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BEING AN ARCHIVIST IN OUR TIMES
- TRYING TO MANAGE LONG-TERM DIGITAL PRESERVATION

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Abstract

Information technology offers the possibility to produce and archive more recorded information than ever before. Thus it is has become feasible to preserve and have access to information in almost unlimited amounts. In sharp contrast, the situation today suggests that societal data has become significantly less accessible than was previously the case. This is both ironic and tragic. In this paper, we recognize that the cultural heritage is at risk, given current circumstances as revealed through observation and dialogue with an archivist. While there are many projects, cultural heritage institutions, government agencies and private enterprises involved in an ambitious research agenda, the majority of these are focussed on technical solutions. In contrast, we provide an in-depth point of view of an archivist who is expected to preserve information in order to safeguard the long-term preservation of the cultural heritage. This report reveals the challenges as well as the systemic implications related to the full implementation of the Archival Information Systems guidelines, that fully involve archivists and users in systems design features and functionalities, in order to enable the advancement of long-term digital preservation.

Keywords: archivists, archival practices, information technology, long-term digital preservation

1. Information Technology - Impact on Archival Practices

Humans have preserved information from different times on many kinds of media, from stone to paper. It is still possible to access this information and we also know that it will remain accessible for many years to come. Today we store books, photos, art and documents in digital form, without knowing whether they will remain intact over the years [Duranti, 2000]. As Dollar [1992] argues, we cannot be sure that we

will be able to access media over time as information technologies (IT) evolve, i.e. hardware and software are developed and replaced and e.g. formats are no longer supported. Hence, the majority of digital information is less reliable, retrievable, and accessible [Duranti, 2001] than that preserved on analogue media, a situation which exacerbates the "already chronic problems in accessing and reading records over time" [Barata and Cain, 2001:257]. Many actors across the globe are involved in ambitious research projects[1] concerning long-term digital preservation and the focus of the majority of these is on technical solutions [Ruusalepp, 2002; 2005]. As part of the Swedish Long-term Digital Preservation (LDP) project[2], we concentrate on human and social aspects of information technology and long-term digital preservation. That advancements in IT also produce workplace changes is well recognized. In systems thinking it is emphasised that changes in one part of the system have consequences on other parts in a number of ways [See e.g. Beer, 1993; Checkland, 1994; Checkland and Holwell, 1998]. Therefore, the introduction and use of IT in organisations influences the organisational processes[3] as well as the formal structures[4] [Kjær and Madsen, 1995]. This is also true in the archival community.

This paper, therefore, aims to explore an archivist's apprehension with regard to the current situation, which is influenced by IT having entered the archives. For archivists this involves the handling of both analogue and digital records. This study assumes that we require an understanding of the day-to day work of the archivists in order to introduce improvements in both Archival Information Systems and archivists work practices. We will provide an interpretation based on one archivist's experience of the current situation and a sense of what to consider when designing future digital archival information systems. Archivists can be seen as translators, mediators and carriers of the cultural heritage from the past to the present day and from the present for the future. Archives and archivists are those enabling communities to cross time [Delmas, 2001]. The question is how archivists should meet the new demands and expectations raised by advances in IT. More precisely, from the archivist's viewpoint we will explore how IT challenges the work processes and organisation, including questions of preservation and access longevity.

The paper is organized into five sections. Firstly, we describe our framework of ideas followed by our methodology and method. Then we present an archivist's current situation in terms of the use of IT. We end up with a discussion of our findings, and summarise our conclusions. In the final remarks we discuss the implications associated with these results, including what is required to be done if social and organisational history is not to be jeopardised.

2. Digital Preservation Tensions in Archival Science

Preserved materials convey memories and ensure that we can learn about human history. Memories are understood as that which stores information from one time to

[1] Among them are, e.g., CAMiLEON, CEDARS, DLM-forum, ERPANET, PLANETS, CASPAR, DPE, PrestoSPACE, EDL, BRICKS, and MICHAEL/MICHAELPlus, and also cultural heritage institutions, government agencies and private enterprises.

