ADI – a Project within a Larger Project

*Digitisation of Archival Material - from preliminary study to main study, 1997 - 2000*

**Introduction**

The heading of this text ("ADI - a Project within a Larger Project") refers to the link between the projects ADI, (*The Digital Infrastructure of the Archives*) and Digitisation of Archival Material.

The project “Digitisation of Archival Material” was carried out as an EU project at SVAR Sandslån during the years 1997 –2000 parallel with the project “Digital Register “ which the Bank of Sweden Tercentenary Foundation co-financed. Both projects have investigated questions regarding the digitisation of archive information, image capture and searching (text databases).

The ADI project was a preparatory study prior to a more advanced research and digitisation project where the experience gained from the digitisation project at Sandslån was considered valuable.

At the ADI project’s workshop in the spring of 2000 the experience and results of “Digitisation of Archival Material “ were presented. The authors of this text were active in the project as Project Leader (Jan Sahlén) and Head of Technical Matters (José Fonseca).

**1. Background**

The project *Digitisation of Archival Material* started as a preliminary study in 1997, progressed to a main study and terminated in 2000. The Swedish Archive Information Bureau SVAR was responsible for the project commissioned by Riksarkivet (The National Archives of Sweden). The headquarters has been at SVAR’s unit at Sandslån, in the municipality of Kramfors, where the bulk of the activities were carried out, with the exception of the workstations which were set up in Ramsele (Rikssscanning AB), and Näsåker (SVAR).

The task was to investigate and suggest techniques and methods for the scanning of archival material, especially the filmed material, at SVAR’s repository site in Ramsele.

A number of other digitisation projects with similar tasks are underway and have been carried out within the archive authorities but the *Digitisation of Archival Material* was specifically concerned with older microfilmed material of which the Swedish Church archives constitute two thirds.
2. Prerequisites

2.1 SVAR’s needs

The prerequisites on which the proposal to initiate the project *Digitisation of Archival Material* was partly based included SVAR’s increasingly apparent need to change its techniques.

- The Swedish Archive Information Bureau, SVAR was set up in 1978 with the principal task of converting and copying microfilm for microfiche distribution.
- SVAR is a bureau within the National Archives.
- SVAR’s task is to distribute archive information and to make archival material externally accessible.
- SVAR can currently distribute copies of all the Swedish Parish Registers on micro card (approx. 2 million micro cards).
- Microfiches are of great importance for genealogical research, one of the most popular national movements in Sweden.
- Increased accessibility through microfiches is also important for scientific research.
- Distribution provides an important income for SVAR/ the National Archives.

The simplest analysis of the surrounding world shows us that rapid technological development has speeded up the transition from an industrial to an information society, with the new demands and needs that this entails. For SVAR this means that requests in the future will be particularly for digital and not analog (paper or film) media. Accessibility also needs to be instant – on the spot.

Therefore SVAR must:
- develop its activities in order to meet future demands more efficiently.
- digitise all the links in its information chain.

2.2 The Information Chain

SVAR’s distribution of archival information has to date been analogical. To be able to utilize information about and from the source material the client (user) needs an unbroken chain of information consisting of clearly identified links.

The links in the information chain can be divided into structural links and activity links – or hard and soft links. Source material, personnel, organisation, tools and communication technology are examples of the first whereas image capture (enhancement), storage, distribution, competence and marketing are examples of the latter.

The final quality depends on the quality of each individual link. To be able to distribute archive information by way of digital media it is not sufficient to simply digitise tools, image capture, storage and distribution links. Digital thinking (competence) must permeate the personnel and organisation in order to correctly process the source material etc.
2.3 The Project’s resources

Finances

*Digitisation of Archival Material*, both the preliminary study and the main study, has been carried out with support of EU structural funds. First through Objective 6 (the preliminary study during 1997) and subsequently via Objective 2 (the main study during 1998-2000). Apart from our own financing regional public and private sources have contributed as follows:

- 32% EU structural funds
- 33% RA/SVAR
- 26% Other public funding (county administration, municipalities, Labour Board)
- 9% Private funding (Kempe Foundation, income)
Costs for the preliminary study and main study eligible for support have altogether amounted to SEK 7.617 million.

