Information Technology, Archives and Archivists
- An Interacting Trinity for Long-term Digital Preservation

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Abstract
This thesis revolves around archivists’ current situation, and the fact that information technologies nowadays are tools that creates digital official documents which must be preserved for long-term. I have studied how the technologies affects and eventually changes archivists work practice and situation, and what recommendations that can be identified, in order to make sure that archivists’ work practice runs smoothly in the future. That is, the research involves how archivists experience their situation, how they look at information technologies and long-term digital preservation, and also which areas they mainly focuses on, or feels most concerned about.

My research consists of participatory observations conducted while following an archivist a couple of times each month for more than a year, data gathering at an archival conference for county council archivists, a future workshop and finally a focus group with archivists working at an existing e-archive. During my research I have focused on things or phenomena that engage archivists and causes problems in their daily work practice. These phenomena I have divided into the following themes: work practice, cooperation and communication, organisation, professional roles and competence, resources, attitudes, information technology, and finally laws and regulations.

My research shows that there is lack of knowledge in archival matters among other professional groups in the organisations, which makes the archivists work practice unwieldy. Archivists must constantly remind, educate and support other personnel involved in archiving. The archivists express that they are ascribed low status in their organisations and that archiving is neglected and low-prioritised – something that is conducted when other work task are done. Concerning long-term digital preservation the archivists ask for The Solution, since they lack knowledge in information technologies. Moreover, archivists express that there are lack of knowledge in archiving, mainly among management and IT-personnel. Meanwhile archivists work rather alone, with little or none cooperation with IT-personnel. IT-departments are said to run their own race and archivists get not enough support from management. Cooperation and communication seem to be non-existing among these groups.

Today many organisations do not have any strategies for long-term digital preservation. Often it is the archivists that are regarded to be the problem owner of this issue. In connection to this I have found that archivists are unsure of their own role and mission, and what competence they should possess. They claim that archivists are mainly connected with paper, and thereby they are shut out from long-term digital preservation issues. Moreover, archivists are not involved when e.g. new computer based systems are to be designed or implemented. Because of this archivists cannot influence the archival creation from the beginning. Lack of resources is also expressed by archivists, and involves lack of time, finances, personnel and competence. Moreover, information technology has caused that the
respect for laws and regulations are declining, and digital documents are not regarded as official.

Conclusions drawn are that there is lack of understanding of archivists work practice among other professional groups in the organisations. Archivists are expected to take care of and preserve information that exists in technologies with which they are not comfortable. Organisations has left the responsibility for long-term digital preservation to archivists alone, since the organisations have not succeeded in establishing cooperation and communication among concerned professional groups, especially archivists, IT personnel and management. This could seem as a paradox, since archivists are not involved when computer based systems are at stake, systems that generates the official documents that the organisation is obliged to preserve, according to laws and regulations.

**Keywords:**
Archives, archivists, feminism and science, focus groups, future workshop, information life cycle, participatory design, records continuum, Scandinavian tradition, situated knowledges, systems design, work practices.
This is for Frej – I love you endlessly…

Man gets tired
Spirit don’t
Man surrenders
Spirit won’t
Man crawls
Spirit flies
Spirit lives when man dies

Man seems
Spirit is
Man dreams
Spirit lives
Man is tied, bound, torn
Spirit is free
What Spirit is man can be!

(Mike Scott)
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Luleå, February 2007

Mari Runardotter
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Prologue

Deep down underground somewhere in Stockholm, the Swedish National Archives holds its treasures. Among them is an old Bible that has served at least two purposes. Originally it was used according to its intention - to be read as a sacred text. In the hands of Gustav Vasa, who was King of Sweden from 1523-1560, the Bible became an accounting book instead. The King used every other page for scribbling down finances. As time passed, the book’s usage changed again and today the Bible has a third purpose - it holds societal memory. The Bible has preserved B.C. memories through artistic illustrations from the Middle Ages and information from the royal court of the times.

To remember and to tell future generations about life in different eras are probably the reasons for the eagerness of humans to preserve what they have created, learnt and achieved. Hence, the need to remember and the wish to be remembered are fundamental reasons for information preservation. From the beginning of time humans have preserved all sorts of creations, such as works of art, songs, oral stories, and written text on various kinds of media. This is how history becomes both a memory and a heritage, which in turn makes history a constituent of the future. Archiving has a long tradition - considering that things such as rune stones and the Rosetta Stone\(^1\) also contain preserved information from ancient times.

As time passed and with the introduction of new media, the extent of what was preserved grew and a need to structure and categorise the information arose. It was necessary in order to be able to find what you were looking for. Exactly when this started is not currently known but it is not misleading to regard archiving “as old as script” (Delmas 2001). The Middle Age Bible is printed on a durable medium for archiving recorded societal information over the centuries. Today we store books, art, and documents in digital form without knowing if they will remain intact over the years (Duranti, 2000). We also cannot be sure that we will be able to access media over time as information technologies evolve and earlier formats are no longer supported (Dollar, 1992). It has been suggested that we may be facing the digital dark ages (Kuny, 1997). I say that we are not, there is far too much effort put into the matter of long-term digital preservation today. There are of course things that need to be further explored, investigated, and developed. Sooner or later we will surely come to a conclusion on how to move forward. Maybe we need to look at things differently. I think we should keep the words of Albert Einstein in mind when taking on this challenge:

Without changing our patterns of thought, we will not be able to solve the problems we created with our current patterns of thought.

\(^1\) The Rosetta Stone was discovered in 1799 when knowledge of the ancient Egyptian language had been lost for over 1,000 years. At the bottom of the stone there is a Greek section with which scholars could decipher the Egyptian scripts above. The middle section was in cursive demotic script, and the top section was a version in ancient hieroglyphs. Today the Rosetta Stone can be seen at the British Museum.
I invite you to read the story of archivists’ work practices, how information technology influences them, and how they see their present situation, which include preservation of digital material for long-term.
Introduction

From the moment information technology entered the archival world it has caused an almost chaotic situation for the archival community. Information technology has made it possible to produce more recorded information than any previous decade of human activity and “The fact that the majority of these data is less accessible than ever before is one of the ironies of the modern information age” (Duranti, 2000, p. 10). Hence, the majority of digital information is less reliable, retrievable, and accessible (Duranti, 2001a) than that preserved on paper – a situation which exacerbates the “already chronic problems in accessing and reading records over time” (Barata & Cain, 2001, p. 257). In other words, humans are able to generate an endless amount of information but can no longer guarantee its long-term preservation.

One reason for this is that electronic records relevant for a single matter might exist partly in a paper file, partly in an e-mail, and partly in a spreadsheet application or relational database. It is not yet known how to preserve links in order to view the record in its entirety (Duranti, 2000). Therefore, it will be impossible to understand the record in its context or the development of the whole affair in the future. Today, records are scattered and exist in many formats, which causes new kinds of problems for archivists. According to Ruusalepp (2002, 2005), the essence of the unsolved problems with digital preservation is the lack of proven methods that can assure the continued existence of digital information, that it will be accessible with available technological tools, and that the accessible information is authentic and reliable.

Many people around the world are involved in ambitious research projects on long-term digital preservation, with most of them focusing on technical solutions2 (Ruusalepp, 2002; 2005). As part of the Swedish Long-term Digital Preservation (LDP) project3, I concentrate on human and social aspects of information technology. Dealing with digital preservation requires a lot of effort in technological matters, especially since people develop information technology at a rather fast pace. However, digital preservation is an issue of great importance in many other areas than the pure technical. Digital preservation is a process that is intertwined with services supporting digital information environments as well as economic, legal, and social contexts (Lavoie & Dempsey, 2004). This means that digital preservation must recognise work practices as well as management practices and not just focus on technical obstacles and solutions. Digital preservation is part of a larger context that involves societies, organisations, and people consisting of those who are actually archiving digital material and those who will secure its accessibility. All information technology is managed, used, and handled by human beings, which means that in the end no technology will succeed if people are not able and motivated to use it.

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2 Among them are projects such as CAMiLEON, CEDARS, DLM-forum, and ERPANET, along with cultural heritage institutions, government agencies, and private enterprises.
3 The LDP-project is funded by the Swedish National Archives, the municipality of Boden, and Luleå University of Technology (LTU), of which the latter two are situated in northern Sweden. Official homepage: http://ldb.project.ltu.se/ [2006-11-07]
For archival institutions, the changes due to information technology and long-term digital preservation will also concern work methods, routines, and processes as well as the organisation, its personnel, and customers, i.e. citizens or organisations interested in accessing the digital material held in the archives. The introduction of information technology also confronts things such as transformation of work, social relationships, privacy, and social control (Meijer, 2001). Information technology and born-digital\(^4\) records also challenge fundamental archival concepts such as appraisal and the provenance principle, concepts that can be regarded as constituting the archival theories.

I believe that archivists are the central group of users of digital archives. Archives have been their workplace and computer based archival information systems\(^5\) are or will be their work tools. What is needed is an archival information system that together with its users (archivists and citizens) can function in constantly changing (technically and organisationally) surroundings. Moreover, since the archival information system is expected to function with its users, the involvement of archivists in the archival information system design process will make it more likely that the archival information system will be successful.

The Scandinavian tradition of systems development is distinguished by its aim of workplace democracy and its intent to make the design process democratic. One way to ascertain this is through user influence, so participatory design is a common feature of the Scandinavian tradition of systems development (Bratteteig, 2004). People that influence their work conditions are more likely to cooperate with the system in which they are partaking. Thus, reasons for user influence are both pragmatic and political. They are pragmatic because it can answer the mutual need of users and information technology designers to learn each other’s fields, and political because of the users’ right to influence their own working conditions (Bødker, Kensing & Simonsen, 2004). These are also reasons for my interest in archivists and their work practices.

**Archivists’ Work Practices and Competence**

Since the concept work practice is central in this thesis, I will begin with a definition inspired by Karasti (2001). My use of work practice involves the concrete and mundane activities performed by archivists in order to accomplish what is expected of them. In other words, what they do in the ordinary course of events at work. As part of work practices, I also include processes of interaction between archivists and other professional groups in their organisation, as well as the use of information technology.

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\(^4\) Born-digital documents, records, etc. are created digitally, which means that no paper original exists.

\(^5\) The archival information system concept represents a computer-based archive, designed to serve an organisation and its personnel (by providing evidence of transactions) as well as the society and citizens (by securing societal memory). This is in line with the primary and secondary purposes of archiving.
The Swedish Archives Act (SFS 1990:782) states that every authority is responsible for the care of its archives, and this should be done in such a way that the archive is protected against damage, destruction, theft, and unauthorised access (Svenson, 2005). This is what archivists are expected to do so it can be regarded as part of their professional activities. These activities are governed by nationally coloured laws and praxis, which implies that archival activities differentiate between countries. There is, however, reason to assume that internationalisation and the impact of information technology might turn this trend toward coherence with common rules and concepts worldwide (Gränström, 2005; Backhaus, 2005).

Archivists enable communities to cross time and communicate the human heritage to unknown generations (Delmas, 2001). In the early 1900s, this career was regarded as one of service, but they have more commonly been regarded as ‘keepers’ (Cook, 1997). Even though archivists have worked in almost the same way for hundreds of years, they are now facing a challenge. The reformulation of the archival paradigm will change and also reinforce the fundaments and principles of archival professionalism (Menne-Haritz, 2001).

What work practices are then to be expected when it comes to long-term digital preservation? Menne-Haritz (2001) argues that archivists should contribute by making material available and offering infrastructures that facilitate the handling of material for researchers and citizens. They need to be knowledgeable about how to categorise, arrange, and find records, not about their content. Archivists should concentrate on providing a range of instruments that help researchers and citizens get to the sources they need and to evaluate their relevance, thereby placing users at the centre of archival awareness. Focusing on access makes it possible to choose flexible strategies for description and preservation in order to secure the use of archival material in different physical forms (Menne-Haritz, 2001).

My interpretation of Menne-Haritz (2001) involves an understanding of the need to develop a new approach to archival thinking and practice, as well as new tools and skills (Dollar, 1992). Focusing on access alters the way archivists handle and manage things, as well as how fundamental concepts such as appraisal, ordering, provenance, etc. should be interpreted and accomplished. In line with the focus on access, Delmas (2001) means that the archival profession should turn towards a service-oriented task, providing qualified, professionally managed institutions.

The situation I described above where archivists are expected to preserve digital material without having access to functional work practices, methods, devices, etc. leaves archivists in what easily could be interpreted as a hopeless situation. If their primary task is to preserve for the long-term, how should they handle the digital material produced today? The introduction of information technology in the archival world and the issue of long-term preservation get consequences in the daily work situation for archivists, they are expected to interact with the technology (Köhler, 2006). These consequences can be split into many areas such as practical, emotional, educational, and technical. I want to explore a holistic view of how archivists
experience all the unsolved problems within this area. I believe the fact that archivists need to acquire new skills and practices as participants in the emerging information handling community is most important (Dollar, 1992). Exactly what these new skills involve or how these practices should be designed is not clear yet, therefore this is also the basis for my research.

It is important to note that an archival information system consists of both technology and social context, that is, humans are part of the information system and archivists’ future work practices will become integrated with the archival information system. The entire archival information system must be taken into account even though I will focus on the human part of the system, that is, the situation from an archivist’s perspective. In other words, my system-in-focus (Beer, 1993) is archivists and their work practices.

**Aim**

The aim of this thesis is twofold. First I intend to explore what impact and consequences information technology and long-term digital preservation have on archivists’ situation and work practices. Secondly, I want to explore how their future work practices could be designed and what needs to be considered when designing an archival information system that includes human and social aspects.

**Research Questions**

In order to find out about the first part I intend to search for understandings of the following:

- How do archivists experience their current situation?
- What views on information technology and long-term digital preservation do they convey?
- What are their main concerns?

Based on the findings of the above three questions, I will also identify what recommendations that can be found for the design of archival information systems.

**Thesis Structure**

The rest of the thesis is organised as follows. In the chapter *Archival Theory* I describe the fundamental ideas and concepts of archiving. I also give an account of the archival profession, how it has evolved, and some future issues in relation to this. The Archival Theory chapter ends with a description of the Records Continuum Thinking. Next chapter is *Systems Design and Information Technology Use*, and here the research area to which I belong, is described. Thus, thinking and theories that constitute my foundation are provided, such as participatory design, and situated knowledges. Thereafter the reader will find the chapter *Science and Subjectivity*, in which I declare my points of departure for doing research, how I look at science and how we can get understandings of things. This involves systems perspectives and a feminist view on science. In the chapter *My Method*, I have described how I have conducted the research, and theories that has informed the same. It is followed by the chapter *Studies of Archivists Experiences*, in which I provide my empirical material,
and what I have observed, learned and understood during my research. *Discussion* is the next chapter, and here I discuss my findings, based on the research questions I stated in the Introduction. Finally the reader will find *Conclusions*, which also contain my Reflections over the research, and suggestions on Further Research. The thesis ends with an *Epilogue*. 
Archival Theory

According to Delmas (2001), it is not evident that archiving is a science, since it has been regarded as the practical and empirical knowledge of classification and inventory. He therefore questions whether archiving instead is an art. Many terms have been used in reference to archiving, such as archival classification, archival services, archival administration and so forth. The term archival science is recent and exists because of the need for a concept that refers to the comprehensive new knowledge concerning archives. This knowledge has only been formalised during the last half-century, and what makes it difficult to define archival science is the fact that archives change in nature and status depending on the evolution of the information society. Delmas (2001) regards archival science as a kind of natural and social science, and a science of observation, but also an applied science in that it uses collecting, preserving, treatment, selection and communication techniques. Based on this, I will use the term archival theory, since I believe it encompasses what this chapter describes.

A concise definition of archival theory is that it is the scientific study of the nature of archives, their importance and developments, and the study of methods needed in order to preserve the archives, make appraisals of them, and to make them functional (Ulfsparre, 2005). Thus, archival theory comprises ideas about the nature of archival material but also principles and methods for controlling and preserving archival material (Duranti, 2001b). The nucleus in archival theory is systematisation and the principles of order (Ulfsparre, 2005).

I was delighted to discover that systems science and archival theory have a lot in common. Both deal with information administration, so systemising and order are present in both. System developers work with structuring information in a computer-based system, system designers structure information in organisations, and archivists structure information in archival repositories. My interpretation is that the main difference is their focus. While system designers and developers want to construct information systems that are adequate for a present or future situation, archivists focus on constructing information systems of the past and long-term preservation of this. One phenomenon that emphasizes this is the fact that most computer-based information systems today do not have any built-in function for long-term preservation. The problem described earlier with the loss of digital records stems partly from this fact.

Duranti (2001b) claims that archival theory can be defined as “a system inclusive of theory, methodology, practice, and scholarship, which owes its integrity to its logical cohesion and to the existence of a clear purpose that rules it from the outside, determining the boundaries in which the system is designed to operate” (Duranti, 2001b, p. 39). In order to see archival theory as a system, we need to identify the three basic characteristics of systems – parts, structure and process – and describe their relationships. The parts are theory, methodology, practice and scholarship. The structure is hierarchic – each level descends from and depends on the previous one,
with theory being determinant and the cohesive element. The relevant process is feedback, which can bring new hypotheses, ideas, findings or realities into the system (Duranti, 2001b).

Looking at archival theory as a system allows us to confront the paradigm shift, as the archival profession defines it, which is due to technological changes and electronic records. Duranti (2001b) claims that systems thinking could enable us to effectively deal with the continuous change that technology brings and can be the foundation for long-term strategies. Archival theory would then be regarded as the system’s cohesive element.

Menne-Haritz (2001) states that the difference between past and future is central to archival theory because it is in this difference we can compare situations or events and understand what phenomena led to which change. Thereby the comparison allows us to make decisions in the present that affect the future. This implies that it must be ascertained whether traces of processes such as intentions and effects can be found in the archival material. Archival theory is thus distinct from other sciences because of its aims, objects and methodology, and its main object is process-bound information (Thomassen, 2001).

The Archival Idea

The principle of free access to public records as stated in the Freedom of the Press Act (SFS 1949:105) together with archival activities provides the foundation for archival theory in Sweden. The Freedom of the Press Act is fundamentally important to research and culture, and to an open, democratic society in general (Gränström, 2005). This means that archives are used beyond the framework of the discipline and have become an important source of scientific and technical knowledge, roots and memory, and the identity of people, families, social groups, enterprises, and public and private communities (Delmas, 2001). The Swedish National Archives (SNA) is the supervisory authority for governmental administrations and authorities when it comes to the management of digital information.

The idea behind archives is to secure the preservation of a collective memory. Archiving rests on two pillars: appraisal and arrangement/description. These pillars still constitute the foundation for archives, even though they are affected by changes in culture, media and technology (Cook, 1997). An archive is a preserver of information; its task is to ensure that the information can be retrieved. However, it cannot be claimed that archives contain all material created and received by administrations. Instead, archives are made up of parts of material chosen by archivists in accordance with laws and regulations to be preserved in the archives. It must be mentioned that context is also important; it ensures that researchers and citizens interested in archival material are provided with the opportunity to interpret the processes in which the material was created (Cook, 1997).

Archives are thus made up of material (documents, photos, audio and video recordings, etc.) that constitutes cultural heritage, organisational memory, evidence,
etc. and is often referred to as records. Records constitute the content of the archives and have both a primary and a secondary value. The primary value is assigned to the records by their creators, that is, their importance to the people creating them. Secondary value refers to the value ascribed by researchers, and this secondary value has a twofold meaning. On the one side, the records can constitute evidential value by documenting functions, programmes, policies and procedures. On the other hand, the records provide an informational value concerning the content of records (Cook, 1997).

Traditionally one could say that it is the preservation of records, and other cultural heritage documents and such that has been the main objective for archives. Menne-Haritz (2001) suggests a reformulation of the archival paradigm, focusing instead on access. The difference would lead to another approach taken by archivists, who would concentrate more on service than on taking care of the material, even though they still would be expected to work with preservation. However, a change in the mental picture of what archives should focus on has consequences for how things are done and for what purpose.

**Fundamental Archival Concepts**

The methods we find in archival theory have been developed in order to understand operations after they have taken place (Menne-Haritz, 2001). From this follows that there are some fundamental concepts such as provenance/respect des fonds, appraisal, preservation and records that are central within archival theory. I will discuss them one by one.

**Provenance/respect des fonds**

In 1898, the provenance (which literally means origin or source) principle was defined, which says that archives must be kept carefully separated and are neither to be mixed with other archives nor placed in artificial arrangements based on chronology, geography or subject. The arrangement of archives must also be based on the original order or organisation of the archival collection. This should correspond to the organisation of the administrative body that produced the archives (Cook, 1997). There has been development, though, regarding the provenance principle, and it is today seen as a more conceptual than physical and a more functional than structural principle mainly because of the digital era (Cook, 1997). Dollar (1992) states that determining the context using the provenance principle means to know where a document was created, in what process, to what end, for whom, when and how it was received by the addressee and how it came into our hands.

Livelton (1996) provides three senses of provenance as the source of records, namely, custodial, transmissive and diplomatic. Custodial provenance refers to the entity/entities that maintain records over time. Transmissive provenance has to do with the entity from which records were taken into custody by an archival repository, and the final source is diplomatic provenance and concerns the entity that authorised the records. Having knowledge of these kinds of provenance, Livelton
(1996) claims, improves the understanding of the overall historical and administrative context of records, which in turn affect archivists in their professional practice.

Cook (1997) draws five conclusions in his article, of which the first concerns a marked change in the reason why archives exist. The shift has been from juridical-administrative towards socio-cultural justification for archives in order to widen public use. In other words, societal memory should not be limited solely to those documents that are chosen by powerful record creators. Public and historical accountability puts other demands on archives and archivists. The second conclusion has to do with how authentic, reliable records have been preserved as evidence of acts and transactions. Today archivists try to ensure that records are initially created according to standards for evidence and that all important acts and ideas are documented. Cook (1997) claims that this means it will be important to be able to reconfigure the actual functionality, and thereby provenance, of the ‘original’ record in the digital era.

