Electronic Recordkeeping

The Recordkeeping System as Framework for the Management of Electronic Records

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Foreword

Why this brochure? Determining the requirements for the management of electronic records is one of the main issues that the *Digital Longevity Program* (programmabureau *Digitale Duurzaamheid*) deals with. To do so, a number of concepts and issues must be clarified: what are electronic records? What quality standards should they meet, and what does their management involve?

This brochure summarizes current theory about the management of records as a framework for subsequent, more practice-oriented elaboration. The theories presented here are closely related to internationally accepted ideas about recordkeeping and are brought together through the concept of the recordkeeping system. It is this notion in particular that is explained here.

The recordkeeping system is not so much a ready-made software package as it is a framework for the definition of the functional and technical requirements that should be met when managing electronic records. The framework allows for the structuring of the requirements by arranging them according to the distinguishable business processes. A related activity is defining the requirements themselves, which can then be applied in practice. These will also be looked at. At the same time, further thought is given to the quality of electronic records, in terms of their authenticity and trustworthiness.

But first the framework must be made; thus this publication. Although there are many concepts in this brochure that should become self-evident, their explicit articulation is not always easy. This brochure does not pretend to be more than a first draft of a systematic description of recordkeeping. The description is not complete and, even less so, it is not the final word on the subject. Comments, criticisms and suggestions for improvements are therefore encouraged.

Archival Theory as Starting Point

The Dutch Archives Law of 1995 assigns responsibility to the government to preserve its records in a proper and orderly state. That is to say, the records must be accessible and useable, as much to carry out its own business as for political, administrative and juridical control; as memory and evidence. Records are increasingly stored in electronic formats which creates additional demands on their management. Points of departure and methodologies must be tested for their correctness and their usefulness in the digital age. What is archival management, why does an organization keep its records accordingly?

The 'Recordkeeping System' is the whole of people, resources, methods, procedures, data and knowledge with which an organization moulds into concrete the required quality of its records.[1] This article outlines what the concept consists of and how it can help to facilitate the demands of managing electronic records. It is intended primarily, therefore, for archival professionals such as document management consultants, records managers and archivists.

Electronic records are records; at its foremost, therefore, thinking about electronic records is thinking about records. The points of departure of that thought must be based in archival theory, not in the technology. The old archival theories cannot be ignored in light of electronic records, they must be re-introduced into the discussion. We are, in fact, witnessing such a critical analysis in modern research; in the United States (University of Pittsburgh), in Canada (University of British Columbia), Australia (Monash University) and others, but also in The Netherlands - in the Archives School and in the *Digital Longevity Program*.

The definition is slightly different from the original Dutch one. Basically the recordkeeping systems implements the recordkeeping function of an organisation. Bearman would prefer

This modern reconsideration of electronic records marks a turning point. In the seventies and eighties the technology itself was the focal point, which threatened some archivists and challenged others. Now there are more and more archivists and records managers who see in information technology the opportunity to give records their rightful place in the organization. They use it to distinguish themselves from other information professionals, or better; to establish what makes records so extraordinary. It is interesting to see the entry points which are used by the different theorists. Luciana Duranti at the University of British Columbia in Vancouver[2], for example, reaches back to the proven concepts of diplomatics; she takes the document itself as a starting point and looks for what turns a document into a record. This is how she arrives at her keywords: authenticity and reliability.

To fulfill their function, records must not only be retrievable, accessible and readable but also authentic and reliable: they must be what they claim to be, and what they claim must be true.

What is the function of records? Why should these documents be preserved? What interests are served by doing so? *Revolution in Records*[3] which has been a topic of debate in Dutch archival circles since its publication, names three different but related interests: (1) accountability (2) business operations (3) cultural-historical. The first two interests deal directly with why the record was created, as a product of a business process, the actions of a person, group of persons or any type of organization. This is, for example, the starting point of David Bearman, who was involved with the research on electronic records at the University of Pittsburgh. For him, the starting point is not the document but,

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'archiving' over 'recordkeeping,' because it implies more action. See David Bearman, "Record-keeping Systems" in *Archivaria* 1993.

[2] As a rule, the results of the various research projects are to be found on their respective websites. The website for the *Digital Longevity Program* has links to all the leading websites in this field.

