal activities of the department. The archivist, because his [sic] work depends primarily on an analysis of the nature and content of departmental records and because his [sic] activities cover all departments, is in a specially good position to contribute to a general theory of records management on which practical experiments can be based.

It would be tempting to report that this tension was somehow resolved by the Committee's firm beliefs or practices as they evolved but it still exists today. It is true to say, however, that while the nature of Australian Archives' involvement in the creation phase generally has waxed and waned over the years,[9] the disposal and appraisal functions have always focussed on the whole life cycle of records with an emphasis on agency input and on disposal planning and coverage for all records regardless of value.

From the published reports of two Schellenberg seminars held in Canberra in 1954 the beginning of a more structured approach to the appraisal process and 'codification' of the values which might be used to select archives is apparent.[10] For example, Appendix D contains a report prepared by Ian Maclean (Chief Archivist) entitled the 'Values for which archives are selected' and Appendix E 'Draft instructions for Archives staff and Departments on scheduling and other methods of authorising destruction of valueless records'.

The Schellenberg visit was seminal in that it not only helped to reinforce the work that had already occurred under Ian Maclean but also cemented the 'American' notion of disposal practice. Maclean clearly demonstrates this in his article published in the *American Archivist* in 1959 entitled 'Australian Experience in Record and Archives Management'.[11] The article, written after a visit to England, Canada and the United States, covers three broad issues: general observations on the profession; recent developments in Australia; and the theory of recordkeeping. Firstly, Maclean points to a change in archival orientation, from primary concern about preservation of records of the past for use by the present generation, to the preservation of records of the present for future users. He then relates the Australian experience of archives and records management as it developed into a 'comprehensive public records administration' featuring an 'integrated archives and record center [sic] organisation' in tandem with the appointment of departmental registrars with responsibility for records management policy including, 'disposition scheduling'. Maclean then summarises the development of the

'Commonwealth Archives System' and provide some detail on the theory and practice of recordkeeping.

Maclean's summary of the development of the Commonwealth archives system is succinct:

> The Commonwealth archives program was launched during World War II. From the outset its two main objectives were, on the one hand, to provide facilities for preserving and making available Commonwealth archives and, on the other, to draw up, in cooperation with departments, lists of records which were *not* [Maclean's emphasis] to be included in the Commonwealth archives. It will not surprise American readers that under postwar conditions almost all the relatively limited resources available were given over to the work of surveying, scheduling, and appraising records and developing departmental disposition programs. The more traditional archival activities of preserving, arranging, and describing records were conducted on records center [sic] lines and the archives repositories developed chiefly as an adjunct to the government wide disposition program ... Hence it may be said that the Archives Division of the Commonwealth National Library,[12] although always conscious of the underlying archival objectives, was more nearly a record management division in the American sense.[13]

Whilst the more traditional activities which Maclean refers to above have been developed and undertaken, the influence of these early developments and the problem of excessive accumulations of government records have continued to consume the attention of the organisation.

Over the next few decades various processes and procedures were developed to deal with the disposal and appraisal of Commonwealth records.[14] With the development of the CRS System in the early 1960s and its aftermath, attempts were made to more closely align the development of disposal schedules and the description of records therein to the registered series which existed in agency custody and/or archives custody. For simple series the disposal class with disposal action was provided at the series level, for complex series the disposal class was at series level but the disposal action was provided in a sub-schedule at what could be called the activity level. Experience, however, over a number of years has shown that the record series and the disposal class don't always coincide.[15]

This last point is the key to another important developmental phase in the context of this article. In 1984–85 a team was formed within the Disposal Program of Australian Archives to review the disposal system in the light of the new legislative requirements of the *Archives Act 1983*.[16] From this came a more systematic approach to the disposal and appraisal of Commonwealth records which reflected the greater accountability requirements enshrined in administrative reform legislation then passing through Parliament. The Act was prepared in tandem with Freedom of Information legislation and was part of a

wider process providing for administrative and judicial oversight and review of government operations and decision-making. The major problems identified by the review team were:

- the lack of material which sufficiently explained the process of drafting a disposal schedule;
- the lack of standardised ways of reporting and reviewing the results;
- the lack of training for personnel in agencies developing authorities; and
- the excessive time taken to issue some schedules (in large part due to the first three problems).

The team concluded that 'better disposal decisions would be forthcoming if officers were given a firm structure within which to exercise an informed judgement and a standard way of documenting reasoning'. The key outcome of this review are the guidelines developed over the years since, contained in the *Australian Archives Disposal Manual*, which support the system of disposal authorisation. A further conclusion which was somewhat incidental to the main conclusions, but which in hindsight and in the context of our current thinking is very significant, concerned the scope of the coverage of appraisal projects aimed at all the records of a given agency. The team felt that such projects were often lengthy and unwieldy, and caused frustration all round. They recommended shorter more manageable projects with a limit on their size and scope and a more incremental approach to the development of disposal coverage. They also recommended concentration on the larger groupings of records where the visible results would be more obvious.[17]

This philosophy of smaller more manageable projects and concentrating on the larger groupings of records has driven the Archives disposal system until relatively recently. Whilst the structure and processes of the disposal authorisation system have remained virtually intact some major challenges have arisen to the philosophy, as outlined by the review team. These challenges can be broadly summarised as follows:

- as the larger groups were covered an increasing number of schedules were issued covering smaller quantities of records;
- many agencies found multiple schedules did not suit their needs, particularly for major sentencing projects and requested amalgamations as schedules were up-dated;
- concentration on this approach ran the risk of neglecting smaller accumulations of high value archival records; and
- with the development of appraisal policy for electronic records it became increasingly obvious that the previous incremental approach was not only inadequate for the appraisal of electronic records, but for appraisal of all records.

The development of strategies to deal with the appraisal of electronic records has had a significant influence on the development of appraisal strategies and methodologies generally. This point is significant in that it is now proposed to deal with electronic records as part of the total recordkeeping picture.