The third conclusion relates to the source of archival theory. Today archival theory "takes its inspiration from analysis of record-creating processes rather than from the arrangement and description of recorded products in archives" (Cook, 1997, p. 45). The fourth conclusion is related to the other three and concerns the traditional notion that archivists are expected to be impartial, which is no longer acceptable. Archivists have moved from being passive keepers to active shapers of the archival heritage and should therefore examine their politics of memory in the process of archival creation and memory formation. Finally, the fifth conclusion is that archival theory should not be regarded as a set of immutable scientific laws. Cook (1997) claims that the changing nature of archival theory over time can, if recognised, become a professional strength.

Dollar (1992) also discusses some issues evolving within archival theory because of the increasing use of information technology. Among them are technological imperatives that shape the way information is and will be used and thereby the way archival work is performed. Dollar (1992) starts by reminding us that information technology is driven by the marketplace and causes profound changes that are inevitable. The technological imperatives imply that the form of documents, the work methods and the technology itself are changing.

**Appraisal**

Appraisal can be regarded as systematic methodologies for the selection of records of archival value, which were developed during the 1940s and 1950s (Dollar, 1992). The methodologies were called appraisal criteria and distinguished between the evidential and informational value of records. Mainly, they have been useful for paper-based archives. Today, when people produce born-digital records and handle multimedia systems, geographic information systems, integrated relational databases and complex databases that cross organisational boundaries, it is not possible to focus on master files or historical files as was possible when it came to machine-
readable records. The integrated nature of databases and complex systems undermines the notion of the uniqueness of a computer’s ability to process and link. Dollar (1992) claims that archivists need to formulate other appraisal criteria and introduce them into the design of computer systems.

Preservation
What is meant by preservation? In an archival context, it could be interpreted as keeping the material in good shape and conserving it over time. The questions are whether or not to focus on the future, that is, whether archives should be closed or open (Menne-Haritz, 2001). There are at least two strategies from which to choose: take care of the original material and lend it to the customers, risking the status of the original, or provide users with a reproduction as a means of preserving and caring for the original. This is true for analogue material, but this scenario is now undergoing changes due to digital records, where the question of what constitutes the original is fuzzier. Hence, media fragility and technological obsolescence means that the term preservation, as applied to electronic records, no longer refers to the protection of the medium of the records but to that of their meaning and trustworthiness as records (Duranti, 2000).

Preservation strategies have to respect their potential usefulness for interpretation and reflect on how to keep them visible or reconstructable, which involves stabilizing traces that emerge from common activities and communication during the birth of the records (Menne-Haritz, 2001). Preserving traces that facilitate interpretation becomes an important task for archivists. When it comes to electronic preservation, the consequence is that records must be kept unchanged, but there is also a need to prepare for reconstructability of the original contexts (Menne-Haritz, 2001).

Records
First, some clarifications. The term record is a bit different from the Swedish term handling. From an archival perspective, a record (regardless of media or format) has to be related to an activity carried out by an organisation or an individual. The activity and the function it supports sets out the provenance of the record. The record, in turn, is evidence of the activity (ICA, 2005). This is in line with ISO 15489-1:2001 (E) where the definition of a record is:

Information created, received and maintained as evidence and information by an organisation or a person in pursuance of legal obligations or in the transactions of business.

We can compare this with the Swedish concept ‘handling’. According to SFS 1949:105, §3, the concept ‘handling’ denotes:

... a work in text or images along with recordings that can be read, listened to, or otherwise understood only by means of a technological device. A ‘handling’
What differs is that the definition of record emphasises legal obligations and business transactions as the reasons for the record’s existence. Hence, a ‘handling’ must not necessarily be evidential for legal reasons or a result of business transactions, even if this is most often the case. I will use the concept record as a synonym for ‘handling’ from now on, since both must fulfil the same criteria when it comes to their digital manifestation. However, I would ask the reader to remember the difference between the concepts, since this thesis is written in a Swedish context.

The definitions above are broad and how to interpret records is not clear. Some claim records to be some kind of container and its contents, others say records are solely communicative actions and measures (Yoos, 1998). The main question is perhaps whether a record should be defined as evidence of actions/transactions or information in context. We cannot replace record with document straight away, since documents oftentimes are text-based, and a record does not necessarily contain only text (this is, however, sometimes done when translating, for example Swedish laws into English). Sound and images are also archival objects, and the term record also includes them. Records are found in different formats and representations, usually as logically limited information objects such as distinct documents. Increasingly, we also find them in the form of distributed objects like databases or compound documents due to information technology. We can classify them according to two criteria: function and format. Function refers to the relation of different files to different types of activities and transactions in an organisational context. Function deals with format, that is, text-based documents, databases, hypertext documents, images, spreadsheets, e-mail, video, etc. (ICA, 2005).

Thus, records function as memory (Thomassen, 2001) and evidence (Bearman, 1994). A record is information that is retrievable in the form of a document, for example, and it is distinguished from other documents by the reason of its creation; they are a product of the process that produced them. Hence, records are process-bound information since they are linked to coherent work processes (Thomassen, 2001). This is true for paper-based records and should be true for electronic records. However, not being physical implies that electronic records do not have interdependent logical structures or physical relations. Instead, their logical and physical relations are separated and stored independently of one another. This distinction between logical and physical relations becomes important since it effects how a record is defined (Dollar, 1992). Thus, defining an electronic record as consisting of logical relations is essential for understanding hypermedia, compound documents, smart documents, multimedia documents and complex information systems such as geographical information systems or relational databases.

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6 Med handling förstås framställning i skrift eller bild samt upptagning som kan läsas, avlyssnas eller på annat sätt uppfattas endast med tekniskt hjälpmedel. Handling är allmän, om den förvaras hos myndighet och är att anse som inkommen till eller upprättad hos myndighet.
According to Duranti (2000, 2001b), the digital era has led to the fact that when it comes to digital records, the only thing we can preserve is the ability to reproduce the record. Authenticity can be secured only if we can verify that:

- The right data was properly stored
- Nothing has happened during the storage or there are no significant changes in the data
- All the right, and only the right, data was retrieved from storage
- The data retrieved was subjected to an appropriate process
- The process was correctly processed and resulted in the reproduction of an authentic record (Duranti, 2001b, p. 53)

The problem of accountability is also evaluated by David Bearman (1994) from a perspective that a conscious intervention is required in order to shape information systems so that the information systems actually create records, not just data, since organisations are facing a crisis of accountability because of electronic information systems. Bearman’s work has included investigating what functional requirements for digital recordkeeping can be identified, and he does so from an organisational viewpoint. Bearman (1994) argues that these requirements must be met by the recordkeeping systems so that they can intervene in organisational policy, systems design and program implementation. By accomplishing this, it is possible to ensure the creation of records, preserve their integrity and provide for access. Hence, records have an evidential value for organisations so they must be preserved and accessible. Archives are a part of the chain of evidence where evidence consists of content, structure and context. Following this, Bearman (1994), not surprisingly, defines records as business transactions, which implies that his focus is not on the cultural heritage. This has consequences for how to conduct appraisals in advance, since it is evidence (not information) that is the criteria. However, some things he points to are relevant even for ‘ordinary’ archives.

**The Archival Profession**

Archivists must have a strictly defined knowledge of the terms archives and records, and know precisely what kind of documents and collections are involved and in what respect they can be distinguished from other types of documents and collections. This includes a clear understanding of what an archive is, its functions and fundamental entities and how they relate to each other. They also need to know how the quality of records and archives can be assessed and ensured in order to establish recordkeeping systems, and to analyse and communicate about them (Thomassen, 2001).

According to Dollar (1992), archivists must modify traditional archival methods in five areas: appraisal, concentration of archival material in central repositories, arrangement and description, reference and preservation. This requires new skills and tools, which must be taught in archival education programmes. Dollar (1992) recommends activities and actions that can help address many archival concerns. I will concentrate on those that focus on individual archivists.
Hardware and software rapidly becomes obsolete since we continue to change the technologies at such a rapid pace. I argue that this implies that archivists should stay in the technological mainstream of information handling by monitoring developments in information technology innovations. They should also be actively involved in the development of information technology standards. Dollar (1992) claims that adoption of open systems standards should be part of organisational information policy, and that archivists should identify migration paths as a major requirement for new information systems applications.

In an electronic information environment, it becomes harder to define what constitutes a record, particularly regarding databases and virtual documents. How archivists ensure the preservation of digital material is also crucial to the integrity of archives. Dollar’s (1992) recommendation on this is that archivists should partake in systems design by identifying and articulating functional requirements for capturing contextual information as well as ensuring that the archival information system captures and preserves provenance-related information. Appraisal functionality should also be built into the archival information system. In the design process, they should define electronic records as electronically communicated and maintained transactions. Archivists should also encourage the development of tools that automatically capture electronic records. In short, archivists should, through involvement in the design of archival information systems, ensure that fundamental concepts and regulations are built into the same.

Information technology supports distribution and duplication of electronic records, therefore archivists should transform the role of archival institutions from a custodial to a regulatory and access-facilitative role. Centralised archives should then be the last resort for electronic records when their maintenance and migration across technologies cannot be assured (Dollar, 1992). Dollar continues by claiming that archivists should facilitate access to electronic records over time by developing, promoting and implementing international standards in order to minimize dependence on hardware and software. In connection with appraisal, an approach that emphasises the competence that produces records rather than the records themselves should be adopted. Archivists also need to identify functional requirements for the life-cycle management of recorded information.

Arrangement and description must be transformed to accommodate digital documents. Archivists should therefore shift towards an understanding of the archival information system context, a context that should support organisation-wide information sharing (Dollar, 1992). Regarding reference issues, archivists should develop a reference strategy that takes into account how emerging information technologies are changing expectations and requirements for researchers. They should develop tools and techniques for facilitating access to electronic records over time, and formulate policies and procedures that protect the privacy of their creators or individual subjects of electronic records.
As many others, Dollar (1992) also suggests a redefinition of preservation to make certain that it includes facilitating access over time and across technologies. Programs and activities that assure readability and intelligibility over time and across technologies also need to be developed. In order to achieve all the recommendations that Dollar (1992) suggests here, archivists need to engage in archival education programmes as well as continuously educate themselves, especially in information systems design.

Bearman (1994) declares that it is important to train the staff if they are to be held responsible for electronic records creation and retention, something that can be regarded as the absolute foundation. They must be allowed to learn about computer-based information systems, as these are the new ways of working in their profession. This is fundamental if archivists are to feel secure and confident while doing their jobs. Bearman (1994) also claims that we need to focus on documentation instead of description, since “Description is focused on records both as the object being described and as the primary source of information” (Bearman, 1994, p. 224). Documentation, on the other hand, focuses on activity and seeks to capture data about the relationship between activities and documents that were created or received in that activity. This, he claims, is necessary if documents are to function as evidence. Documenting documentation should be regarded as a process whose objective is to construct a value-added representation of the archives. In order to accomplish this, archivists need to take on a pro-active role by participating in records creation. I interpret this as taking part in systems design, which is when the archival information system is created. As Bearman (1994, p. 232) puts it: “Documentation of organizational activity ought to begin long before records are transferred to archives and may take place even before any records are created.”

According to Delmas (2001), archives are in essence a public service, which should serve collecting, preserving, treatment, selection and communication techniques. Archivists need not continue old practices that would only be updated, but instead renew and take into account the achievements of other disciplines that can contribute to its development, one of which is systems science (Duranti, 2001b). This makes metadata crucial, since with virtual documents, metadata is now the real medium (Nilsson, 2006). Archiving rules must therefore be adapted according to the importance metadata has in digital surroundings. Sorting and selecting is another issue that Delmas (2001) discusses. To sort things out or in implies more than it might seem at first glance – it has consequences we are not aware of (Bowker & Star, 1999). These consequences must be thoroughly investigated within archival domains. However, to sort and select is not a question of physical space anymore, since information technology and digital archives free us from time and space: “…physical carriers and tools to produce and play them being still fragile and obsolescent, which leave us in the long-term with a contradiction between medium and message” (Delmas, 2001, p. 36).

In order to be able to participate in the design of archival information systems, Cook (1997) suggests that archivists need to research and understand archival functions
and activities. His reason for this is that analysis and planning should precede the gathering of archival material. Cook argues for letting the past form archivists’ future, and one way of achieving this is to focus on the provenance principle, since it constitutes the archivists professional legacy. His argument is that “… by focussing on ‘provenance, respect the fonds, context, evolution, interrelationships, order’ of records, that is, on the traditional heart of our professional and theoretical discourse, archivists could move from an ‘information’ to a ‘knowledge’ paradigm, and thus to renewed relevance in the era of electronic records and networked communications” (Cook, 1997, p. 36). This has, according to Cook, led to archivists in Canada rediscovering the intellectual excitement of contextualised information. Provenance could well promise the future relevance of archivists’ unique perspective of organisational creation, use and appraisal of records.

Finally, it is important to remember that even if a lot of focus today is on electronic records, the reality for archivists and other records professionals is that they are working in a mixed paper and electronic environment (Barata & Cain, 2001). Hence, at the same time as they develop new skills, methods and routines for digital material, they must also continue to work in the traditional way. Because of this, it is essential to create links between the paper and electronic parts of recordkeeping systems (Barata & Cain, 2001). Even though information technology and all the challenges it brings with it dominates research today, the reality for many archivists is that they still must take care of analogue material to a high degree. There is also reason to believe that since the technology is not yet totally reliable, making paper copies ‘just in case’ may help secure the longevity of the material.

**Records Continuum Thinking**

Taking information technology and all its implications into consideration, what will happen in the future? Of course, the fact that information is the main resource and principal means, as well as the predominant product produced today, makes archives crucial to securing information longevity (Delmas, 2001). This, in turn, makes it “necessary to obtain information critics, memorisation foundations, scientific recordings, and to obtain a precise memory” (Delmas, 2001, p. 29).

Perhaps we must develop a new view of archives and archiving because of the digital era. According to Cook (1997), it is necessary to re-conceptualise traditional archival principles and move from a product-focused toward a process-oriented activity. Instead of focusing on the arrangement and description of recorded products, archivists should analyse the record-creating process. One line of thought comes from Australia, where they have thoroughly reassessed archival matters. Monash University has taken on the challenge and developed the records continuum thinking and the records continuum model, a model that also emphasises processes (Upward, 1998a; 1998b; 2000). The records continuum thinking is an answer to the new rules of the game, caused by what Upward (2000) argue is a paradigm shift driven by technology.
Records continuum thinking can primarily be regarded as an approach that replaces life-cycle based perspectives with a continuous and a time/space construction (McKemmish, 2001). Information has most often been presented as created, used and maintained for a period and then placed in the archives when it was ‘dead’. This implies that the Information Life Cycle has in fact been linear. In Runardotter, Nilsson, Quisbert, Hägerfors & Mirijamdotter (2005; 2006) we provided a new model for the Information Life Cycle, where the model is actually cyclic. We felt this to be necessary since with digital documents the ‘old’ life-cycle (linear) thinking will not be the case since digital objects can exist on many levels at the same time. Fundamental for records continuum thinking is a view on records as always in a process of becoming. Archivists can no longer focus on physical groupings of records. The post-custodial involves logical or virtual multiple realities (McKemmish, 1998a).

Furthermore, life-cycle thinking negates the transactional and evidential nature of records, disconnects both record managers and archivists from organisational purposes of recordkeeping since it is based on tasks, not systems, and it divides the professions. The records continuum instead expresses continuities between the work of records managers and archivists, and brings them together under the recordkeeping umbrella (McKemmish, 1998b, 2001; Reed, 2000). However, there are divergent views on this – it is questioned whether there is an advantage to maintain separate specialists or whether electronic recordkeeping is the daily work of all archivists (Reed, 2000). McKemmish (2000) argues that a large undertaking of re-inventing archives and records management work is ongoing. It involves a more rigorous definition of the archival and records management discourse, especially concepts associated with a record’s qualities of transactionality and contextuality.

The records continuum model builds on four principles (See Figure 1 below). As the first principle, Upward (1998a) suggests a concept of records that includes their continuing value, that is, “a unifying concept of records inclusive of archives” (McKemmish, 2001, p. 334). Furthermore, this concept stresses records uses for transactional evidentiary and memory purposes and thus unifies approaches to archiving and recordkeeping, regardless of records are kept for short or long-term. The second principle is to focus on records as logical rather than physical entities irrespective of their form (paper or electronic). The third principle is to emphasise the need to integrate recordkeeping into business and societal processes and purposes and the fourth principle, finally, is that archival science is the foundation for organising knowledge about recordkeeping (Upward, 1998a). The last principle should be combined with an acceptance of the need to continue to identify the knowledge and skills in other disciplines of relevance. Finally Upward (1998a) claim that recordkeeping should be integrated as a natural part of business and societal processes and purposes. A distinction made is also that archivists should focus on recordkeeping evidence – not evidence from a legal perspective, since this is an area for other professionals, which are the legal experts (Upward, 2004). Upward continues by stating that when archivists emphasise electronic recordkeeping processes, it also distinguish them from librarians.
It is also true that physical location is not important in the digital era – in virtual archives the location of resources and services is of no concern to researchers and citizens interested in their content (Upward, 1998a). The continuous value of records also implies continuous custody (instead of the distributed custody that is often used today), which in turn forces the establishment of new ways of legitimising responsibilities for records storage and custody that show all the shifts that have occurred. This results in the archival institutions fostering better recordkeeping practices within all dimensions of recordkeeping (Upward, 1998b).

The records continuum model is also a representation of a social system, i.e. the entire organisation with all its employees are encompassed by the model. When applying the model in an organisation, every archives must adapt the model to its situation, that is, the organisation need a strategy and a program that is appropriate for its business needs and the culture in which it exists (Reed, 2000). The organisation creates or receives records, records that are regarded as continuously evolving, and thereby living and living evidence within the organisation. The record might be found anywhere, since the fundamental principle behind the model is the expanding of a social system where the division between time and space is erased – time and space cannot be separated. Hence, the model inherits a constant movement. Within the model, no separate parts are readily discernible. Its elements pass into each other, so the model is self-referencing (Upward, 1998a).
Figure 1 shows that the records continuum model has four axes, or as Upward (2004) name them continua, that relate to accountability in an interconnected way, that is they address the issues of who did what (insofar as it can be identified in records), what traces of evidence and memory can be found of this, and how is the information stored. In other words, they represent Identity, which has to do with the authority, or organisation the model represents when applied to a specific organisation, the actor(s), the work unit the actor(s) are associated with, and the organisation. The next axis is Evidentiality, and consists of traces of actions, since records are regarded as evidence of the different transactions the organisation performs. The Transactionality axis represents the activities, functions and purposes as coordinates, and concerns records as a product of activities. Finally we have Recordkeeping containers, which deal with vehicles for the storage of records, since they are to be preserved (Upward, 1998a).

The four dimensions represent different processes in connection with records in the organisation. First, records are a result of an activity. They are created (or received) – Create. This is the only zone of action, which means that all actions return us to this zone in transaction cycles (Upward, 2004). Thereafter metadata should be captured in a routine way in order to make the records useful – Capture. The Organise dimension deals with organising the memory so it is possible to share information with others. Lastly, the Pluralise dimension is about bringing the information to society. The idea behind the model is for information to be used in a more predictable and controlled way (Upward, 1998a). The process of communicating records make them transactional, and all recorded information is transactional (Upward, 2004).

The records continuum model was developed as a tool for evidence-based approaches to archives and records management. Here, the evidence concept is a synonym for archives and records, so recordkeeping should be interpreted in a broad sense, and archival description becomes a rich, multi-layered recordkeeping and archival function. Description is thus a series of iterative recordkeeping processes (McKemmish, 2001). The records continuum is meant to be a metaphor for the technically driven paradigm shift caused by information technology and systems practices. It aims to help us organise our knowledge by constituting the foundation for analyses. It is also a communication device that helps us understand complexity. However, since the issue is very complex, the model naturally is a simplification. The purpose of the records continuum model is to be of help with the first analyses of tasks and missions that encompass different demands put forward by evidence-based records management. The records continuum model can be used to structure the analysis of early records management systems as well as the analysis of organisations’ records management within and between departments, from the smallest to the broadest levels of the organisation and its management.

What implications might be seen for archivists, given that the records continuum model shows us a probable future? The model has been criticised, mainly from two groups. Archivists who regard themselves to be carriers of culture believe the model is too concentrated on records management, while records managers who view
themselves as servants of contemporary organisations believe that it is too archival. These interpretations could be discussed, but it could also mean that it actually suits both groups. The emphasis on evidence could of course be interpreted as neglecting societal memory. It could be argued that all records eventually lose their evidential use, e.g. surviving records from the Roman Empire has no legal-evidential value today, and instead they carry societal memory. But, as Upward (2004) argue, people destroy as gladly as they preserve, so in the end it is a human choice what will remain and what will not. This is something that calls for attention and carefulness when we manage records - the information kept in the records will evolve and change, and lead us to new knowledge. Archivists must be aware of records shifting values.
Systems Design and Information Technology Use

My interest in exploring the impact and consequences information technology and long-term digital preservation have on archivists’ situation and work practices stems from my background in social informatics. There are certain theories that laid the foundation for my understanding of the area, which in turn led to my research questions and the recommendations that follow. Thus, I would like to introduce to the reader my view of selected theories.