[3] 'Omslag in Opslag'. The Hague: Ministry of the Interior, 1991. For an English translation see, Peter M. H. Waters and Henk Nagelhout, “Revolution in Records: A Strategy for Information Resources Management and Records Management,” American Archivist 58/1 (Winter 1995): 74-83.

instead, the business activity, in his words, the 'business transaction'. Business activities generate 'records' which document the business activity and, after which, can function as evidence, evidence of what happened in the process. Here we have another emerging archival keyword: evidence[4]. Records must therefore be authentic and reliable. Every type of process will place specific demands on the authenticity and reliability of the records which it employs.[5]

Providing evidence for accountability and business operations is not the only reason to consider documents as records and to preserve them. Records form an important part of organizational memory and all the records together make up society's memory. What applies to both the accountability function as well as the memory function, is that the relationships between the records and the process which generated them must be preserved, and thereby also the connection between related records. This is what Luciana Duranti calls the 'archival bond'.[6] Nowadays, the Netherlands Archives School is using a working definition of 'process-bound information,' essentially to establish the same principle, that records draw their meaning and relationships from the functions and business processes of the records creator - a principle that is anchored in a century of archival theory. Records can only be interpreted properly if their original context is known: the underlying relationships and the process in which they played a role. Contextual information is necessary to establish the authenticity of a record. All current research in the field of electronic records management pays considerable attention to what it means and entails to provide context for the purpose of establishing the reliability and authenticity of electronic records.

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[4] It is not entirely new. Already in the mid-1950's, Bearman's compatriot, Theodore Schellenburg introduced the concept of the 'evidential value ' and the 'informational value' of records.

[5] Which means it does not apply to 'dispositive records' (*akten*) alone, as in the archival definition: 'a dispositive record (*akte*) is a document, created to serve as legal evidence of that which it contains notice of.' *Lexicon of Dutch Archival Terms* (The Hague, 1983), no. 38.

[6] We can almost hear the Utrecht archivist P.J Vermeulen in this, more than a hundred years ago: "An archives is surely more than just a simple collection of historical manuscripts." P.J Vermeulen, *Inventory of the Province of Utrecht Archives*... (Utrecht, 1875) XVIII, printed in: P.J. Horsman en J.P. Sigmond, *The Land of Provenance. A Collection of Articles on the Principle of Provenance* (*Het Land van Herkomst)*. (The Hague, 1984); p.17.

Thus, the bond between an electronic record and its context must be established and preserved. If this doesn't happen and the records are removed and scattered from their relationships, much of their meaning will be lost. When there is then a need to establish the evidence of an activity or if a portion of the activities must be reconstructed, this will be done unsatisfactorily. There are many examples of this. Think, for example, of a pension plan for which part of the file went missing or a parliamentary inquiry for which a department can't find all the documents. To reconstruct these activities using the records, an accurate representation must be presented. At all times it must be clear what the records say, why they were made, and why they were used. This requires recordkeeping action before, during and after the business process. That is to say, before and during the creation of the record, and not only afterwards. The 'recordkeeping function' can be defined as the whole of the records management actions that an organization undertakes to document its activities, through maintaining the completeness, authenticity, reliability and accessibility of the records generated by the processes. The primary goal of which, say Bikson and Frinking, is "to ensure the availability and integrity of records."[7] The recordkeeping function ensures records maintain their reliability and authenticity, keeps them accessible and thereby serves the underlying regulatory requirements.

[7] T.K. Bikson and E.J. Frinking, *Preserving the Present. Towards viable records*. (The Hague: Sdu, 1993).

Memory, Accountability and Evidence

The awareness that the information in records holds important knowledge may not yet be strongly developed in government organizations. Still, governments use their records as memory, to ensure the continuity in the delivery of government services, for example. Knowledge management is a relatively new branch of information theory. A recent publication[8] in this field names the records as one of the components of the knowledge infrastructure: "learning from the past." As a source of knowledge, the collection of records must be compete, reliable, authentic and accessible.

These quality factors play an even more important role in the other function of the records: making accountability possible. There are different types of accountability: political accountability, financial accountability, legal accountability, accountability for internal business operations, societal accountability - to which we can add: historical accountability. We choose a somewhat different perspective than *Revolution in Records* and frame everything under the concept of accountability. The point of departure is therefore a requirement that is demanded of the organization: to delegate appropriate accountability to policymakers, the political sector, society, the tax department, accountants, the Auditor-General, stockholders, etc.. In our shared experience or, actually, in our legal and political system, authentic and reliable records play an important role as it relates to accountability. To a considerable measure, records make up the evidence that an organization did what it was supposed to do and, for which, they will be held accountable.