The Appraisal of Electronic Records[18]

The genesis of the early electronic records appraisal methodologies in the mid 1980s needs to be seen as part of the attempt, at the time, to deal with so-called 'special format records'. It was felt that special format records had to be dealt with differently from 'standard' paper records. Electronic records were placed in the same bag with audio-visual records, photographs, maps, plans etc. We considered that special approaches and expertise were needed to deal with these 'different' records. There was even some doubt then (still prevailing in some quarters) that electronic records were really records at all.[19]

The first attempts by Australian Archives to develop guidance and methodologies for the appraisal of electronic records were heavily influenced by overseas practice, particularly Canadian practice. The key influences on the process (and there are many others[20]) were the early work of Charles Dollar, particularly his 1978 article and the work done at the Machine Readable Archives Division of the Public Archives of Canada, by John McDonald and Sue Gavrel.[21] It was ultimately the Canadian approach to the appraisal of electronic records, consisting of the twin components of technical analysis and content analysis that Australian Archives adopted.

The level of resistance to this methodology and the formative guidelines that went with them together with the growing realisation that they did not suit Australian disposal practice gradually forced a re-examination of this approach. In particular, there was resistance to the level of technical detail required (and based on this was the perception that it was difficult for archivists with no technical understanding of computer systems). When the Canadian approach was re-examined in the light of Australian Archives experience it seemed that, whilst the appraisal techniques were basically sound, the technical aspects of the exercise were designed to be applied to records just prior to their transfer to archival custody; hence the need for detailed technical information. It was concluded that a guideline was required which was more suitable to Australian Archives appraisal practice whereby the great majority of appraisal work is done well before records are due to be transferred into custody. In addition, the development of classes for schedules had evolved to be based on ongoing functions or broad groups of records not series. Australian Archives was then (and still is) only providing passive access[22] to electronic records taken into custody.

At the 1992 workshop, *Managing Electronic Records* organised by the Australian Council of Archives, Australian Archives presented its Electronic Records guidelines to the wider archival community for the first time.[23] Papers were delivered by Australian Archives staff and agency representatives, on various aspects of the selection and management of electronic records. A paper 'Appraisal of Electronic Records by Australian Archives' outlined the development of appraisal policy within Australian Archives since the mid 80s, and provides examples of some recent appraisals undertaken.[24]

The workshop was the first public statement of the move away from the 'Canadian approach' which had itself been announced at the *Keeping Data* workshop (also in Sydney) two years previously, in October 1990. At the workshop and in the appraisal guidelines current at the time the 'Applications' approach was promoted as the preferred option to employ in the development of classes for disposal schedules. This essentially meant that the development of classes is linked to the functional applications which run on computer systems; applications 'produce records or transactions and provide the framework and administrative context in which data is managed.'[25] An example of an authority using this approach covering the records of the Department of Veterans' Affairs was included in the papers from the Workshop.

Since that time Australian Archives has had cause to modify its approach still further. Appraisal by function is still very much the focus of our approach to the appraisal of electronic records.[26] However, it is now considered to be important, in schedules dealing with electronic records, to be more specific about which records need to be retained and for how long, so that a 'record' is actually created and maintained. The concept of a 'transactional record' (i.e. a record as evidence that a transaction occurred[27]) is not always apparent in the electronic environment. Previously schedules had specified applications, databases, even systems in some cases, and this was considered to be enough to enable records to be selected and preserved. This approach is no longer satisfactory because it does not provide details of 'records'.

In the electronic environment, because the content, context and structure[28] of records is not self-evident experience has led to the conclusion that it is imperative to specify which records are to be captured. As a consequence, to enable the records to be physically selected, more specific details about what data might be needed to make the record needs to be provided linked to good descriptions of the functions to which they relate. This point is critical if we expect agencies to implement authorities and commit themselves to building disposal considerations into system development life cycles. The need for archivists to intervene in the records creation process has never been stronger or more imperative than it is with electronic records.

IT (Information Technology) managers are clearly key to this process as it is they who will (a) physically capture the records and (b) develop or re-develop systems to ensure that records are identified and retained for the appropriate period of time.

To provide IT managers with the necessary information an appraisal is undertaken at the 'logical level' i.e. the high-level diagrammatic representation of the system where it is relatively easy to see what functions the system manages and where records may be kept. Appraisal done at this level is independent of how the records are physically stored. The next step is then to build a link between the 'logical level' of a system and the 'physical level' (the level of databases, files, data etc). Details of this linkage are covered in the case study which follows. At this point though it is worth making the comment that the approach being advocated, i.e. functional/logical level appraisal, is seen as producing a simple, integrated and non-redundant definition of the permanent records that is independent of frequent system and software changes.

One principle outlined at the 1992 workshop still holds and is worth repeating here. It is Australian Archives primary concern to locate or identify permanent electronic records. Provision of coverage for all other records, whilst important because of the legal obligation to do so, should be a by-product of this process rather than a principal focus. The rationale for this is threefold. Firstly, the Archives' primary responsibility is to select and preserve archival records. Secondly, the resources devoted to the exercise must produce the most worthwhile outcome in terms of identifying the records with the highest values. Thirdly, it has been recognised, from experience, that a significant proportion of most records and data on systems will be of temporary value. Because of these three factors agency functions and recordkeeping systems need to be examined at the broadest level. From that point the activities and processes employed to manage these functions are examined in more detail and the values of the records created as a result determined.

Regardless of the way in which records are kept, be it electronic or otherwise, they can be appraised using standard methodology and employing standard appraisal criteria. To re-emphasis the earlier point, 'Records is Records', 'the medium is **not** the message, the message is the message.' It is the recordkeeping systems of agencies which we now must appraise; looking at information flows, the interrelationships between elements of the recordkeeping system, what (or even if) records are created in the documentation of activities and functions, and crucially what information is needed in our schedules to ensure that records are able to be captured by the IT people responsible for their maintenance.

Case Study

A practical example of the functional approach to appraisal is the appraisal of the electronic records of the Department of Immigration and Ethnic Affairs ('the Department').

This project began as a coincidence of needs. The Department, which had been rapidly computerising its functions during the 1980s and early 1990s, was beginning to recognise that the increase in data volumes could not be sustained without a marked loss in the efficiency of its systems. To increase the computing power to match increased volumes could not be sustained within current diminishing Systems budgets. At the same time, due to some recent appraisal activity, Australian Archives recognised that the coverage provided for electronic records was inadequate to meet the Department's needs. The timing for the appraisal project also coincided with the first phase of Australian Archives' Electronic Records Project (which was looking at the question of ER identification and appraisal) and it was seen as an ideal vehicle to test and more fully develop Australian Archives' electronic records appraisal methodology.[29]

The following broad functional analysis of the Department will place the appraisal in context:

The Commonwealth Department of Immigration and Ethnic Affairs is responsible under the Administrative Arrangements Orders for:

- Migration, including refugees;
- Citizenship;
- Ethnic Affairs; and
- Post-arrival arrangements for migrants, other than migrant child education.

