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CHAPTER FIFTEEN

International Archiving and New Technologies

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The title of my paper already signals that I shall be discussing issues quite different from those examined in preceding chapters. I too have done a good deal of historical research, with a focus on economic and banking history. My present topic however is not history but rather the future of archives in light of new developments in information technology. This is only apparently distant from the questions addressed by others. In fact, the fate of historical archives should be a matter of concern to all historians. Their research depends on the safeguarding of documentation, the way it is managed, preserved and made available to scholars. In the event, these remarks on a field undergoing rapid change, where the situation is in flux, will necessarily skip over many details. I shall attempt to outline the main problems on the agenda and the most important trends.

The nature of the technological revolution in the world of archives

The international archival community often has diverse opinions and is influenced by what are sometimes very different cultural and professional traditions. However, it appears to agree on the extraordinary nature of the developments that the world of archives and, more generally, the world of information have been seeing for the last several years. An epochal turning-point has been reached: the method by which documents are produced, preserved and utilised, which for centuries basically remained the same, are now changing rapidly under the powerful drive of information technology.

In my opinion, this turning-point is even more radical and more important than those following the advent of paper or the printing press, because the current changes, which are taking place in a relatively very short span of time, are simultaneously affecting both the nature of documents and the

methods by which they are transmitted. First of all, let us try to define what is being transformed. We are seeing simultaneous change in:

- the medium on which information is recorded. Paper is increasingly giving way to documents that are created and stored exclusively on electronic media
- the techniques for reproducing documents on media other than paper. I am referring particularly to the growing use of optical technology for storing documents originally created on paper
- the techniques for entering documents and preparing archival finding aids (guides, inventories, indices, etc.), which can make use of the remarkable possibilities offered by new information technology
- the techniques for transmitting documents, which now make it possible to send information in real time

Most of my paper will focus on digital archives, which involve the computerised management of documents that are created and that remain in electronic form. It is likely the way of the not too distant future, and it has already been introduced in a limited number of archives. More commonly, one finds IT being applied to individual elements of archival management: registering of documents, record-making and creation of a database that can be used for searches, computerised management of paper documents, reproduction of paper documents on CD-ROM for more efficient use, transmission of information via telematic networks, etc.

The process of change is therefore just beginning, reflecting the youth and dynamism of Information Technology, which also makes it very difficult to foresee the direction it will take in the future. The foreshortened nature of these changes further complicates prediction. Notwithstanding these difficulties, it is essential to attempt to manage the process of change, in order to prevent it from creating greater problems than those it is meant to solve.

The advantages of information technology

Information technology is here to stay and we will all have to come to terms with the changes it brings. It offers far too many advantages and extraordinary opportunities in the area of document management (as indeed it does in all aspects of life) to think that it will not develop even further in the coming years. Without attempting to enumerate all of the opportunities created by information technology, we can at least list the main benefits:

- it offers a definitive solution to one of the oldest problems faced by archivists: the ever increasing demand for space to ensure the optimal storage of documents. The use of information technology makes it possible to store enormous quantities of documents in very little space
- it reduces the cost of running an archive by reducing expenditure on storage space and for the handling of document containers. This benefit, which has already made itself felt, is destined to increase with the gradual spread of computerised document management, which will further reduce the cost of hardware and software
- it enables archivists to manage the entire lifecycle of a document in a unified and efficient manner. Obviously, the technology also makes it possible to move and reorganise documents electronically, thus reducing costs; it permits decentralised archive management, eliminating the physical and other barriers in the various stages and locations of the document handling process
- it ensures much more efficient control than is possible in traditional systems, thereby enhancing the preservation of documents, which remains the crucial problem for any archive
- it makes it possible to handle documentation in multiple formats (video, photographs, audio, etc.)
- it optimises and speeds up enormously the search for information using the increasingly sophisticated information retrieval systems available today
- it permits remote real-time consultation of archive inventories and the documents themselves
- it makes it possible to store documents virtually forever, using appropriate techniques (I shall return to this point later)

Further opportunities and benefits no doubt will soon come into view. The technology is evolving rapidly and it is difficult to forecast the progress it might make. What is certain is that the static conception of the archive that has characterised the sector for centuries is swiftly being replaced by a dynamic vision.

The problems and risks of information technology

All that glitters is not gold, however. The opportunities and benefits of information technology in document management are accompanied by many potential problems and risks.

First, information technology is highly dependent on the medium used to store information and the hardware and software used to manage and to consult documents. The problem concerns the life span of storage media and the need for regular updating of constantly evolving hardware and software. In addition to the cost of transferring information between media, which is far from negligible, there is always a risk of losing vital information in the process. Technological obsolescence must be managed with care to ensure that electronic documents are in fact 'eternal'.