**Personnel**

The project has been manned by four people from SVAR’s unit in Sandslån. Of these two had academic qualifications in archiving and information and technical engineering whilst the other two were self-taught and had taken additional courses in history, databases and system maintenance. None had an academic degree in history or experience of scientific research. All four, however, had long experience of working with archive information databases (Enskilda arkiv, Nationell Arkivdatabas - Private archives, National Archive database).

**Concept**

SVAR at Sandslån initiated and developed the project concept and handled the planning, application and organisation. It was the firm conviction of both personnel and unit that:
- there would be a strong development in digital that would bring with it new demands
- the personnel and the unit had the right prerequisites and background to acquire further knowledge and develop what they already possessed
- the future of the staff, the unit, SVAR and the National Archives lay in digital technology
- through the project the staff and unit could be developed into a resource for SVAR and the archive authorities.
2.4 The Project’s geographical location

The surrounding environment is very important for a development project. Infrastructure, education/research, networks as well as references and steering are significant factors for a project’s creativity. Traditionally development projects are located in the vicinity of the project owner’s head office, especially when it comes to new technology. This project however did not follow tradition in that it was located 120 km from SVAR’s head office (Ramsele) and 500 km from the National Archives’ head office in Stockholm. In the local environment (the municipality of Kramfors) none of the factors mentioned above exist, apart from SVAR at Sandslån, they can however be found regionally or nationally at a distance of at least 60 km. At the beginning of the project the existing staff lacked established contacts within the area of scanning.

3. Implementation and results

3.1 Project organisation

In consideration of the project’s task and the special circumstances the work was organized according to a fixed model. The task was to study the application of digital technology in the area of archiving in general and the scanning of older microfilm in particular. Apart from a specified number of products the project was to suggest techniques and methods for the implementation phase for use within the archive authorities. The circumstances that were particularly taken into consideration when constructing the model were staff background and geographical location. The project work was organized into four parts to achieve optimal knowledge acquisition.

1. **Project staff** (project leader and project co-workers)
   For planning, processing and documentation of acquired knowledge.

2. **Workstations** (project co-workers as well as extra or external personnel)
   For practical (internal) acquisition of knowledge through trials and pilot production.

3. **External contacts** (national, international, conferences, companies)
   For theoretical (external) acquisition of knowledge through study visits, education and co-operation.

4. **Reference group** (archive, library, museum, research and user competence)
   For analysis of results achieved as well as guidance when new problems were encountered.
As a whole this model worked well. New questions and practical results could be tested in different limited areas which facilitated assessment of the trial results. Because of resource reasons different parts functioned unevenly which weakened the project. The fact that the work-stations were not localized to the project headquarters created delays and a lack of focus on current questions. The project staff’s central role in the project work cannot be over-emphasized. Nor can the utilization of the project co-workers’ competence for purposes other than the project’s which reduced the efficiency of the work done (planning, treatment and documentation).

3.2 Equipment

The technical equipment is of great importance in a digitisation project with an emphasis on scanning. The equipment is not only important as a tool for image capture but also for acquiring a deeper understanding of digital technology.

At the start of the project in 1997 only one microfilm scanner existed in Northern Sweden and the project’s budget did not allow for the purchase of one. The scanner, a SunRise machine was not configured for the scanning of greyscale and was owned by a newly set up company in the interior of Norrland. Much project time was spent negotiating with the company for the setting up of a workstation there and motivating an upgrading of the scanner to meet the needs of the project. The distance to the newly established workstation (120 km) meant that the project staff was split for long periods, with half the staff at Sandslån and the other half on duty at Ramsele. External financing enabled SVAR to purchase a SunRise machine for greyscale scanning in 1998. This was installed at SVAR in Näsåker where the project was able to set up a new workstation, somewhat nearer but still distant (100 km).