[2] The LDP-project was funded by the Swedish National Archives (SNA), the municipality of Boden and Luleå University of Technology (LTU), the latter two are situated in northern Sweden. The LDP-project was officially ended in December 2006.

[3] i.e., dynamic aspects such as people, routines, work practices and so forth.

[4] i.e., relatively stable aspects of the organisation such as division of labour, technical artefacts, etc.

another, hence memories are preserved information. Individuals have memory[5] (they can learn and remember), memory is found as data in a computer, and also in books, news papers, recordings and films. The latter is said to constitute the cultural heritage and is found in archives, museums and libraries[6]. In this paper we refer to memories as an organisation's preserved information of transactions and history, that is, that which constitutes the organisational evidence and memory. This means that records (that hold memories) have two values: the primary value is assigned to the people who have created them (evidential) whereas the secondary value refers to the value ascribed by the society, i.e. researchers and citizens [Cook, 1997]. Organisational memories are therefore necessary for juridical and administrative information requirements, but also for research needs [SFS 1990:782]. Since people have saved their creations from the beginning of recorded time, archives hold an enormous potential for enabling knowledge creation – i.e. the memories embedded in preserved information can support new knowledge generation [Runardotter, Nilsson, Quisbert, Hägerfors and Mirijamdotter, 2006]. The archival idea is to provide collective societal memory, thus archives are more than information since they provide us with a collective memory of nations and people and are also a protection of rights and privileges. We can thereby experience continuity with the past, obtain a sense of roots, belonging and identity [Cook, 1997]. In other words, archives are an important source of scientific and technical knowledge, and the identity of people, families, social groups, enterprises, and public and private communities [Delmas, 2001].

Moreover, the Freedom of the Press Act [SFS 1949:105], one of four fundamental laws in Sweden, is a cornerstone in Swedish democracy, guaranteeing the right of public access to official documents and an insight into government bodies. This is called the principle of free access to public records [SFS 1949:105, Ch. 2, § 1]. The principle, together with archival activities, provides the foundation for archival theory in Sweden. The Freedom of the Press Act is regarded as fundamentally important to research and culture, and to an open, democratic society in general [Gränström, 2005].

Of course, in order to navigate these information sources, it was necessary to organize a collection. This fundamental storage and retrieval premise suggests that the need for structuring and categorizing arose concurrent with human expression through reading and writing. Thus, archiving can be regarded as being as old as script [Delmas, 2001]. Archival science was developed for analogue media and when information was recorded as physical documents, it was possible to observe well established archival practices. The increased use of IT has changed all this, precipitating the necessity for a re-think of work practices and a re-training in digital media in order to be competent in applying and exploiting new tools. The present day archivists must manage both digital and paper based records and documents - i.e. they live in a hybrid environment [Barata and Cain, 2001; ICA, 1997; McInnes, 1998]. This is in keeping with the experiences of other professional groups who must also learn to handle new digital media - e.g. nurses [Köhler, 2006] and librarians [Somerville et al., 2007]. Professional responsiveness is also challenged by exponentially increasing demands for the application of foundational arrangement,

[5] By memory in living organisms is meant the psychological and biological mechanisms that ensure coding, storing and retrieval of information. Source: Nationalencyclopedin http://www.ne.se/jsp/search/article.jsp?i_art_id=256601&i_word=minne [2007-06-21]

[6] Nationalencyclopedin: http://www.ne.se/jsp/search/article.jsp?i_art_id=256601&i_word=minne [2007-06-21]

description and appraisal competencies, which are increasingly affected by changes in culture, media and technology [Cook, 1997].

Menne-Haritz [2001] argues that the temporal difference between past and future is a central defining facet of archival theory. The temporal difference between then and now makes it possible to compare different situations or events and thus understand the relationships between what was, what has changed, and why. The emergent understanding can then be used for subsequent decisions. Hence, archivists must recognize and capture process traces, such as intentions and effects, to be found in archival material and the main objective of Archival Science is therefore process-bounded information [Thomassen, 2001].