As an informatician my focus is on information systems and especially information technology use, which in turn has implications for their design. Use and design are two sides of the same coin and there are relations between them (Bratteteig, 2004). The information systems and systems design concepts might need some clarification. To begin with, both include the word system, which is an abstract concept implying that we look at some phenomena as connected elements. Together these elements form a whole, and this wholeness shows us some emergent properties. The elements taken together with the properties constitute the system or make up the whole (Checkland, 1981; Checkland & Scholes, 1999). Hence, a system is more than the sum of its parts. What then, is an information system?

**Information Systems**

What we include in systems depends on where we draw the system’s boundaries, meaning what is regarded as information systems differs. Information systems are sometimes referred to as the actual computer-based system, while others believe they always involve human beings and are social systems. The concepts are blurred and used at abstract and practical levels. Emphasising use means involving people in the relevant system, so I argue that human beings are included in information systems. Moreover, information systems exist to serve, help or support people taking action (Checkland & Holwell, 1998; Checkland & Scholes, 1999). I believe this set the goal when designing information systems - they should facilitate and make things run smoothly for people that use them. Both information systems and information technology are agents of change – it is not possible to introduce either of them without changing the situation for humans involved in the situation (Checkland & Holwell, 1998).

**Systems Design – or Systems Development**

The systems design and systems development concepts could cause confusion. They are often used synonymously while having slightly different meanings. Here I will describe different aspects connected to the concepts. Primarily, systems development can be distinguished as a social and technical process. “Systems development is the process of developing a computer-based information system. The focus of systems development is on the computer technology in the information system, but in order to construct a working information system the context of the computer has to be considered” (Bratteteig, 2004, p. 9). This view focus on the computer, so system development actions are taken that builds a computer-based information system. Involving the context implies that information gathering is one part, since any
information system that actually fits an organisation must be built on knowledge of the organisation’s needs. Out of this gathered information, the development of a computer-based information system can be built that solves the identified problematic situation. However, the focus is mainly on the mechanics of a system. Hence, systems development has to do with constructing a computer-based information system (Bratteteig, 2004).

The manner of constructing computer-based systems differs among system developers. Bratteteig (2004) categorises systems development as a social and technical process. The social and technical work process emphasises technical and non-technical matters, that is, there is interplay between the social and technical parts. Within the systems development research area, different perspectives are emphasised, of which Bratteteig (2004) describes four: systems development as construction process, organisational change process, political process and work process.

The construction process and its aspects of system development is what make systems development different from other social, organisational and human change processes (Bratteteig, 2004). The construction process deals with constructing the software, that is, building, integrating, adapting, maintaining and tailoring software products, and it is the engineering part of systems development.

The organisational change process implies that studying use has mainly been done in work situations, and most research in Scandinavia has focused on organisations and their context. Building or changing a computer system involves designing a corresponding work organisation with new work routines and processes. From this view, a system becomes part of the organisation of work. Information is produced and used as a resource, which is communicated and used to control the work. In order to study this, research has been conducted in cooperation with social sciences. System development is a planned change process – something that is inherent in design.

The third type of process according to Bratteteig (2004) is system development as a political process. Here are aspects regarding who decides what the problem is and what the solution should focus on of concern. Basic assumptions are that technology is not neutral and represents different perspectives in society. Therefore, the Scandinavian approach (see below) emphasises cooperation and negotiation, the latter so that management does not overrule employees. Also acknowledged is the fact that technical people might talk non-technical people into solutions they would not want if they understood the consequences.

As the fourth process, Bratteteig (2004) describes system development as a work process, by which she means that systems development involves the production process of the information system, that is, systems development is also about planning and organising the technical work. She claims, “Systems development work
differs from other project work because the organisation of work depends on the technical characteristics of the product-in-the-making” (Bratteteig, 2004, p. 15).

In the social informatics community to which I belong, the word design includes an intention to change and/or improve something, be it a work situation, a computer-based system, etc. This indicates that designing an information system might as well result in a new way of designing the organisation as a computer-based information system. This can be compared with the views of what constitutes an information system, as described above. In Scandinavia, systems development is a term used for both types of design described above — the social as well as the computer-based system (Bratteteig, 2004). I believe design always involves some kind of change and it always starts with the context in order to consider the whole. In conclusion, my interpretation is that the systems design and systems development concepts are interchangeable and are therefore used synonymously in the remainder of this thesis.

**The Scandinavian Tradition**

The Scandinavian school of systems development, with roots in the 1970s, became known as the Scandinavian tradition of participatory design. According to Bratteteig (2004) three approaches can be discerned, the systems theoretical tradition, the socio-technical tradition and the critical tradition. The first is rather technology focused but advocates that the use organisation should be basis for the design. The socio-technical emphasise human factors and a socio-psychological work environment, and aims at balancing the technical and social systems rather than favouring one of them. The critical tradition is characterised by politically oriented critique of computing technology, and aims at making alternative solutions through close collaboration with workers. The common feature of these three traditions is the strong emphasis on user participation and work place democracy. The intention of the latter is to balance claims from different interest groups. Two fundamental reasons to involve users, which are regarded as experts in their own work, is that it will improve the knowledge upon which the systems are built, enable people to develop realistic expectations of the systems, and thereby reduce resistance to change. Arranging for work place democracy includes taking into consideration claims from different interest groups (Bratteteig, 2004).

User participation and participatory design seem to be conceived differently in Scandinavia than other places. In Scandinavia is emphasis on users as co-designers, and the systems development process is regarded to be an organisational, technical and human change process. In Europe participatory design has been conducted under different labels, such as Ergonomics in Germany, and Human Factors in the UK (Bratteteig, 2004). When the North American human-computer-interaction (HCI) community began to pay attention to this approach, participatory design techniques were appropriated and further developed during the 1990s. The HCI community had other reasons for participating than the Scandinavian, whose foundation was ideological and political and dealt with people’s right to influence their work situation. The HCI community was more concerned with the possibility of increasing user acceptance and a better understanding of use situations (Löwgren &
Stolterman, 2004), not user involvement in the organisational development over time, as was the case in Europe and Scandinavia (Bratteteig, 2004).

Today we can see how the Scandinavian tradition of participatory design has influenced a new field called interaction design (Löwgren & Stolterman, 2004). Nevertheless, I will concentrate on participatory design in this thesis. In doing this, I will involve Löwgren & Stolterman since their definition of interaction design as “the process that is arranged within existing resource constraints to create, shape, and decide all use-oriented qualities (structural, functional, ethical, and aesthetic) of a digital artefact for one or many clients” (Löwgren & Stolterman, 2004, p. 44) is closely related to what participatory design involves. Another definition of interaction design is “designing interactive products to support people in their everyday and working lives” (Preece, Rogers & Sharp, 2002, p. 6). Since this definition focuses on interactive products, interaction design in that sense is not included this thesis. Instead we will look at what participatory design stands for.

**Design and Use in Focus**

As stated, use is a key concept, and a prerequisite for use is that the designed information system is constructed in such a way that users find it useful. This presupposes that the users are competent and motivated to use the information system, but also that the design process is adapted so that users feel that they make a difference. It is the capacity and ability to get translated and transformed, together with its fluidity and ambiguity that makes up the strength of participatory design (in particular the Scandinavian tradition), since this makes it possible to create space for agency for those involved (Elovaara, Igira & Mörtberg, 2006). Many times, information technology projects fail because neither organisational conditions nor qualifications and skills among personnel are considered (Bødker et al. 2004). My interest in participatory design stems from the fact that this tradition recognises design as a social process, which targets change and shows respect for the practitioners’ right to influence decisions that affect their working life directly (Karasti, 2001). Moreover, I interpret the Scandinavian approach mentioned above, which emphasises cooperation and negotiations, to be in line with feminist information systems development, which aims to question the separation of design and use (see e.g. Elovaara, 2004; Karasti, 2001; Mörtberg, 1997; Suchman, 2002, Vehviläinen, 1997).

One idea of the feminist strand is to reconstruct relevant relations that cross the boundaries between designer and user (Suchman, 2002). If we want users to be involved, we must also act openly and adapt our behaviour as well as our language, and our method of passing on our knowledge to the users. This is necessary if they are to have confidence in contributing to the design. Participatory design involves both users and designers, thereby allowing mutual learning to occur throughout the design process (Bratteteig, 2004; Löwgren & Stolterman, 2004; Ståhlbröst, 2006). Users and designers learn from and about each other, requiring a shared social and cultural background as well as a shared language. The designer also attempts to share practices with users (Löwgren & Stolterman, 2004). Because of this, I interpret
that participatory design can be used both as a method for designing actual artefacts and computer systems and as a method for conducting research. “Participatory design is both a goal we share in studying and working with the development of e-government, and a means to interact with our research partners around design, as it provides additional input for our analysis of both current situation and possible design” (Elovaara, 2004, p. 148).

**Situated Knowledges and Located Accountability**

I regard situated knowledges to be tangible, so how we conduct a design process depends on where the design comes from, it must be design from somewhere – we must rely on located accountabilities (Suchman, 2002, see below). As Elovaara (2004) expresses it, when talking as a researcher (or archivist, registrar, etc.), I can only tell my story, and I tell it through my experiences and my body and from being in a particular somewhere, since no person can be in all places, situations and positions at the same time. Therefore, we cannot talk of knowledge in the singular – instead we must refer to knowledge in the plural. Situated knowledges are what we can achieve through exploration and research (Haraway, 1991), and it is the only way in which claims to objectivity are or can be grounded (Haraway, 1991; Suchman, 2002). The consequence I wish to distinguish is that situated knowledges should make up the foundation of the design. In other words: “... there is in fact no distinct boundary between technology design and use insofar as professional designers, in order to develop systems with any integrity, must develop them in relation to the specific settings in which they are to be used” (Suchman, 2002, p. 93). This should be the starting point for the system-to-be, and the system should evolve from the situation in which it will be used.

There are, of course, other ways to design, and Suchman distinguishes three: design from nowhere, detached intimacy and located accountability. Design from nowhere represents what Haraway (1991) calls the view from the God’s eye – independent designers that stand above the use context and create systems without concern for their own positions in the system’s design process. They view technologies as objects and themselves as their creators, thereby making it impossible to locate responsibility for technical production (Suchman, 2002). In detached intimacy, the designers establish a joint creation of a social world that remains self-referential. Put otherwise, they have created their own universe and cut off others who challenge aspects of their community’s practices. They are ambiguously placed in a position in which their accountability refers to those who employ them, and their value lies in their autonomous exercise of professional skills. Located accountabilities should build on partial, locatable and critical knowledges in line with Haraway’s (1991) thoughts of situated knowledges.

Located accountability demands mutual learning, since technology production and use involves a number of aspects, such as computer science, electrical engineering, mathematics, cognitive psychology, linguistics and anthropology. Not only do they address different problems, they also have different conceptions of the social/technical world. Involving all these fields makes it hard to distinguish where
responsibility lies. Nevertheless, Suchman (2002) is confident that designers should be held responsible for the design. The design, in turn, should be based on the collective knowledge of particular and multiple locations of the production and use of effective objects. Designers are one group, and users are another. Users are not a coherent group either – most workplaces employ a range of different professions, with different tasks, practices and roles. Each of them has their view of what constitutes knowledge work (Suchman, 2002). This becomes a situation where the designers must balance all perspectives, be able to see different work practices and acknowledge the same. Systems development is “the cultural production of new forms of material practice” (Suchman, 2002, p. 99), not merely the creation of objects. Artful integration, she writes, is assuming the continued existence of hybrid systems composed of heterogeneous devices. The success of a design lies in the extent to which the technology is placed within existing, specific environments of devices and work practices. Change is an aspect of everyday practice, since new technology and new work practices grow out of old ones. Many things are involved in systems design. One way of understanding the context of design is a framework by Gärtner & Wagner (1996).

Mapping Actors and Agendas

Most such situations are complex and multifaceted, and I see no reason for assuming that the archival situation is an exception. There is no single answer or version that might explain all different aspects involved, since phenomena do not exist in a vacuum, disconnected from other influential factors. Based on this, I find Gärtner & Wagner’s framework useful (Gärtner & Wagner, 1996). As they point out, the Scandinavian approach of participatory design is supported by the strong tradition of workplace democracy. However, political issues seem to have vanished in favour of the partnership between designers and future systems users. Therefore, participatory design must define good will in design for itself. The framework provided by Gärtner & Wagner (1996) enables discussion of the political and organisational context of design and participation and identifies some of the central characteristics of these. Involved, then, are actor networks, where power relations are a concern.

Gärtner & Wagner (1996) identify three arenas for participation where there is space for action: Arena A – designing work and systems, Arena B – designing organisational frameworks for action, and Arena C – the political arena. However, as Elovaara (2004) emphasises, it is important to remember that the arenas exist in parallel and influence each other. They are also not necessarily forming a top down hierarchy, so control, steering, etc. might come from any one of the arenas. For example, changes in legislation (the political arena) will affect the local level, but the latter might interpret and implement an adjusted or adapted version. Following this, “… perhaps Arena A is also a space for resistance or re-negotiation of the ideas developed and worked out in arenas B and C” (Elovaara, 2004, p. 133).

Arena A is where specific systems are designed, which implies that any intention of enhancing things such as workplace skills and working conditions must be concrete.
(Re)design of work and technical systems is what shapes the agenda and might involve issues such as skills, procedures, communication and cooperation, but also dependency and automation. Arena B is where actors negotiate productivity and social agreements. The actors represent groups within and outside the organisation. Here, participation is indirect and eventual conflicts are regulated in a more institutionalised way. However, Arena B also constitutes the location where conflicts are diagnosed, questioned and redesigned. Arena C, finally, is where negotiations of the general legal and political framework are done. Norms for many work-related issues are established within this action space and they are often culturally specific. However, this arena increasingly involves global spaces, since we live in a world where the flow of people, money, goods, information and technical systems is becoming more and more common. Actors are not necessarily spatially and culturally close to one another and transnational regulations address domains of human practice (Gärtner & Wagner, 1996).

Information Technology Use

Following my firm conviction of the importance of participatory design, I conclude with a discussion of use qualities in relation to archival information systems. To discuss the use of information technology necessitates an entrance – a perspective from which to start. I find Löwgren & Stolterman (2004) especially useful here. They approach the issue by identifying and discussing use qualities. Good system designers should not leave anything out – what might seem inadequate could very well provide opportunities one could not foresee. By this I mean that when an actual design situation is at hand, the designer must be aware of many different options or use qualities.

Löwgren & Stolterman (2004) sort the qualities into five areas: motivation, immediate experience, users’ interactions with digital artefacts, mediations of structural meaning, and creation of meaning. The first area involves qualities concerning users’ motivation for using the artefact: intrinsic motivation such as anticipation, playability and seductivity, and extrinsic motivation, that is, relevance and usefulness. To design an archival information system (or any work-related system) that makes the archivists and administrators react with anticipation, and wanting to play with the system “just one more time” might be more than anyone could accomplish. If one succeeded in this, one could indeed claim to have built a fantastic system! Nevertheless, extrinsic motivation is important – the system must be relevant and useful for the work task, something that seems obvious. If the system is a work tool, it must function in accordance with users’ demands and expectations.

The second area – immediate experience of interaction with the system – is about how we handle and perceive the same. Qualities mentioned by Löwgren & Stolterman (2004) are pliability, control/autonomy, immersion and fluency. Here I find pliability and control/autonomy most important. Surface pliability concerns how closely connected the user’s move is. The result of that move and the user’s understanding of the result is connected. Deep pliability is about acting freely and shaping the material and is of less importance for archival information systems. Since
these should rely on certain fundamental concepts, I imagine the system must be rather strict to some extent. It must therefore handle questions of control and autonomy, such as whether the system should be mainly a tool and to what extent it can be automated.

The users’ interaction with digital artefacts and outcomes on a social level are the themes of the third area. Social action space, personal connectedness and identity are the qualities, and the first concerns what potentiality for social action the digital artefact inherits. Personal connectedness is about getting in touch, being in touch and staying in touch with others in a personally meaningful way. Lastly, identity and constructing and maintaining identity is central when using digital artefacts, since they possess symbolic use qualities. All of these seem to be concerns for an archival information system. There are many users using the same system, so these qualities play a significant role in archival information systems.

As the fourth area, Löwgren & Stolterman (2004) mention mediations of structural qualities, and these are transparency, efficiency, and elegance. High transparency enables the user to uncover underlying layers of functionality and complexity in the system. Efficiency is the quality of being able to perform tasks quickly and error-free, and elegance stands for a combination of power and simplicity. The system should function very well with as simple a construction as possible. All of these are important considerations for the archival information system.

Lastly, there are qualities that revolve around the user’s creation of meaning in relation to the system – ambiguity, parafunctionality, and surprise is at stake (Löwgren & Stolterman, 2004). In relation to archival information systems, they could be problematic. For example, ambiguity, meaning no prescription for how to interpret is provided, might cause difficulties in an archival information system. In short, an archival information system should only convey the meaning that is in line with the fundamentals that constitute the same. This is necessary if the information to be preserved is to be consistently stored and easily found.
Science and Subjectivity
A doctoral student taking her first steps into a research community is met by a situation that implies many things. First, she needs to discover and uncover the area her research focuses on, which is the main objective of the doctoral studies. This involves a lot of reading, discussing and thorough thinking about the subject(s) in focus. Secondly, she is now a member of a community and must get to know other colleagues and academics. This involves learning the norms, values and taken-for-granted rules and regulations that surround the workplace (Traweek, 1992). Finally she needs to make clear, both for herself and the reader, her point of departure, i.e., how she looks at science, scientific methods and scientific results. This, in turn, hinges on the norms and values that prevail in the community. Being part of a community implies being influenced by everything that surrounds it, especially when it comes to questions of a scientific nature. No man is an island, all things are intertwined, interconnected, inseparable and inescapable. Every man perceives the world in a subjective way, constantly interpreting what is happening in order to take adequate action and meaningful steps, and, I believe, in order to learn.

My background is in informatics, which according to Bratteteig (2004) is expertise in the technical work of systems analysis and design, and programming. Dahlbom (1996) provides another definition of what he calls the new informatics as a theory and design oriented study of information technology use. My foundation is more in line with Dahlbom’s definition and social informatics, which is the interdisciplinary study of the design, uses and consequences of information technology, and which considers their interactions with organisational and cultural contexts (Kling, 1999). Goldkuhl (1996) considers informatics to be the study and knowledge of people’s work with the development, use and change of information systems in activities. Obviously, use is a key concept and is what interests me the most since no technology will ever succeed or fulfil any purpose unless it is used.

Systems thinking or systems science has had a great influence on my scientific perspective. I have also been influenced by feminist perspectives on science, and science and technology studies (STS). All of these deal with the questions focused on in this chapter and my intention is to provide the reader with my interpretation of these views. So, what is science? What counts as science? What do terms such as rationality, subjectivity and objectivity mean? What is possible to know? How is it possible to know? What do we regard as true, justified belief (Hartman, 2004)? In other words, what is taken to be knowledge, sensible action and morality (Traweek, 1992) within the research community of which I am a part, and how well does this fall in line with my own views? Furthermore, how can my research be conducted, and what methods are appropriate in my studies?

Hermeneutics
Hermeneutics is mainly connected with social sciences while positivism is the main approach within natural sciences (Hartman, 2004). The key word in hermeneutics is interpretation. The main assumption is that every human being perceives herself and
her situation in a special way, and that she applies meaning to everything that surrounds her. This means science that aims to find out something about something involves interpreting the world and how it is perceived, not how it is. Individuals also interpret situations according to what they find meaningful and this depends on their preferences, background, knowledge and experience (Mirijamdotter, 1998). When investigating something, we need an approach that provides us with the knowledge and understanding we seek. Subjectivity becomes a necessary part of social science – a part that is impossible to exclude. The question is if the matter is ontological or methodological.

According to Weber (in Mirijamdotter, 1998), the difference is methodological and depends on different ways of knowing. In other words, Weber saw only one reality and this reality could be represented as history or as natural science. Put simply, we only live in one reality but it can be represented in different ways. We can learn about that reality through positivistic research – there is no doubt that this has been successful. But has any positivistic research ever been purely objective? I do not think so. More important, the positivistic approach is weak when it comes to understanding social phenomena in depth. I cannot agree with Weber; I think it is an ontological matter. It is all about how we look at and perceive the world and how we believe it is possible to attain knowledge and an understanding of it.

Positivism places scientific knowledge above ordinary knowledge and for this, it is criticized by interpretivism (Mirijamdotter, 1998). Social phenomena can never be studied in isolation; they must be understood in the context of which they are a part. The hermeneutic circle refers to the recognition that a social phenomena needs to be understood as a whole, and isolated parts cannot provide us with that understanding. Instead, we need to circle around the whole and the parts, subject and object (Hartman, 2004). The idea of the circle is that no knowledge is possible without presuppositions, and this leads to a learning process with no fixed or starting points. Instead, we iterate between parts and relate them to the whole, gradually increasing our understanding of the social world (Mirijamdotter, 1998).

**Systems Science**

It is an inescapable fact that Western civilization has developed the organized human activity called science, and this science is a product of that civilization as a whole, i.e., social, cultural, and economical as well as intellectual aspects have played a part (Checkland, 1981). I claim that this is the first hint of the impossibility of an objective science, since it is developed and influenced by the Western world, and therefore it has several distinguishing features that bear its mark. It is not possible to write objective history. Instead we can only write history that is consistent with a particular point of view. Originally, science was all about the urge to know (Checkland, 1981), and, I believe, the joy of learning (learning is really the core of the soft systems methodology [SSM] developed by Checkland, but that is another story).

Checkland (1981) continues by saying that systems thinking complement scientific thinking. Adopting a systems approach to a problem involves describing the
problem holistically, that is, in terms of whole entities linked in hierarchies with other wholes. The description should therefore contain the researchers purpose, the selected system(s) and various system properties (boundaries, inputs, outputs, components, structure, the means by which the system retains its integrity and the coherency principle, which makes it defensible to describe the system as a system). The minimum number of system classes required to describe the whole of reality is four: natural, designed physical, designed abstract and human activity systems (Checkland, 1981).