The Department was established in July 1945 taking over the functions of the Immigration Branch of the then Department of Interior. Subsequently the Department has been known as Labour and Immigration (1972–1975), Immigration and Ethnic Affairs (1975–1987), Immigration, Local Government and Ethnic Affairs (1987–1993) and after the March election in 1993, again Immigration and Ethnic Affairs. The Department manages the Immigration function through four functional programs and a number of sub-programs as follows (administrative support functions are excluded):

Citizenship

Migration
- Immigration and population research
- Permanent entry
- Temporary residents

- Review
- Refugees, humanitarian and special assistance

Students, visitors and entry
- Students
- Visitors
- Entry
- Compliance

Settlement and Ethnic Affairs
- English training
- Interpreting and translating services
- Information/orientation
- Access to Services
- Ethnic Affairs[30]

The Department began to computerise its systems in the early 1980s. The manual system could not cope with the visa applications resulting from the tourist boom generated by the 'Paul Hogan' advertising campaign. The Department began by automating the visa issuing system which is now operating in about sixty countries enabling rapid visa issue at source. Other functions followed. In 1988 a system was introduced to facilitate the issue of Citizenship certificates to overcome counterfeiting problems. The Travel and Immigration Processing System (TRIPS) was introduced in 1989/90 to integrate visa, passport, alert and movements data into the one system, provide travel documentation authentication, provide on-line capture of passenger clearance records and hold and maintain Australian passport data. The process of automating business functions continued until the present with a multiplicity of systems now in place[31]. The computerised systems the Department uses to manage its electronic recordkeeping systems can be broken down into functional and housekeeping systems. The appraisal dealt only with the functional systems of the Department. The major systems/applications are listed below against each function:

Citizenship
Citizenship Automated System (CAS)

Compliance
Compliance Computer System

Migrant and Entry Systems
Immigration Records Information System (IRIS II)

Residence

Residence II
Client Services System (Client Status Management System)

Movement

Travel and Immigration Processing System (TRIPS)
(including an Interface to PASS (Australian Customs Service))[32]

A number of these systems are integrated or linked to systems outside the agency. For example TRIPS, Residence II, IRIS II and CAS are linked and can be accessed either directly or through the Client Status Management System (CSM). Also TRIPS interfaces with the PASS System which is managed by the Australian Customs Service and is installed at major Australian ports.

The object of the appraisal was to select the records from the functions listed above which, assessed against the appraisal criteria, were deemed to have permanent or long-term value. In addition the Department was concerned about the massive volumes of movements data generated on its TRIPS system and required a method to ensure data required for short term, administrative use was not retained for longer than necessary.

But selecting the records is only half the exercise. As this was the first electronic records appraisal of its type conducted by Australian Archives we had to ensure that the resulting authority could be effectively implemented by the agency. This involved not only providing details of which records, but also which data would be required as components of those records. Linking the 'logical level' to the 'physical level' enables IT personnel to physically select the 'records'.

To illustrate this last point it might be useful to look at the process involved in selecting a particular record and how this might be represented in terms of the data on the System. Taking the Citizenship function, as an example, the first step is to examine the responsibilities of the function. The Department's *Annual Report* (1992) advises:

Citizenship

The objective of this program is to facilitate the grant of citizenship to eligible persons to enable their full participation in Australian society.
The Citizenship program, managed by the Migrant Entry and Citizenship Branch of the Department, administers the operation of the Australian Citizenship Act 1948, regulations and instructions which govern the:
- full range of circumstances under which Australian citizenship can be acquired or lost; and
- maintenance of accurate records of persons who acquire or lose citizenship and the provision of evidence of citizenship to people requiring it.

The strategies being pursued to achieve the program objective are:
- reviewing operating procedures to streamline the processing of applications and to increase program efficiency;
- improving the training and productivity of processing officers; and
- updating the Citizenship legislation.

The most significant records created by this function and indicated above in the functional statement are 'records of persons who acquire or lose citizenship.' In this case these 'records' in their broadest sense are contained in application case files and significant details of the application process maintained on the Citizenship Automated System (CAS) system. The CAS system produces, electronically, the Citizenship certificate. For persons not born in Australia the details enshrined on the Citizenship certificate form the fundamental record and basis of their rights as Australian citizens. Collectively they form a record (along with Birth and Marriage records) of primary importance to individuals, as evidence of an entitlement to individual rights, and of the Government's responsibility to those individuals. These evidential qualities persist beyond the life of the individual concerned for a country such as Australia where immigration has played such a fundamental role in its development.[33] As a result it was determined that these records should be retained permanently. Essentially these disposal classes specify that a record of the Grant of Citizenship and a record of the Relinquishment of Citizenship are to be kept permanently. So what are the components of this record?

The Citizenship history summary, from the CAS System entitled 'Summary of a decided Citizenship Application' illustrates the information which an action officer requires to verify the status of a particular application. The Summary record combines the following data as a record:

> Citizen ID/Box Number/Name/Basis for Citizenship/Birth Date/Sex/Birth Place/Address/Date Arrival/ File Number/Marital Status/Previous Citizenship/Previous Residence/Certificate/Certificate Issued/ Ceremony Date/Comments.

The above categories are the way the software arranges the summary screen and describes the data as it is provided to the action officer. This is merely a convenient way to arrange the information which the user seeks. The data in CAS and other systems can be accessed through the Client Status Management System (CSM). Through CSM the Client Status for more than one application can be accessed for an individual client. Unfortunately, the descriptions of the data on the screen are not precisely the way the data is described in Systems documentation, the data dictionary and therefore in the programming code (although linkages are maintained). The data is actually comprised of a number attributes and entities. For example the Name and Address can include the following data attributes and entities.

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NAME  =        CLIENT NAME.Family Name
               CLIENT NAME.Given Names
               CLIENT NAME.Current Name Flag
               CLIENT NAME.Name Added Date
               CLIENT NAME.Name Change Comment
               CLIENT NAME.Name Effective Date
               CLIENT NAME.Name Effective Date
               CLIENT NAME.Name Type Code

ADDRESS  =  CLIENT.Postal Added By System Code
               CLIENT.Postal Address
               CLIENT.Postal Effective Date
               CLIENT.Postal Postcode
               CLIENT.Residential Added By System Code
               CLIENT.Residential Address
               CLIENT.Residential Effective Date
               CLIENT.Residential Postcode
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As details of more than one application or record can be accessed through CSM it seemed reasonable to propose keeping the records in the long term on that basis. The Department is moving towards fully integrated systems, of which CSM is the basis, so this seemed the most logical way to go. In essence we decided that the principle access point to all data should be based on the client and the client's relationship with the Department through particular functions, such as Citizenship, Permanent Residence (i.e. applications for a particular 'service' provided by the Department).