However, the most important problems are theoretical and regard:

- the definition of the essential features of electronic documents
- the specification of criteria to guarantee the authenticity of electronic documents
- the design of a system that makes it possible to preserve existing archive links between the stored documents

On the first point, it is the basic task of archivists to determine the features defining a document so that it can be recognised and preserved by scientifically valid methods. Archivists themselves disagree on the definition of a document. In the Anglo-Saxon tradition, or at least in one part of it, the dominant conception is that an archival document is any type of information generated and memorised on a storage medium during any type of activity. By contrast, the Latin archival tradition which prevails particularly in Italy, tends to emphasise the legal nature of the document and its use by the body or person that produced it. In this tradition, an archival document is legaly valid evidence of an event or an act. Whichever definition is adopted, only clear principles and unambiguous terminology will enable the producers of documentation to co-ordinate and manage their document output efficiently.

As regards the medium used to store information, it is basically a vehicle, a matter of subsidiary importance with respect to the information contained in a document. The nature of the medium does not influence the concepts and underlying theoretical definitions of the document management process. A document is a document however it is stored. Nevertheless, we must not overlook the fact that information storage and transmission media can have a major impact on the management process.

As concerns the authenticity of electronic documents, broad consensus has been reached on the use of digital signatures in the form of asymmetric keys. I cannot give you a detailed review of the situation in other countries but I believe that most are currently working on legislation that will make digital signatures legally valid. In Italy a decree was adopted in November 1997 giving

full validity to acts and contracts produced in electronic form with digital signatures.

Preserving existing links between the documents that make up an archive is essential to maintaining the informational and evidential value of documentation. Documents are not isolated entities: they acquire meaning through their relationships with other documents. The problem consists in directly and permanently binding the identifying particulars of a document (archival mark, reference date and number, digital signature, etc.) to the text itself and, obviously, to the rest of the archive. The obsolescence of the software needed to read the documents is also a factor. In transferring information to other media or using different consultation software, it is not enough to store the text of the document alone: it is also necessary to ensure the preservation of its form and context, which attest to its authenticity. In short, the challenge is to store the information content of the document and its link with the filing information and the details of the digital signature, which are necessarily stored in different databases from the document itself.

The problems I have been discussing must be confronted in time and with due awareness of their implications. A wide range of skills are required, beginning with those of computer experts and database designers. However, in order to ensure high quality results with expectations, the archivist's expertise is needed to orient and guide the design of changes to the document management system. This is the only way to take full advantage of this technological revolution.

The effects of information technology on the archival profession

Information Technology is thus emerging as an essential tool in the management of documents. And some of its features are so consequential and its effects so far-reaching that its advent offers organisations the opportunity to re-engineer not only their document management procedures but also the entire administrative process.

But the most significant impact of the application of IT to archives concerns the actual job of the archivist, which is set to undergo a profound change in the near future. The tasks traditionally performed by archivists, which focused mainly on the management of documents already transmitted to archives (receiving papers, re-arrangement, selection for permanent preservation, indexing and preparation of procedures for rapid information retrieval), will increasingly make way for new duties more closely linked to the planning stage of document management systems. The core of the archivist's tasks will

shift from the end to the beginning of the document management process and the archivist will become less a manager than a planner, in full agreement and cooperation with the other specialists involved.

It is not even going too far to suggest, as some have done, that the management stage will cease to be one of the archivist's tasks. Once documents can be retrieved and consulted from any point and the process of managing documents has been properly set up through the adoption, among other things, of clear rules, it is not at all necessary for an archivist to be directly responsible for managing the electronic files. Paradoxically, it may even be desirable that this function, which also involves the administration of a complex information system and calls for specific professional qualifications, should not be performed by an archivist.

Discussions at the international level

For the world of archives the advent of information technology is thus both an unusually important event and a challenge of historical proportions. At this point it is important to know how well those engaged in archive management are endowed with the necessary flexibility and theoretic tools needed to ensure that they fully comprehend what is happening. I believe that, apart from some inevitable lags in perceiving the full import of the changes under way and a few pockets of resistance in more traditional environments and those less familiar with contemporary documents, we can safely say that archivists have fully understood what is at stake.

This is proven by the fact that the issue of electronic documents now occupies a central position in discussions among archivists and that more and more initiatives are being organised to study and analyse the numerous aspects of the question. This is no mean feat, since it entails the construction, from next to nothing, of a diplomatics of electronic document, a twenty-first century diplomatics which is entirely new in several respects. The problem is felt by most archivists and needs to be addressed at the international level. The INTER PARES project, which involves European and North American countries, is a step in this direction and has set itself four objectives:

- to define requisites to protect the authenticity of electronic documents
- to establish criteria and procedures for the discarding of electronic documents
- to establish methods and procedures for the storage of electronic documents

- to provide a framework for the formulation of guidelines, strategies and standards of conservation

For some months now, a working group has been active in Italy. It comprises the principal operators in the sector and proposes, over three years, to provide a definitive and all encompassing solution to the problem of conserving documents in a digital environment, with particular attention to the twofold issue of guaranteeing the authenticity of the documents stored and the need to ensure their preservation over time.