In conclusion, I will state that my approach is hermeneutic, simply because I am convinced that every human being experiences and interprets the world around her constantly. As human beings, we are not able to shake off all our pre-understandings when facing a phenomenon.

**Systems Perspective**

The obvious thing to start with, then, is what constitutes a system. A system is a part of the world, chosen to be regarded as a whole (Bratteteig, 2004). Taking a systems perspective implies that phenomena are viewed as consisting of an input into a system, which the system transforms in some way in order to create an output that is a change of the input. This is the simplest description of a system. Everything can be regarded as a system, from the human body to an organisation.

Every system is part of a larger system and the system itself consists of systems. This means that systems are recursive, and depending on which recursive level (which system) one chooses to study, one must state where one puts that specific system’s borders (Beer, 1993). However, systems do not exist; they are intellectual constructions of a whole entity, just as nature does not consist of physics, chemistry and biology. They are fabricated arbitrary divisions that are a convenient way to study nature, and Checkland (1981) introduces systems as another subject to study.

To take a systems approach when studying something is to take a broad view, trying to consider all aspects and concentrating on interactions between the different parts of the problem (Checkland, 1981). It could be argued that it is difficult to study wholes. Instead we can be aware of the whole while studying its parts. Nevertheless, studying parts while iterating between them and the whole, or holon in Checkland’s words, is possible, and maybe this is what systems thinkers do. It is always a question of iterating between the parts and the whole as well as being aware of the fact that changes in one part of any system affect other parts, thus influencing the entire system. This implies that the parts we choose to study are also systems within system(s) and consist of system(s) in a recursive manner. According to Beer (1993), the part we choose to study is called the system-in-focus. The hermeneutic circle where we iterate from parts to holon also plays a part. What needs to be remembered, though, is that the part(s) we focus on are different in different situations and in different social contexts, especially when people are involved. In some, certain things might be at the centre while in others the thing can be marginalised (Star, 1991). This means that depending on which perspective we
choose, what is centred and what is marginalised differs. From one perspective a person might be embraced by the intentions, while from another the person is not included. Therefore, Star argues that we must recognise that much work is conducted by many, not necessarily by only one actor, and that we must reveal invisible work and refuse to exclude any single self. Star bases this last argument on the fact that people have multiple memberships in many worlds, and this applies to all actors in a network.

Feminism and Science

We perceive the world subjectively, but what affects that subjectivity? In feministic views of science, there are ideas and suggestions that pose a challenge to this question. Feminist critics of science suggest, “The directions that the forms of scientific knowledge have taken since the seventeenth century are grounded in (or at least supported by) a historically explicit identification of scientific values with the values our particular cultural tradition takes to be masculine…” (Keller, 1992, p. 75).

Keller continues by saying that feminist theory has helped us re-vision science as a discourse but not as an agent of change. She argues that the ideology of ‘pure’ science and the focus on truth or consequences (but never both) are obstacles that prevent a reformation of science. Keller (1992) suggests that we need a better understanding of how science works, because science does selectively impinge on the real, i.e., it is never neutral since it affects certain kinds of changes rather than others. Therefore, I regard selectivity as important, because it implies that we make our choices based on our subjective comprehension of the world. The important point is that it is possible to redirect science in the direction we want to instead of letting it spread out in any direction. In other words, the content, results and effects of science are crucial. What world do we want to create? Whose knowledge should be valued?

In answer to this, Haraway (1991, p. 195) argues “for politics and epistemologies of location, positioning, and situating, where partiality and not universality is the condition of being heard to make rational claims.” In short, all knowledge is situated, located and partial. What we can get is situated knowledges, i.e., multiplicity of local knowledges. The concept situated acknowledges memories, experience and knowledge as embodied and, therefore, situated – socially in a culture, and physically in a context or environment (Jansson, Mörtberg & Berg, forthcoming). Thus, knowledge is always partial, where history, culture and places are intertwined. Accordingly, situatedness is not solely about a specific place but more of certain circumstances such as the specific history, social culture, organisation culture and work practices a person is embedded in and which become obvious in her/his narratives of everyday work.

To understand the relevance of situated knowledge, researchers and those being studied must be appreciated as actors or agents within the context of particular social and material relations and practices (Vehviläinen, 1997). There is no uniform knowing subject but, rather, temporary and fragmented identities that are central to
some social worlds and marginal in others. Thus, the subjects are constituted in practices where meaning is created through languages and agency (Mörtberg, 1997).

Haraway (1991) also includes the body. A researcher is not only eyes as the positivists like to see it, but also a body. She contrasts the view from the body with the view from above, where the first is complex, contradictory, structuring and structured and the latter is from nowhere and from simplicity. We cannot learn everything using the God trick, i.e., seeing everything from nowhere. We need to learn in our bodies instead. I find this sympathetic, for what is the fixed point that constitutes what holds a human being together if not the body? The body is the place where my biography happens or takes place (Mörtberg, 1997). It is also where our science originates.

Situated knowledges require that researchers as well as the subjects being studied are perceived as actors or agents. Subjectivity in this sense is challenging the image of the Western person (Vehviläinen, 1997). These subjects should also be regarded as mobile subjectivities (Kathy Ferguson, in Vehviläinen, 1997) or nomadic subjects (Rosi Braidotti, in Vehviläinen, 1997) to make it clear that they are located in particular social and textual material relations and practices. Feministic post-structuralism is critical to the notion of one uniform knowing subject in line with other critical practices and positions by modernism and its crisis. The post-humanistic and post-structuralistic deconstruction of this uniform knowing subject has led to understandings of temporary and fragmented subjects. As we move between positions – chosen or those we are placed in – we can experience conflicts and contradictions, which imply that the subject is being shaped or shapes within these fields of tensions. Hence, the subject is neither coherent nor fixed, rather, it is constituted through language or social practices and is dependant on traditional and cultural ideas (Mörtberg, 1997).

Feminism, as I see it, clearly shows awareness of that view. Feminist research could be described as a process from making complementary studies via making corrections to the notion of sex as an analytical category used to reach an understanding of how societies, cultures and classes are shaped and constituted. However, this has been broadened today and involves an ambition to provide a critical view of science. The goal to be achieved is the development of complex understandings and theories in order to transgress oppressive gender relations and alternative forms of knowledge (Mörtberg, 1997). Gender studies today have two main “study objects” of which the first is women, men, the production of femininity, masculinity, gender, gender relations and power relations, and the second is knowledge processes, theories and methodologies.

Dichotomies make us view things in contrasts, and when it comes to research, it has put men and women in opposite positions, where men have been the norm by which women are measured. A woman’s perspective in feminist research could be said to reverse the picture, resulting in an either/or relation with constant hovering between two extremes. Since women and men are shaped in interactions, we really should
view constructions and constitutions as mutually overlapping instead of mutually excluding (Mörberg, 1997).

One way of avoiding the dichotomies is feministic post-structuralism. Inherent here are critical strategies in relation to Western metaphysical tradition such as theories of fragmented subjects, analyses of power/knowledge, social constructions, discourse analyses and deconstructions of conceptual systems. Differences are the central issue. Human beings are constituted through activities in or through relations to different social practices. Identities are not static – instead they are products of social and cultural practices in specific historical timings, and they are in constant transformation (Mörberg, 1997).

My view is that people are actors or agents. They place themselves in every scenario of which they are a part and act based on their needs, ideas, norms, social and cultural preferences, etc. In other words, as stated above, they shape and are being shaped in the situation of which they are a part. This implies that many things affect how and why people act as they do. It may seem obvious that what mainly influences them are other human beings, but apart from this, so does the building, the design of the work place and the technology they are expected to manage, just to mention some examples. Complexity and differences is what distinguishes human beings. We can never study people and their actions in isolation. Indeed, the hermeneutic approach and feminist views of science provide us with the necessary foundation for these kinds of studies. My interpretation is that the hermeneutic approach and feminism to a higher degree are implicitly aware of the most important question of all: what do we want to leave behind? This might simply depend on the fact that I believe they put human beings in focus. Doing research where human beings are involved means understanding how they interpret the prevailing situation and what situation they desire. Every researcher and/or research project intends to change a situation, implicitly or explicitly, and we must be aware of the consequences and effects of that change.

**Scientific Method**

With a qualitative method, the researcher intends to make explicit qualities that capture what is central in a specific situation or phenomena. Qualitative methods form the natural consequence of a hermeneutic approach, and rest on at least two assumptions of the reality, where the first is a holistic perspective of the world that is in line with systems thinking (Checkland, 1981). The second involves a particular perspective of the relation between the researcher and what she examines, which is called the subject-subject model. In the meeting between the researcher and what she examines, there is actually a subject-subject relationship, both embracing and trespassing each other, but also having a partially shared understanding of the data (Eneroth, 1986).

Introspection also plays a part in qualitative methods. The researcher must bring out things in the phenomenon that she herself is affected by and be able to “put herself” in the situation which she wants to analyse. This is fundamental if an understanding
is to be reached. Empathy is connected with this, which according to Eneroth (1986) can be passive or active. Passive empathy implies that the researcher is listening and observes without any personal expressions, while active empathy means that the researcher uses more of an acting role, confirming or using body language. What is needed here is a situation where confidence is crucial.

The theoretical perspectives that can be used, according to Eneroth (1986), are the static, the dynamic and the teleological. A theoretical perspective is the idea of which data are important and is at the core of the situation the researcher examines, thereby forming the framework within which the researcher acts. The perspective steers the attention toward certain data and ignores others, enabling limitation of the data, which is necessary if the researcher is to form an overall picture. These three perspectives are fundamental in that a researcher always originates from one of them. However, it should be mentioned that the holistic approach, which is what hermeneutics claims to be crucial, should be kept in mind. According to Eneroth (1986), it is also an inescapable fact that the only way to approach the whole is via the more limited qualities of the phenomenon. This forces us to limit our perspective.

In short, the three perspectives can be described as follows. The static perspective focuses on the relatively permanent in a situation/phenomenon (the stable) which can be observed from time to time. Here, it is the components or parts of the situation/phenomenon that are interesting. The dynamic perspective is aimed at studying changes, the non-permanent or flows. This involves relating clearly with earlier forms of this component or part. Finally, the teleological perspective is goal-oriented and interested in fundamental goals for the phenomenon, i.e., the perspective is a purpose perspective. There are four kinds of goals: functionalistic (deals with the existence of the phenomenon), nihilistic (revolves around the decomposition of the phenomenon), the problem-solving perspective and the problem-creating perspective (Eneroth, 1986).

When it comes to the research I have conducted, my approach is a mixture of systems perspectives and feminist perspectives with an underlying hermeneutic philosophy, and a thorough belief that we construct our reality through a range of different phenomena such as sex, class, language and so on. We stand with our interpretations and experiences, influenced and coloured by them. As researchers, we need to declare our point of departure systematically and honestly, along with our world view. In other words, we need to locate our knowledge in time and place, and social and cultural context, in order to make our research credible, reliable and worthwhile.
My Method
During this research, I have conducted studies in four different ways. The first two – following an archivist in her daily work and brainstorming conducted by participants at a conference for county council archivists – were chosen because of my wish to explore archivists’ current situation and the impact and consequences information technology brings to it. Since I also wanted to identify recommendations for design of archival information systems that include human and social aspects, I conducted a future workshop and a focus group with archivists at an existing e-archive.

My studies were conducted with archivists from public authorities, county councils and municipalities. It must be kept in mind that laws and regulations are somewhat different depending in which area the archiving is done. The strictest area is the government level, which is regulated by the Archives Act (SFS 1990:782). Municipalities are given good advice and, to a certain degree, they can decide themselves what and when to archive something and what should be appraised.

Participatory Observations
My desire to understand how archivists experience their work situation today was easily followed by a decision to study an archivist in her daily settings. I started gathering data for my research by following an archivist at a university. I wanted to get a picture of archivists’ current situation regarding their professional role, methods and techniques. It was easy to contact the university archivist, since she had an interest in the matter. It might be more honest to say that we contacted each other, since it felt that way. I want to state this early on, because knowledge, commitment and interest in long-term digital preservation matters – she had it all right from the start. Jill, which is not her real name, is the only archivist at the university\(^7\) and she knew about the LDP project before my own involvement in it and was eager to participate in some way. Knowledge, commitment and an interest in long-term digital preservation matters – she had it all right from the start. She wanted her university to become a forerunner in long-term digital preservation, so in April 2005 our collaboration began and lasted, for this thesis, until June 2006\(^8\).

At the start, I knew very little about the profession. The little I knew about it came from literature on archival theory. I wanted it this way, since I was eager to have as few prejudices and preconceived ideas and thoughts as possible. I wanted to study what Jill did and how and why she did it with as open a mind as possible. This implies that I did not prepare any questions or themes for discussion in advance, but approached the task with as little prejudice as possible. I read and continued to read about the subject during the research, which influenced my understandings.

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\(^{7}\) In Sweden, public universities are regarded as governmental authorities, and as such they are obligated to follow current rules and regulations.

\(^{8}\) From April 2005 to June 2006 I followed Jill in general half a day, two days per month.
It was obvious that I could not record the entire time I spent with Jill. Instead, I carried a notebook with me in which I wrote my observations, thoughts and first analyses of what I observed. Afterwards, I transferred my notes to a computer. At this stage, I extended my notes into a more comprehensive text to make it readable, but I also added thoughts, reflections and ideas since I wanted to ensure that I would not forget them. I found it important to write down everything I saw and learned, even if I was uncertain whether it was important to my focus. The idea behind this was that when I was ready to analyse my material, I could clean it up and sort it into themes. I also wanted to be sure I had understood everything properly, so I sent my text to Jill, asking her to comment on the text and to make corrections if there was something I had misunderstood.

Being part of a scientific community (social informatics) and being based in that area has naturally coloured how I look at the world. I was surprised to realise that I expected Jill to work so much more with the computer than she did! This was an eye-opener for me and a reminder that computers are tools to be used when needed but they are not the only means of conducting work tasks. I followed Jill to meetings, helped her in the archive and listened when she gave lectures for administrators, talked on the phone and so on.

**Brainstorming at a Conference**

I was happy to be invited to an information conference for archivists from county councils, which took place in Lidingö outside Stockholm in early December 2005. Thirty-four persons participated in the conference. They were mainly archivists but four of them were from other areas. Nevertheless, they were all connected to the archival community. I contacted the organisers and asked if I could conduct a study in which the conference participants answered some questions. This was alright with them, and I was given one hour to use, which characterized how I conducted the study.

At the conference, I started by providing some information on the LDP project and how it was proceeding, and made some remarks about my colleagues and their research but as little as possible about my own. The reason for this was that I did not want to influence the attending archivists too much with my view of things. What I did say was that there are many ways to look at digital archiving, as Lavoie and Dempsey (2004) suggest, which among other things implies that there are many unsolved issues. The issues are connected, and some issues are of a technical nature but others are not – the social, juridical and financial contexts are also involved, for example. I continued by telling them about the basis of my research, which is that development of information technology should be done in cooperation with future users and that the design and implementation of information technology should consider the organisation and its context. Finally, I mentioned that I regard archivists to be one group of users (besides citizens) of archival information systems, and they

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9 The Centre for Long-term Digital Preservation was about to open 1 January 2006 and this was the reason for the invitation to the conference.
should be part of the development, so therefore I was curious to know how they felt about the current situation.

I instructed the archivists to answer my question individually by writing as many answers they could come up with, but only one answer on one note. Even though my research questions revolve around long-term digital preservation, I wanted them to write down anything that came to mind. I wrote this question on the white board: “What do you see as problems/problematic in your current work situation?” The archivists were asked to freely consider the question and provide as many answers as they could for about fifteen minutes. The result was 142 short notes with problems/problematics.

Back home I wrote down and numbered the answers after transferring them to the computer. Then I took each answer, read and reflected on it and interpreted the area of concern referred to by this particular answer. I was looking for patterns and themes (Wibeck, 2000). The themes I identified were resources, information technology, cooperation and communication, work tasks, organisation, professional role and competence, laws and regulations, and attitudes (See Appendix 1). The results were sent to all archivists who answered the question via e-mail, since I had promised them feedback on their contribution. I was pleased with their eagerness and willingness to take part and received comments such as “it feels good to be recognised” and “it’s nice that someone is interested in our situation.” Such things make this kind of research worthwhile!

Since people are creative and committed, some of the notes concerned more than one issue. The reason for this is that the archivists sometimes identified an issue and then added their interpretation of what caused the problem in the first place, so another issue was identified. I did not, however, split the answers up any further. Instead, I chose to develop their answers in the Studies of Archivists’ Experiences chapter.

**Future Workshops**

One way to find out about the subject you are interested in is to listen to what people discuss and suggest. Future workshops is a method with which you conduct a meeting where the objective is to create an initial joint proposal for changing a situation the group of people finds unsatisfactory, in this case archivists (Bødker et al., 2004). This means that future workshops can also be defined as participatory social and organisational development, since they aim to design a future scenario (Löwgren & Stolterman, 2004). According to Jungk & Müllert (1987), future workshops can be used for problem solving in organisations, designing development plans and enlivening seminars and meetings. I believe future workshops can be fruitful as scientific data gathering methods, even if research was not Jungk & Müllert’s prime concern. However, we agree that by participating in a future workshop, all participants can gain a shared understanding of the problematic situation and learn how others experience it. They also learn to structure the expressed ideas and to draft a plan.
The idea behind future workshops is to create a better society and to find out what concrete suggestions ordinary people have to achieve that. Future workshops have an inherent, underlying democratic value, and this seems to be in line with participatory design. Thus, they fit together like hand in glove. There can also be (are) great differences between what people expect from the future and what they want. When people cannot influence, they become apathetic; when they can have their say, they engage and act (Jungk & Müllert, 1987). Since the latter clearly suits my second research question (how to design archivists’ work practices and recommendations for future archival information systems) my decision to use the method was easy. Another reason for choosing this method was that things happen while people interact. Together we discover more than we do alone, so we can thereby reach synergy.

A facilitator organises and coordinates the future workshop, so this was my role. Participating and assisting me were my PhD student colleagues who were involved in the LDP project. During the workshop, participants alternate between brainstorming and group work. The brainstorming part generates critiques and ideas that are formulated as key words, written down on large sheets of paper and put up for everyone to see. The aim is to analyse and expand the critiques and ideas. Originally, a future workshop was divided into a preparatory phase and the actual workshop into three phases: critique, fantasy and implementation (Jungk & Müllert, 1987). Today it is defined as consisting of five phases since a follow-up phase has been added. Bødker et al. (2004) and Löwgren & Stolterman (2004) call them preparatory, critique, fantasy, realisation and follow-up, and this is also what I will do.

Jungk & Müllert (1987) say that the preparatory phase should be carried out before the workshop and involves planning. Those responsible for the workshop should decide the place, time, theme, structure and so forth. That a workshop must be planned is also mentioned by Bødker et al. (2004). They also state that the theme of the future workshop should be as specific as possible and reflect the group’s preliminary understanding of the situation. In short, this involves thoroughly thinking through the future workshop in advance. This of course goes for any kind of scientific method. I must be well prepared and clear about what I want to achieve when gathering my empirical material. According to Bødker et al. (2004), the actual future workshop starts with the preparation phase, during which the theme of the future workshop is presented and how the work will be conducted. Important here is to create a relaxed and open atmosphere so each participant feels secure. Thus, there has been a change in what the preparatory phase concerns.

The next phase – critique – aims to create a rich common image of the problematic situation through brainstorming. The objective is to bring all the grievances and negative experiences related to the topic into the open (Jungk & Müllert, 1987). The results should be quick, short statements, of which keywords are written down for all to see. Based on the keywords, a shared experience of what must be changed is created providing the participants with a common foundation (Bødker et al., 2004).
The keywords are then identified and themes are chosen for continued work in small groups. The groups are expected to end up with a concise and coherent critique of the contemporary situation (Löwgren & Stolterman, 1998; 2004).

In my study, I tried to make this phase as short as possible. The future workshop took place over one day and I wanted to save time, so the participants were provided with the results of my earlier data gathering as stimuli material. That is, they were made aware of what other archivists regarded as problematic. The participants were asked to read and react to the different perceived problems and then report back when we met. I was interested in whether they agreed or not, and if they could identify other things in their everyday work that were not running as smoothly as they could.

The fantasy phase aims to develop ideas and utopian proposals for the future – ideas that should be in response to the problems with their desires, fantasies and alternative views (Jungk & Müllert, 1987). This should be done without restrictions and an air of “everything is possible” should permeate the phase. Again, brainstorming is used as a method, proposals are written down and discussed, and ideas are selected to be further developed. According to Bødker et al. (2004), it is difficult to be creative in this phase. People are often not used to coming up with wild ideas and suggestions together with others. Bødker et al. (2004) provides some questions that can be asked to open people’s minds and suggests that participants can be asked to change their perspective if this phase appears difficult to complete.

In the realisation phase, the utopian proposals are presented and evaluated to discover whether they are possible to implement under present conditions in the workplace, or if new conditions must be established. This phase involves coming back to the present with its power structures and constraints (Jungk & Müllert, 1987). Here participants are once again encouraged to criticise in order to find out what barriers hinder the realisation of the utopian ideas. Activities that must be initiated if the ideas are to become real are also identified. A common plan is shaped and its first steps are detailed, so everyone knows who will be doing what (Bødker et al., 2004).

In my study, this last part of the phase was not quite adequate, since the archivists came from different organisations and the probability that they, as a group, would come up with some sort of implementation plan was less likely. Nevertheless, they were provided the opportunity to suggest different ways to implement their desired future.