There are at least two activities that determine the availability of reliable and authentic records (information) as a source of evidence: creation and

[8] Gertjan van Heijst en Eelco Kruizinga, *Knowledge Infrastructure: The backbone of learning organizations (Kennisinfrastructuur: De ruggengraat van lerende organisaties*). (Utrecht: Knowledge Centre CIBIT, 1997); 13.

preservation. There are written and unwritten rules for the creation of authentic records. Judges, lawyers and other jurists deal with these on a recurring basis, but managers, journalists, archivists and historians do as well. For the most part, the responsibility for the drafting of the record lies with the person who is also accountable for the process. This person will be led, in the first place, by the requirements demanded of the process and almost never by the larger, eventual framework of accountability, unless the record is intentionally created therefore, such as licenses or legal records. However, the majority of records are not made to serve as evidence but for other reasons such as communication or to aid one's memory - to bridge place and time.[9] Moreover, the motives for creation don't have to be same as those for preservation. As a rule, the sending of a letter is how a communication is made with a person who is located somewhere else. The reason to keep a copy of the letter is to remember which communication has been made. Especially when it must be used to demonstrate something to a third party, authenticity and reliability come into play (although this is actually not any less important if a record is kept for personal reference). For those categories of records for which it is known beforehand that they will serve as evidence, specific requirements are demanded for their creation: licenses, for example, which have a fixed form and are often made by a person authorized to do so; or minutes which must be signed by the chairperson and secretary of the group to strengthen its authenticity and reliability. But, again: the creation of an authentic and reliable record is, in the first place, a concern of the relevant business process. Secretaries, clerks and chanceries can contribute support and special knowledge to this.

The recordkeeping function is a special, supporting business function. It ensures foremost that those records which could at some point serve to assign accountability as well as those that the organization needs, for whatever reason,

[9] The *Lexicon of Dutch Archival Terms*, shows this through its paragraph sections which, by their arrangement, indicate the motives for the records' creation. In his book, *Archivwissenschaft* (Marburg, 1976), the German archival theorist Johannes Papritz speaks of *Enststehungursachen*.

remain accessible for as long as necessary. This function makes accountability possible and maintains the institutional memory.

The recordkeeping system does not make records but ensures that, if they are made, that they are properly preserved. The English language literature names this portion of the function 'capture.'[10] The recordkeeping system preserves the captured records in such a way that they remain incorruptible, thus authentic and reliable. It guarantees that they can't be messed around with, that they can't be torn from their relationships and that they always remain accessible to those who are authorized to use them.

The recordkeeping system ensures, therefore, that all the records that it manages can be used in a proper way for accountability and memory. It is a type of information system that meets high quality standards; namely the delivery of authentic and reliable records for accountability and to carry out business. These records are not collected but generated and used in the business processes for which they can atone what has happened and in what manner. Providing this evidence is of fundamental importance to a democratic society.

[10] To some writers this is the nucleus of *archiefvorming*, more powerfully expressed in English as 'record creation.' This is not so much the making of the document but the accessioning of the document into the 'record system'. As it were, the recordkeeping system transforms the document into a record. It does not do so with all documents but only those documents that are generated in the business process, played a role therein, reveal knowledge thereof, can be used to determine accountability and is therefore preserved as a record by the organization - and thus must be preserved with care
- This is in large measure a theoretical, archival ideal in which the archival document is, in the first place, a document for which it can be guaranteed that it has the same qualities as it had originally. According to the Dutch Archives Law, every document which meets its definition is a record regardless of whether it is acquired by the recordkeeping system.

The Recordkeeping System

To define 'recordkeeping system' we must consider it as a concept not as an automated system. It is not a software package that one can buy. It is, in the first place, the complete description of the activities that an organization must carry out to bring its records under control and the means that are necessary to do so. It must be developed in terms of the organization, procedures and, eventually, the software.

Every government organization must manage its records and thereby has a recordkeeping function. A recordkeeping system can, therefore, be found in every government organization. However, the new elements of the concept are in the use of systems analysis and design methodologies and the explicit definition of system elements to give the 'recordkeeping system' a recognizable structure. From this emerges an instrument that can bring about the changes that are necessary to adequately manage electronic records.

The ICA defines a recordkeeping system as "an information system developed for the purpose of storing and retrieving records, organized to control the specific functions of creating, storing, and accessing records, to safeguard their authenticity and reliability."[11] This is a relatively global interpretation.

