

Using Electronic Systems for Document Management in Economic Entities

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Document workflow and management, be them scanned documents, computer-generated e-documents or complex file formats, are critical elements for the success of an organization. Delivering the correct information to the right person, at the right moment is a fundamental element of daily activity. In the Internet era, documents have a new format; and what is more important: completely new functions. Paper is replaced by electronic formats such as .html, .xms, .pdf or .doc. The price for this progress is the increasing technological complexity, and with this complexity comes the need for more efficient techniques of management and organization such as a document management electronic system. This paper aims to present document management not as a separate software category on the IT market, but as an element integrated with any software solution, maximizing its capacity of making business more efficient.

Keywords: *document management electronic system, document workflow, document libraries, workflow applications.*

All members of an organization search for information and then they take decisions based on it, and also transmit and archive it every day. The manual process of searching, scanning, photocopying and distribution is time and money consuming. These inefficiencies of the informational system consume time in an unavailing manner and prevent them from their most important mission: that of processing information. A solution of documents management eliminates the need to move physically documents from one place to another. There will be no time wasted in establishing who keeps a document; or which is the last version. There will be no more lost documents or useless copies of documents. Documents will be moved in an automatic manner between departments and persons. A solution for the management of documents allows the employees to spend time in an efficient manner: taking decisions or analyzing information in another manner that making copies.

Documents are always an indispensable part of the organizations at any size. From the technical records to the offer records received or requested, from contracts to invoices or from the documents of the employees to the formularies regarding taxes, the documents lead the process of making busi-

ness; then they allow us to understand how it was realized.

Documents are key elements for the success of today companies. Once we have entered the 21st century, probably documents will become the essence of the entire affair. Once the technologies will be developed, documents are expected to have new forms and offer new possibilities of communication. We can ask ourselves, in a justified manner what future can offer us regarding documents?

Before the digital revolution, the document was nothing else but what the dictionary defined: "document through which will be certified, will be observed or contemplated a fact, offers a right, recognizes an obligation; written or typed text, inscription or other evidence used to recognize a real, actual fact or from the past"¹. For many people, a document is a sheet of paper on which something important, such as a piece of information, is written.

Today, integrated, powerful technologies, which we have, allow them to redefine the document: "any package of structured data which can be used as information". This means that a document can be almost every-

¹ DEX 2nd edition 1996, Editura Univers Enciclopedic

thing: holograms, CD-ROMS, video sequences. The essential is that the document can be defined by its author. When the author names a document, it is a document.

A typical document becomes a text composition and multimedia elements, typed more seldom than before. The document can be read, seen, heard simultaneously on portable wireless devices or on office equipments. With the aid of the document transactions can be realized anywhere, without time and space constraints.

The document helps us, now more than before, to create new relationships, with the possibility to make it particular according to the desire of the addressee. Then, there is the variant of interactive document. This thing offers to the author the possibility of diversifying the access, content and modality to transmit a document, depending on the addressee.

The new structures of administration, new techniques and strategies will be the effect of adopting a marketing of type one to one. The document of the future will support communication and collaboration in the sense of increasing efficiency and the degree of satisfaction in our work. Documents might also allow us to realize several inter-connected communication environments.

A global connection through the agency of documents will not necessarily lead to the apparition of paperless offices. The technologies that allow us to administrate and manage documents, without necessarily typing them, increase significantly the quantity of information from the documents of a company, these being able to double each year. But, despite digital conversions of documents, the paper quantity consumed in companies increases year after year.

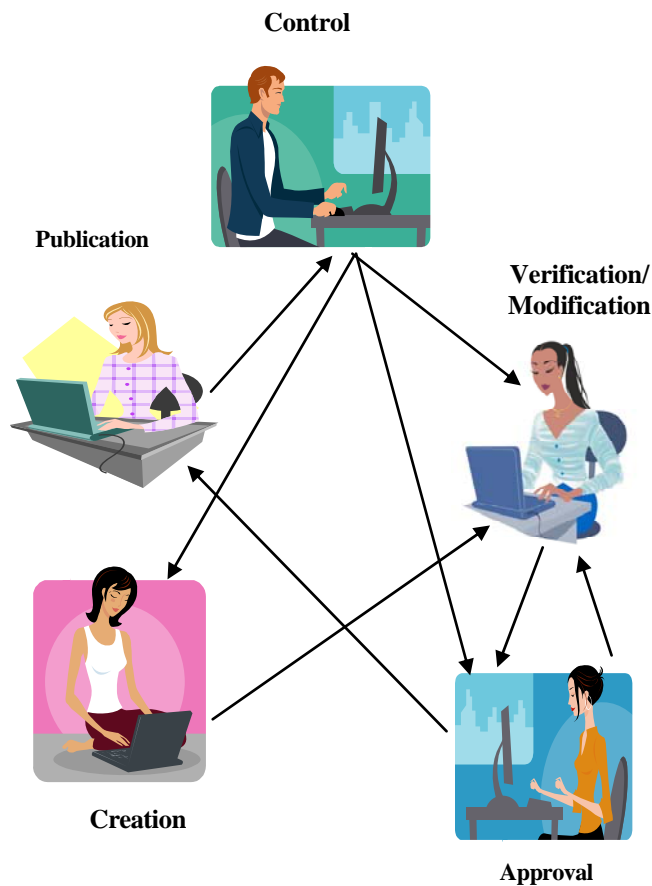
It is also stated that "paperless office" has the chance of existence due to technology of "type at request" which means a type of printing documents when necessary, eliminating the necessity of typing, for example an inventory because some updating has just