Finally, in the follow-up phase, the aim is to let participants know that the work has started through a report that summarises the entire future workshop (Bødker et al. 2004). I wrote a report, with a summary of the critiques, visions and realisation plans, which was sent to all participants to provide them with feedback on their work (see Appendix 2).

It is important to note that during all of the phases, all material is saved, not only those the group decides to work with. This was important to me since that kind of
material can also provide material and insights that can be analysed. It is not always the things we choose that tell us the most but the things we reject and avoid. All results from all brainstorming sessions and discussions can provide insights, both for the participants and for me as a researcher. Directly after the future workshop, my colleagues and I also discussed and wrote down our impressions and interpretations, since this could provide even more material for the study.

Focus Groups

Focus groups are another method that involves people as a group and that can be described as a focused group interview. The method has mainly been used in marketing investigations but has recently also been used in academic research. Its advantage is in providing insight into people’s ideas, attitudes and values. Depending on the subject of the focus group, people are chosen based on certain criteria in line with the theme or subject to be discussed. To initiate discussion of the subject, some kind of stimuli material is provided to the participants. When the focus group meets, the researcher acts as moderator, initiating the discussion and introducing new aspects of the subject when needed. The idea is for participants to speak as freely as possible, whereas the moderator rarely intervenes. Focus groups also help the researcher study how people express themselves and people’s interactions as well as focusing on what they say (Wibeck, 2000).

Morgan (1996, p. 130) defines focus groups “as a research technique that collects data through group interaction on a topic determined by the researcher.” This indicates three important things. First, it is a method aimed at data collection for a research purpose, so other kinds of groups such as working groups, management groups, etc. are excluded. Secondly, the data is collected through group interaction, since interactive discussions are focused. Finally, the researcher chooses the topic, and a certain outcome is expected. The researcher has an implicit question or idea, which (s)he wants to explore. The aim is more than a mere meeting.

There is a county council in Sweden that is one of the first to create an e-archive. In April 2006 I met three of the employees at the county council archival depot. Before I went there, I informed them of the LDP project and my part in it. I told them that I wanted them to provide their view of how an e-archive works. The focus group revolved around three basic themes: the situation before the e-archive was built (what was), the situation today (what is), and a desirable future situation (what could/should be) (Ståhlbröst & Holst, 2006). The focus group was recorded and transcribed. I also sent the transcript to one of the interviewees to ensure I got it all right, and the interviewee confirmed this.

Rethinking Future Workshops and Focus Groups

The two methods described above are similar in that both involve a group of people. Even though focus groups involve more interviewing, the intention of focus groups is that the mediator should intervene as little as possible (Wibeck, 2000). This is in line with future workshops, which aim at user involvement in the design process, and where the intention is to let them have their say (Löwgren & Stolterman, 1998).
The difference between future workshops and focus groups is that while future workshops have a clear objective to change a perceived problematic situation by finding realistic new visions, the main objective of focus groups is to provide the researcher with empirical material. I claim that focus groups could aim at future solutions for something perceived as a need or problem, depending on the theme(s) of the interview, which means that the two methods merge in some aspects.

These methods have several advantages. Partaking in a future workshop implies that the change process starts for future users (Löwgren & Stolterman, 1998). The meeting can make them aware of things they did not reflect on before, while gaining insight enabling them to create visions and plans. My opinion is that this also applies to focus groups. All discussions we as human beings take part in, provide us with opportunities and possibilities for reconsidering our own view. A change process could occur, or our view is reinforced and confirmed. Any group discussion involves a certain level of learning. I am convinced that future workshops and focus groups provide everyone involved, not only the moderator, with new insights, understandings and knowledges. Whether everything learned is true is of course discussed, and the discussion stems from the fact that there are different philosophical views of science. The understandings acquired during future workshops need not necessarily be “true, justified facts”, but rather people’s views of the subject in focus, which is their situated, embodied knowledge (Haraway, 1991; Suchman, 2002). The main advantage of future workshops then, is that they make it possible to reach a common understanding of how to solve something that is perceived as problematic, and that participants become aware that others might view the situation from other perspectives. Of course, some things could affect empirical material gathered this way that may demand awareness and attention. People may adjust their opinions and suggestions when working in groups. One person might dominate the discussion thereby silencing others. Attention to these types of occurrences is naturally the responsibility of the moderator.

Methods for Analysis

I wish to emphasise that analysing one’s material is an ongoing activity during a research process (Thomsson, 2002; Wibeck, 2000). When following Jill, attending the archival conference, and performing the future workshop and focus group, I had already begun to interpret and analyse what I perceived. After transcribing the studies, I read through them all several times, highlighted sections, words, concepts, phenomena, etc. From this, I discerned patterns or themes around which the archivists were talking. Overall, analysing is very much a question of splitting the material into parts and looking for trends and patterns (Wibeck, 2000). So I stepped back and asked myself what the archivists were talking about now. What area of concern are they addressing? The themes were found in the material from following Jill, from the archival conference and the future workshop, even though I ordered them somewhat differently. From the conference, they are set in a descending scale, from the most mentioned to the least (see Appendix 1), while in my account of the studies, I rearranged them with the individual archivists as the basis. The themes start with work activities, which demand cooperation and communication in an
organisation. To accomplish work tasks, archivists need a professional role and competence and resources. Attitudes are what they meet, information technology is what they work with, and all this is ruled by laws and regulations.

I intend to analyse and discuss my studies from two angles, as presented earlier. First, I will analyse and discuss my studies from the theories I have described, which are archival theory and systems design. Based on the discussion I intend to identify recommendations for the design of archival information systems, and this will constitute the second angle.
Studies of Archivists’ Experiences

In this chapter, I will give my account of the studies by acting as an intermediary for the voices I heard in the four different studies. The first three studies’ voices will come together in different themes. The voices belong to a university archivist whom I will call Jill, 34 persons who attended the archival conference, and seven persons (six archivists and one registrar) who participated in the future workshop. The fourth study, the focus group, involved two archivists (I will call them Anne and Mary) and one senior assistant (here called John) and is presented in itself since these archivists work at a county council archive that claims to have built a functioning e-archive. Hence, this study has a slightly different approach.

I identified the following themes: work activities, which are further split up into cooperation and communication, organisation, professional roles and competences, resources, attitudes, information technology, and laws and regulations. Before I present the themes, I will start with a brief description of the archivists and their work practice.

Archivists and Things that Influence their Work Practices

I will start with laws and regulations that govern the archival sector, which in Sweden are separated into official and private parts. Official archives are found in governmental authorities, and municipal and county council bodies, while private archives are made up of national movement, non-profit organisation, trade and industry, personal and relative, and village archives. Acts and regulations mainly address the governmental authority level. The Freedom of the Press Act (SFS 1949:105) states that every Swedish citizen should have free access to official documents, with the idea that this is important for research, culture and an open, democratic society (Gränström, 2005). The right to free access to official documents can only be limited for national security reasons, prevention of crime or protection of individuals (SFS 1949:105). The Archives Act (SFS 1990:782) declares the aim and purpose of archiving. The act emphasises that archives are part of the national cultural heritage and should be preserved, kept in order and cared for so that they can answer to the right of free access to official documents, and the need for information for judicial, administrative and research needs. The Secrecy Act (SFS 1980:100) regulates how to register and what might prevent an authority from distributing official documents to citizens requesting them, that is, if the document contains classified information, the authority can deny distribution of the requested documents. Finally, the Archives Regulations (SFS 1991:446) state that the Swedish National Archives is a supervisory authority, and as such, it can issue additional regulations to other authorities in Sweden. My studies show that archivists have concrete, embodied knowledge of laws and regulations. They also have expertise in

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10 The Swedish word is myndigheter for which there is no clear definition. The activity should, however, be based on regulations or governmental/Riksdag decisions, be funded by public means, and be able to take independent decisions, which can be appealed. This comprises state or municipal bodies that carry out official administrative duties under an official constitution. Activities governed by private constitutions such as The Swedish Companies Act (SFS 1975:1385) are not included.

11 The Freedom of the Press Act is one of four fundamental laws in Sweden.
national policy documents such as these Swedish Government official reports: Arkiv för alla – nu och i framtiden (Archives for everyone – now and in the future, SOU 2002:78) and Ordning och reda bland offentliga handlingar (Systematic ordering of official records, SOU 2002:97) and the government bill Arkivfrågor (Archival Matters, Prop. 2004/05:124). These policy documents provide additional thoughts and guidelines on digital preservation.

The interviewed archivists’ backgrounds are interesting. Jill has a master’s degree in languages (German, English) and pedagogy, with courses in library science, archival theory and law. In the future workshop, I learned that before they became archivists, some of the participants worked in a range of profession such as secretaries and floor-layers. Their educations span from archival theory to cultural science12. Many of them admitted to drifting into the archive business, meaning that they had not intended or specifically educated themselves to become archivists, while others were specially educated for the profession.

What does working as an archivist mean and what do they actually do? The work involves arranging and describing archives, building structures and processes around archival matters, planning and controlling records management, and informing, supporting, and educating administrators and others involved. It also includes providing records and other requested documents to citizens who ask for them. The work is varied and workdays are different. One day can be spent in the archives sorting documents, another can involve educating administrators, and yet another day the archivist might sit in front of the computer planning and structuring the records management process.

The work practices of archivists occur in an organisation surrounded by several actors that influence their work, primarily registrars. According to the Swedish principle of free access to official documents (SFS 1949:105), records must be managed from the moment they are received or created, that is, when they are registered at the authority. Hence, the registrar and the archivist have related work tasks, and together they secure the records management process. This, of course, depends on where the archivist works. In larger organisations with highly centralised archives, such as the county council e-archive in my fourth study, there are many of them and they are more specialised in certain parts of the archival process.

There are other influential factors, mainly the organisation itself (illustrated by the green circle in Figure 2 below). The organisation has units/departments (black rectangles) which includes the archive (pink rectangle) and the IT department (turquoise rectangle), and management (blue rectangle). Information technology (IT, the light green star), laws and regulations (yellow rectangle) and other kinds of policy documents influence their situation as do society and citizens (lime rectangle), since they can ask for official documents. Lavender represents the knowledge foundation that constitutes their professional expertise.

12 In Swedish: kulturvetare.
As will be shown, the actors and themes often coincide, so I will provide a picture of their current situation by using a figure of the archivist in context and illustrating the themes in red. By placing them in an overall picture I also want to emphasise that the themes are intertwined and connected, and they oftentimes merge. This is also the reason for using the concept themes, not categories, since categories and classifications should be clear-cut and distinct (Bowker & Star, 1999).

**Work Activities**
The red circle in Figure 3 below illustrates the space in which an archivist’s work practices mainly occur. Remember that the archive in the figure represents the physical place, the content (the analogue and digital documents that constitute the archive) and the department that the archivist belongs to. Since much work today is done through information technology, the red circle partially includes the information technology star. Many work practices also involve the entire figure, since in some way ‘everything’ influences their daily work.
Jill currently finds herself in a situation that originated in 2003 when the university started a project which included developing its records management process. The aim was to improve openness and insight into and create order in the records management process while increasing quality. Another objective was to help the university in its development towards e-government. This is in line with the ongoing Swedish e-government transformation process toward a reliable service society by using information technologies. The goals seem to be rationalisation, efficiency and effectiveness, and qualitative services to the citizens (Elovaara, Igira & Mörtberg, 2006). The fundamental idea is that authorities should be electronically available and accessible to citizens around the clock.

Jill and the registrar intended to provide guidelines and models of the records management process and thereby the preservation path for different types of documents within the organisation. These paths, called swimming lanes, concern registration, and it was mainly the registrar that handled this work. Jill mostly worked with policy documents such as *Plans for Handling of Documents*. These build on regulations from the Swedish National Archives. Plans for Handling Documents specify, for instance, whether a document is available in paper or digitally (and hence should be preserved digitally or on paper), reflecting the prevailing situation where different types of media are used. In the end, Plans for Handling Documents leads to the archives, so, Jill reasoned, the whole process should be covered. Models for *List of Records* is also included in Jill’s framework to ensure that administrators have access via the intranet to examples and models for various kinds of records management and information administration protocols.

Jill learned that even if models and examples are provided, administrators make interpretations and do things “their own way.” Official documents that belong in the university archives are sometimes not treated according to the policy guidelines.

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Figure 3. Where most of the archivists’ work practices occur.

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13 The swimming lanes provide a model for an issue, which results in an official record, showing when the issue should be registered (the received or created document), what will happen next with the record (e.g. a document belonging to the issue should be signed, by whom, and so forth). When the issue is completed, the swimming lane shows what documents should be preserved.
Consequently, documents could be difficult to find on the information technology-enabled information system. Jill hoped that when the necessary swimming lanes, Plans for Handling Documents and List of Records were fully implemented, all that would be left to do would be updating the policy documents when necessary. Overall, the greatest difficulty with the increasing number of digital records is that Jill has only vague ideas about how to preserve them. Jill seizes as many opportunities as she can to learn more about matters surrounding digital preservation including attending conferences and seminars. Despite her professional development diligence, Jill faces many unique situations for which no established protocols exist. Hence, the double security strategy is sometimes used, meaning that they print things out on paper to ensure that the documents are preserved.

The informants at the archival conference conveyed the overall impression that archivists really just want to know how to work with digital archives. Many notes had questions about how to deregister (not convert) to the archives and in what periods. They did not know how to archive their 450-500 data systems and wondered if it was possible to export information from these systems and store them uniformly in an archival system forever without changing the information. County councils must also take care of so-called ownerless archives according to the Patient Records Act\textsuperscript{14} and the National Board of Health and Welfare. Since these archives are now digital they did not know who should be responsible for the costs if they must be converted. So, the archivists asked, “Should we print everything on paper or microfilm?” Just like in Jill’s case, a double security approach was used. One archival conference informant even wrote that electronic patient records systems are bought but originals are printed on paper. The informants also expressed their desire to be able to guarantee delivery, access and availability to e-archives. Security issues were also a concern, since they are obliged to protect personal data according to the Personal Data Act (SFS 1998:204).

In the future workshop, the participants expressed that their workdays were fragmented, since they constantly had to jump from one task to another. Persons in the organisation expect immediate help and presume that the archivist can leave whatever s/he is doing immediately. The participants said that archiving is a low priority and low status area in their organisations and there was no sympathy for their work situation.

\textbf{Cooperation and Communication}

At the university, the situation was the same as in the other studies. Jill and the archival conference and future workshop participants stated the same: archivists and IT personnel cannot communicate with or understand each other. They speak “different languages and mean different things when using the same words.” One archivist even asked whether IT personnel listen to the archivists at all. The perceived lack of cooperation and communication refers mainly to IT departments and management (see Figure 4 below).

\textsuperscript{14} SFS 1985:562, Patientjournallag.
Technical concepts make a mess of things and technical issues seemed to be given higher status than archives. One informant at the archival conference experienced that information technology projects have unlimited budgets. This is further expressed by not involving archivists in different information technology projects. Archivists were not contacted during the planning stages of new information technology solutions. The organisation introduces new systems without informing the archivists, so archival and preservation aspects are not covered. Many informants pointed to the need to regard archival matters as part of the organisational context, where the archivists’ expertise is acknowledged and makes a difference. This understanding is needed not only by the organisation, but also by suppliers.

Figure 4. Main areas involved in cooperation and communication.

The archival conference participants stated that long-term digital preservation is not an issue among IT personnel. They run their own race with “no thought of future archiving, preservation and appraisal.” One informant asked how to make management aware of the importance of cooperation at an early stage, another asked for an archivist that concentrated only on information technology issues. The participants in the future workshop regarded their organisation as having insufficient knowledge in archival matters, and thought that there is little or no cooperation regarding archival matters.

None of the three studies showed a functioning cooperation between archivists, registrars and IT departments. Difficulties in communication were mentioned as a reason for this. At the future workshop, one archivist said, “No one wants to take the first step because everyone is protecting their own turf.” Another asserted, “We can identify consequences of long-term digital preservation but we lack information technology knowledge.” Because of their different roles, archivists/registrars and IT personnel have different views of archiving as well as different time perspectives. “It is common for IT departments to look at archiving as ordinary back-up.” But the participants believed that the responsibility for functioning communication rests with all parties. One way to overcome this is to ask what others do and request explanations. “Maybe we leave too much to other professional groups”, which
means that if people are asked to explain the rationale behind their actions, communication can begin. Information technology archivists were suggested as another way to solve the communication problem. People with insight in both areas might be the key to mutual understanding. The participants also expressed hope that digitalisation could raise the status of archives.

Cooperation can be found among the archivists themselves. Jill participates in a network for university archivists that meets regularly, and through which archivists help and support each other by sharing information, tips and ideas. The archival conference is another example of cooperation. It is an annual conference where archivists receive information on matters concerning their work practices, situations and so forth. Hence, archivists actively support each other.

**Organisation**

Here the organisation (green circle in Figure 5) itself is in focus. The informants claimed that their organisations have not adapted to or prepared for long-term digital preservation. There is no organisation or strategy for the matter.

![Figure 5. The organisation in which archivists work.](image)

Although Jill has worked proactively and diligently, she has remained unsuccessful in convincing the university management or IT department about the importance of long-term preservation. Consequently, the university has no written long-term preservation strategy or established cooperation between the IT department and archivists, something the other two studies also confirm. According to the archival conference participants, it was hard to make management understand the archival problematic, which leads to many county councils not having a long-term digital preservation strategy, “There is no organisation or technology (or competence) for preserving digital archives.” This also made it difficult to get answers regarding what should apply when it comes to long-term preservation, and the area is rife with uncertainty.
The archivists at the archival conference and the future workshop asked for coordination and a common view from all parts on the issue. In some county councils, it was not clear who should be responsible for a coherent view of activities and technology in general, and long-term digital preservation in particular. “Organisational ambiguities - in my county council, the responsibility for information technology issues and long-term preservation is very unclear. Who owns the question?” Besides responsibility, the informants also mentioned financial matters, asking if everything really should be preserved. There exists an overwhelming belief in that everything can be digitalised, resulting in little to none of the resources being directed toward matters concerning “mixed systems” or paper and digital documents. “Processes are often forgotten.” The county councils were also perceived as eager to solve problems quickly, so long-term preservation was interpreted as a hinder, which stopped the process.

**Professional Roles and Competence**

In this theme, the professional role and required competency is in focus (see red circle in Figure 6) both for archivists in information technology and other professional groups in archival matters, especially IT personnel.

My impression from the study with Jill was that she was secure in her professional role. For her it was obvious that she needed to be proactive and constantly raise issues concerning archival matters. One argument for this was that taking archival issues seriously is a way of controlling public funds. She showed awareness of the low status the profession has had, but argued that change is on the way. Partly because of information technology but also since she learned that many students now attend archival programmes and courses. She said that a lot has happened since the 1990s, including upcoming new laws\(^{15}\).

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\(^{15}\) Lagen om hantering av allmänna handlingar (Management of Official Documents Act), expected in 2007 at the earliest. (My translation into English.)

Figure 6. The archivist’s professional foundation.
While the comprehensive planning for the archives rests on Jill, much of the actual routine, day-to-day work of archiving is spread out to administrators. Most administrators do not have sufficient insight in archival matters and archiving is just one task among many. Consequently, personnel must be taught “how and what to archive.” Toward that end, Jill decided to establish a records management process – according to the objectives of the university’s project – from registration (of received or created documents) to archive, to provide administrators and other users with an overall picture of the process and thereby encourage their participation in ensuring that mission critical documents are preserved. When it comes to other professional groups, Jill believes they lack expertise in archival matters, especially when it comes to long-term digital preservation, and this was especially alarming when it comes to IT personnel and management, since they are, or should be, involved in the matter.

The archival conference informants expressed insecurity regarding roles and missions. They stated that their professional role is unknown and vague and that archivists get no understanding of their situation (and thereby no resources). Some of them even argued that their roles and functions are wrong and obsolete. The archival conference informants were not clear about what expertise is needed among archivists within the areas of information technology and long-term digital preservation. They mainly wanted to know what they themselves need to know about long-term digital preservation, for example, what metadata is needed to understand the preserved data. Some informants added that not all personnel in the archives have sufficient knowledge in archival matters, and that their educational level is low. That IT personnel also need knowledge of archival matters was mentioned several times, and that both professions need to learn from each other. “The technical competence is insufficient among archivists, as is the archival competence among systems developers.” One archival conference note showed a completely different view arguing that archivists must concentrate on what they know best, which is judging what information is to be preserved and what can be appraised. “I believe we should hand over the technical part to those who can and only place demands on the information.”

In the future workshop, their response on the low status of the profession and low interest in archival matters resulted in a suggestion that archivists must do the marketing themselves. They figured this could be started right away and believed that they would, or could get some attention for this. For example, the participants thought that taking initiatives and coming up with a proposal for how to solve something opens up for discussions and “Many times people go for the proposal.” Having ideas on how to solve things before documents are to be archived is also a kind of marketing, they figured. They agreed that it is important to act, take the initiative and be on the alert before documents are to be archived. Networks were regarded as a means of receiving marketing support. Through networks, ideas and suggestions could spread, providing help for the individual archivist. The participants wished for two networks: one that is organisation-bound consisting of archivists and registrars and one across organisations with only archivists. An alternative could be a network of organisations that have the same records
management system. Everyone would benefit if they all had the same records management system, they believed. To steer archives from the start, one must acquire a position by taking responsibility for strategic missions and thereby gaining power. For example, an archivist who had been an ombudsman for the Personal Data Act (SFS 1998:204) succeeded in gaining a higher degree of influence. The participants stated that positions can be attained by revealing one’s knowledge and expertise. The participants returned to the importance of being active, taking initiative, and making themselves seen, heard, known and visible. It was regarded as important, since “people even mix up archivists with antiquarians.”