All microfilm scanning for the project’s products was done on the above-mentioned machine. At the beginning of 2000 the project was able to purchase a microfilm scanner (Wicks & Wilson) also thanks to external financing, which has been installed at its headquarters.

The supplier’s faulty description and configuration meant the machine could not be used until September 2000.
3.3 Knowledge acquisition

As described under the heading “Organization” the work was organized according to a fixed model to achieve maximum acquisition of knowledge. Theoretical knowledge was obtained via external contacts and a reference group whilst practical knowledge was acquired through internal trials and pilot production at the workstations. As soon as the project began it was stated that knowledge about the methods was more important than the products. Digitisation of archival material has therefore never been an order or production project but rather a development project with the emphasis on establishing contacts.

The common platform for acquiring knowledge has been:

- Learning by doing
- Gaining knowledge – in order to become a future resource within the archiving authorities
- Development project today – good customer tomorrow

With this platform as its guiding light the model has worked very well as regards acquiring knowledge. The continuity lacking in the project group’s work however has resulted in weaknesses in the processing and documentation of this knowledge. More resources would have been needed to work with and structure the information and knowledge that the project has today, but which perhaps remains unaccessible.

3.4 Contacts & Networks

The project Digitisation of archival material has been carried out in a municipality, which lacks cultural heritage institutions, further education and scientific research or companies possessing advanced knowledge with regard to digital technology. As a consequence of the active procurement of knowledge many more international than local contacts have been developed. Even national and regional contacts are relatively modest compared to the international contacts.
It was also at the international level that we found digitisation projects which made similar demands on quality and source fidelity, readability, good resolution as well as reliable image and file processing.

Companies
RIKSSCANNING (RAMSELE), SUNRISE (ENGLAND), IBM SWEDEN

Conferences & seminars
RLG IN WARWICK, EUROPEAN CULTURE HERITAGE IN UTRECHT, DLM IN BRUSSELS, MARGARET HEDSTROM SEMINAR IN HÄRNÖSAND, COLLEGIUM BUDAPEST

International
ICA/ CIT, ARCHIVO GENERAL DE INDIAS (SEVILLE), NHDA LEIDEN, MAX-PLANCK INSTITUT (BERLIN), NIEDERSACHENS UNIVERSITETSBILOTEK (GÖTTINGEN), PROVINCIAL ARCHIVES (VIBORG), ANNE KENNEY AND SANDY PAYETTE (CORNELL UNIVERSITY), NATIONAL ARCHIVES OF SCOTLAND, ARCHIVIO STORICO (ROME), VATICANMUSEUM (ROME), ACC- OCH IMAGO-PROJECTS (ITALIAN STATE ARCHIVES, ROME), NATIONAL ARCHIVES OF HUNGARY, NATIONAL ARCHIVES OF CANADA

National
NATIONAL ARCHIVES OF SWEDEN, BÖRJE JUSTRELL

Regional
UMEÅ UNIVERSITY, MIDSWEDEN UNIVERSITY, PROVINCIAL ARCHIVES (HÄRNÖSAND), SVENSK ARKIVINFORMATION (SVAR)

Local
-

International Council on Archives
Committee on Information Technologies
Third working session, Ramsele, Sweden 10-12 June, 1998

The co-operation with the ICA/ CIT committee was formalized at its third working meeting at Ramsele 10-12 June 1998. This co-operation was of great strategic importance for the project because of the committee’s credibility and the structural thinking that it added. During the project’s latter part a method of cooperating was developed which could prove useful in continued international work. The project sent
about 1000 image files to Chris Seifried at the National Archives of Canada in order to improve the image quality through various enhancement processes. The result of the Canadian work with the Swedish pictures was then made available via Internet at the international ADI workshop in May 2000.