In the face of such challenging professional responsibilities, many archivists increasingly report that they are experiencing chaotic situations, as they navigate between old and new technologies. For instance, Swedish archivists are expected to ensure the longevity of the cultural heritage, according to the Archival Act [SFS 1990:728]. One part of the cultural heritage is official documents, which in Sweden should be available to citizens in line with the principle of free access to official documents (see p. 3 above). IT inherently challenges the established work practices of the archivist, the fundamental archival concepts and routines and methods, since these were developed for analogue media and are therefore not always able to be conducted in the same way for digital media. Although archivists are aware of the laws and the regulations which define what is expected of them, and, in addition, the art of archiving, IT has changed their work situation and complicated their fulfilment of societal responsibilities.

We could see archivists as carriers and mediators of the cultural heritage, partly due to their background in the humanities – many of them are historians and therefore often wonderful storytellers of ancient times. In the digital world, a transition has been initiated and instead of being able to retell the archival content, archivists must now possess other competences such as finding the digital information, work that is more in line with librarians or other information specialists work practices [Dollar, 1992]. Hence, IT causes a shift in work practices and work experiences for those interacting with IT [Bradley, 2000].

There are also new actors, e.g. IT systems and technical staff members, able to provide technology-enabled substitutions for the services of the archivists who have been the carriers of the cultural heritage for centuries. Thus, today it is more likely that computer systems, databases, and files will function as carriers and mediators, in order to secure our cultural heritage. Consequently, Menne-Haritz [2001] argues that the archivists should focus more on access than on preservation. We argue that the focus should be on the *preservation for future access*, since IT provides the opportunity to disseminate archival material more widely than was possible with analogue material. Accomplishing this will require re-conceptualising traditional archival principles and moving from product to process-oriented activities [Cook, 1997]. Additionally, the need to modify traditional archival methods, as well as to facilitate access, suggests that archivists will require new skills and tools [Bearman, 1994; Dollar, 1992].

Of additional concern is the question: How trustworthy is technology? IT provides organisations with the possibility of producing enormous amounts of information. Simultaneously, the use of IT can cause information to not always be accessible [Duranti, 2000]. The pace at which people develop and exchange hard/software has made it impossible to guarantee that records are available, readable or trustworthy, something that fails to satisfy Swedish preservation laws and

regulations[7]. Given the temporal nature of software, archivists must also consider the contradiction between wishing to maintain the digital information intact, as created, and wanting to access it dynamically using the most advanced tools [Chen, 2001]. These are critical concerns because "Failing to address the problems of preserving digital information is analogous to fostering cultural and intellectual poverty…" [Chen, 2001:24]. Chen claims that this failure would withdraw our rightful return of all the investments made in IT. One part of the 'rightful return', we argue, is the cultural heritage.

3. Bridging Framework for Research and Methods

In Nordic mythology the rainbow is regarded as a bridge that unites Asgard, the abode of the gods, with the human habitation Midgard. We use a rainbow to illustrate that our methodology, and the methods we have used, constitute the bridge that unites our theoretical framework with our area of concern. The theories influence our methodological choices and the colours our research approach, which are applied in our area of concern, see Fig. 1 below.