Having made that decision the next step was to devise a way for the classes in the disposal authority, based on functions/activities and records, to be acted upon by Systems personnel who would be responsible for physically selecting and maintaining the records; in other words to facilitate the sentencing process. Traditional sentencing methods are clearly inappropriate for this task. Sentencers and action officers cannot sit and casually peruse electronic systems and sentence records in the way they could with non-active paper files. Whilst they might know what the records are they would not have the ability to deal with the technical process of selecting and managing the electronic records.

To bridge this gap additional details are required in schedules. The details need to be in language that Systems personnel would understand, without compromising the essential nature of the disposal process and the disposal schedule. There are three types of information required:

• the class descriptions are ordered by function. These classes essentially indicate which records should be kept for which

functions, for how long and where (although the 'where' is, at time of publication, very much an unresolved issue);

• a data model is provided which indicates the interrelationships between the activities and data and which data elements should be retained (see Figure 1);

• a listing is provided of the relevant data elements as further assistance to the Systems personnel.

The class descriptions, organised by function, serve a threefold purpose. They act as a set of criteria to enable appropriate records to be selected. They also act as a method of describing the records and their retention periods. From an electronic records viewpoint they allow for continuing coverage over time through changes and upgrades in systems and applications. This stems from a recognition that functions, in the broadest sense, have far more stability than the systems used to manage them. In theory, by taking the macro view of the agency and its functions, we can select records without necessarily being concerned about their format. In practice, we need to be concerned about the multi-media nature of certain records and examine closely whether, for reasons of uniqueness or accountability, they need to be preserved in one or more than one format. For example, a comprehensive record may only be found by examining case files and application records on the computer system together.

Attached to the disposal schedule is a data model, a list of data entities and attributes (such as those above) and current systems lists. They are designed to provide details which we hope will enable the agency IT people to physically select the records (or at least ensure they are not destroyed). At this stage of the project we are awaiting advice from the agency confirming its ability to be able to do this, although we are reasonably confident, based on earlier advice from agency IT people, that we are on the right track. The ultimate test, however, will come from the agency addressing the implementation of the authority and its full implications.

It should be made clear that the primary concern of this project was the electronic records as disposal coverage was already in place for the significant paper records of the Department. The need to concentrate on the electronic records for policy development reasons drove the process, although the nature of that coverage certainly influenced the outcome of the electronic records appraisal, particularly in regard to the relationship between case file records and related electronic records.

Increasingly the preferred strategy will be to appraise an entire Department's recordkeeping system(s) by concentrating on its unique core functions as part of a mega-appraisal where the focus would be on the selection of the most important records regardless of format. This

approach is seen as the most effective long term solution to maximise the outcome from the resources available and to ensure that the most important records are identified and preserved. The strategy will be to look at recordkeeping systems and such things as the interrelationship between records in different formats and potential duplication between elements in the system. The Records Evaluation and Disposal program of Australian Archives has begun preliminary work on a nationally focussed broadly based appraisal strategy which involves prioritising Departments/Agencies[34] as a basis for the development of appraisal projects. As a pilot in 1993/94 the Australian Taxation Office was chosen as a test for this approach.

The long term custody of the records and provision of access to them was not directly addressed as part of the appraisal project. At this stage of the Electronic Records Project Australian Archives is examining the feasibility of long term retention of electronic records by creating agencies versus transfer of the records to the Archives. The details of this will be issued at the end of Phase Four of the Project due for completion in June 1994.

Costing Retention of Permanent Data[35] by the Department of Immigration and Ethnic Affairs

One issue that was addressed which impacts on the Department's ability to keep the records in its custody is the question of cost. We see the question of cost as a key appraisal criteria against which to balance the other considerations of value. The preliminary findings are based on work conducted by consultant Rob Smith-Roberts who was engaged by Australian Archives as part of the Electronic Records Project to enquire into this issue.[36]

Using the findings of the appraisal stage, the consultant set about estimating likely data volumes based on 'record' type[37] to be retained permanently. This consisted of establishing data volumes for individual records which are made up of client and application data and then multiplying that by the volume of records created per annum. An estimation was then done of the likely growth rates per year for the next fifty years. The following table provides a summary of the approximate 'permanent value' volumes the consultant estimated would be involved for the major record types — Application for Citizenship/Application for Permanent Residence and Compliance cases.

In bulk terms, the permanent value 'records' held is in the order of *1.05 million* and the raw data is in the order of *44.3 megabytes*. The growth per annum is estimated at around *0.6 million* 'records' and *22 megabytes* of storage space.[38]

'Records'	size (bytes)	volume (now)	volume (growth)
Application (5 Attributes)	30	300 000	150 000
Application-Client (ID linkage data)	20	320 000	160 000
Client (6 Attributes)	20	250 000	120 000
Client Name (5 Attributes)	80 (avg)	280 000	130 000
Compliance Case (3 Attributes)	15	100 000	30 000

Even including the usual overheads for on-line data (indexing/backups etc.) this data still accounts for less one thousandth of the Department's storage which is currently between 120 and 150 gigabytes. After fifty years, assuming stable immigration patterns and stable government policies etc., this permanent value data should grow to around thirty million records and over one gigabyte of data.

Although the current cost of maintaining the permanent value data on-line is $750 per annum (based on mainframe costs for disk space at $15 000 per gigabyte per year) Australian Archives has no current requirement to store this data on-line. It is only mandatory that the data be preserved. Therefore, tape or cartridge storage would be adequate. The costs involved here are typically around thirty-five cents per slot per day (i.e. a slot in an automatic tape or cartridge library). This includes the cost of the tape or cartridge itself. Assuming one tape or cartridge can contain 200 megabytes of data (it is often more), the storage costs for the permanent value material are in the order of $130 per annum (using a single slot and not sharing the costs in spite of the unused space).