Börje Justrell has been of most great importance to the project as a link with the ICA/CIT committee and as a member of the reference group. Other contacts of strategic importance for the project were: Archivo General de Indias, NHDA (Leiden), Anne Kenney, Umeå University, Mid Sweden University, RLG Conference in Warwick and Margaret Hedstrom-seminar in Härnösand.

3.5 Products

The four products, which have been produced by the project *Digitisation of Archival Material*, have been published on CD ROMs. The scanning was done at the project’s work stations and the linking work and image enhancement at headquarters. All the work was completed within the project by permanent and temporary staff.

With these products the project would like to show readability as well as different search engines and ways of presenting the material. In order to evaluate possible search and retrieval methods for future use, the project linked all the digital images to different types of text databases: the Demographic Database, a scientific database at an individual level, SVAR’s parish catalogue at village or block level and examples of linking to registers which have been voluntarily set-up. The Swedish Parish Registers (of Tuna, Vadstena and Alingsås) are the common source in all four products.

3.6 Technical report

In the final report of the project *Digitisation of Archival Material - a preliminary study* the different tests and studies made on the scanning of older microfilmed archive materials from both microfilm and microfiche are set out in detail. In the main study the objective was to use the knowledge and experience gathered during the preliminary study and to apply it to circumstances resembling production and to present an evaluation of the various links in the digitisation chain.
Scanning

All images were scanned under the following conditions:
Scanner: Sunrise SRI 150
Source: 35mm positive film
Generation: 2nd
Resolution: 300 dpi
Filter: none
Reduction ratio: Not available. Estimated at 12x
Quality index: 8 very good in accordance with AIIM standards*
Number of bits (depth): 8
Number of grey shades 256
Type of scanning: greyscale
Compression: none
File format: raw TIFF 6.0

* This presupposes that the smallest character in the original document (books) is 1mm high.

It is important that the scanner be handled by an experienced person who is also knowledgeable when it comes to digital image processing. The operator should be able to judge whether the settings to be used to scan a certain collection of films should be adjusted for certain images or films e.g. the focus and darkness level are other parameters, which must be adjusted for each film, subject or image. Certain stages are involved during image capture which are more or less automatic, whilst others must be considered according to each subject to be scanned e.g. the quality of the film. The operator should be able to make these judgements himself/herself so that there is minimal involvement of others thus ensuring that production is not hampered.

Quality assurance

Quality control starts as soon as the quality of the images on the film is judged and continues throughout the digitisation chain. This means that different people judge the quality of the images from different perspectives. Therefore it is important to have a clear description and an example of how the images should appear. Demands must be set which the images have to meet at every point of control. However it is always a question of time and money and a commercial activity is often steered by these factors.

Another aspect to consider is the durability of the images. How will they be regarded in the future, after five or fifty years? Just a few years ago many claimed that 1-bit pictures (black and white) were the only realistic way of scanning and distributing digital images of archival material. Today the perception of quality is totally different and it is generally accepted that scanning in both forms (black & white or greyscale) depends on the raw material and what the pictures are to be used for.

When it is a case of production the first quality control station is the most important because it is there that the two most important characteristics of the digital image are
checked i.e. that everything which is on the frame has been captured and that it can be read. If the image does not meet these two criteria it is useless. At the same time the effectiveness of the process has to be considered and several things done in each station. Every file is opened to check the characteristics above and the page number of the image has to be checked so that the name of the file can then be changed to the page number it has. In this way it is possible to see what the files contain simply by checking the name of the file.

With distribution quality control takes on a different form as it is then aimed at what the images are to be used for. It is not always so important to be able to read every single symbol in the document. It could be that the images should be available in three different qualities (low, medium and good) or perhaps the image should be offered in the same quality as the original. Whatever the case we suggest that it is preferable for two people to be involved at every stage in the quality control.

**Storage**

The decision about which file format is to be used to store the master files has to be made in advance. We chose **TIFF** (Tagged Image File Format) 6.0 partly because it is a de facto standard for both colour and greyscale images and partly as different compression tools use this file format as a starting point for their compression algorithms. **TIFF** 6.0 is also the starting point when it is time to migrate to new file formats.