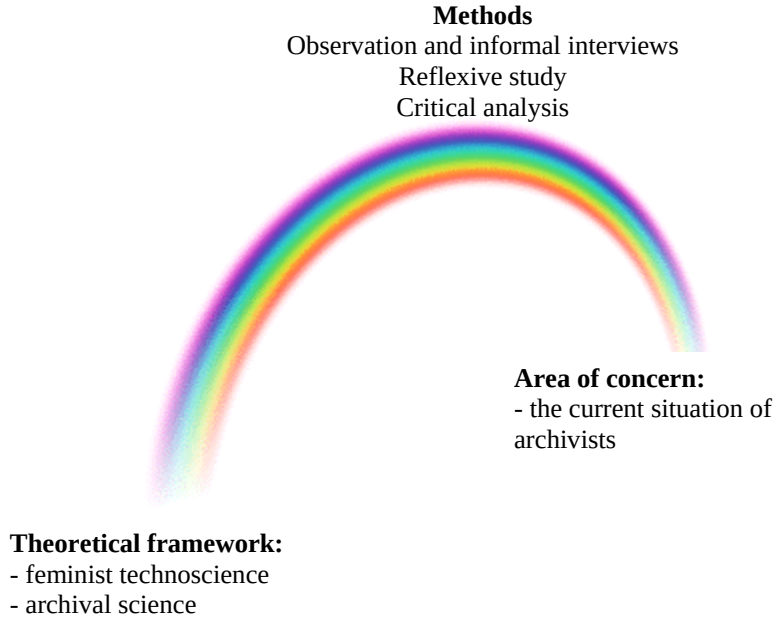

Figure 1. The rainbow illustrating framework of ideas colouring methods.

The area of concern will, in turn, be analysed based on our theoretical framework and therefore the bridge leads us back. The theoretical framework is found on the left side of the rainbow and is based on Feminist Technoscience [see, for example, Haraway, 1991], and Archival Science (see previous section). On the right side is our area of concern, which is the current situation for the archivists. The methods used involved both observations and informal interviews, and these were carried through as a reflexive study, since continuous reflection was given with regards to what was or was not observed. Additionally, in line with Feminist Technoscience, we have critically analysed our observations and also discussed them with the archivist.

[7] Depending on content, time requirements vary. A common time frame for preservation is ten years before appraisal of the documents can be completed, while certain documents should be preserved forever.

Our research approach recognizes knowledge and experience as local, situated, and partial, in line with Feminist Technoscience [Haraway, 1991; Suchman, 2002]. The concept 'situated' acknowledges that memories, experience and knowledge, individual or collective are embodied, and therefore, situated – socially in a culture, and physically in a context, or an environment. Thus, knowledge is always partial, where history, culture and places intersect; accordingly, situatedness is not solely about a specific place, but more of certain circumstances such as the specific history, social culture, organisation culture, work practices, and so forth, a person is embedded in and which become obvious in her/his narratives of the everyday work.

To understand the relevance of situated knowledge, both the researchers and what and whom is 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 within some social worlds whereas for others they are marginal. Thus, the subjects are constituted in practices where meaning is created through languages and agency [Mörtberg, 1997]. Additionally, because this is a reflexive study, it is distinguished by being both systematic and unsystematic. It is systematic when the focus, for instance, is on thematic patterns in transcribed observations and unsystematic when it allows us to reflect upon whatever notice (or later discover that we did not notice), regardless of whether or not it is intended for use [Thomsson, 2002].

From our starting point in Feminist Technoscience, our intention is to acquire understandings and knowledges by exploring the archivists' daily work. This involves a critical viewpoint aimed at questioning the taken for granted, the ignored or disregarded – including consideration of data typically deemed recalcitrant or irrelevant - in order to influence the design of future archival information systems which consider situated and embodied knowledge. Such a viewpoint might contribute to renegotiations and retranslations of current systems' design processes, since we believe that "… feminist research may contribute to re-configure, re-formulate or give systems design other directions" [Mörtberg, 2003:66].

Our view is that systems design is always designed from 'somewhere', there is always a point of departure – a 'somewhere' – for (re)designing practices, processes, and principles [Suchman, 2002]. Hence, it should be conducted in cooperation with the user of the information system and in this paper we focus on archivists as users[8]. This standpoint is further emphasised through our background in the Scandinavian tradition of participatory design (PD), which is one way of ascertaining the relationship between design and use [Bratteteig, 2004]. This approach, in addition to its intention to make the design process democratic, is appealing because when people influence their work conditions, they are more likely to cooperate with the system in which they take part [Benyon et al., 2005]. The various reasons for user influence in systems' design are therefore both pragmatic and political. Pragmatic advantages include the advancement of mutual learning as system users and system designers become conversant with each others fields. In addition, ensuring users' rights to influence their own working conditions promotes political equality and justice [Bødker et al., 2004; Elovaara et al., 2006]. Within this diverse set of justifications for enhanced user involvement, we support archivists playing a crucial role in envisioning

[8] Of course, other groups of archival users are citizens, researchers etc, that want to access the archival material. However, they are not in focus here.

a future archival information system because they are part of it, fill it, use it and take care of it, and nowadays they struggle with it.