The last issues discussed in the future workshop were teaching and education. Increasing knowledge and competence has two sides: gaining more knowledge about information technology as archivists and spreading knowledge about archival matters among other personnel categories. The participants wished for a situation where archivists, registrars, IT personnel and legal experts work together on solutions regarding long-term digital preservation. They also found informing others about the regulations as a possibility. There should also be policies regulating diary and records management. One participant said “… newly employed should not have access to the diary until they have had brief training.”

Resources
Lack of resources was a unanimous problem in all three studies. Archives need financial means, more personnel and competence, and more time if they are to fulfil their mission. At the university, the archival work was totally under-dimensioned. There were not enough funding, tools or devices for the authority to be able to accomplish what was expected of them, both from inside and outside the organisation. The red arrows in Figure 7 illustrate where resources could be provided from and the red circles where the resource competence could first be enhanced.

![Figure 7. Areas responsible for resources.](image)
The archival conference participants’ most common answer was that there was a lack of finances. When further commented, the informants mentioned, among other things, that it is economics that steer, computer connections are expensive (“100 Mb broadband costs a lot”) and that their archives get the old databases but not the finances needed to manage them. “Running metres cost, but not digital systems?” The benefit archives can provide was neglected in favour of finances among decision-makers. E-archives were also regarded as difficult to calculate, that is, it cannot be shown that they save money. Another phenomenon is that “tests of the digital material, which are necessary” are ignored because they are expensive. Lack of time was also mentioned often. The informants saw information technology as one work area among others. They should also keep aware of external environments, read and learn about the latest news and become knowledgeable in issues that are essential to their tasks. “It is hard for a lonely county council archivist to keep up with everything that happens.” They also stated that they felt great pressure regarding delivery of records, including difficult secrecy examination of requested records. Expertise was not discussed any further. They merely stated that there is lack of expertise. Two notes pointed out that lack of resources could also mean bad office and archival facilities, i.e., the climate control systems were inferior.

The phenomenon showed up again in the future workshop where the participants mentioned that they were undermanned and there should be more personnel to cope with the situation. One solution could be to ensure that there are grants for the archives and calculating this into budgets – this might increase insights into the importance of archiving. The participants also raised a warning that there are also disadvantages with this. “If there is a price it will strike against the archives.” It could end up that departments postpone the cost of archiving, so in the end the archivists must handle the material and the cost anyway. A small department might optimise its own activities at the organisation’s expense. This area, the participants claimed, demands research that can result in pricing models that reduce these kinds of scenarios. There is money to be gained if the archival material is well cared for. A well-arranged archive saves money, the participants concluded.

**Attitudes**

The archivists expressed that there is a common view of archives as old-fashioned and out-dated. The attitudes come from all directions (red arrows in Figure 8 below), so people in general have little or no understanding of archival principles and objectives.
According to Jill, archiving is a low priority and is therefore oftentimes neglected by administrators, teachers and researchers. In particular, it is regarded as “the least important” work task for administrators. It is only done when there is time left, which is seldom if ever. However, Jill believes information technology has increased campus interest in archiving, prompted also by news of new directions for archives expected from the Swedish National Archives in 2007. The new directions consider digital material and involve process thinking. Jill thinks the new directions are the reason for current inspections conducted by Swedish National Archives officers at universities, and that the idea is that ‘old’ material should be archived before the new directions are implemented. In the case of Jill’s institution, no archivist was on staff until the 1980s and this created a large backlog of unprocessed documents.

The archival conference participants said that archivists are mainly associated with paper or analogue media. “That archivists should only care for paper is a common view.” Following this was, “digital information is not an issue for archival authorities” and that there was poor use of archival competence within county councils. Digital information is treated as something special and different. Where there are information security directors, they only care for digital information. “At the moment information becomes digital, the ‘responsibility’ is taken over by other actors.” Digital information is not regarded as official documents. Apart from this, some informants said that archival matters are seldom discussed in society, and decisions on digitalisation are made based on financial gains rather than the readability of the information in the future. At the future workshop, the participants expressed similar concerns. One of them said that people think it is a piece of cake to be an archivist since “Anyone can create an archive.” The participant added with a smile, “but everyone cannot make it searchable.”

**Information Technology**

Digital documents were not primarily perceived as official documents, argued Jill, so the importance of preserving them is not understood. The result is that what is
preserved depends on the individual. Since information technology makes it easy to make copies, the documents get harder to manage. Information technology systems’ lack of defining authority to users, how much different systems are being used, and the way they are used could be attributed to whom is using the system.

Information technology causes Jill and university administrators to use a double security strategy, that is, printing paper copies of documents stored on electronic media. In the case of websites, this approach fails to capture iterations of content that reflect changing conceptions and evolving policies and procedures. Besides technical issues on how, this example raised practical concerns such as when should websites and other electronic resources be preserved? What methods, routines and regulations can resolve these questions? Jill expressed frustration with the ambiguous responses to these questions from the Swedish National Archives and hoped for distinct and precise directions. Jill also wished for enhanced (and compatible!) automation of the university’s archival systems. She believed that the systems really should be able to do more, and that the simplifying and facilitating of information technology based processes is important. For example, the system for university courses could signal that a course certificate should be automatically sent to the student after a course is completed. Instead, information technology could lead to increased workloads. For example, official documents such as course evaluations might specify individual teachers, so a different version must be generated where no individual can be identified, and this version is the one finally published.

At the archival conference, most comments in this category concerned the number of systems. One informant wrote that their county council has 561 information technology systems and databases for which they had no plans for appraisal, documentation or how to treat personal data. Different systems are not integrated or coordinated. One informant believed that this is the effect of their strongly decentralised purchasing routines, resulting in a wide variety of systems “that cannot talk to each other.” Additionally, many of them must deal with systems and programs that are “home-made”, besides the fact that there are different electronic patient record systems at health centres and hospitals.

Often mentioned was that the informants are expected to manage old systems, something they consider difficult and costly. For example, one wrote that when systems were replaced by newer ones, “we get the responsibility for the database, but the search tools!! Did they think we would not need ‘Surely, we are used to search in paper’?” Another example is receiving hard disks from private doctors who have passed away without any password or information about the software.

Having these old systems in their archives, the informants had no idea how to preserve them for the long-term or how to conduct appraisals of electronic patient records. Many mentioned the need for standards – what format and medium to use and so forth. As one informant commented, “… even if technological development is continuous, it happens in leaps that are not easy to predict.” There was also a
comment that there are bad practical solutions within the area of records management, and that there is no technique for description.

When technical issues were discussed at the future workshop, information technology terminology, file format standards, and updating and/or converting to new software and/or systems were brought up. The participants asked what should be regarded as the ‘original’ and mentioned CAD/CAM, 3D or many layers, or loss of information when printing. They also reacted to the fact that in ordinary information systems the term archive really means part time storage, not archiving in the sense they interpret it. Lack of digital space was also an issue.

**Laws and Regulations**

Jill felt that guidance from the Swedish National Archives was not strict enough. The archival conference informants also expressed a declining respect for laws and regulations. The comments ranged from “Getting the legal to function in the work” and getting the organisation to follow guiding principles that actually exist, to “No actual regulations.” Legislation was seen as inconsequential and ambiguous, and one note claimed that there was unwillingness in their organisation to follow laws regarding the delivery of patient records.

That legislation and regulations can be interpreted as an obstacle was also mentioned: “…if they do not already exist, obstacles might be invented that prevent the best solution.” One said that county council, municipal and governmental archival issues differ to some degree, and it is a problem if this is not taken into consideration.

At the future workshop, the participants argued that ensuring implementation of archival rules is a useful strategy. Asking who is responsible for archival issues in a project is also a good strategy, “since in most cases this is something they have not considered.” Another suggestion was to leave ‘archival documents’ and instead check ‘theirs’ as a starting point when having conversations about archiving with
other personnel categories. The participants pointed out the fact that there are archival regulations that are not being followed, and acting as suggested above might prevent that.

Archivists Working with E-archives

In April 2006, I met three employees of an archival depot: two archivists whom I will call Anne and Mary, and John, a senior assistant. At the depot they concentrate on the received archival records, making sure that information is actually where it should be and that there is enough metadata, that is, they check what the information is. This, of course, follows with the records but is separately registered in the depot archives. The depot is also responsible for delivering requested records. Hence, the depot focuses exclusively on taking care of and delivering requested records to the public. Archivists at the supervisory unit are those that have the first contact, so they interact with hospitals, health centres, etc. that are about to transfer records to the archive.

How the E-archives Started

In connection with the great wave of privatizing health centres and some comprehensive reorganisations in the early 1990s, the supervisory archivists recognised the need to deliver not only paper-based but also electronic patient records. Since the depot had neither the tools nor the infrastructure for digital preservation, they referred back to those responsible at the public health services, forcing them to preserve their digital information themselves. In early 2000, the county council decided to gather and handle all patient record systems in one e-archive. A systems developer was engaged to handle this matter. At that time, the county council had an archivist who was also a systems developer. These two people in the IT department started to look at different technical solutions, of which some proved to be failures. They finally ended up with the technical conditions needed, which have now been implemented. Today the county council has two e-archives, one at the depot and the other out in daily businesses.

Meanwhile, the archivists at the depot looked at what needs they could identify for deliverance of an e-archive and forwarded these to the IT department. They dealt with questions such as what needed to be concentrated on. We cannot take all systems at once, so what should we focus on? They decided that patient records were the prime concern and then web sites, because of their similar background. Health centres were being shut down with systems spinning around in cyberspace that no one took care of. The archivists concentrated on what information should be preserved and what should be removed and destroyed. Their main role, they believed, was to emphasise preservation and appraisal plans. Some technical competence was needed for determining how to present the digital information. The digital delivery, how it should be presented and how it should be brought to the depot was to be worked out by the IT personnel. The technical part in the creation of the e-archive has been easy from the archivists’ viewpoint, since it has been handled
by the IT department. Even so, they felt that it was difficult to find the archivists’ role in the work of creating the e-archive. Being firm and deciding not to accept the delivery of electronic records when they were not prepared and making their positions and tasks obvious was tough. But this difficulty may have been most tangible for the supervisory archivist.

Anne: *It’s important not to take over each other’s roles – instead each one of us should accomplish our own tasks while at the same time everybody should be involved … Our situation is different compared to archivists who work alone in an organisation, I think. As the only archivist, one must know all the different parts of the process. We’re bigger, so we must split up the work and are therefore specialised to a higher degree.*

**How the E-archives Function Today**

At the depot, the archivists are responsible for assessing the information, ensuring it is intact and contains the right metadata, etc. John is responsible for the group of assistants who are expected to submit requested information.

John: *One should not forget that we’re supposed to use both the e-archive and the paper-based, which means that we still must look in the paper-based archive. Sometimes we must complement the old with the new. It’s also a question of whether or not you like to sit in front of the computer… The technical part isn’t that well built. I hope something will be done about it. The technical part must be further developed.*

The depot also has electronic records on CD-ROMs, but there are dissimilar systems and one is out of order. Registers and records are erroneously transferred to the archive, so information must be copied and edited to be comprehensible to people who ask for the information.

Anne: *This depends on the fact that for the moment we’re in a kind of in-between situation with early deliveries received before we knew what demands to put on it. These must be taken care of and for the moment, they’re being converted. In the future, we will not accept CD-ROMs; instead, everything should go right into the e-archive.*

For the time being, withdrawals from the e-archive have been put on hold. The idea is that a search and withdrawal from the e-archive should be automatically logged to a person and diary number. Every time information is collected, it must be registered in connection to the record. This did not go smoothly and was not easy, and making this function technically is ongoing work. Since the depot also has split archives with paper-based records containing microfilm and/or digital pieces, the process of capturing all parts is complicated. A proposal for a solution will be finished any day now, they believe. Before it will be implemented, they will initiate training for all assistants. Educating the personnel involved is necessary.

John: *But we must be aware that not all have a feel for technology… The idea of an e-archive is fantastic, but it would need to be easily managed with few actions. Unfortunately, we still have the old archive…*

Anne: *Everything can be scanned.*
John: Oh!

**E-archives for the Long-term**

So far, they spoke of living materials, information that was still in use to a great degree, so I asked how they planned to ensure the digital material is accessible in ten years. They considered this to be a question for the IT department, but said that the principle was that there should not be any CD-ROMs or tapes – everything should be stored in the e-archive.

Anne: *This is, however, not possible at the moment, since we need to have systems first, and we need to find out and develop what common criteria we must establish to find information. Then maybe our search forms will look different than today’s. So we… trust the technicians to ascertain the preservation. We place demands – this is preservation material according to our preservation and appraisal plans and should be preserved for all time. Solve that!*

Hence, the technicians provide guidelines, standards and formats. XML is used in the e-archive. However, communication with the IT department is not an easy task.

John: *They don’t understand what’s happening in the archive. For them it’s simple, we should take everything right away and start everything right away and… who’s going to do that? They think we think like them but we don’t.*

This meant that the depot, as mentioned earlier, still had archives on CD-ROM and had decided to keep it that way until they felt the time was right to move them into the e-archive. But they felt that the IT department did not take this issue seriously since they suggested getting rid of all the CD-ROMs and concentrating on the e-archive.

John: *I must repeat that many of the employees at the depot don’t like the technical part.*

Anne: *The IT department thinks it’s so easy and wants development to go faster, but if one doesn’t have the technical knowledge, it’s tough.*

John: *The financial part also slows down the process, since it’s not possible to do, when there aren’t enough resources.*

How much archival knowledge do the IT personnel have? The answer is simple – not much. The head of the county council’s e-archive project is the depot’s communication channel. It is with him they communicate and present their wishes and demands, so at least he partially understands. He, in turn, is the one who negotiates and acts as intermediary with different partners.

**Issues Discussed Regarding Technical Solutions**

Anne: *I’m surprised that it has run so smoothly, and that it actually works technically, even if some things have gone wrong.*

John: *No, no. To say that information technology is fast and easy is a chimera – it’s not. I would like to get away from all the running around.*
They spoke of a delivery managed and arranged according to their demands, but that did not work when they looked at the information in a meeting. Every note must be signed, but this information was lost. The XML specification that searches this information could not find it because it was somewhere else. So things show up all the time, since there are many variants of the patient records.

Anne: *What surprises me is that such small things can make things fail. And we don’t see total preservation of ’everything’ as an alternative. Not everything can be preserved just because there’s place and space.*

The information must be checked in a standardised way. It makes no sense to preserve all information, but this is what is done at the moment, and Anne figures it could make it impossible to search in the future. Hence, at the depot they were working on a technically neutral plan. The preservation and appraisal plan considers what *must* be preserved, irrespective of where the information is found – paper, digitally, microfilm, etc.

Mary: *To work technically neutral and not make a distinction between paper and digital is our wish. The IT personnel want to separate it, and they’ve had a hard time accepting that we see it differently.*

No formal training has occurred. They have acquired knowledge in information technology through reading. Mary, who graduated as an archivist three years ago, told me there was a lot of focus on information technology during her education, since they were supposed to become skilled purchasers of services. Knowledge is needed to be able to communicate with IT personnel.

Mary: *There’s a lot of talk about what and where we are aiming at, but no one has any idea how we should get there. It’s a bit frustrating sometimes.*

**Wants and Needs**

A registration solution is needed.

John: *I really want it to be simple. The current e-archival system demands that we press too many buttons, which has scared people off. If it’s simple, it becomes fast… our e-archive is Internet-based and very slow.*

No digital documents are distributed today. They make paper copies and send them instead. In the future, they want a system that is completely integrated, where every connection between different information, irrespective of type, can be identified.

One phenomenon they believed could make it easier in the future is that many of the employees at the depot are close to retirement age. A younger work force, used to computers, will probably change the scene.

A common view on the delivery process, a coherent preparation process before deliveries are made and a uniform way into the depot were some of the wishes
expressed. Even though preparation of archival information differs for paper and digital, they still want the preparation process to be linked, so they are content that they have a clear vision of what they want to accomplish. The work is ongoing.

**Summing Up the Studies**

When it concerns archivists’ work activities, it is clear that archivists do not have that many ideas about how to maintain digital records. They convey confusion and anxiety, but are also able to provide a holistic view of their situation in that they can identify many causes and phenomena. To fulfil their obligations they still entrust analogue media, while showing eagerness and commitment to digital matters. Most of them feel rather alone in this. Communication and cooperation with other parts functions badly – most often this concerns IT departments, but also management. The organisations are not aware of or disregard the problems of long-term digital preservation, and few if any have an organisation or strategies for this.

Being an archivist today could be considered a challenge. The lack of communication and cooperation, shown in the way archivists are locked out from the decision-making process, forces them to struggle to be heard. Information technology has brushed them aside, while they themselves believe it could be the instrument that reinforces their profession. Archivists seem content that information technology will increase their status, and they are confident that their expertise is needed. That their work practices will change is clear. There were only a few who strongly emphasised that archivists should stay in their niche and leave information technology matters to the IT department (one note at the archival conference and those at the existing e-archive in my last study). The future workshop showed that archivists regard marketing of themselves to be a means of regaining their status and making the organisation aware of their situation. Hence, spreading knowledge can solve some of the problems. The archivists spoke of a lack of resources in the form of finances, time and personnel. I interpret this as another example of long-term digital preservation being neglected, even though it must be remembered that many organisations struggle with tight budgets in general. When it is an issue, it is an issue for the IT department. Digital records are different and special, and are not treated as official documents according to laws and regulations.

The actor information technology definitely plays a decisive role. It has changed the view of records and what should be preserved. It has also affected the view of archives and archivists themselves. It changes archivists’ work practices and it challenges fundamental archival concepts such as provenance and appraisal. Information technology has also led to a declining respect for laws and regulations. Information technology is a powerful actor indeed.
Discussion

In this chapter, I discuss how archivists experience their current situation, their view of information technology and long-term digital preservation, and their main concerns in connection with this. Then I sum up the discussion by relating archivists’ viewpoints to the local, organisational and national levels, that is, the A, B and C arenas (see p. 28). The chapter ends with a discussion of what recommendations can be found for designing archival information systems. The recommendations are based on my findings and the theories I used, especially records continuum thinking (see p. 18).

How Archivists Experience Their Current Situation

Among the first things that struck me when I started to analyse the empirical data was the differences between archivists and other professionals. Besides using information technology as a tool in their ordinary work practices, archivists are supposed to preserve and take care of the information held within this same technology. This is the tricky part for archivists. When the information to be cared for and preserved exists in a technology in which they feel unfamiliar, problems arise. They are no longer content that the digital information in their systems is trustworthy, authentic, reliable or accessible in the future (Duranti, 2000). Even though there is global awareness and research on this problematic with many ongoing research projects (see p. 3, Introduction chapter), my studies show that many archivists take personal responsibility for the matter, since they obey and are very knowledgeable of laws that regulate their work. These same laws cause their insecurity, since there are currently a number of clashes between what is stipulated by law and the actual digital situation.

My interpretation is that archivists also experience unspoken expectations from other personnel groups in their organisations that regard archivists as the problem owner. But the archivists’ viewpoint is that responsibility for archiving rests with the organisation’s management, in line with national policies (SOU 2002:97). My studies indicate that responsibility has been transferred to archivists and archivists alone – but perhaps not entirely. Even though I find it hard to abandon my impression of the university archivist as working alone, I must remember that archivists cooperate with registrars, administrators and in networks with other archivists, where they exchange knowledge and experiences and can discuss different issues. The Swedish university archival network has regular meetings, and the annual county council archival conference is another example.

Today many archivists can only sit and watch official documents such as web pages disappear, since they do not have a clue how to preserve them. What county councils should do with their huge number of databases is still an unanswered question. Indeed, this is the reason why archivists are asking for “The Solution”, i.e., they would very much like explicit guidelines telling them exactly what to do so all problems can be solved. Archivists know all other related issues by heart – they
Archivists perceive their professional role and competence as vague in their organisations. This is however not how I perceived the archivists’ view of themselves. Many archivists give the impression of being content and secure in their work practices. Nevertheless, they, or rather archival issues, are neglected by their organisations and are thereby not brought up and spread around the organisation. Archivists’ status is only recognised when they are connected with paper-based material. Being seen by other professional groups as only managing analogue material is probably used as an argument for not letting archivists participate when new information technology systems are to be implemented in the organisation. My studies show that archivists are often not involved when information technology and computer-based information systems are in focus.

Instead, archives are regarded as a service function, since other personnel in the organisation expect immediate help when it is requested. Archivists were expected to drop whatever they were doing and answer requests immediately. One interpretation is that archivists can be identified as facilitators (Dollar, 1992), i.e., other personnel expect archivists to focus on archival accessibility. Regulations also stipulate that when official documents are requested, they should be delivered without further delay, something that also contributes to this identification (SFS 1949:105). To regard archives as a service function is of course not wrong – they are. But archives are more than that – organisational archives can provide evidence of transactions and organisational memory (Bearman, 1994). Archival material can also be used as a source of knowledge, roots and societal memory (Delmas, 2001). As such, they also have a broader significance than merely service and they could be used more economically. For example, the university archivist commented that universities seldom reuse their research material.

According to the university archivist, most other professionals in the organisations involved in records management such as administrators have no insight into archival matters and do not see archives as carriers of memory. In addition, archiving is not prioritised and is regarded the least important thing to do. It is difficult to ensure that the records management process runs smoothly, i.e., that administrators or other personnel accountable for archiving know exactly what to do. The university study showed that attempts have been made to solve this by appointing institution administrators (not education or project administrators) as responsible for archival matters at institutions. Some of them perform this task excellently. Even so, to be the only archivist in an organisation with almost 1500 employees, as the university archivist is, implies that commitment, interest and support from management are essential. The importance of preserving official documents is not understood by other groups in the organisations. Routines and methods are not well known, archiving is not an ongoing activity, and even if templates exist, they are not obvious to people who do not know archiving. In other words, other professional groups have no situated, embodied knowledge of the importance of preserving official
documents, as is identified with archivists (Haraway, 1991; Suchman 2002). Management and archivists have not succeeded in reaching out and influencing the organisations’ archival processes to the extent desired. Hence, there is a need for understanding preservation concerns throughout the organisation.