It should be noted that the reliability of tapes and cartridges is such that data should be copied from one volume to another every two or three years to reduce the chance of corrupting the data with Input/Output errors. For this reason most automatic tape/cartridge libraries have a built-in facility to exercise all tapes/cartridges on a regular basis.

The maintenance of access to the data is dependent on the agency migrating the permanent data in tandem with its current on-line data (permanent data will obviously be on-line or near-line whilst it has a current administrative use, the off-line data may only be the permanent non-current set). The Department has indicated that it has no intention of removing off-line any of the records the Australian

Archives has identified as being of permanent value. Logic suggests that inevitably it will, but given the lengthy periods of time some Immigration records remain 'current', it might be some time (possibly 50–100 years in some cases). Logic also suggests that records with a continuing but low reference rate will be kept in a 'jukebox' near-line environment, rather than continuously on-line. However, the point seems clear that 'permanent' electronic records, provided they are properly identified and managed, can stay in their creation environment for significant lengths of time. In this case there would be minimal additional cost to the Department whilst the 'permanent' records were needed on or near-line.

The above estimates could be affected by major changes to technology at the Department but it would depend very much on the nature of the change. For instance, a change in database management systems (e.g. from say ADABAS to some relational type) should have no effect on the estimates. However, a change in mass storage technology from cartridge to something else (e.g. optical discs) could have the effect of lowering the estimates considerably. A full systems environment change (say from some proprietary system to an OSI one) is likely to include a mass data conversion and, therefore should not incur any significant extra cost. However, there is a danger that historical data (already only on tape or cartridge) that is no longer needed by the production systems might be excluded from the conversion. In this case, the cost of converting 'permanent' value component of this data must be calculated.[39]

Preservation Copies and Transfers

Australian Archives has also been investigating the option of requesting preservation copies of the longer term or permanent value material. The primary rationale for this approach is to ensure that the agency actively and regularly involves itself in the disposal process; the key to the success of this whole exercise. This could be done annually by transferring either a 'full dump' or an 'incremental copy'.

A 'full dump' would involve the Department going through each of the major files annually and copying (to an ASCII tape) all the records that satisfied the permanent value criteria during that year as well as those already identified from previous years. The previous tape in Archives custody would be then superseded. Within ten years this will involve copying 6–7 million records annually. Each of the smaller reference files which explain such things as application codes, country codes etc. would also need to be copied. It is important that such reference files are synchronised with the main data records since the meaning of certain codes may change over time.

The alternative is to only transfer that data which is **new** since the last transfer (i.e. 'incremental copy'). An incremental approach would keep

the volumes down and can be achieved by accessing dates such as 'application outcome date' to see if they are after the last transfer. This date can also be used as a means of 'ageing' the data to determine how old it is. In addition an audit log of changes to data would also need to be included where changes had occurred since the last transfer. Transferring data to archival custody will incur costs additional to those shown in the previous section. The cost of tapes is relatively small, currently $15–20. The cost for a 'full dump' is marginally more expensive than for an 'incremental dump'. The major cost, however, given the current mainframe processing costs of around $100 per CPU minute[40] is the cost of extracting the appropriate data for transfer. Such programs are typically very efficient, but because of the volume of data to be read it has been estimated that annual costs might be in the order of $500. This is regardless of whether 'full dump' or 'incremental copy' was used. The final cost which needs to be factored in is the cost associated with the gathering and maintenance of the metadata. Because of the likelihood of database format and size changes, maintaining metadata will be an ongoing cost. For the agency these costs are estimated to be in the order of 1–2 person days per annum ($300–600).

There are some advantages to these approaches. Copies of the records are regularly deposited in archival custody as insurance. The archival records, whilst they remain on the agency's databases, are selected as a regular part of the IT process. The records remain accessible (via the agency system) and keep pace with agency IT developments.

It has been concluded from this preliminary costing study that the costs involved in the preservation of the permanent electronic records in the Department (including provision of preservation copies) would be in the order $1200–1500 in the first year. These costs are quite insignificant when compared with the overall costs of IT in the Department.[41]

The question of the necessity for archival custody (or otherwise) looms large here. Is custody an essential feature of the archival process for electronic records or can we ensure that they are 'morally and physically defended' without taking them into custody?

At the time of writing Australian Archives is investigating all options for the long term management of archival electronic records, including custodial and non-custodial options. There is an increasing recognition that a range of options will be ultimately required, including the provision of access on the Archives premises to some electronic records (e.g. defunct agencies, Royal Commissions). It is outside the

scope of this paper to delve too deeply into the technical issues of custody, transfer and access as its primary focus is the disposal/ appraisal process. These questions have been touched on in relation to the Department of Immigration case study because the issue of cost has a direct bearing on the appraisal decision-making process and the costing data (admittedly limited) developed as a consequence of the appraisal process is offered for comment by a wider audience.

Conclusion

This article has covered a broad landscape, from the development of Australian Archives appraisal practices to current thinking on the appraisal of electronic records. The main points have been covered in detail and others fleetingly and it is realised that many could do with further development. However, it illustrates a number of themes and issues:

- the medium is **not** the message;
- the appraisal paradox (the inexact but critical nature of appraisal);
- the strong influence of records management practices;
- the tension between a 'traditional' archives role and involvement in records creation;
- broadly based functional appraisal; and
- intervention and the creation of records.

It is precisely at this last point that the principles and practices of Archives Administration and Records Management merge. The need to adopt this interventionist approach at the very outset of the records life cycle, which for electronic records is the systems development phase, in order to preserve the archival record finally kills the notion that archivists are passive spectators at the genesis and over the formative years of the life of a record.

The notion of intervention is not a new concept, of course. Maclean and Schellenberg were advocating the involvement of archivists in the records management process in the 1950s. What is new is that archivists during the appraisal process for electronic records now need to specify that records **are** kept.

The pressing need for intervention to ensure that valuable electronic records are not lost dictates not only a more strategic approach to appraisal but also a more strategic approach to the whole field of archival practice. Traditional thinking and practice in relation to the intellectual control, custody, access and preservation of records need to be thoroughly re-examined. Our continued relevance as key players in the information age depends on it.

DILGEA High Level Data Model

Australian Archives

MOVEMENT
Holds details of a leg of travel by a tourist or any kind of traveller. It may be by air or sea or land (??) and it may be with or without visa. The details include dates and flight numbers etc.

EXTERNAL ORGANISATION
This contains details of organisations that have dealings with DILGEA. Includes Businesses, Migration Agents and Ethnic Multi-Cultural Organisations.

