

CONSTRUCTING AN E-ARCHIVE SYSTEM AND ITS ROLE IN IMPROVING DOCUMENT MANAGEMENT

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A Traditional document is a written or printed paper that bears different kind of information about the organization activities e.g. legal, managerial, etc. Nowadays mainly there are two types of documents, which will be referred to as traditional (paper) documents and digital (electronic) documents. This discrimination between the types of documents in addition to the advances in the field of computer applications, networking, internet, and other digital processing tools were good motivations to use the Electronic - Archiving Systems (EAS). E-archiving is one of the first steps toward creating electronic environment on which e-government is based. There are a lot of risks and limitations of using traditional archiving systems which nowadays are not suitable to be used in organizations. This paper is a study of the archiving systems in both formats, traditional and electronic. The advantages and limitations of Electronic Archiving Systems (EAS) have been discussed briefly. A comparison between both electronic and traditional systems has been carried out as well. Traditional documents definition and digital (electronic) documents has been presented in addition to the methods of converting traditional (paper) documents into digital ones which is called the digitization process was discussed also. A brief description and the phases of constructing an e-archiving system has been proposed and discussed briefly. Finally, the cost feasibility of constructing an e-archive or converting a traditional archive into an electronic one has been studied in two aspects; long term cost and short term cost aspects.

Keywords:- E-Archive, documents digitizing, digital archive

1. Introduction

A document can be defined as a written or printed paper that bears the original, official, or legal form of something and can be used to furnish decisive evidence or information. This is the definition of traditional documents, nowadays there is another important type of documents which is the digital documents, which may be defined as a piece of work created with an application, as by a word processor. It is represented digitally as a digital file which can be stored on a digital storage media. This file might be an image, executable file or any other files which contains data or information (Free Dictionary).

The documents produced by a formal or informal organization represent its existence and express its activities. The accumulation of documents is the data and information for that organization and its effect on society.

An archive is a collection of historical records, as well as the place they are located (wikipedia). It contains documents that have been accumulated due to organization's

activities. The archiving is an integrated dynamic process in which organization can store the documents and the official correspondence of the organization.

2. Traditional vs. Digital Archiving

2.1. Traditional Archiving

Traditional archiving is the process of storing and retrieving documents in physical archives; mostly these archives consist of shelves and drawers cabinets to save the files and documents. This process needs to follow the following three steps:

- (i) Classification: in which the documents are classified according to their subject, location, date, name, and so on. The documents in one class must be relevant to each other.
- (ii) Coding: in which each document is given a code to recognize it, these codes might be numbers, letters, or a combination of them.
- (iii) Indexing: it is the last step in this process, in which a full description of the document and the information it contains is added to the archive to describe the document, so it can be retrieved easily.

2.2. Digital Archiving (Electronic Archiving)

There are no considerable differences between electronic archiving (e-archiving) and traditional archiving, but they differ in the form in which the documents are stored and the storage media. Electronic documents (e-documents) are stored in a digital format on a digital storage medium and transferred in a digital format [3].

The electronic revolution and innovative inventions and development were important motivations to launch the e-archiving. Most of organizations' infrastructures allow using the e-archiving, which leads to the occurrence of e-documents environment.

3. Types of Digital Documents

Mainly there are two types of digital documents:

- (i) Born-digital documents which refer to materials that originate in a digital form like word documents, Web Pages, forums, online discussions, wikis (Library of Congress).
- (ii) Digitized document which are the documents that reformatted or converted from a paper format into a digital format (Wikipedia); in other words from hard-copy into soft-copy. One of the methods that can do this conversion is by scanning the papers with a digital scanner.

4. Objectives of Digital archiving

The digital archiving aims to achieve some objectives, the main two objectives are:

- (i) Strategic objective: which aims to create a non-paper environment which is the first step toward e-government.
- (ii) Organization objective: which aims to find a way to control the huge flow of documents between different department and persons and to find a fast way to retrieve and disseminate information.

5. Advantages of Digital Archiving

There are many advantages of digital archiving. Such as saving space, money, time, and efforts (Article Dashboard) (Digital Archiving Services) the following are some advantages that might be achieved by adopting E-archiving:

- (i) Space saving: by using the e-archiving there will be a reduction in the amount of paper that the office has to contain. The main reason for this reduction is that most of the paper documents are digitized and converted into a digital format that can be stored on a digital medium. As a result there will be no need for a special place to store the files.
- (ii) Time saving: with digital environment, storing and retrieving documents is a fast and easy process. Searching for a specific file is an easy and fast process with digital technology as easy as pressing few keys or clicking buttons.
- (iii) Money Saving: in addition to freeing more space which might be utilized in improving the working environment, it can reduce the space requirements of the company which leads to a smaller premises and as a result smaller fees.
- (iv) Disaster recovery: in case of disasters such as flood, fires, cyclones, etc. it is important to protect the documents. With e-archiving it is easy to back up the information and store it in a small safe place, such as CD's and internet archives and restore it after the disasters.
- (v) Increasing employees' productivity: the availability and ease of access to large quantity of information increase the employees' productivity.
- (vi) Ease of organization and customization: with digital archives it is always easy to organize and customize archives for every business need.
- (vii) Accuracy and security: An accurate revision history can be compiled and once documents have been electronically indexed there is no longer the possibility that they will be lost, stolen, or misfiled. Security features may be added only allowing access to documents by authorized individuals (Top 10 Benefits of Digital Archiving, 2001 - 2010).