occurred. It is of lesser importance if this technology will be called "type at request" or, in conformity with some proposals "type at need". Much more important is the technology itself, of which we will be hearing in the following years. The real potential of typing at request is the possibility of typing what is necessary, when it is necessary. The user of the document has the opportunity of connecting only the information that he needs and to type the document this way, when he needs it. The economical value of this is obvious if we look at the paper bin.

The knowledge management will have a great impact on the documents of the future, even if there is a global adhesion in what concerns the definition of the management of knowledge. Anyhow, almost every implementation of management of knowledge will be based on an intelligent technology. Either the applications are for the collaboration place or separation of knowledge, these are dependent of technologies from behind documents, as is the management of content, the request of connections between documents or ones for the integrated data basis that are for data stores and data mining.

It is difficult to underestimate the importance of documents. The organization is structured around them: piles of letters, copies of different documents, shelves full of records, mail box full of electronic messages – are only some examples. And the entire activity of the company is organized around these documents. We have to remember contracts situated on shelves, at data basis of IT department and diverse transactions. The affairs can be defined as architecture of documents. That is why we can say that documents represent the essence of the entire affair.

A simple analyze of the problems connected to the manual flux of documents show difficulties of classical management of documents in the conditions of a modern organization (Figure 1)



Problems connected to the document flow in a company:

- manual roure;
- lost documents;
- where are the documents?
- employee temprary absent from the office;
- non-observance of procedures;
- difficulties in observing documents.

Fig.1. The document flow in an organization

In the Internet era, documents have a new format; and what is more important: completely new functions. Paper is replaced by electronic formats such as .html, .xms, .pdf or .doc. The price for this progress is the increasing technological complexity, and with this complexity comes the need for more efficient techniques of management and organization such as a **document management electronic system**.

If we talk about such a system, we refer to a software platform which contains an archive of documents that can be maintained under any form of the content, to a set of functions which can help us to deposit in the archive the content, a mechanism which must connect to the history of such a document, some of research, sorting, filtering and organization of the documents in the archive.

So, the management of documents shouldn't be seen as a separate software category on the IT market, but as an element integrated with any software solution, maximizing its

capacity of making business more efficient. The vision of the entire software arsenal of a company as an entire opens the possibility to eliminate the redundancy, to automation certain information activities and circuits and to help inter collaboration. From the point of view of middle companies, this vision of the entire must stop at the point of maximum efficiency - after this point the management of documents become more expensive, more complex and harder to be implemented.

The management of document represents an informational system which allows the flow (of information, approvals or modification), depositing and finding documents in any electronic format, with facilities to be connected at informational systems of electronically devices (for example, by connecting scanning devices paper documents can be introduced automatically in the system).

Statistics show that for the conclusions of a transaction, at present there are two times more documents necessary than in the last

five years. The introduction of a system of ensuring quality (compulsory obligation for the companies that want to be situated at European standards), brings also an impressive volume of documents which must circulate inside a company or in the relationships with partners. The management system of information and documents must:

- transmit precise information: only to persons who need it and when they need it;
- to ensure complete safety of information;
- to observe permanently the stage of decisions and instructions transmitted

A document management electronic system offers an organization a standard modality to create, manage, control and supply documents. This will allow the improvement of the performances of the company through work realized faster, with fewer people, with better accuracy and less paper.

A solution in managing documents does not refer to documents; it is projected for users and for their objectives as part of the organization. Studies show that 80% of “knowledge” of a company is maintained as unstructured data. A management solution of completed documents produces a modality of structuring, organization and securing this information.

A performing system of document management presents the following characteristics:

- implements rapidly flows of documents;
- is flexible at every organization structure
- has a high degree of security
- can be adapted at any type of document
- can be connected to other applications
- presents facility in use
- can be situated on ulterior developments

The main functions of such a system are: indexing, security, visual, archiving, searching, control of versions and control of the access on documents. The processing and flux of documents which completes the solution to manage documents is tightly connected with these. Other functions that these systems might have are:

- Allocation of an unique registration number to each document

- Establishing the place where each document is active
- Attending the entire life cycle of a document;
 - personnel which is responsible with its reception
 - the moment when it was received
 - the person which responds with the notice/ response that is formulated
 - date at which the response/ notice were finalized

One of the greatest advantages of a management quality system of documents is integrated in a more transparent manner, as possible, with the infrastructure of the company. The solutions of documents management are easily implemented and integrated in the intranet of the company. The role of data security in this case is decrypting documents, allowing only users with correspondent rights to see or to modify documents.