SETTLEMENT SERVICE
Includes details of each service given to clients as migrants. It includes education, language and translation services, telephone interpreter services, temporary accomodation and child care facilities.

REFERRAL
An example of a referral is where say an airline contravenes to DILGEA visa regulations by illegally transporting a person into the country. Information held includes the circumstances and reasons for the infringement.

SERVICE PROVIDER
These are institutions which provide educational, accommodation and other services to DILGEA clients.

CARRIER
Contains details of each airline and shipping company.

PERSON
Details are held about individuals at DILGEA. People may fill one or more roles such as:
Travellers (incl. Alert travellers)
Applicants
Interpreters
Sponsors
The kind of data held includes: Name, Address, Date of Birth, Sex and Occupation etc.

APPLICATION FOR SERVICE
The types of application that are handled by DILGEA include:
Migration
Residence
Citizenship
Refugee
Temporary Visa
Temporary Extension
Peoples Republic of China
The information held for each application includes details of the entitlements, review arrangements and the result (granted or refused etc)

ACCOUNT
This is mainly needed for handling accounts 'receivable'. This is for fees for things like residency and visa applications and also for fines which may eventuate from compliance action.

TRAVEL DOCUMENT
Types of documents involved are:
Visas
Permits
Passports and
'Alert documents

COMPLIANCE ACTION
Holds details for activities such as Prosecution, general casework, 'dob em' and intelligence work. May result in the use of a detention centre.

DILGEA OFFICER
Includes details such as name and level for each departmental officer within a DILGEA office or an overseas post.

ASSESSMENT CRITERIA
Contains details of each type of criteria applied in the assessment of an application. There will be a score based on aspects such as legislation and quotas (for professions etc).

What does a 'Chook's Foot' mean?
A —< B
This means that there are many instances of 'B' for each one of 'A'.

The model represents the major 'pools' of data within the department. There is no direct correspondence with existing databases (of which there are more than eighty) - being independent of implementation. It therefore provides a means for future integration. The Local Government portfolio is not included.

Figure 1

Australian Archives

DILGEA CSM (Client Status Management)

* = permanent value entity
(bold type and # within these indicates permanent value data item)

TRIPS PERSON ⑥
Person Id #
Record Status

CLIENT NAME ⑤
Current Name Flag
Family Name #
Given Names #
Name Added Date
Name Added System Code
Name Change Comment #
Name Effective Date #
Name Key
Name Last Used Date
Name Type Code #

CLIENT ④
Client Birth Date #
Birth Dept Country Code #
Postal Added by System Code
Postal Address
Postal Effective Date
Postal Part Code
Residential Added by System Code
Residential Address
Residential Effective Date
Residential Postcode #
Sex #

VISA ⑦
5 Attributes
(none required)

VISAED PERSON ⑪
11 Attributes
(none required)

NEW ZEALAND PERSON ⑨
9 Attributes
(none required)

NON VISAED PERSON ⑪
11 Attributes
(none required)

PERMIT ④
4 Attributes
(none required)

CSM APPLICATION ACTION
2 Attributes
(none required)

VISAED MOVEMENT ⑧
CP (?) Date #
Movement Direction #
Negotiated CP Date #

NON VISAED MOVEMENT ⑩
CP (?) Date #
Movement Direction
Negotiated CP Date #

CSM APPLICATION OUTCOME TYPE ②
Application Outcome Code #
Application Outcome Desc #

APPLICATION CLIENT ③
24 Attributes
(none required)

AUDIT DETAILS
10 Attributes
(none required)

CLIENT STATUS TYPE
2 Attributes
(none required)

ADP SYSTEM STATUS REASON
2 Attributes
(none required)

APPLICATION RECEIPT
1 Attribute
(not required)

APPLICATION ①
Active Application Flag
Application Form Number
Application Outcome Date #
Application Outcome Type #
Application Receipted Date
Application Receipted Time
Application Type Code #
Client Total
Current Case Id
Current Processing Action Code
Current Processing Office Code
Current Processing State Code
Duplicate Receipt Code
Extract Date
Extract Required Flag
File Number #
Initial Fee Paid
No Client Application Flag
Primary Receipt Number
Processing Commenced Date
Reconciliation Date
Sub System Code
System Code

APPLICATION ACTION
13 Attributes
(none required)

CLIENT STATUS
1 Attribute
(none required)

ADP SYSTEM STATUS
2 Attributes
(none required)

RECEIPTED APPLICATION
1 Attribute
(not required)

ADP SYSTEM
2 Attributes
(none required)

STATE
2 Attributes
(none required)

DILGEA OFFICE
2 Attributes
(none required)

DILGEA OFFICE CSM USER
2 Attributes
(none required)

PROGRAM
2 Attributes
(none required)

SUBPROGRAM
2 Attributes
(none required)

APPLICATION FORM NUMBER
2 Attributes
(none required)