The global nature of these problems makes it highly desirable to arrange more frequent occasions to discuss and co-ordinate the measures taken in different countries. Although the brunt of the work should be borne by international archivists' organisations, the European Association for Banking History could also make a useful contribution.

The experience of the Historical Archive of Banca d'Italia

So far the computer revolution has primarily, albeit unevenly, involved the management of current archives, that is archives now in the process of being formed. For historical archives, which almost always conserve their documents in paper form and will continue to receive paper documents for decades to come, the problem is that of harnessing the new technologies in order to make their documents available in electronic form. Some institutions, including Banca d'Italia, have already taken this path, which is not without risks and uncertainties. Their experience may be of use for companies wishing to follow suit. And so I shall conclude with a brief description of what has been done at the Historical Archive of Banca d'Italia, which not long ago was successfully integrated into the Bank's Historical Research Office.

Basically, two IT projects have been implemented in the Historical Archive, namely: electronic inventory of the archival collection, and reproduction on optical disks of all the available documentation.

The electronic inventory involves the description on electronic media of all of the Historical Archive's collection through the preparation of highly analytical records. The sheer volume of the documentation (some 5,000 shelf meters of paper, equal to more than 300,000 files) ruled out preparing a record for each individual document, so it was decided to create a record for each file or sub-file of documents, each letter-book and each register. Each record has 66 fields and contains the original data of the documentation, such as heading, reference data, chronological details, etc., a summary of the content of the

papers, and a series of other information taken from the documents like senders, recipients, etc. Access to the information contained in the database is practically unlimited. Every word and numerical value represents a search key. When the data are entered, they are instantaneously included in indices set up according to field. Specialised archivists are entrusted with creating records.

The system enables the Historical Archive to make very detailed information on archives available to scholars, greatly improving the design and conduct of archival research. It has proven to be quite flexible, useful both for a traditional archival approach based on the form and context of information and as a powerful search tool targeted to the structure of information or the descriptive keys added by the archivists.

The other major project concerns the use of optical technology for document reproduction and has been operational since 1996. The Historical Archive of the Banca d'Italia began microfilming papers of historical interest in 1971, in order to create back-up copies and, where possible, avoid the consultation of original documents, with the attendant risks of deterioration and removal. Naturally, the original documents were retained. The idea of switching from microfilm to optical technology in the reproduction of archival papers took hold five years ago, reflecting the conviction that optical technology was by then sufficiently mature and standardised and the resolution to keep up with technological progress. The goal is to make the Historical Archive's complete documentation available on CD-ROM by converting the existing 9,000 reels of microfilm (18 million frames), and by direct recording of the paper-based backlog of 12 million documents.

The new technology is expected above all to enhance the speed and ease of utilisation of the archival documents. Its features and advantages include:

- multifunction consultation stations, allowing researchers to access database records, view the corresponding images and navigate through the archive according to their own itineraries
- preservation of great volumes of data in even less space than is required for microfilm
- shortening of the time needed to access information, achieved partly through the use of juke-boxes
- automatic skimming to disable the display of documents that are still confidential
- possibility for users to obtain extracts on magnetic or optical disc, creating personalised document collections

A number of workstations, managed by a local server with a client-server product, are dedicated to specific procedures: system management, acquisition of images from paper documents, conversion of microfilm reels and inventory, performed by the archivists; consultation, reserved for scholars; image quality control; and production of CD-ROMs. Images recorded directly from the backlog of paper documents are indexed automatically with a bar-code system. Those converted from microfilm are indexed manually. All of the archival procedures are performed by an in-house team of technicians and specialised personnel.

The electronic inventory and the adoption of optical technology were conceived at different times but there is a clear logical and physical link between them in that both are managed by the same server. In setting up the optical disc project, the greatest effort was devoted to maximising the efficiency of linkage between the two projects so as to facilitate the use of the archival documents by outside scholars and for internal administrative purposes. The link is ensured by the indexing system, which binds every image to the record describing the set of documents to which it belongs. Copies of the selected documents can be provided on paper or directly on CD-ROM.

The IT revolution has indeed arrived at the Historical Archive of Banca d'Italia: the electronic inventory of documents, the introduction of optical technology and, above all, the integration of the two on a single platform and single workstation have resulted in a quantum leap in the potential use of the Historical Archive's collection and the service it provides. And they could pave the way for other major developments, including the possibility of consulting the Historical Archive's inventories and even its collection from afar.