The research presented in this paper is based on observations of a university archivist through informal interviews and a follow-up dialogue of the observations. In this sense it is a case with the purpose of "making sense of the complexities of a real-world working environment" [Pather et al., 2006:16]. However, findings presented in this paper are confirmed in other studies, reported elsewhere[9].

Our research method therefore involved an investigation of the daily work of the archivists from her/his perspective. This made sense, given our intention to involve future users in the design of a digital archival information system. Therefore, we needed to know what such a user did and how she/he did it. The data collection has been conducted between April 2005 and June 2005. The observations and discussions were conducted with a university archivist, selected because of her/his recognized competence and interest. In addition, the archivist is deeply engaged in the issue of long-term preservation. The archivist's reasons for participating in our research study involved the search for information, guidelines and best practices. We shared in common the commitment to create a situation for mutual learning in which it would be possible to obtain an understanding of the work practice and its logic and where the archivist could receive information about the LDP project and its findings. One of the authors spent half a day approximately twice a month with the archivist, in order to learn about different situations that were confronting the archivist. During the observations, notes were taken. Moreover, the observer and the archivist ended each of the sessions by discussing different experiences which were part of the archivist's daily activities. Observations, and the dialogue, were later transcribed and reflected upon. Thereafter, the archivist read and commented on the complete text in order to clarify intentions and to avoid misunderstandings.

4. To Be an Archivist at an Authority

Following our intention to explore an archivist's apprehension of her work situation, which is influenced by IT entering archives, this section describes the archivist and her view of the current situation. The chapter is thus a compilation of issues that became obvious during the observations and dialogues with the archivist. Hence, we focus on how the current situation, in which the archivists must handle both analogue and digital records, is perceived by an archivist, not what archivists actually do. Nevertheless, the main work of the archivist involves arranging and describing the archive; building structures and processes around archival matters; planning and controlling record management; informing, supporting, and educating administrators; and providing records and other requested documents.

Jill[10] is the only archivist employed at the university[11], and she has overall responsibility for securing the university's memory, while much of the actual routine,

[9] In its entirety the research additionally consist of material from an investigation at a national archival conference in Sweden (34 participants), a future workshop (7 participants), a focus group interview (3 participants), and document analyses. The research is funded by the Swedish National Archives and is published as a licentiate thesis:
Runardotter, M. (2007). *Information Technology, Archives and Archivists – An Interacting Trinity for Long-term Digital Preservation.* Licentitate Thesis 2007:08, Luleå University of Technology, Luleå. Available at http://epubl.ltu.se/1402-1757/2007/08/ [2007-02-21]

[10] Jill is a pseudonym.

[11] In Sweden, public universities are regarded as governmental authorities, which imply that they are obliged to follow current rules and regulations.

day-to-day work to archive is given to administrators. The registrar is also involved since, in accordance with 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.

The university consists of 1500 employees[12]. A recent reorganisation has resulted in administrators having moved between departments while some have resigned and thereby been replaced. The majority of the administrators have neither the insight in archival matters nor do they see the importance of the archive for evidential and memory reasons. In addition archiving is merely one of many tasks they must perform. Consequently, personnel must be taught 'how and what to archive'. Toward that end, Jill decided to establish a records management process, from registration (of received or created documents) to archive, in order to provide users with an overall picture of the process and thereby encourage their participation in ensuring that mission critical documents were preserved.

Jill (together with the registrar) intended to provide guidelines and models of the preservation path for different types of documents within the organisation. These paths, called 'swimming lanes', concern registration[13]. However, it was Jill alone, who performed the majority of the work with regards to policy documents such as *Plans for Handling of Documents*. These build on regulations from Swedish National Archives (SNA) [14]. The policy document *Plans for Handling Documents*, specifies, for instance, whether a document should be preserved digitally or on paper, reflecting the prevailing situation where different types of media are used. The *Plans for Handling Documents* leads in the end to the archives – hence, Jill reasoned, the whole process should be included. Models for *List of Records* are 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.