The definition of 'recordkeeping system' which will be developed in this article is: "the whole of the procedures, methods, knowledge, means and documents with which an organization gives form to its recordkeeping function."[12] This definition focuses on two important elements: the first element lists the parts with which the recordkeeping function is given form: "the whole of the documents, procedures, methods, knowledge and means." The second element

[11] International Council on Archives, Committee on Electronic Records, *Guide for Managing Electronic Records from an Archival Perspective.* Paris, 1997.

states what the recordkeeping system does: it gives form to the organization's 'recordkeeping function.' The first element will be dealt here because it is the easiest to define and because it makes it clear that the 'recordkeeping system' is not just a computer system. The second element (what the system does) will be addressed in the next section.

Just listing a recordkeeping system's parts (documents, procedures, methods, knowledge and means) makes for an incomplete definition. Each component must be developed into a more comprehensive and exclusive concept:

- Documents, the records. The entire system revolves around them. Although it is theoretically possible, we do not want to separate them from the system but, instead, to consider them to be the nucleus thereof. When under control and documented, all of the records together are a subsystem of the recordkeeping system that we identify with the term 'record system'. The record system can be all of the records, therefore, but also a segregated portion thereof. This depends in particular on the organization and how it fulfills the recordkeeping function.

- Procedures, also included with this component is computer applications as so many of the system's tasks are automated. In fact, from a computer's perspective, a software application is a procedure. For the most part, however, procedures are carried out manually, that is to say, tasks performed by people. For the sake of brevity, we shall refer to both manual and automated tasks (those carried out by software applications), as 'procedures'. In a recordkeeping system, procedures are concerned with such things as the registration of correspondence, the manner in which disposition takes place, or how records are made available for consultation.

[12] The word 'organization' in this definition can be traded for any cooperative effort between two or more persons.

- Methods are of a higher order than procedures. They have, for example, a theoretical basis. It is archival methods that are used to determine the essential functionality of the recordkeeping system. Such as the description, classification, or the appraisal (including establishing its criteria). Methods can also be borrowed from information technology; this applies, for example, to the storage of records.[13]

- Knowledge is needed to ensure that recordkeeping system functions properly. In all instances, the recordkeeping system consists of archival knowledge. The methods are, in turn, the application of that knowledge. But more knowledge is required to ensure that the system functions well. For example, knowledge about the system's environment, the organization's business sector and its operational procedures. Knowledge about the organization applies to its structural units, what they do, where responsibility lies, who has what authority and, eventually, even the physical environment of the organization. Moreover, legal, financial, political and administrative knowledge is necessary to know how the lines of accountability run and which records are required therefore. Technical knowledge is also necessary, for the maintenance of software or the materials that were used, for example. The system must know when a particular record must be converted or migrated. In currently existing systems, knowledge is captured in manuals, instructions, regulations and,for a large part, in people's heads. For the proper management of a recordkeeping system, it is crucial that the necessary knowledge is explicitly formulated[14].

- Lastly, we include People, Means and Materials. Materials are mostly trivial concerns such as paper, boxes, tapes, folders, and so on - which must meet

[13] The recordkeeping system itself can also be developed very well using information technology methodology; ideally this should happen. It is not for naught that that the previously cited ICA definition calls the recordkeeping system an 'information system.'
[14] Peter Horsman, "A knowledge-based electronic record-keeping system,' *Proceedings of the DLM-Forum on electronic records*, *Brussels, 18-20 December 1996*. (Brussels: European Commission, 1997) 54-59. Ibid., "A model for a record keeping system," *Proceedings European*

> certain quality norms. Means are the things that do the work: aside from the people, those are computers and other equipment. People are also the holders of knowledge and people follow procedures. What we are developing here is a somewhat mechanical concept, that people are part of the system. The ideal recordkeeping system is objective and the more human discretion you can eliminate from it, the better.

A recordkeeping system is, therefore, more than a computer system. Recordkeeping is a supporting, administrative function. Carried out by people, although with the help of computers, it is based on certain methods and follows its own procedures. We consider the recordkeeping system first as an abstract concept, then as a concrete object.

Experts' Meeting on Electronic Records, June 18, 1997. (The Hague: National Archives/Digital Longevity Program, 1997) 51-59.