APPLICATION TYPE ⑪
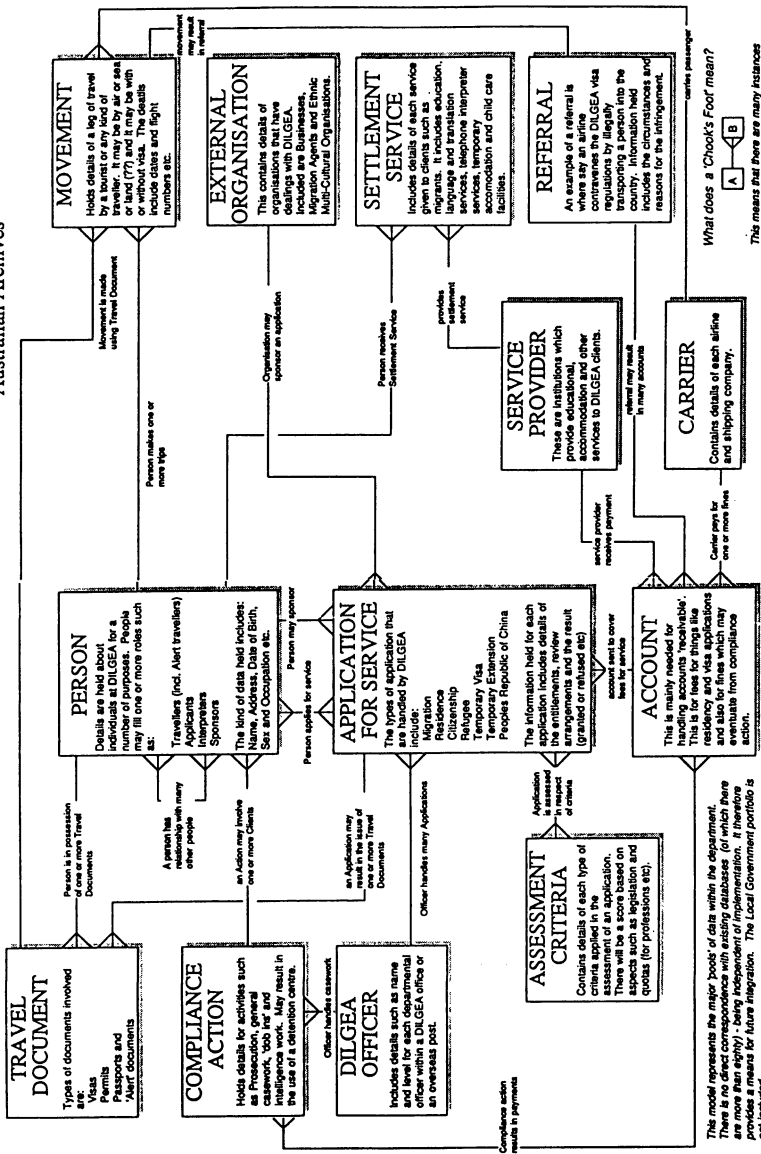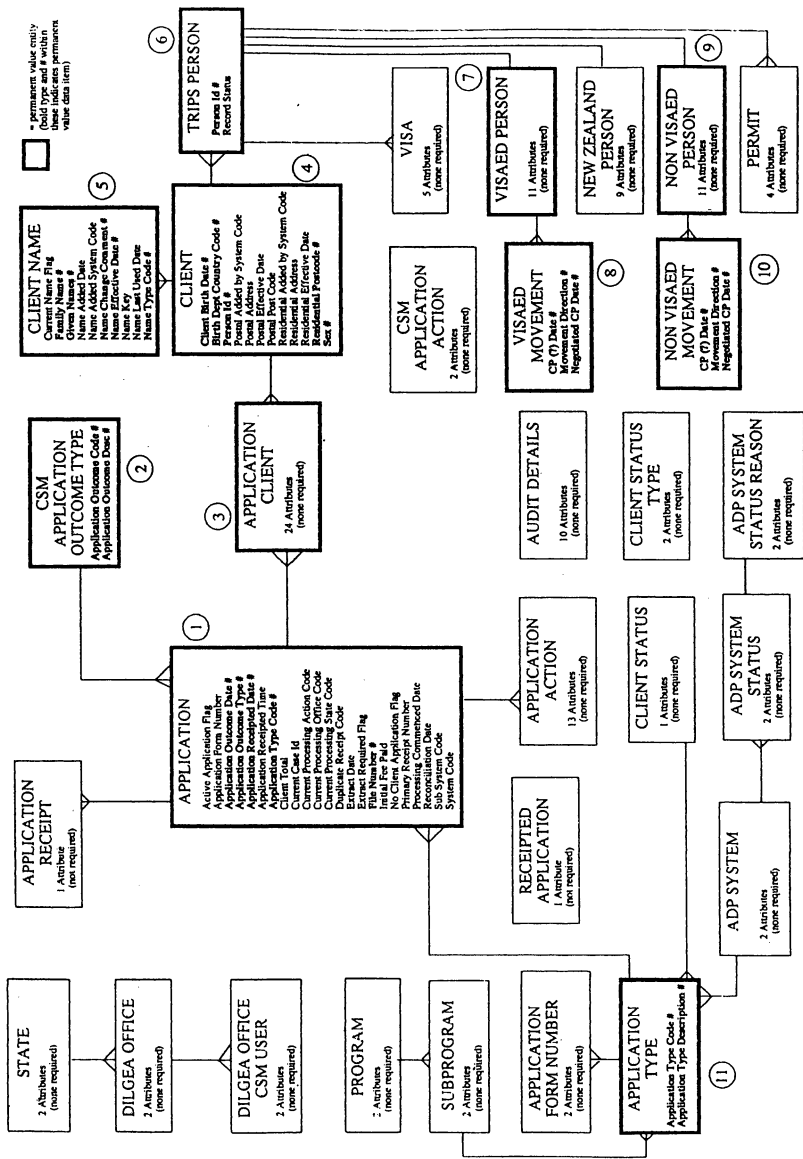Application Type Code #
Application Type Description #

Figure 2

ENDNOTES

1. See Steve Stuckey on the Petroleum Data problem 'The Good Oil for Australia' in Barbara Reed and David Roberts, editors, *Keeping Data: Papers from a Workshop on Appraising Computer-based Records, 10–12 October 1990*, Australian Council of Archives and Australian Society of Archivists Incorporated, 1991, pp. 95–104, and Australian Archives 'When it's Gone it's Gone' campaign literature and electronic records appraisal guidelines both developed during the latter half of the 1980s.

2. For example see Stephen Ellis, 'Ensuring Long-Term Access to Electronic Records of Permanent Value' in Dagmar Parer and Ron Terry, editors, *Managing Electronic Records: Papers from a Workshop on Managing Electronic Records of Archival Value, 30 October 1992*, Australian Council of Archives and Australian Society of Archivists, 1993, pp. 102–109.

3. Glenda Acland, 'Archivist — Keeper, Undertaker or Auditor: The Challenge for Traditional Archival Theory and Practice' in Barbara Reed and David Roberts, editors, *Keeping Data: Papers from a Workshop on Appraising Computer-based Records, 10–12 October 1990*, Australian Council of Archives and Australian Society of Archivists Incorporated, 1991, pp. 115–119.

4. C.E.W. Bean, 'Australian Federal Archives; John Curtin's initiative', *Historical Studies*, vol. 3 no. 11 November 1947, pp. 176–186.

5. Melbourne was the 'temporary' seat of National Government until the move to Canberra in 1927. Much central government administration was still located there at this time.

6. *First Annual Report of the Commonwealth Archives Committee from commencement to 31 June 1952*, Canberra, October 1952.

7. Michael Piggott, 'Schellenberg and the study of Australian archival history', *Papers and Proceedings of the 7th Biennial Conference of the Australian Society of Archivists, Inc.*, Hobart 2–6 June 1989, Australian Society of Archivists Incorporated, 1991, pp. 15–19.