6. Challenges and Limitation of Digital Archiving

- (i) The high cost of building the e-archive. Although the e-archiving is cost-efficient in long term but the cost of the fixed infrastructure which may contain hardware and software requirements might be high.

- (ii) The document trustability, the traditional document are certified by the signature of the person in charge while in digital document such certificate is missing. So it is important to find another way to certify the digital document. One approach is by using digital signature.
- (iii) Continuous developments of technology and the need to upgrade the system periodically which consumes extra money, time, and efforts.
- (iv) The risks of stealing digital information, and the possibility of getting infected with viruses.

7. Phases of Building an E-Archive

As shown in figure (1) there are two phases the organization should follow to create its e-archiving system and converting the traditional archive into an e-archive. The phases are planning and implementation

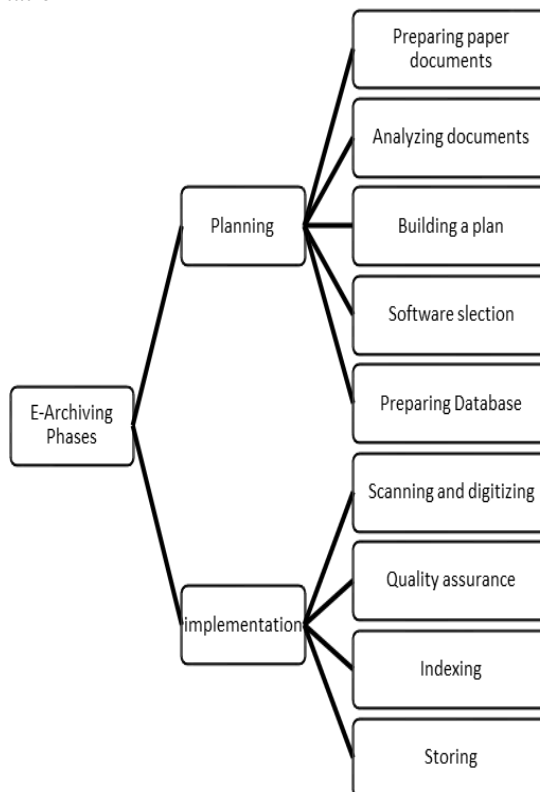


Fig. 1. E-archive creation phases

- A. Planning Phase:** in which the organization should prepare the paper documents, analyze them and classify them according to their priorities, then a plan must be built to dictate the process of conversion, and finally select the appropriate software.
- B. Implementation Phase:** in which the paper documents are converted into digital format by digitizing them, then the quality of the digital document should be reviewed to assure the digital documents quality. Indexing is one of the most important processes in which the digital documents are given a number and code to recognize them. Finally storing the digital document on digital media such as hard drives, CD's, or any other media.

8. Converting Papers Documents into Digital Documents Approach

Selecting the appropriate approach of converting documents from paper into digital format is a time, efforts, and money consuming process. Selecting the best approach is a fatal issue that should be considered. One approach of which, is by scanning the document and converting it into an image. The second approach is by scanning the document and converting it into an editable digital document using Optical Character Recognition (OCR) software. The third approach is by re-entering the document by retyping it.

There are many differences between the three approaches in costs, time, and efforts. A simple comparison between the three approaches is given in the following table:

Table 1. Approaches of Converting Papers Documents into Digital Documents

| approach | Properties |
|--|--|
| Scanning and converting into an image | low cost Image format, cannot be searched Fastest Needs large storage capabilities |
| Scanning and converting into an editable document with OCR | higher cost editable document, can be searched medium speed Needs less storage capabilities |
| Re-entering by retyping | Very expensive editable document, can be searched low speed Needs less storage capabilities |

9. Economic Feasibility Assessments

The feasibility of the e-archiving system can be studies and analyzed in different aspects, like economic, technical, and operational feasibility (Jeffrey Hoffer, 2002). Economically,

one should analyze the costs and the benefits of adopting such systems. Benefits can be analyzed in two aspects, tangible and intangible benefits. In tangible benefits, cost reduction, error reduction, increasing flexibility and speed of activity, and improving management and control should be discussed. Intangible benefits are discussed in the light of improving employees' skills and knowledge.

10. Cost Analysis

For any system cost should be studied in two aspects: one-time costs and recurring costs.

10.1. One-time costs

Are the costs which are associated with project startup, initiation and development and it includes: system development, new hardware and software purchases, user training, and data or system conversion. In E-archiving system, these costs are represented by the following:

1. Hardware costs, like scanners, storage media, computer systems, printers ...etc.
2. Software: like the necessary operating systems, OCR software, database development, and other necessary software.
3. Network requirements.
4. Preparing a well trained staff may cost extra money but for one time only.

10.2. Recurring costs

Which are the costs that are associated with ongoing use of the system and it includes:

1. application software maintenance,
2. incremental data storage expense,
3. new software and hardware releases,
4. consumable supplies, and
5. Incremental communications.

11. Conclusions

As a result of the above discussion, it is clear that nowadays the e-archiving is an important issue in each organization because of its advantages and the improvement it may add to the organization. Time, space, money, and efforts reductions may improve the capabilities of the organization to compete and to do better business.

The feasibility analysis shows that the cost might be large but for one time only in addition to the recurring costs which are quite affordable by organizations. In the other hand there will be remarkable benefits the organization might gain when it adopts this technique. These benefits compensate the costs that the organization pays.

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