No matter if the information will be presented under the format of a Microsoft Word document, an e-mail in Outlook, a PowerPoint presentation, an Adobe PDF folder or multimedia information, the security method of the system of documents management must face all these types of documents, separating the writing of the content on the access list at this document. This information is deposited on a server, the entire access process to confidential documents passing through the security system of the management system solution of documents.

Unlike manual systems, the automatic systems of documents management present the following advantages:

- deposit the information connected to a document in a single place
- allow the rapid access at the place where the document is in the organization
- Inform regarding the notice stage (resolution) where the document is situated
- Attend the necessary period for the finalization of a notice (resolution) and the ones that exceeded this term
- Observe the number of documents that entered daily, each weekend, each month.

The main types of applications from a management system of documents are:

a) **Documents library.** The central element of a management system of documents, documents libraries are

- Documents regarding a project
- Procedures of the quality system, manual of quality
- Norms, procedures, regulation which must be consulted personally
- Internal documents, etc.

a) **Flow applications (workflow).** The documents in an organization are not static. They are created, modified, distributed on routes clearly defined. That is why, management systems of documents contain workflows which establish precisely where a document will be sent, if it has reached its destination, when it was redirected and which is its status at a certain moment

Figure 2 illustrate the modality in which the processing of fluxes of documents is made under the management of an administrator of workflow.

Among flow applications we can mention:

- Information sent from / in the internal system for information/ approval
- Activity Plans and Rapports
- Essays, Notes, Requests, Holiday Requests, Transport Request, Acquisition request
- Generation and publication of politics to ensure quality, human resources politics
- Transmission for approval of the documents required by the procedures of the quality system, multiple approvals.
- Treating non – conformities

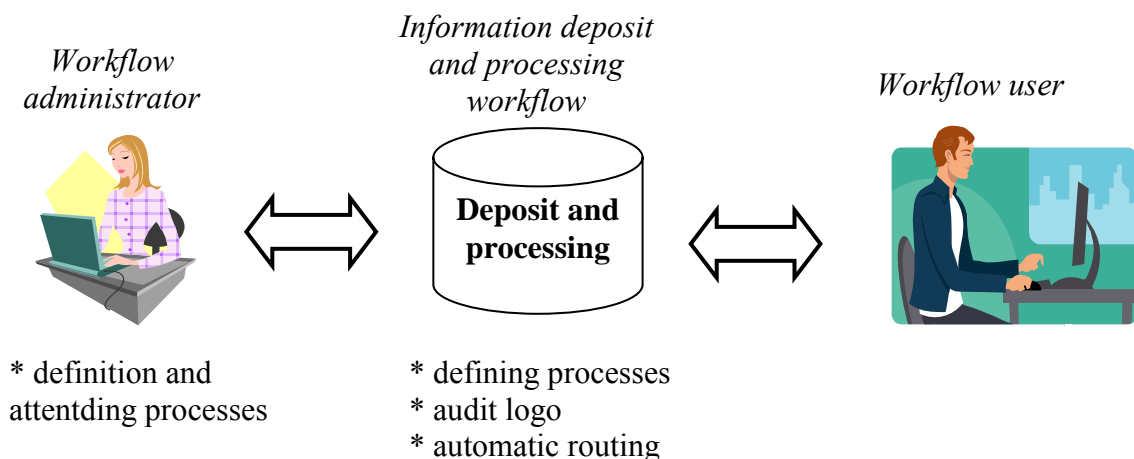


Fig.2. Processing workflows

The services offered by the systems of quality management of documents must fulfill three aspects from the security point of view:

1. **Confidentiality.** This aspect refers to all access restrictions to information and resources. Controlling, promoting and implementing security politics of the company will be reflected in a direct modality on the management system of documents, offering a prompt response to the question “who and when accesses, what document and with whose approval?”

2. **Integrity.** Information has two characteristics: initiator and content. The trust level granted to the initiator and non alteration of the content represents the integrity of infor-

mation. Its violation can be prevented or detected by implementing solutions of electronic signing, which authenticates the initiator person as being or not a confidence source and ensures the conformity of information with the initial one, preventing changing information

3. **Availability.** The ability of accessing information or a resource is considered availability. A management service of documents can be blocked by persons who attack, by restricting or denying availability at the level of security. If at the first level of the management solution of documents, the system is on dimensions regarding the number of users and entrances a day, at the last level, the one

of the interface with the user, either is a portal or an executable program, the authentication must be made with the most secured methods, using smart cards and biometrical devices, as it is the main access in the system.