We used both magneto-optical (MO) discs and hard discs for media storage. MO discs have the advantage of being both reliable and technologically tried and tested. Every disc stores up to 2.6 GB, 1.3 GB on each side. A large number of images requires a large number of discs, which are expensive, and also continuous surveillance by the operator as during batch processing the discs have to be turned over or changed. The same demands apply when migrating the images to another file format.

On the other hand, hard discs are not meant for long term storage of information. However we used them along with MO discs to show the advantages and disadvantages of both. They are also the outcome of tried and tested technology but are not as trustworthy as MO discs for long term storage mainly because they contain both electronic and mechanical components. Their life expectancy is also shorter than MO discs. The advantage in using hard discs is when a large number of images are to be processed (for compressing, filtering, downscaling etc). An automatic process (batch) can be started and it will then run for hours without supervision.

**Digital image process**

In capturing images the idea is that they should be as close to the original as possible i.e. without any image enhancement. It is only when you make copies of the master for distribution that enhancement comes into question. In principle the possibilities of creating variations of the original are unlimited. In our products we used three different file formats; Pdf, Jpeg and Djvu. Of these only Jpeg is a de facto standard for
colour and greyscale compressed files. PDF uses JPEG’s compression algorithms and can be seen as a variation of JPEG. The Djvu (Deja vu) format is relatively new and has been specially developed for black and white scale, colour and greyscale images containing text. It is also intended for use on the Internet.

The Tuna pictures were compressed to medium quality JPEG and scaled down to 30% of their original size to make them as small as possible to allow distribution on the Internet. An alternative solution was a hybrid product where you could search in the text database on-line on the Internet and read the images directly from your computer.

The Vadstena 1834 images were compressed to medium quality PDF and scaled down to 35%. This was less compression and downscaling than Tuna as the smallest characters had become illegible. The images were then stored according to volume.

The Vadstena 1700 pictures were compressed to Djvu with standard quality. Here it was not possible to batch compress them as the compression tool did not have this option. There is a version of the tool which has batch processing possibilities but it costs about $8000 for greyscale or colour.

The Alingsås images were compressed to high quality JPEG and scaled down to 70%. The pictures are only to be used on CD and it is therefore possible to present larger images of high quality.

During the last few months of the project the Tuna images were sent to the ICA/CIT committee which resulted in Canada’s National Archives working on the images using various methods for improving their quality and after using a particular method they did a batch process for all the Tuna images and put them onto the Internet. We learned the method and used it when processing the Alingsås images.

Searching

Digital images can principally be used in two different ways. Either you skim through them until you find what you are interested in or you use a text database to search for the right image. We have tested both variants with the products.

Tuna is a unique case in that it has a database, which has been extremely carefully registered and with such a wealth of detail as can be found in only a few databases. It is possible to make a search by name and in the database is a wealth of information on each person. There we have linked the images to each individual. It is important to mention that the linkage work has been intensively time consuming.

For Vadstena 1834 we used two different text databases; the SVAR catalogue and the Parish Catalogue Register (SOKAT). SVAR’s database is registered according to volume level, which means that the search result shows far too many images, often hundreds of them. SOKAT is registered at block level, which markedly reduces the number of hits. After a search in both cases you have to look at the images one by one until you find the one you want. The third variant is to use a text database at personal
level which would mean finding the right person at once and the page or digital image
where the person appears. Unfortunately this possibility does not exist in this product,
which explains the empty frame in the search alternative. We have included images of
the registration programme and the information which can be registered with it.

Vadstena 1700 contains only digital images and there is no possibility of searching for
individual images. This product is equivalent to a digital copy of the original document
i.e. the parish catechetical meetings register.

Alingsås shows a voluntarily compiled text database at an individual level with digital
images. This product illustrates that it is possible to use such databases and as long as
a reference to the source is registered, it is possible to link digital images to these. The
digital images can also then be used for revising text databases. This also applies to the
SVAR catalogue and SOKAT.