Quality Standards for Recordkeeping

To fulfill their accountability and memory function for as long as is necessary, records must be managed in such a way that they stay:

- complete
- authentic
- reliable
- retrievable
- accessible
- useable

'Complete' means that none of the parts of the information on the record goes missing as well as that all the relevant records are preserved. 'Authentic' means that the user of the record can assume that it is genuine. 'Reliability' concerns the correctness of the information. 'Retrievable' suggest that the records can be located. 'Accessibility' is achieved when the found or retrieved and readable records can be consulted in a timely manner by those who need them and have the competence to do so. 'Useable' means that the records can actually be read, something that can not just be assumed in the electronic environment.

Recordkeeping Processes

The second element of the 'recordkeeping system' definition is concerned with the dynamic side of the system: the 'recordkeeping function.'[15] Put in another way: what does the system do? which activities does it carry out? of which processes does it consist. After developing a summary of the system components in the previous section, this section will contribute further to understanding the 'recordkeeping system' concept by describing the processes which make up the recordkeeping function.

(1) The very first process is Capture, which takes records into the system. With a little stretch of imagination, the old label 'registration' can be applied; it is also sometimes referred to as 'acquisition.' The process includes the choice of whether or not a record is taken in as well as the acquisition itself. At capture, the contextual information and metadata will also be acquired. We will return to this with 'description.'

(2) The second process is the Storage of the record on a suitable medium as one or more computer files. This process is a direct extension of capture. The record must be stored in such a way that the sender or addressee or anyone in the organization cannot alter the record any longer. Reliable storage is the first prerequisite to maintaining the record in an authentic and reliable manner. Registration alone is not enough in the digital environment since electronic records can be easily altered. In practice, the person for whom the record was intended would also receive a copy for further handling in the administrative process; the recordkeeping system would also save a copy which is exactly equal to the created record and which cannot be altered. Revising records must then be considered the same as creating new records.

[15] a recordkeeping system is "the whole of the procedures, methods, knowledge, means and documents with which an organization gives form to its recordkeeping function."

(3) The third process is the Arrangement, creating files, for example: establishing the relationships between records - what was previously identified as the 'archival bond.' This can be in the form of files, but there are also other forms such as series, or arrangement according to activities. A special quality of electronic records is that multiple arrangements are possible. The bond between the record and the process in which its functions is fulfilled is, in any case, essential. In an electronic recordkeeping system, arrangement and description are generally dealt with together. The physical arrangement is not of concern, it is in fact dealt with wholly by the operating system. The logical arrangement is established in the classification scheme and through the descriptions of the records.

(4) Process number four is Description. An electronic recordkeeping system does this largely automatically, in fact all essential information about a record is made known to the system when it is accessioned. Description is therefore about the contextual information and the metadata. Contextual information consists of data such as sender, addressee, businessprocess, the applicable organizational unit, and so on. Metadata is the technical data from the computer and data communications system that generated and, respectively, distributed the record. Metadata plays a primary, if maybe not an exclusive, role in automated systems. When this information is acquired at the same time as 'capture,' low-level description, particularly the connection with the business process, can happen almost completely automatically. In an electronic environment, description at the series-level and at other high-level aggregations will still have to be done by the archivist.

(5) The fifth process is Appraisal, the determining of how long records should be preserved by the system. Appraisal takes place as a continuing process. In fact, it already begins in the capture process; namely the decision whether a document should receive status as a record. Appraisal is also of interest to an electronic archives. Even though physical space hardly plays a role, storage and preservation costs money and every dollar that is spent on preserving

extraneous information could be better spent somewhere else. The appraisal process takes into account all the underlying interests, those of business administration, accountability and memory.

(6) The almost logical continuation of Appraisal is Disposition. In every case, disposition affects those records which may be destroyed. Whether records with 'preservation' status must be removed - by transferring them to an archival storage place, for example - depends on a number of different factors, such as agreements, technical requirements, internal use, etc.. The long-term preservation of electronic records will be affected by an ongoing, theoretical discussion about how much archival agencies will be able to manage complex systems. Some assert that all the management is better carried out by the records creator and that archival agencies must limit themselves to establishing access (the *non-custodial* concept). Others believe that archival agencies must take control of all records after the expiry of the legal period, however that may be done (the *custodial* concept). Yet others surmise that the solution lies somewhere in between: an archival agency takes over as much as possible and the very complex, organization-specific systems will stay with the creating organization.