During the course of this research, Jill learned that, even if models and examples are provided, that the administrators will still interpret and perform certain tasks 'in their own way'. Therefore, official documents which belong in the university archives are sometimes treated out of compliance with the policy guidelines. As a consequence, it might prove difficult to track down documents in the IT-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 required would be an update of the policy documents when necessary.

According to Jill, archiving is a low priority - and is therefore often neglected - among administrators, teachers and researchers. In particular, it is regarded as 'the least important' work task for administrators; it is only performed if time is available - which is seldom if ever. However, Jill thought, IT has increased campus interest in archiving, which has also been prompted by news of new directions for archives expected from SNA in 2007. The new directions consider digital material and also involve process-thinking. Jill believed that the new directions are the reason for current inspections conducted by SNA officers at universities, and also that the idea is

[12] The employees consist of 91 professors, 550 education personnel/researchers, and 860 others.

[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 finished, the swimming lane shows what documents should be preserved.

[14] SNA is the supervisory authority for all Swedish authorities that are obliged to preserve official documents according to the Swedish Archival Act (SFS 1990:782).

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 1980’s and this created a large backlog of unprocessed documents.

Overall, the greatest difficulty experienced by Jill with regards to the increasing number of digital records is that she has only vague ideas regarding how they should be preserved. Jill seizes as many opportunities as possible to learn more about matters surrounding digital preservation including attending conferences and seminars. But despite professional development diligence, Jill faces many unique situations for which no established protocols exist. For instance, both Jill and the university administrators often use a “double security” strategy to print out paper copies of documents stored on electronic media. In the case of websites, this approach fails to capture iterations of content that reflect changing concepts, as well as evolving policies and procedures. In addition to technical issues regarding *how*, this example raised practical concerns – i.e., *when* should websites and other electronic resources be preserved? What methods and routines - and regulations - can resolve these questions? Jill expressed frustration with the ambiguous responses to these questions from SNA and hoped for distinct and precise directions. Furthermore, Jill wished for enhanced (and compatible!) automation of the university’s archival systems.

Although Jill has worked proactively and diligently, she has remained unsuccessful in convincing either the university management or the information technology service about the importance of long-term preservation. As a consequence, the university has neither a written long-term preservation strategy nor an established cooperation between the IT department and archivists.

5. Discussion

In this section, we reflect on the issues that have emerged during the observations, informal interviews and dialogue with Jill, regarding the current situation. This will be discussed on the basis of archival and Feminist Technoscience theory. The main results of the discussion involved identifying the requirements which must be addressed in further studies.

5.1. The tricky questions

The analysis showed that archiving is not a priority at the university and, relatedly, good preservation was not valued. Jill worked alone on these issues, with surprising enthusiasm despite the university’s failings. However, it did appear that she possessed valuable experience and knowledge that could be used in the reconfiguration of the existing system, paper based and digital, towards a more durable digital archive [Mörtberg, 2003; Mörtberg et al., forthcoming]. It was not a question of a non-existing cooperativeness, but only a question of archiving as a non-prioritised issue. This is, to a large extent, attributable to the absence of recognition across the campus that the archival collections and information system had an important role to play in the life of the organisation. Instead, these assets were regarded as something separate, outside, and independent of the university’s resources. Consequently, Jill emphasised that a shared understanding among university actors to promote a common appreciation for the role of archives in ensuring the university community’s collective memory does not exist. In the case of archives, the lack of diligence in identifying critical collections for preservation irreparably erodes the archivist’s ability to perform her/his official responsibilities.