**Distribution**

The most common way of presenting and distributing text databases and digital images
is by way of CDs and the Internet. The images created for distribution are always
inferior in quality to the master. You can never avoid having to compromise between
quality and file size. And the steering factor is always the method of distribution.
Another factor to consider is the type of application used. Are you going to show one
image at a time, as in Tuna and Alingsås, or do you need or want to skim through the
images to find the right one as in Vadstena 1834 and 1700? If you show one image at a
time without the skim option and the product is distributed on CD you can always
include images of better quality. When distributing or publishing on the Internet the
images have to be more compressed (Tuna).

The four products created during the project period have been published on CD. Tuna
and Vadstena 1700 are also published on the Internet.

Tuna can be found at: [http://www.foark.umu.se/tuna_dig/](http://www.foark.umu.se/tuna_dig/)
Vadstena 1700 is at: [http://www.svar.ra.se](http://www.svar.ra.se)

**Technical conclusions**

One of the most important lessons learned from the project is that certain demands
must be met before starting a digitalisation project:

- Clear goals as to what is to be achieved by the project
- Knowledge about the source material
- Information about the quality of the source material
- How the product is/products are to be presented and distributed
- Knowledge of and contact with the users/market
- Access to equipment
- Clear methods for image capture, quality control etc.
- Search/selection possibilities
• A plan for how the resources are to be used
• Financing model

You must think about the fact that you are in a constant process of decision making which means that each decision leads to a new “fork in the road“ where new decisions have to be made. Preparatory information and knowledge about the different stages of digitisation are two important prerequisites for a successful project.

4. Effects

A collective opinion shows that the project has strengthened the SVAR unit at Sandslån and SVAR as a whole. It has also contributed to further strengthening the county’s image as an archive county and paved the way for interesting cooperation projects in the future. Through this project the world of archiving has got yet another able actor in the area of digitisation that can contribute to continued development work.

Apart from the above-mentioned results the project has produced a number of effects.

4.1 New tasks for SVAR

The fact that Digitisation of archival material has been run as a project within SVAR during the last three years has gradually changed the image of SVAR both internally and externally. From having earlier only been thought of in terms of microfilm, SVAR is now considered to be just as much involved in archive information and digitisation/scanning. This has resulted in SVAR securing several larger undertakings involving the scanning of state archive materials.

4.2 Resource for the archive authorities

The aim of the project to develop the project participators and the unit at Sandslån into a resource for SVAR and the archive authorities has been achieved. Their collective competence is already being used today for various tasks within all the archive authorities. An extra spin-off is that we can also see how this competence is being sought externally in connection with research projects and international co-operation projects.

4.3 Knowledge of necessary measures

One significant lesson learned by the project is the importance of continually updating knowledge. The digitisation of archival material involves a variety of sciences and techniques and without continuous awareness of developments, established techniques and methods run the risk of becoming very quickly outdated. The archive authorities should also try to co-operate with established research in this area of development, across disciplines and in collaboration with other cultural heritage institutions. It is important that the archives’ more practical activities (registration, scanning, and systems building) are cross-fertilized by scientific questioning and active research. More on this in 4.4. below.
4.4 ADI, The Digital Infrastructure of the Archives

The Digital Infrastructure of the Archives (ADI) is a one-year development project involving the Swedish and Hungarian National Archives. The aim is to make an inventory during the year 2000 and discuss suitable subjects and source materials for a research and digitisation project stretching over several years concerning European cultural heritage.

The Research Archive at Umeå University is included in the project and wants to conduct comparative studies in Northern, Central and Southern Europe. Subjects, which are currently being discussed, are identity, baptism, and education/educational routes throughout Europe. Source material for the Swedish part comes from censuses and the parish registers. SVAR Sandslån is the Swedish National Archive’s representative in the project through *Digitisation of archival material*.

5. Lessons learned

What lessons are learned from the project – *Digitisation of archival material* – a development project in the periphery of the periphery i.e. far from head office and without local networks?