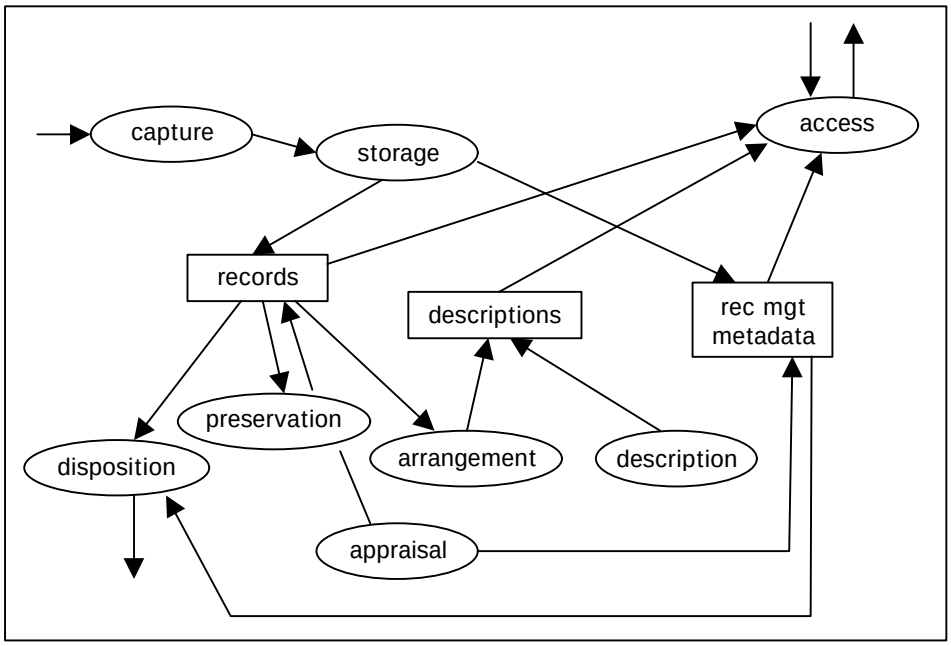
(7) Then there is the process of Preservation, the conservation, which is much more dynamic in the digital than the paper environment. Electronic records are dependent on software which quickly becomes obsolete. This means that the recordkeeping system must continuously migrate records. This is more than copying from one tape to another, or to convert from one type of medium to another. Migration means, foremost, the transfer to another software environment. This is almost always paired with the loss of attributes. Determining which loss is acceptable is an important component of a migration strategy.

(8) Possibly the most important function of the recordkeeping system is Making Accessible, which makes the records available to those that are interested in

them. Thanks to the preservation process they have remained in a readable and understandable form; likewise, thanks to the arrangement and description process they can be found and understood in their context; thanks to selection and disposition, the junk has been weeded out. 'Making accessible' ensures that whoever asks for the records, gets them, given that the requester has the proper access authorization.

Figure 1

Schematically, the connection between the different processes, the record collection, and the descriptions looks as follows:



Facilitating the search for records is not a specific function of the recordkeeping system but a separate component that is directed, not only to the archives, but also to other information collections, such as libraries, databases, the Internet, etc.. Search systems in the electronic office must be intelligent: they must know which information is stored in what information collection and how these collections must be accessed. The collections themselves look after the further delivery, including authorization and presentation. For the recordkeeping system that means, for example, that not only the requested record is presented, but also the contextual information.

The Changing Role of the Archivist

The digital age demands that archivists[16] re-evaluate their profession. They must begin to design and manage recordkeeping systems; translate organizational requirements related to memory and accountability into actions of the recordkeeping system; they must express these requirements as well as their own and other available knowledge into a form that can be understood by the system, such as collections of rules, neural networks, frameworks and whatever methods might be available for knowledge representation. The new role of archivist as records manager is less oriented towards carrying out manual tasks than developing, guiding, controlling and translating what the environment demands from the system. The role is also pro-active and definitely not passive. The archivist is the one who ensures that the recordkeeping system functions the way the organization wants it to. Therefore he or she must know the structure of the system - much more precisely that this brochure can do - and which knowledge the system must possess. The system developer must, in turn, know how such knowledge must be represented in the system.

These developments will happen quickly and in parallel. Archivists and records managers must hurry with the development and implementation of recordkeeping systems. For this they can use document and workflow management systems which, on their own, are not recordkeeping systems but can be used as building blocks, particularly in a change-over situation. The development of recordkeeping systems must become a fixed component of information planning and the recordkeeping system itself must acquire a fixed place in the information architecture of every organization.

[16] We assume a broad definition of "archivist," as a specialized information professional, not as a functionary that works in an archival agency. Archivists can work as such but just as well as records managers. They might work for government organizations but also for corporations or for other private institutions.