In contrast, in an 'ideal situation', identifying, safeguarding, and preserving archival records would start at the creation stage of the record [ICA, 1997; McDonald, 1999]. Preservation analysis and planning would precede acquisition and classification [Cook, 1997]. Such comparisons highlight the importance – in the digital age - of involving the archivist from the inception. This contradicts earlier practices which required consultation only at the end of the life cycle for recorded material [ICA, 1997]. Now provenance, appraisal, and so forth must be negotiated in advance [Dollar, 1992], in order to build a good IT system for long-term digital preservation.

From a preservation point of view, and according to Jill, it appears that few university employees were either aware of the importance of the cultural heritage or cognizant of the archivist's traditional responsibilities for its maintenance. Given their authority in making resource decisions, it is regrettable that university management officers did not prioritise the issues surrounding long-term digital preservation. This created a situation without a long-term preservation strategy at the university, which is compounded by IT department decisions that produced information systems ill prepared to ensure long-term digital preservation and access.

Within an even broader context, if the university does not fulfil its responsibility to create reliable records that also accommodate digital preservation requirements, then it could face problems. It is suggested that a pro-active attitude should be taken to archives [Hofman and Buckens, 1998; ICA, 1997]. The responsibility should not belong only to the archivists, but also to others involved such as records creators, records managers, and resource allocators. This includes IT departments and producers and suppliers of IT [Cox, 2001; ICA, 1997]. According to Jill, at this university these groups did not understand their responsibilities towards long-term digital preservation cooperation, coherence, and consistency.

According to the International Council on Archives, ICA [1997], archivists cannot be expected to assume total responsibility for solving archival issues. Instead, archivists must initiate contacts and offer leadership guidance. Within this context, Jill situated and embodied knowledge, provided creative ways to constantly raise the issue, even if it was not prioritised. Hence, the university has not acted in line with findings reported in previous research, which claim that organisations producing digital records must take drastic measures and establish strong controls with regards to record creation, and apply policies, strategies and standards that are consistent with one another [Duranti, 2001]. In turn, the archives themselves should facilitate the establishment of these policies, strategies etc [McDonald, 1999].

5.2. What could improve the situation?

First and foremost – Jill and the registrar are on the right track, considering their efforts to establish the records management processes. The idea of providing guidelines could very well improve the situation in the long run, as administrative personnel become more familiar with the processes and routines. Hopefully, the guidelines and examples will prevent a situation in which people are creative and find their own solutions and thus retrieving information will become less problematical.

Nevertheless, among the critical issues for resolving this dilemma are questions regarding who should be involved in and responsible for the archiving decisions. Relatedly, how might the campus 'preservation system' - including structures, routines and methods - best be organised… and who is responsible for compliance? If these matters were to be clarified, it would be easier to ensure that the memory of the university - as reflected through its documents - could be created for the future

through thoughtful reflection upon well-organised, easily accessed and vivid memories.

Ideally, then, archivists, university management and IT departments would be involved in the co-design of good recordkeeping systems that observe solid archival principles. In addition, archival concerns would be considered even before records are created and/or before the system is implemented, which means that archivists must be actively engaged in the development and implementation phases [Dollar, 1992; ICA, 1997]. According to McDonald [1999] most archives appear to be poorly positioned to influence the records management infrastructure that enables organizational evidence and memory. The question then becomes: How do you reach a group of people that are not interested or are unconcerned?

While we cannot answer that question, we do note that in the absence of organizational appreciation for the archiving functions, the presence of IT further decentralises and diffuses operational functions [Cook, 1997]. This, of course, also involves diffusion of responsibility as it impinges on archival issues [Cox, 2001]. Despite this, the fact remains that increased reliance on information technologies potentially positions archivists at the forefront, even before records are created [Cox, 2001; McDonald, 1999]. Therefore, potentially, archivists could – and should – aspire to improved influence in campus information and knowledge creation affairs. For the moment, this places intense responsibility on individuals, who must, at present, among other things, manage their own competence development and market themselves [Bradley, 2000].