The empirical data provide another example of neglect – many archivists talk of a lack of resources. Economic restrictions are found in many organisations, so archives are probably not the only departments asking for more resources. Nevertheless, based on my empirical studies, I argue that it is mainly cooperation, communication, long-term strategies, and a common and coherent view of digital preservation that is missing in many organisations today. It is possible that if these things were functioning, the lack of resources would diminish. Meanwhile, most digital archiving is ad hoc, so to ensure the mission of preservation, many archivists (and other professional groups) print out on paper to be sure that official documents are preserved. Another aspect that has not yet been raised in many organisations is the fact that preservation of digital material demands financial resources as well, according to the university archivist and the archivists who participated in the future workshop. There is a belief that digital preservation is not costly. A consequence of this is that when economics steer, organisations risk losing even more digital material. My empirical material from the archival conference shows that tests of digitally preserved materials are ignored since it is expensive. In addition, information technology per se is allowed to cost, which provides a clue that information technology has a higher status than archiving in organisations. Maybe this is the reason for the belief that digital preservation does not demand financial resources – the cost is assumed to be covered in the total information technology budget.

My analysis of the empirical material, that is, reading it over and over again, soon made it obvious that the provenance, appraisal and original concepts (see pp. 11-15) that regulate archivists’ work practices permeate their work. I wish to emphasise that I do not mean that these concepts should not be important in the future, only that a view of the paper-based archive is inherent in the concepts. It is indisputable that these concepts were developed before the digital era (Delmas, 2001) for understanding operations after they occurred (Menne-Haritz, 2001). Few of the informants questioned the relevance of the concepts or whether appraisal must be revised, adapted or treated differently when it comes to digital objects. Neither have I noticed any questioning of the slightly different interpretation of the provenance principle due to information technology by archivists (Cook, 1997, McKemmish, 2001). When it comes to preservation, it is clear that, just as Duranti (2000) states, preservation of electronic records refers to their meaning and trustworthiness as records, not protection of the medium. Original is slightly different, though, because archivists are aware of the possibilities that information technology brings with it, such as faster and easier access to digital objects. Thus, the problematic around what constitutes the original is more or less accepted.
Information Technology and Long-term Digital Preservation from the Archivist’s Viewpoint

Archivists use the IT systems that the organisation buys, but many times they have not participated in the purchasing process of the IT systems or been asked what functionality must be considered from an archival perspective. This is probably an effect of their vague role within the organisation and the fact that archivists are regarded as dealing with paper, as my empirical material shows. Another reason is that archiving is not highly prioritised in the organisations. I cannot say if decentralised purchase routines are common, but my studies show that many county councils and the university face a lack of integration and coordination of their many systems. The systems are built on a view from nowhere rather than a view from somewhere (Suchman, 2002). By this is meant that the systems designers view technologies as objects and isolated parts, not connected to all processes of which the systems are a part. Those who take the decisions regarding the systems do not base their decisions on the views of those involved, or should I say affected – in this case archivists. In addition, the interviewed archivists claim that many systems could support archival functions in a better way. This is a statement that shows the lack of archival concerns when systems are bought. In other words, it is not possible for archivists to be active shapers of the digital archives to any desirable extent. Archivists are active shapers of the information content (Cook, 1997), but not when it comes to the archival information system. This is contrary to what most archival theorists argue is necessary today (Bearman, 1994; Dollar, 1992; Duranti, 2001b; ICA, 2005; Menne-Haritz, 2001; Thomassen, 2001). This might also indicate that organisations cannot be sure that they actually produce records and not merely data today (Bearman, 1994).

The fourth study, that is, the focus group and the archival conference, show that some archivists draw a clear line between what is and what is not an archivist’s concerns and responsibilities. These archivists saw themselves as the ones who should make demands on the system, and in this way, they were able to influence the e-archive. But almost every archivist I observed, interviewed or talked with, underscored the need for cooperation and communication, and they gave the overall impression that if this problem were overcome, the situation would change profoundly. Archival information systems design in organisations was not considered a democratic process and no situation where mutual learning could occur among different professional groups was created. Hence, the systems design process did not focus on mutual understanding, and did not pay attention to the importance of archivist participation for an opportunity to improve the organisations’ records management process or the archivists’ work practices. This implies that participatory design was not an option when designing organisational archival information systems (Bratteteig, 2004; Bødker et al., 2004).

Although archivists are not involved when new information technology systems are at stake, they are expected to manage the (replaced) old systems. They should suddenly be able to preserve these old systems, and manage and maintain them. This shows that the early view of archivists as keepers is still valid (Cook, 1997).
assumption that archivists should be the ones to secure the societal memory demands new skills for archivists, such as knowledge about systems design, according to Bearman (1994), Cook (1997) and Duranti (2001b), to name a few. In connection with this, archivists ask for standards and norms, something they believe would make it easier, which is also probably true.

The introduction of information technologies has brought with it a declining respect for laws and regulations. It is also difficult for people in the organisations to realise that digital documents are official documents. This is linked to an identified lack of knowledge. In Sweden, much archival theory is built into the juridical system, and other professional groups are not knowledgeable about archiving in practice or archival laws and regulations. Despite the scattered education of my informants, they show signs of embodied knowledge of archival theory and its concepts, along with laws and regulations. Because of this, they questioned the idea of everything being placed on the Net. Possibilities are not necessarily obligations.

Another aspect of information technology is that besides being a work tool, it also replaces the archive as place (premises). This is not yet an issue for archivists. They do not spend their entire days in the archive searching for requested records and documents – neither in paper-based archives nor in digital ones.

Archivists’ Main Concern – Long-term Digital Preservation

What view of long-term digital preservation can be discerned? Based on my empirical material, I argue that this issue is muddy. None of the archivists thought of it as an impossible mission, on the contrary, they expect it will be solved in the future. Nevertheless, it is The Problem today, and it surely has turned archivists’ worlds upside down, perhaps more mentally than in practice. We must remember that they still manage paper documents as well (Barata & Cain, 2001).

The most pressing question is finding a solution to the long-term digital preservation issue. This is ultimately what forces archivists to attend conferences and grasp every opportunity to learn more about the issue. I argue that archivists are certain that when a solution is worked out, they believe that once they learn how to deal with long-term digital preservation their problems will disappear.

What competence should an archivist possess? It is obvious that many, although not all, archivists think that they need more knowledge about systems development and technical issues in general. This is in line with what contemporary archival theorists also claim (Bearman, 1994; Cook, 1997; Duranti, 2001b). I believe that this once again shows that archivists take on great responsibility as a result of their embodied knowledge in archival matters. I question though, together with some of my informants, whether what is needed instead are system developers with knowledge of archival theory, laws and regulations. The lack of knowledge about long-term digital preservation matters in IT departments is something that worries archivists. Remedying this would probably solve the cooperation and communication problems, which is evidently an acute concern. IT departments are not the only ones
– organisational management also shows little or no awareness of long-term digital preservation. According to national policy, the responsibility lies with management (SOU 2002:97), but my interpretation is that organisations have transferred the responsibility to archivists, who in turn, do not object to this but ask for support. Actually, the archivists who participated in the future workshop suggested that collaboration between archivists, registrars, IT personnel and legal experts on long-term digital preservation would be the ultimate solution. This would also cover legal matters, ensuring a comprehensive view of the issue.

**Summing Up the Discussion by Mapping Actors and Agendas**

In this last part, I intend to discuss the political and organisational contexts that constitute archivists’ daily surroundings. I will discuss the three arenas (local, organisational, political) as explained by Gärtner & Wagner (1996), and in essence, this means that I will provide my interpretation based on what the archivists expressed. The underlying thoughts are that arenas are spaces where action can be taken, so power is a concern. These arenas are also developed from and built on the idea of participatory design.

Arena A forms the local level where design of work and systems occurs, participation is concrete and archivists’ work practices are performed (Gärtner & Wagner, 1996). This arena currently functions as it most always has. My studies show that the (re)design that occurs in archives due to long-term digital preservation is not yet a planned activity; the work is done more in an ad hoc fashion. A thorough (re)design due to the implementation of information technology is something that has not happened yet, as shown in most of my studies. Instead, I would argue that archives are in the pre-stage, insofar as they have acknowledged the matter, and archivists are concerned and eager to start this kind of work. My university study, for example, shows that changes that occurred were mainly done by the archivist herself, together with the registrar. Their work with swimming lanes and plans for handling documents demonstrates their awareness. The conducted university project aimed to improve the records management process, but the doer was mostly the archivist alone. The exception is the fourth study, where the transformation to digital archives has begun but is far from complete. Here, the archivists were the ones who placed demands on the e-archive. To what degree this can be called participation can of course be discussed. These archivists wanted it that way and that is what really matters. However, when technical systems are to be implemented or improved, real participation is not to be found; instead it is driven by IT departments alone, according to archivists.

Based on my studies, I argue that the main obstacle is found in arena B, the organisational level. I would like to emphasise that what hinders the (re)design of archival information systems is difficulties in cooperation and communication between archivists, IT personnel and management. The organisational level should be the arena where participation is indirect and conflicts are regulated (Gärtner & Wagner, 1996). My informants who are archivists regarded the communication and cooperation problem to be a concern for management, and so an issue on the
organisational level. I can only conclude that the organisations involved in my studies do not have a genuine and thorough strategy for long-term preservation. They have not succeeded in establishing cooperation in their organisations on the matter and it is not clear who should be responsible for this. Meanwhile, archivists express that they are the ones who fight for the preservation of digital material, despite their insufficient knowledge of systems development.

The political arena, arena C, seems to be aware, according to the university archivist, that knowledge is needed in both archival theory for non-archivists and information technology among archivists (SOU 2002:78; SOU 2002:97). This implies that knowledge and commitment is found among policymakers in arena C (national level) and archivists in arena A (local level), but disappears in arena B, the organisational level.

I must also mention that according to Ruusalepp (2002; 2005) there has been ongoing research in long-term digital preservation matters for 30 years but little of it has reached out to archivists and organisations. Why is this? Does it depend on how we develop science and knowledge? Maybe this leads us back to the quotation by Einstein that I mentioned in the prologue: our patterns of thought must change. If we are to transform knowledge and science, we must find new solutions and new ways of thinking. At the utmost it may be a question of the science not reaching out but rather staying in the research community, thereby mainly being analysed and discussed among researchers themselves. This takes far too long, and, of course, there is no solution to the long-term digital preservation issue. Perhaps we must realise that there will never be a final solution. Instead, we must redesign the archival process and involve more professional groups in it. We must demand more automation of computer-based systems and create contemporary archival information systems that are prepared for migration. This involves, among other things, the use of standards and recommended formats and demands forward compatibility of hardware and software (Quisbert, 2006). A focus on metadata is also of concern (Nilsson, 2006). In digital archives another approach to metadata is needed, in order to secure the readability of the digital records. The archivists in my studies who ask for this are on the right track.

Finally, what will happen in the policy area regarding digital archives in Sweden in the future is hard to say. One reason for this is that the latest general election in September 2006 resulted in a shift. After many years in office, the social democrats were replaced by a coalition of non-socialist parties. How the new Swedish government will attend to the issue of long-term digital preservation is not settled yet. Meanwhile, how should organisations proceed with long-term digital preservation? Let us have a look at what my studies and the records continuum thinking recommend.

**Recommendations for the Future**

Based on the discussion above, I will provide recommendations that must be addressed in future practice and design of archival information systems. These relate
to responsibility, the roles of archivists and archives, and alternate views on different concepts.

**The responsibility for long-term digital preservation must spread**

By now, it is obvious that the first thing needed to ensure the preservation of digital material is establishment of an organisation-wide collaboration involving people from all departments concerned. They should approach the matter together and cover all the different parts of their records continuum. This is fundamental if we are to avoid loss of evidence-based information and societal memory. Long-term digital preservation is an organisational matter, not only an archivist’s concern (SOU 2002:97). From a long-term perspective, it is also a societal responsibility (Prop. 2004/5:124). Cooperative efforts are needed, and coordination and common views are a prerequisite if long-term digital preservation is to succeed. This is understood by archivists but this understanding must reach all personnel groups involved.

Bearman (1994) argues that explicit responsibilities for records management must be assigned to appropriate units. These responsibilities include formulation of specifications or systems evaluation methods, testing the system’s ability to satisfy requirements, educating users, establishing management guidelines and audit plans and so forth. I believe this shows that archivists cannot be expected to conduct these tasks in solitude, even if they should be involved in most issues for a coherent view of the matter.

**IT personnel must understand their role as technological experts**

The situation in which IT personnel are regarded as nonchalant toward digital preservation issues, which worries archivists, must be resolved. I argue that system developers need education in and understandings of recordkeeping and the long-term digital preservation problematic, something that is not recognised in national policy documents (SOU 2002:78). Nevertheless, system developers must be trained in better cooperation processes and records management principles, so they understand the importance of different functions and processes (ICA, 2005) and can perform the tasks described above by Bearman (1994). This is very important, considering that information technology to some extent will replace both archivists and archives, as will be discussed below.

**The benefit of good electronic recordkeeping and archiving must be explicitly explained and known**

Arguments are needed – arguments that can convince people in managerial positions of the many benefits that good recordkeeping provides. Storing digital information in a highly structured way provides easy access and retrieval, so the information can be used in an efficient way. Recordkeeping involves five key areas. First, it plays a role in governance by regulating relationships between people and organisations, and as instruments for power and authority. Secondly, it is connected with accountability. Thirdly, it constitutes corporate and collective memory. Fourthly it provides evidence, and finally, it is a source of assets that can bring value-added information, which in turn can lead to new records being created (McKemmish, 1998b). Besides securing evidence-based information and the societal memory, the financial advantages must be explicit. Hence, there is a need for research and
development of economic tools and devices that can justify the costs and demonstrate the savings that can be made, especially since in modern society, "money rules", i.e. most cases end up being a question of financial means.

**Archivists should have a key position together with records managers**

When it comes to long-term digital preservation, archivists and records managers should have leading positions and be the ones who have the overall view of the matter (McKemmish, 2001). Archivists and records managers must be involved early in the continuum of records (Bearman, 1994; ICA, 2005). They should keep their eyes on the records continuum (all processes that produce records), that is, the dimensions that create, capture, organise and pluralise (Upward, 1998a; 1998b; 2000). This should also be done from an accessibility perspective (Menne-Haritz, 2001). In other words, archivists must have intellectual control of the records. This is important to keep in mind, especially because of the development of e-government, which puts additional demands on the recordkeeping process (SOU 2002:78).

The divide between archivists and records managers is not clear-cut and is probably about to vanish (ICA, 2005; McKemmish, 2001; Reed, 2000). Perhaps it is more appropriate to call them records and archives managers or even more radical – information ‘mediators’? Despite what we choose to call them, they need knowledges and skills in archival theory, but also some understanding of systems development and design (Bearman, 1994). Perhaps the informants in my fourth study, the existing e-archive, have a point when claiming that the younger generation will doubtless handle the issue better since they will be even more familiar with information technology.

**The view of archivists as keepers must change**

Personnel working in organisations must be influenced to change their prevailing view of archivists as keepers. The archives and archivists are resources and can, if used economically, add value to many processes in the organisation. I argue that the keeper of digital documents today is information technologies, not archivists. Hence, information technologies also function as carriers of the societal memory.

It must be understood that the work practices of archivists involve so much more than handling and preserving ‘old’ or ‘dead’ material – they are also active shapers of the content of the archive (Cook, 1997). This means that archivists have a powerful position and must be aware of the political and social effects of their work. Besides this, I argue that archivists should also be active shapers of the archival information system per se. The future role of archivists is to have intellectual control over and facilitate access to the information.

I also claim that something is deeply wrong when information is regarded as outdated or old. Information is what leads to knowledge and evolves through time (Runardotter et al., 2005; 2006). Records can be regarded as constantly becoming (McKemmish, 1998a; 2001), and thus they are a living material.
A new view of archives must arise...
In the digital era, the term archive is no longer valid as a concept for archives as place. Information technology means archives can be found everywhere, all the time, in different systems, in different formats, etc. Time and space are inseparable and the construction of them as two different things is no longer correct (Upward, 1998a; 1998b; 2000). This, together with the above discussion of information and records as living and constantly becoming, implies that information technology challenges the archive concept in the traditional sense: both archive as a “collection of records” (since there is no coherent collection of electronic records, they are spread over many places, systems, technologies), and archive as place. In other words, the archive concept has little justification in the digital world. Perhaps storage is a better word, since it implies that the information is stored to be reused. I question whether we should abandon the term archive when referring to digital preservation and leave it as a concept for the analogue era?

... and a new view of records
The first thing needed for future archival information systems is of course that all people in the organisation realise that digital records are also official records. This must be emphasised, otherwise organisations will continue to lose information they are obligated to preserve. As such, a new view of records is also needed. If records are in a state of constantly becoming, this demands another way to relate to them (McKemmish, 2001). Even if this view is applicable to both paper and digital records, according to Upward (1998a; 1998b; 2000) and McKemmish (2001) it surely suits the digital records like hand in glove. This involves focusing on records as logical rather than physical entities (Upward, 1998a). Records continuum thinking and practice is permeated by a concept of records as inclusive of their continuing value (McKemmish, 1998a). Archives and records are assets and should therefore be treated with care.
Conclusions

We have finally arrived at the chapter where I present my conclusions. I started this thesis by presenting the current situation with implications by information technology’s entrance into the archival world. Today there are no technological methods that can assure that digital material will continue to exist ‘forever’ (Ruusalepp, 2002; 2005). I argue that we must realise that a permanent solution for long-term digital preservation will never be.

As I argued in the introduction, there is not much focus on human and social aspects when it comes to long-term digital preservation either. My research focus was therefore on archivists’ situation and work practices and what effects information technology and long-term digital preservation have on them. In connection with this, I stated several research questions. How do archivists feel about their current situation? What are their views on information technology and long-term digital preservation? What are their main concerns? Based on my findings, I also wanted to identify recommendations that must be considered when designing archival information systems. The time has come to answer these questions.

Conclusions Regarding the Current Situation

Archivists’ current situation and work practices are distinguished by great uncertainty when it comes to digital preservation. This is rooted in the fact that archivists should not only use information technologies as working tools, as most other professions today. Archivists should also preserve and maintain information existing in this technology with which they are not comfortable. They ask for education and a greater knowledge of systems development, as well as explicit guidelines of how to secure long-term digital preservation.

Many of the archivists that have been studied have been assigned the role of problem owner, i.e., the archivists expressed that they received no support for the issue of long-term digital preservation from management or IT personnel. Archival matters are neglected and not prioritised among other professional groups in their organisations, and the responsibility rests in most cases with archivists alone. This results in a situation where archivists are trapped between technology and organisational demands and laws and regulations.

This implies that archivists and archives have a low status, and the benefits of good recordkeeping and well-structured archives are not observed by people in the organisation. Archives are therefore poorly utilized and archival material is seldom reused. This implies that other personnel groups such as administrators and IT personnel need more knowledges of archival issues and understandings of laws and regulations that govern archive creation. They need to be aware of and able to conduct routines and methods that secure the preservation of official records and, I argue, of the societal memory. There is information that can be highly interesting for future generations, even if it is not of an official type.
Today many organisations have not established any cooperation or communication channels concerning the long-term digital preservation issue. These organisations have not come up with a common view of how to proceed, so no strategies have been developed. This in turn means that most digital preservation today is ad hoc, so there are losses of digital material to some extent. I argue that difficulties in cooperation and communication are a great obstacle that hinders a common effort from the people involved and therefore puts the societal memory at risk.

**Conclusions Connected to Information Technology and Long-term Digital Preservation**

Information technology has taken over the role as keeper of the archives and carrier of the societal memory – something that has been the archivist’s role for centuries. This implies that the professional role of archivists should aim to facilitate access to the content of the archives, while retaining intellectual control over it.

This, in turn, demands that archivists and records managers are involved in the design and arrangement of computer-based systems. Today they are often shut out and neglected. They are not contacted or asked for opinions when new systems or system modifications are made. Even when the e-archive presented in my fourth study was developed, there was a sharp division between archivists and IT personnel. Archival information systems design in organisations is not a democratic process, and opportunities for mutual learning and understanding of each other’s work and roles among different professional groups is not achieved. Contemporary digital archiving does not rest on participatory design and situated knowledges. Collaboration between involved professionals such as archivists, records managers, IT personnel and management would profoundly improve the situation.

Information technologies are also the reason for the declining respect for laws and regulations. Awareness of what these contain and their requirements must therefore be raised.

Information technologies have also replaced archives as place – archives in the traditional sense do not exist anymore. This implies that we must reassess our understanding of what the archives concept embraces. It might even be an option to leave the concept to the analogue world, and in the future regard records as constantly becoming, and therefore never actually archived. Instead records are parts of the recordkeeping system, in line with records continuum thinking.

This means that archivists are to a greater degree part of daily activities, more in line with records managers, and archiving is an ongoing process. In this process, archivists should have a leading position, and with it should come authority. This indicates that information technologies influence archivists’ work practices as well as archival theories.
Finally, long-term digital preservation is the main concern of archivists in this study. It is also the foundation from which all other issues stem. In relation to this I conclude with the recommendations I have identified:

- the responsibility for long-term digital preservation must spread, it is an organisational matter
- IT personnel must understand their role as technical experts, and learn records management principles
- The benefit of good electronic recordkeeping and archiving must be explicitly explained and known, since it secures both evidence of transactions as well as societal memory and cultural heritage
- Archivists should have a key position together with records managers, they should have the intellectual control over the organisation’s records
- The view of archivists as keepers must change, instead they should be regarded as active shapers of the content and accessibility facilitators
- A new view of archives must arise, archives can be found everywhere, all the time
- A new view of records must be developed, even digital documents are official and records have continuing value.