- **Establish good contacts with centres**

Good contacts with those who commissioned the project are vital for its steering of it and its activities. It is a good idea to formalise a contact in a steering group for regular exchange of information and reporting. The project *Digitisation of archival material* has not had such a steering group but on the other hand it did have good contact with individual representatives, from its principals amongst others, via the reference group.

- **Establish good contacts with research**

The project had a representative from the Department of Archive and Information Science at Mid Sweden University in the reference group but on the other hand did not manage to establish a common research project with that department. In this way we lost the meeting between theory and practice where scientific questions can be posed and practical technical solutions developed.

A common problem for projects is that the ordinary line of work wants to use the project’s resources, both soft and hard. The project therefore has seen its co-workers forced to carry out other tasks and focus their involvement on other problem areas. In the long run there is a risk that the project’s chance of achieving its goals might be undermined. To defend and nurture resources is therefore a way of guaranteeing a good result.

- **Build networks**

Nurture and cherish contacts made within the subject area. Build networks for information exchange. Knowledge is not something to compete over. On the other
hand the ability to transfer the right knowledge to new activities is something to compete over.

- **Work methodically - document more**

When the project was initiated the work was carried out methodically with everything documented, planning, meetings, decisions, scanning activities etc. As time went by and the project resources were used for other tasks the methodical way of working deteriorated and the documentation from the latter half of the project is less comprehensive than from the first part.

- **Cultivate vision**

An important prerequisite for long-term methodical work is a vision which is kept alive. This is especially important for projects far away from what are considered to be creative centres. A clear vision acts as a signpost which can point the direction to be taken at every single crossroad or decision point. The words “Archive” “Digital” and “Development” can be found in the project’s vision. The goal is also stated in terms of “resource for” which has guided the activities. Creative centres are perhaps not physical places but rather environments or states of mind. Projects taking place on the periphery can very well be in the centre of things. Or vice versa.

6. Necessary measures

**Archives’ digital R&D station**

The establishment of a station for research and development was one of the goals of the project. For resource reasons amongst other things this was impossible during the project period. However the project itself has acted as the embryo for such an R&D station. The station’s mission should be to collect, distribute and impart new knowledge and techniques within the area of digitalisation and the scanning of archival material. Therefore different sciences should be tied to the station such as archiving (cultural heritage), information and communication, technology, pedagogy. The technical performance should be of a high quality to enable the establishment of a laboratory environment. Transfer of knowledge will be realised through courses, workshops, seminars and training programmes. The R&D station should also be able to supply consultants.

The mainstay of the R&D station should be establishing a new arena for co-operation between the practioners’ field and the scientific, theoretical field. This would preferably be done through international exchanges where research projects and digitisation projects would utilise the creative environment of the R&D station. With the R&D station as part of the archive authorities a constant flow of new skills into the ordinary activities should be facilitated. Using examples from the project’s contact network and achieved effects co-operation at the R&D station could be organised as follows:
7. Conclusions

Old societies are replaced by new. At the present time we are in a state of transition from the industrial society to the information society. New skills are being developed to meet the needs of the future. In the same way that common sense was not enough in the industrial society many of our conceptions will be useless in the information society. We are adopting digital technology but do not seem to be able to fathom its force, analogical methods and analogical thinking is transformed to zeros and ones. We use the new technology to produce digital exhibitions and “peepshows” instead of using it to develop effective tools for its users. Tools which reflect events, happenings and processes and which make possible the development of new knowledge.

The archivists need to analyse how the development of digital infrastructure will influence the profession, questions and the use of source material. We need more knowledge about digital technology, the power of which we can only begin to understand. Perhaps it will only be when all the links in the information chain are digital that we will see and understand how to utilise this force. When the Archives’ Digital Infrastructure is a reality.
THE DIGITAL INFORMATION CHAIN
= THE DIGITAL INFRASTRUCTURE
OF THE ARCHIVES
ADI