Even though digital archiving is 'a reality', its practice reflects underdeveloped potentialities. A systemic approach would yield a strategy for long-term preservation that considers all aspects from the technological to the organisational [Cox, 2001; Dollar, 1992; ICA, 1997], in cooperation with IT department and university management personnel. Ideally, people in various organizational positions would find ways to cooperate which both respect and value the competences of other professions. As has been demonstrated, the idea of participatory design is absent when the university takes on the challenge of long-term digital preservation and the entire design of their archival information system does not involve the archivist. This means that the university does not take advantage of her knowledge, wishes and demands on the design of IT systems [Bratteteig, 2004; Bødker, et al., 2004; Elovaara, et al., 2006]. The archivist's situated and embodied knowledge appears to have a low priority in the organisation. Another explanation might/could be that, as she takes responsibility and develops routines and guidelines, her knowledge is probably taken for granted [Haraway, 1991; Suchman, 2002].

In an inclusive, participatory systems design process, these elements are nurtured and can lead to mutual learning [Bratteteig, 2004; Bødker et al., 2004; Elovaara et al., 2006]. Throughout, the archivist's preservation and access mission – for the purpose of enabling sustainable cultural heritage - remains the same, even when faced with new storage and retrieval media [McInnes, 1998]. Within this context, the capability to express the requirements outweighs the ability to use various technologies [ICA, 1997]. Thus, the question is not whether archivists should learn to design and develop systems or whether system designers and developers must know archiving. Instead the question is: what do they need to know about one another's' fields? And how can information exchange be encouraged, so as to advance knowledge co-creation? As Cook [1997] has stated, rather than abandoning archival principles and replacing them with information technology proficiencies, archivists should perhaps rediscover the

power of contextualised information - that enables knowledge creation - which is the legacy of their profession.

6. Conclusions

Based on the archivist's stories and what has been observed, the conclusions of the study are now given. Considering that archivists today must handle both analogue and digital records, and securing long-term digital preservation, we have identified the following:

- The authority has no overview regarding preservation of their different IT systems – the systems are not compatible and are not prepared for long-term digital preservation.
- Archives and archiving have a low priority.
- There is neither a long-term digital preservation strategy, nor established cooperation between involved personnel (archivist, registrar, and IT staff).
- Records are printed out, to secure the preservation aspect – hence there is greater trust in analogue material.
- The most acute question for the archivist is how and when digital records such as e.g. websites should be preserved.
- Management is unaware of their responsibility.
- IT has, however, increased interest in archival issues.

A summary of these conclusions is that the authority per se works re-actively with preservation issues, instead of approaching the matter in a pro-active fashion, even if the archivist is ahead in her way of dealing with the matter. She has adopted process-oriented thinking, and has identified what is required to be developed in order to secure long-term digital preservation. Since archivists should be placed at the forefront, the potential exists for the authority, provided that they allow the archivist to be more involved in the organisation's systems design.

7. Final Remarks

The aim of this paper was to enhance the understanding of the current situation for archivists. This, in turn, will guide our future work – to design archival information systems that acknowledge the archivists situated and embodied knowledge. The understandings achieved thus constitute our starting point.

If the question is what jeopardizes cultural heritage in a digital world, the most pertinent aspect in our case was the neglect of archival matters. We argue that traditional archival principles and priorities must be retained and, in fact, enabled. These traditional precepts underscore the importance of the cultural heritage which, particularly within a university context, enables intelligent decision making that builds collective knowledge over time. Admittedly, usage changes over time. Classical archival principles must take future usage into account, in the anticipation that digital documents will be read in 500 years.

Finally, the understanding reported in this paper has led to new questions that might also be fruitfully explored, such as: what does the move of professional background, from historians, via librarians and archivists to administrators imply for the cultural heritage? This investigation implies that consideration should be given as to how these traditionally independent professionals might work together to advance digital age information access.

In addition, we wonder how best to incorporate an understanding of the importance of preserving memories in every day work practices. Obviously, this too requires unprecedented levels of cooperation among a wide variety of cultural heritage stakeholders. However, we believe that the use of IT has the potential to change this scenario, and we claim that cooperation is the first key for securing our cultural heritage. It is also our belief that by addressing the issues presented here, great opportunities for improving future archival information systems will emerge, thus enabling the longevity of cultural heritage.

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