8. T.R. Schellenberg, *Modern Archives: Principles and Techniques*, University of Chicago Press, Chicago, 1956.

9. It is now in the ascendancy again as the development of electronic records policies make it inescapable that we get involved at the 'front-end' of the electronic records life cycle at the systems development phase.

10. Commonwealth National Library Archives Division, *Proceedings of the Archives Management Seminar*, Canberra, 12–23 July, 1954 and *Proceedings of the Records Management Seminar 26–30 July*, 1954.

11. Ian Maclean, 'Australian Experience in Record and Archives Management', *American Archivist*, vol. 22, no. 4, 1959, pp. 387–418.

12. The Archives Division was separated from the National Library in 1961 and became the Commonwealth Archives Office until 1974 when it was renamed Australian Archives. Significantly, the Archives Division was responsible for government archives only. The collection of private archives, apart from those accumulated by politicians and senior administrators, was handled by another division of the Library. This function remained with the Library when the split occurred in 1961, a situation which still pertains to this day.

13. Maclean, op. cit., pp. 392–393.

14. See Dianne Easter, 'Records Disposal in the Australian Archives', *Archives Conference 1979: Supplementary volume of papers presented to the Second Biennial Conference of the Australian Society of Archivists*, Sydney, 18–22 May 1979, for an explanation of developments in the 1960s and 1970s, particularly pp. 30–45.

15. Record series here means a group of records maintained in the same alphabetical, numerical, chronological or other sequence, which usually have the same form, shape, and size. The disposal class, as used by Australian Archives, contains the notion of like value and is therefore quite different from records series which contains no notion of values, being part of a hierarchical system of intellectual control.

16. The *Archives Act 1983* for the first time provided a legislative basis for the operations of Australian Archives. Under s. 24 the Archives was given responsibility for the authorisation of disposal of all Commonwealth records. Disposal, in this context, covers the process of deciding on retention, destruction, alteration, transfer of custody or ownership of records.

17. Beverly Hart, Stephen Ellis and Ian Pritchard, 'The Appraisal and Scheduling of Government Records: A New Approach by the Australian Archives' *American Archivist*, Fall 1987, pp. 591–597.

18. Whilst there is no wish to get sidetracked into the 'what is a record?' debate two definitions with which Australian Archives currently works are: the *Archives Act 1983* defines a 'record' very broadly as any document or object (all media) with some form of informational content or relational context, and in a much narrower sense a 'record' is the evidence of the occurrence of a transaction.

19. Catherine Bailey, 'Archival Theory and Electronic Records', *Archivaria*, no. 29, Winter 1989–90, pp. 180–195.

20. For a perspective on these other influences on the Australian scene see David Roberts, 'The Disposal and Appraisal of Machine-Readable Records — From The Literature', *Archives and Manuscripts*, vol. 13, no. 1, May 1985, pp. 30–38.

21. See Charles M. Dollar, 'Appraising Machine-Readable Records', *American Archivist*, vol. 41, October 1978, pp. 423–30 and K. Gavrel and J. McDonald, *Appraisal Guidelines in the Machine Readable Archives Division*, Ottawa, Public Archives of Canada, 1981.

22. Passive access involves Australian Archives providing access to the media (tape or disk) but not to the data on the media.

23. Dagmar Parer and Ron Terry, op. cit. Guidelines 1 and 2 cover the appraisal and disposal of records. Guideline 3 covers the management of records identified as have permanent value (the archival records). Guidelines 4–6 cover the current and potential modes of continuing access to the permanent records; passive, active (Archives custody), networked access (custody by the agency). In each case the Archives collects and maintains the metadata.

24. Greg O'Shea, 'The Appraisal of Electronic Records by Australian Archives' pp. 14–67 in Parer and Terry op. cit.

25. ibid., p. 17.

26. This approach of appraisal by function was not developed in isolation being concurrent with developments elsewhere. The work of Terry Cook at the National Archives of Canada and the Dutch PIVOT approach are two key examples. See Terry Cook, *The Archival Appraisal of Records Containing Personal Information: A RAMP Study with Guidelines*, UNESCO, Paris 1991 and Netherlands Rijksarchiefdienst, *PIVOT, A Turning Point in Appraisal Policy*, The Hague, 1991.

27. See David Bearman, 'Archival Data Management to Achieve Organisational Accountability for Electronic Records', in Sue McKemmish and Frank Upward, editors, *Archival Documents: Providing Accountability Through Recordkeeping*. Ancora Press. Melbourne, 1993, pp. 215–228.

28. ibid.

29. Refer to Australian *Archives Disposal Manual* Section D and Section E for the current appraisal guidelines. These are available from Australian Archives.

30. The Department of Immigration, Local Government, and Ethnic Affairs, *Review '92: Annual Report 1991–92*, AGPS, Canberra, 1992.

31. Diana McPhetres, 'Development of a Data Management Strategy' in Dagmar Parer and Ron Terry, op. cit., p. 87.

32. Department of Immigration, Local Government and Ethnic Affairs, *Corporate Information Systems*, Canberra. May 1991 (to be up-dated 1993/94)

33. See Terry Cook, op. cit., for an extremely useful and thought provoking treatise on what is described as 'the Citizen-State interaction'.

34. Essentially Departments equal Ministries, Agencies are administrative elements below that level at the Central or Regional level.
35. Data elements were used by the consultant as a basis for the calculation of cost and is therefore used here and in this section when permanent 'records' would be more applicable.
36. Unpublished consultant's report: R. Smith-Roberts 'The Cost of Preserving Permanent Value Electronic Data: A Case Study', Australian Archives, 1993.
37. This 'record' is not a record in the archival sense where a number of data elements might be brought together as part of a transaction. The 'record' type is the primary element of data which generally has one or more attributes.
38. 1,000,000 bytes = 1 megabyte   1,000 megabytes = 1 gigabyte   1,000 gigabytes = 1 terabyte.
39. The Department of Veterans' Affairs advised, in late 1992, that the production of software to 'read' their old data tapes dating from the 1970s would cost approximately $50,000. This figure is significantly less than the cost of storing the agency's paper records in archival custody for one year (approx. $300,000).
40. A CPU minute is not the same as elapsed time. For example the extraction of data which takes an hour in real time might only involve use of the CPU for a total of one minute during the hour.
41. The Department's 1991–92 *Annual Report* indicates the IT budget for that year was approximately $14 million.