The management system of documents is a definite step towards progress in the information era and is based on the already existing working system, which implies the maintenance of a duplicate of documents, their authentication by signature, their approval by authorized people and maintaining them in an environment with controlled access.

The introduction of the digital system will be based on these principles, having the same purpose, but with a plus of value brought by optimization of the document flow and their quality from the security point of view.

A system of document management contains applications that can be easily used, very intuitive and well organized, has an integrated system of electronic messenger for fast and safe communications inside the company, and with other organizations and economic agents connected to Internet and allows:

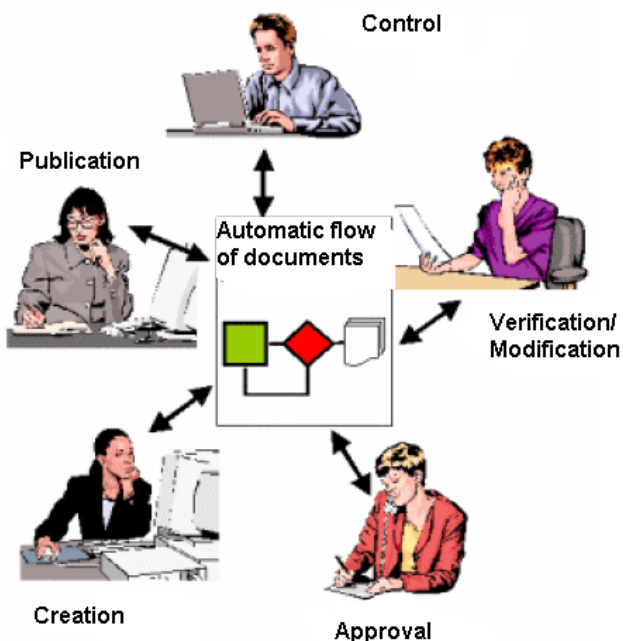
- The circulation of documents on precise hierarchical routes, or defined by the author of the documents with the authority of approving or rejecting them;

- Standard creation, distribution and circulation of internal information and documents from the company, as well as those generated in the relationship with other organizations, ensuring the highest standards of safety and confidentiality;

- Observing the status of the documents, in various stages they go through, underlining the modality of solving documents. The system allows authorized personnel from the company to know permanently the location and status of a document, by registrations that will be made over documents;

- The possibility of accessing rapidly statistics and situations regarding completed or in work documents, sorted by status, type, responsibility, etc.

Compared to manual systems, the automat flow of documents has the numerous advantages as it can be seen in Figure 3.



Advantages of the automatic flow of documents:

- *automatic route;*
- *integrated system;*
- *monitoring activities;*
- *automatic advising of problems;*
- *using groups;*
- *facilities in observing documents*

Fig.3. Advantages of the automatic flow of documents

The security of document management systems. A management system of documents, as any informational system, needs classical security measures, such as firewall

protection, backup, antivirus protection, intrusion detection systems, current sources, etc;

The multitude of functions that a manage-

ment system of documents brings induces specific needs of security, the most important being the authentication and authorization. The authentication represents the identification as an authorized user in the system. The authorization defines the rights that this user has in his system.

The authentication will be realized by the classical combination username/ password or using biometrical systems, smart cards. Not what we make the authentication with is the most important aspect, but how it is made. In other words, where are verified the authentication information received from the user. Either the system has its own user basis, or will use another authentication provider. The first mechanism is the simplest that can be used, there will be defined the users on the own basis of soft management of documents. But these methods can be hardly used, when the user must use more and more pairs of usernames and the password for all the systems he uses. The alternative is using a mechanism of single sign –on – an interface for the unique authentication at more systems, or using a management system of documents which can be integrated with mechanisms of management of already existing identity in organization compatible LDAP, as might be Microsoft Active Directory of IBM Directory Server.

Authorization. After a user is presented in the system, he receives or not the right to access information. The authorization will be realized using three important methods: role based, rule based or content based. The role based authorization implements a mechanism by which a user possesses one or several roles in the system, as it might be editor - each of these roles has diverse rights groups of access to information. Using the rule based authorization, the level of access of the user is determined after realizing a set of rules introduced by the administrators- for example verifying some conditions. The content based authorization uses access lists, discrete on every item of information or collection of information than can be defined at their introduction in the system. We can often find a combination of modalities of ac-

cess, as might be the combination of roles and content: for a set of information will be given discrete rights to groups (roles) and the users can belong to one or several groups.

It is obvious the fact that a management system of documents brings advantages in an organization. The implementation of such a system often leads to the functionality and efficient archiving, but neglects the fact that at present new risks may occur: the unauthorized access at information.

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