When an organisation is about to start their work with long-term digital preservation I advise them to take the recommendations above seriously and putting effort in establishing an organisation wide cooperation in the matter. The chance to succeed increase if the entire organisation is aware of what long-term digital preservation implies (or rather records continuum thinking), for themselves as well as for the cultural heritage.

**Reflections on the Research**

My different methods (participatory observations, archival conference, future workshop and focus group) for collecting material for this research have been interesting and an opportunity for learning. Discussing and interacting with people is always fruitful and educational. It was obvious that all archivists that have taken part were happy for the attention and that they believed it could put focus on their situation and raise a wider discussion. A natural question to ask, considering my approach of following one archivist in a large organisation, is how representative the archivist is. Even though Jill is the only archivist at the university, she does not work in a vacuum and is not an isolated phenomenon. University archivists in Sweden collaborate in a network where they share experiences and knowledge, helping and supporting each other. Hence, Jill’s voice could be said to represent archivists as a group, especially since she can provide examples and suggestions from other university archivists.

During the course of research I began to wonder about my focus on problems. I believe it would add more value to start from a positive stance, and focus on what is actually functioning well today. With what are archivists’ satisfied? What is going well, and runs smoothly when it comes to long-term digital preservation and
information technology? and so forth. It would surely be interesting to conduct such a research, and compare these findings with my findings here. This is something I will carry with me in the future.

Further Research

My research shows that organisations are not prepared for nor have they adapted to long-term digital preservation issues. Preconditions for ensuring this do not yet exist. Besides the technical aspects, there are organisational, strategical, tactical, juridical and financial issues that must be further explored. My interest lies mainly in the area where organisational issues due to digital preservation and information technology are focused, since my research shows that many obstacles that prevent long-term digital preservation are found here.

Another thing that has occupied my mind for some time is that even though the focus of this thesis has been on records and official documents, I argue that long-term digital preservation research should focus on information, not records. Records are also information (of a kind), and they are mainly of interest to archival authorities and organisations that are required to preserve them. Preservation of information concerns everybody: archives, museums, libraries and the general public. For example, what will become of all the digital photos we now have in our home computers? Encompassing everything and focusing on information implies that societal memory and cultural heritage will receive more attention, since the record’s value is often based more on evidence than memory. This implies that it would be interesting to further explore the information continuum.
Epilogue

The endeavour of completing this thesis has come to an end. My aim has been to provide the informatics and archival communities with a picture of archivists’ work practices and situations and what it was all about in the early twenty-first century. What the reader gets a glimpse of is a located history. It is situated in Sweden and in the Swedish culture and society. It is situated in about 40 archivists and several records managers and how they feel about their work practices, information technologies and long-term digital preservation. It is situated in the archivists’ embodied knowledge and their interpretations of its context. It is also situated in me, seen through my eyes and body, and my understandings. I assure you that, while I am aware of all these different aspects, I have put all my energy into telling the story as honestly as possible.

The archivists and records managers I met have provided the picture presented in this thesis. Most certainly there are other archivists and organisations in Sweden or elsewhere around the world where work with long-term digital preservation has come further than that which is stated in this thesis. Nevertheless, this is what it looks like in many organisations; this is the reality for many archivists and it represents a situation where long-term digital preservation is far from being accomplished. This, I hope, will strengthen research within the area and also expand it instead of causing a feeling of dejection.

Long-term digital preservation is not entirely a technical issue. In the end it is something people must accomplish, and they should be allowed do it under the best conditions possible. There already are and will be more guidelines, best practices, standards, norms, routines and methods, all to ensure that the times we live in will not be forgotten. A hundred years from now, people will be able to create knowledges and understandings of the lives we lived and how our culture and society were arranged because they have access to all the preserved digital information. No matter how curious I am about how they will perceive it all, it is not for me to know. But I know that they will know how curious I was when they are reading these words. And I do hope that their patterns of thought have changed.
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Appendix 1  Resultat, Arkivkonferens

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Resursbrist

2. E-arkiv är ”svårberäknade” och går ej att ”räkna hem” = ingen besparing
3. Dyra dataförbindelser (100 MB linor kostar skjortan)
5. Vi får databaserna, men inte de ek-medlen att förvalta dem
6. Test är nödvändigt men ofta dyrt. Ekonomin kan ibland bli styrannde
7. Tid att läsa och f.o. sätta sig in i frågor som är väsentliga för uppgiften
8. Möjlighet att i praktik testa förslag på den teoretiska nivån
9. Stort tryck att serva med utlämnande av handlingar inkl svåra sekreteressprövningar
10. Arkivarien ofta tyngd av personalproblem hos sin personal då han/hon ofta är chef över ett antal personer
11. Svårt att få tillräckligt med pengar till arkivverksamheten
12. Resursbrist
13. ”det är omöjligt att lagra informationen i all evighet, för dyrt! Var glad om vi kan bevara datan.”
14. Kompetens och resurser saknas
15. Svårt att få verksamheten (vården) att avsätta resurser till att lösa långsiktig lagring
16. Kostnaden för e-arkivet ”få budgetmedel”
17. Svårt för en ensam Landstingsarkivarie att hänga med i svängarna
Appendix 1  

Resultat, Arkivkonferens

18. Svårt att ta till sig och sortera nyheter inom teknik och teori pga tidsbrist
19. Ekonomin – vem ska betala (initialt och på sikt)? Genomförnade, utrustning, personal, kompetens, migrering etc
20. Kostnaden mer tydlig – ekonomin ställs mot nyttan att bevara (hos en del beslutsfattare)
21. Kompetens och resurser
22. Ekonomi
23. Resurser, kompetens
24. Dåligt klimat (temp, RP)
25. Dåliga kontors- och arkivlokaler
26. För lite personal
27. För lite resurser
28. Idag är vi ofta ute i sista minuten och hittar t.ex. ett diarieföringssystem som ligger och snurrar någonstans el är nedbränt på skiva, verksamheten är nedlagd och vi saknar ansvariga
29. Som arkivchef på en liten enhet har man ”alla” uppgifter på sitt bord. LDB kräver koncentration och tid om man skall komma någonstans

Information Technology/Information Systems

30. Alltför många olika system
31. Hemmagjorda system
32. Leverantörsberoende system
33. Olika filformat gör att systemen inte kan kommunicera
34. När nya system tas ur bruk får vi ansvaret för databasen, men sökverktygen!!
   Tänkte man att vi inte skulle behöva ”Vi är väl vana att leta i papper”
35. Hårddisken kommer från t.ex. avlidna (privata) läkare utan att vi kan lösenna eller uppgift om programvaran
36. Bristen på standarder
37. Även om teknikutvecklingen är kontinuerlig så sker den i språng som är svåra att förutse
38. Ingen samordning av IT-system
39. Inköp av IT-system har varit starkt decentraliserad, vilket har lett till en flora av system som inte kan prata med varandra
40. Problem att långtidslagra ”hemma”-byggda databaser
41. Problem att gallra datajournaler i äldre system
42. Många äldre system som är svåra och kostnadskrävande att hantera
43. Det finns så dåliga praktiska lösningar inom området Dokumenthantering.
   Beskrivningstekniken saknas. ISO std finns
44. Nya versioner av datorsystem
45. Digital lagringsmedia?
46. Vilka format ska vi använda vid långtidslagring (standard)
47. 561 st IT-system och databaser. Inga gallringsplaner, dokumentation och personuppgiftsbehandling
48. Olika digitala journalsystem på vårdcentraler och sjukhus
49. Hemmagjorda program
50. Att plocka upp gamla program
Appendix 1

51. Olika journalsystem
52. Format på digital lagring
53. System införs utan arkivets vetskap
54. Få eller inga resurser läggs på frågor rörande ”blandsystem” digital-papper.
   En övertro finns att ”allt” kan digitaliseras. Men glömmer ofta bort processor...

Samarbete & Kommunikation mellan yrkesgrupper
55. Svårt med tekniska begrepp etc i kommunikationen med IT- och datafolk
56. Arkiv inte lika hög status som IT, man får kämpa för att lyfta frågan och få vara med ”på plan”
57. Arkivarien får inte vara med från början när nya IT-lösningar planeras
58. IT-folket kör sitt eget race utan tanke på framtida arkivering, bevarande och gallring
59. Svårt att få genomslag och gehör för arkivariers kunskaper och kunnande
60. Svårt kommunicera med tekniker
61. Få leverantörer att förstå både verksamhetens och arkivets behov
62. Att få verksamheten att förstå vad man som arkivarie vill få fram och få dem att tänka ”arkivariskt”
63. Svårt för arkivarier och systemvetare att förstå varandra – förstår inte varandras språk och menar olika saker när samma ord sägs
64. Systemvetarna. Jag vill inte springa efter dem hela tiden
65. För lite delaktighet för arkivarier i olika IT-projekt
66. Ingen tanke på långtidsbevarande hos de systemansvariga
67. IT-projektens fpr kosta hur mycket som helst
68. Hur får man förståelse av behovet av någon arkivarie som kan arbeta med bara IT-frågor
69. Hur får man ledningen att förstå vikten av samarbete IT – arkivarie i ett tidigt stadium
70. System införs ibland utan att arkiv- och bevarandeaspekter beaktas
71. Lyssnar IT-folket på arkivarierna
72. IT-avd är inte arkiv utan teknik
73. Att förstå arkivfrågornas betydelse som en del av sammanhanget
74. Prata inte om arkiv – informationshantering
75. Ingen eller liten förståelse för arkivfrågor i organisationen
76. Noll förståelse för problem med långtidslagring från datafolket på IT-avdelningen

Arbetsuppgifter
77. Hur ska man göra avställning till arkivet? Tidsperioder?
78. Journalsystem inköps men pappersoriginal tas ut för att sedan skannas.
79. Säkerhet och åtkomstfrågor måste belysas på enhetligt sätt.
80. Räcker det att lagra elektroniskt eller bör man även ta ut på ex mikrofilm?
81. Vi har 450 datasytem i vårt landsting. Hur ska vi arkivera dem?
82. Går det att exportera information från 450 system och lagra dem enhetligt i ett arkivsystem in i evigheten?
83. Säkerställa inleverans till e-arkiv
Appendix 1

84. Säkerställa långsiktighet av det digitala materialet
85. Över 500 system i verksamheten. Hur ska det sparas utan att information förändras
86. Tillgängligheten – tillhandahållandet (praktiskt)
87. Kopplingen mellan info i pappersbunden form och info i digital form
88. Arkiv – beständigheten i framtiden?
89. Skydda personuppgifter enligt PUL
90. Arkivbeständighet?
91. Avställa en arkivbildning ej konvertera
92. Arkivbeständighet
95. Mediat är ”flyktigt” dvs oerhört lätt att uppdatera/förändra. Ska allt fångas?

Organisation
96. Saknas modell för långsiktighet: ansvar och finansiering
97. Samsyn och samordning saknas i myndighetens digitala hantering
98. Ofta är man beroende av andra eller så är andra beroende av mig. Sällan kan man arbeta i samma takt
99. Få en samordnad syn och helhetsgrepp både vad gäller teknik och verksamhet
100. Att det är svårt att få svar på och en osäkerhet vad som bör gälla angående digital bevarande
101. Jag är bra på att prata om våra problem och hur min vision ser ut. Hur ska vi nå dit?
102. Vården får inte lida för utvecklande av ett elektroniskt arkiv
103. Svårt få gehör för arkivproblematiken hos ledningen
104. Det finns ingen organisation eller teknik (eller kompetens) för att ta emot digitala arkiv
105. Organisatoriska oklarheter – i mitt landsting är ansvaret för IT-frågor och långsiktigt bevarande mycket oklart. Vem äger frågan?
106. Verksamhetens iver att lösa problem snabbt – ordet ”långtidslagring” stoppar upp processen tycker dom
107. Alla nya system borde gå igenom arkivet. Så görs ej idag
108. Tydliga riktlinjer för digital långtidslagring
109. Att digitala system köps in utan att arkivfunktionen tillfrågas
110. Att långtidslagring av digital information inte beaktas av inköpare
111. Nationell strategisk plan inom arkivering
112. Att vi inte har ”rätt” personer på de olika sidorna, dvs de vi har kontakt med vid leverans av digital information kan inte påverka på det sätt som är önskvärt (vi har kontakt med arkivredogörare och i viss mån arkivansvariga)

Yrkesroll & kompetens
Appendix 1

113. Otydlighet i roll och uppdrag. Vilken kompetens inom IT och LDB bör en arkivarie ha?
114. Okänd yrkesroll, bristande förståelse, svårt att få tillräckliga resurser.
115. All personal i arkiven har inte tillräcklig utbildning i arkivfrågor
117. Förstår jag själv vad som krävs för att lagra information i ett långsiktigt arkiv. Vad ska jag efterfråga?
118. Vilken metadata måste vi ha för att förstå datan vi ska lagra? Är det EAD som gäller?
119. Vilken kompetens ska de arkivarier jag rekryterar ha för att vi ska fixa ett elektroniskt arkiv?
120. Kompetensen hos arkivarierna i IT-frågor/ och tvärtom
121. Tror inte att arkivarierna har så mycket IT-kunskap
122. Felaktiga, obsoleta roller, funktioner
123. Låg utbildningsgrad

Lagar & regelverk
125. Respekten för lagar och regler är i dalande
126. Inte sällan finns eller uppfinns legala hinder för den bästa lösningen på problem
127. Att få verksamheten att jobba efter de riktlinjer som ändå finns
128. Att få det juridiska att fungera i arbetet
129. Ovilja att i vissa fall följa de lagar som styr utlämmande av journalhandlingar
130. Landstings- kommun- statliga arkivfrågor är olika på vissa områden. Det är ett problem om man inte uppmärksammar detta
131. Inget aktuellt regelverk
132. Inkonsekvent och svår förstålig lagstiftning
133. Fastställda riktlinjer/planer följs ej. Ex gallring

Attityder
134. Arkiv = papper. Den digitala informationen är inte arkivmyndighetens fråga.
135. Arkivarian ska bara bry sig om papper, är en vanlig inställning
136. Digital information behandlas som något speciellt och annorlunda
137. Det finns informationssäkerhetschefer men de bryr sig bara om digital information!
138. Man betraktar inte digital information som allmänna handlingar
139. I samma stund som informationen blir digital tas ”ansvaret” över av andra aktörer
140. Arkivfrågor diskuteras sällan rent allmänt i samhället
141. Att beslut om digitalisering tas utifrån ekonomiska winster snarare än att man utgår från att informationen skall kunna läsas i framtiden

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Resultat, Arkivkonferens

142. Arkivkompetens utnyttjas dåligt inom landstinget
Appendix 2

Rapport från framtidsverkstad

Rapport från Framtidsverkstad

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Nedan finner ni vad som kom fram under Framtidsverkstadens tre faser: kritikfasen, fantasifasen och realiseringsfasen.

Kritikfasen
Under denna fas identifierades genom brainstorming de problem som deltagarna upplever på sin arbetsplats idag. Dessa var:

- Låg prioritet
- Avsaknad av helhetssyn/bild
- Tröghet (brist) i lagstiftning
- Strategi för långsiktigt digitalt bevarande saknas
- Standarder för filformat
- Uppdateringar/konvertering → nya programvaror/system
- Brist på samarbete
- Brist på tid
- Brist på förståelse
- Underbemannning
- Begreppet ”arkiv” i IS = mellanlagring
- Vad är ”originalen” CAD/CAM, 3D eller många ”lager/skikt” eller informationsförlust vid utskrift
- Nätverk saknas
- Brist på förståelse för arbetssituation (status)
- IT-terminologi
- Handläggarnas/organisationens låga kunskapsnivå
- Brist på digitalt utrymme
Deltagarna (utom doktoranderna) fick efter detta poängsätta problemen. Det de ansåg vara mest brinnande skulle ges mest poäng. De fick sju poäng var att fördela hur de ville. Det var alltså möjligt att ge poäng från alla poäng till ett problem, till ett poäng till sju problem. Fördelningen blev denna:

**Problemprioritering**

- 11 p: Låg prioritet
- 10 p: Strategi saknas
- 7 p: Brist på förståelse för arbetssituationen
- 5 p: Samarbete saknas
- 5 p: Avsaknad av helhetssyn/bild
- 3 p: IT-terminologi
- 2 p: Vad är originalet?
- 2 p: Standarder för filformat
- 1 p: Underbemanning

Arbetet fortsatte sedan med att hitta lösningsförslag på dessa problem. Det skedde under fantasifasen.

**Fantasifasen**

Här genererades lösningsförslag med utgångspunkt i de prioriterade problemområdena. Även här var brainstorming använt. Frågan var, vad skulle kunna göras för att hantera problemen? Förslagen blev dessa:

- Färdiga rutiner och mallar. Bara att följa en checklista
- Tidperspektiv finns i mallen
- Rutiner
- Planer för filformat, standarder
- Arkivarie kopplas ihop med IT-avdelningen, ”lyfts upp”
- Marknadsföra oss själva → ut i organisationen
- Pro-aktiva, synas mer ju mer digitalt
- Undervisning och utbildning åt båda hållen
- Informera!
- Informationskanaler finns
- Registratör och arkivarie sitter med i inköpsgruppen
- Registratör och arkivarie sitter med i processutvecklingsgrupper
- Styr upp arkivbildningen mer från början
- Arkivtänkandet ingår naturligt från början
- Arbeta mer rationellt
- Redskap som automatiserar arbete
- Ekonomisk styrmodell
- Avsätta medel i budget
- Dokumentation över vad som behöver göras
- Tidsplan för olika åtgärder
- Arkivarien och registratör = kravställare
Kurs för IT-folk, arkivarier och registratorer av LDB-centrum
• Få format och standarder, ex bara ett bildformat
• Ett internationellt arkivsamhälle som kan ställa krav på tillverkarna finns
• Leverantörsoberoende

Återigen sattes poäng av deltagarna (på samma sätt som tidigare). De blev fördelade som följer nedan.

Lösningsprioritering

- 7 p: Ekonomisk styrmodell (avsatta medel)
- 6 p: Arkivarie kopplas ihop med IT-avdelningen, ”lyfts upp”
- 6 p: Styr upp arkivbildningen från början (sitter med i processutvecklingsgrupper inköpsgrupper)
- 6 p: Kurs för IT-folk, arkivarier och registratorer av LDB-centrum (tillsammans med Undervisning och utbildning åt båda hållen)
- 5 p: Färdiga rutiner och mallar. Bara att följa en checklista
- 5 p: Marknadsföra oss själva → ut i organisationen
- 5 p: Arkivtänkande ingår naturligt från början
- 4 p: Leverantörsoberoende
- 1 p: Arkivarien och registrator = kravställare
- 1 p: Få format och standarder, ex bara ett bildformat
- 1 p: Ett internationellt arkivsamhälle som kan ställa krav på tillverkarna finns

Efter detta var det dags att diskutera vilka av alla lösningsförslag som var möjliga att genomföra. Det leder oss fram till det sista momentet i Framtidsverkstaden.

Realiseringsfasen

Utifrån hur lösningarna prioriterades skrev vi upp följande förslag att jobba vidare med:
- Ekonomisk styrmodell
- Samarbete arkivarie, regulator och IT-avdelning
- Styr upp arkivbildningen från början
- Arkivtänkande från början
- Undervisning och utbildning
- Marknadsföra oss själva
- Rutiner och mallar

Trots att ekonomisk styrmodell fick flest poäng blev det andra saker som diskuterades först. NEDan följer en redogörelse för diskussionen i den ordning de olika förslagen avhandlades. Det börjar då med marknadsföring, följt av samarbete, styra upp arkivbildningen, ekonomisk styrmodell och sist undervisning och utbildning.
Marknadsföring


Det som hindrar egen marknadsföring är främst tid och splittrade arbetsuppgifter, och det faktum att som arkivarie får man "dutta" mycket, dvs. hoppa från arbetsuppgift til arbetsuppgift. För att underlätta marknadsföring anses nätverk vara ett bra stöd. Önskemål om två nätverk kom fram, ett organisationsbundet, där arkivarier och registratorer ingår, och ett tvärnätverk med andra arkivarier, alternativt ett nätverk tillsammans med dem som har samma ärendehanteringssystem. Det sista förslaget bottnade i åsikten att alla skulle tjäna på att ha samma Ärendehanteringssystem.

Arkivarier – registratorer – IT-folk samarbete

Att samarbetet inte fungerar bedömdes bero på kommunikationssvårigheter. Ingen vill ta första kontakten på grund av revirtänkande. Deltagarna ansåg också att arkivarier/registratorer och IT-folk har olika syn på arkivering och olika tidsperspektiv.

Ansvaret för att kommunikationen ska fungera bedömdes ligga hos alla parter. Det gäller att inte ge upp utan kämpa vidare, för "strategitänket" behövs.


Styra arkivbildningen från början


Ekonomisk styremodell

Att se till att det finns anslag till arkiv och lägga in det i budget kanske kan öka insikten om vikten av att arkivera ute i organisationerna. Men här finns nackdelar.
Appendix 2  Rapport från framtidsverkstad


Det påpekades även att det sker en ekonomisk vinning om man kan tillvarata material bättre. Ett välordnat arkiv spar pengar.

Undervisning & utbildning
En LDB-kurs för arkivarier, registratörer, IT-avd och jurister vore bra. Deltagarna vill föra samman olika yrkeskategorier, för att dessa gemensamt ska lösa problemet med långsiktigt digitalt bevarande.

Undervisning om regelverk kan ske, det blir också en marknadsföring.

Det bör även finnas en policy för diarieföring: "nyanställda borde egentligen inte ha tillgång till diarieföringen innan de fått en kort utbildning."
