



Digitizing DMS System with Block chain Approach

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Abstract: With digitization we achieve the electronic form of the document as a copy of physical document. The electronic form of document increases the life of document and also the accessing capabilities. Most of the organization are moving towards digitization no matter what kind of document it may be. Digitization is one time process unless and until the document get altered or modified, thus we have DMS system also know as Document Management System to work with us.

In this paper we are focusing how to develop the DMS system so as to digitized, maintain and access the document from any place anytime with appropriate access using block chain technologies. Further we also focuses on the security aspects of DMS system.

Keywords: Document, Document Processing, Security, Authorized Access, Document Retrieval, Digital transformation, Digitization, Workflow, block chain

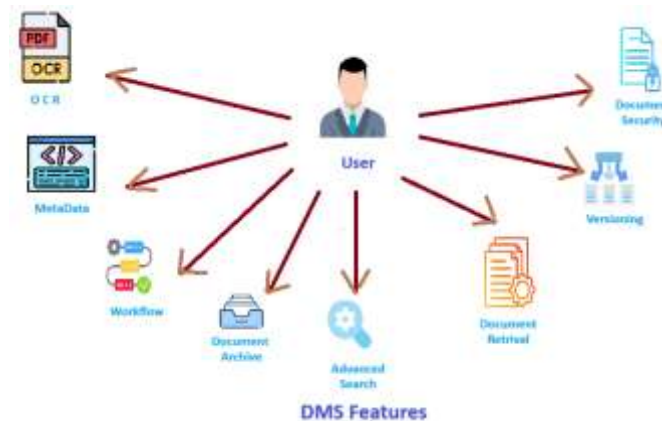
INTRODUCTION

Now a days digitization is every where no matter it may be school, collage, offices, industries or any government organization. The fact that with digitization we get multiple benefits easy in storage, retrieval, security and availability any place and any where.

However, the digitizing document is not an easy task and need multiple tools, software, hardware's and manual efforts. There are various ways by which the digitization can be achieved however amongst all the DMS system is best suited for any of the organization. The DMS system provides many features as per the requirements and also ensure the security, availability with optimum cost. With the introduction of Block chain Based Authentication System for DMS we can improvise the process such as document verification and managing complex document workflows. In general we can achieve document automation with DMS systems with high performance. Also we have advanced software features including capture, indexing, search, retrieval, and distribution, workflow management, version control, security via role-based access control and end to end integration with third party software systems

NEED OF DMS

DMS is the need of an hour because it bring tones of benefits to the customer such as electronic form document, easy in storage, ease in retrieval, multiple access, authorization and security. Further it enhance the document tagging facility by which we can access multiple source of the document or any keyword exist in the document which become very important for Researchers to reach to the actual source of document rather than dealing with the duplicate sources.



DMS SYSTEM BLOCKS

The basic block of any DMS system can be split into following main units

- a) Document Processing
- b) Document Storing and Retrieval

a) Document Processing

This unit function is to convert the physical document into its equivalent electronic form. The unit is a combination of software and hardware systems. The physical document is firstly scanned with the help of electronic scanner by which we can get the scanned image of the document. Secondly the scanned image so obtained is processed to get the digitization and segmentation of image, then we have extract the typographic and layout of the paragraph and then we extract the physical structure. Once we get the physical structure we label the logical blocks and finally get the logical structure.

We can think of the physical and logical structure of a document are the arrangement of data in a document's memory and the organization of information within the document. Also note that the logical files do not have data with them whereas they have the description of records that are found into the physical structure of files and also possess the hierarchy of information and the relation between different parts of the document.

b) Document Storing and Retrieval

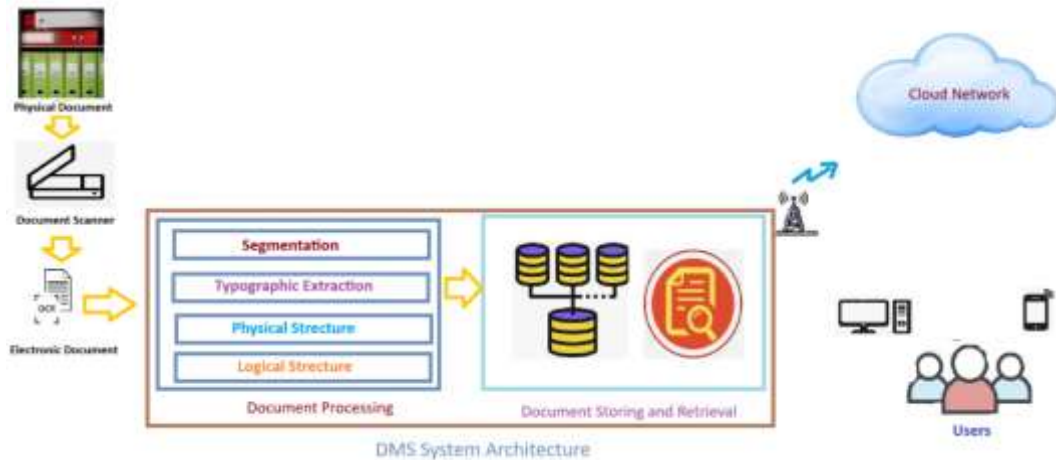
Once we get the digitized form / electronic form of the file we need to tag the file with keywords for easy access or retrieval process and finally we need to group or categories the electronic document and store into the database or cloud system as per the requirement. Once the data get stored into the system we can have the conversion module to retrieve the actual document format or reconstruct the document from physical and logical structure.

The retrieval process of the document can be implemented understanding customization needs of the end user so that maximum throughput with minimum waiting time i.e high performance.

ARCHITECTURE OF THE PROPOSED SYSTEM

The physical document goes through various process and converted into electronic document finally with the help of DMS software it get stored into the compressed and encrypted form into the database. At the time of retrieval or getting authorized user access the document the document first uncompressed and decrypted and share with the authenticated user who requested for the document.

Also for secure access we have roles assigned to each users, we can have multilevel user access via secure API services.

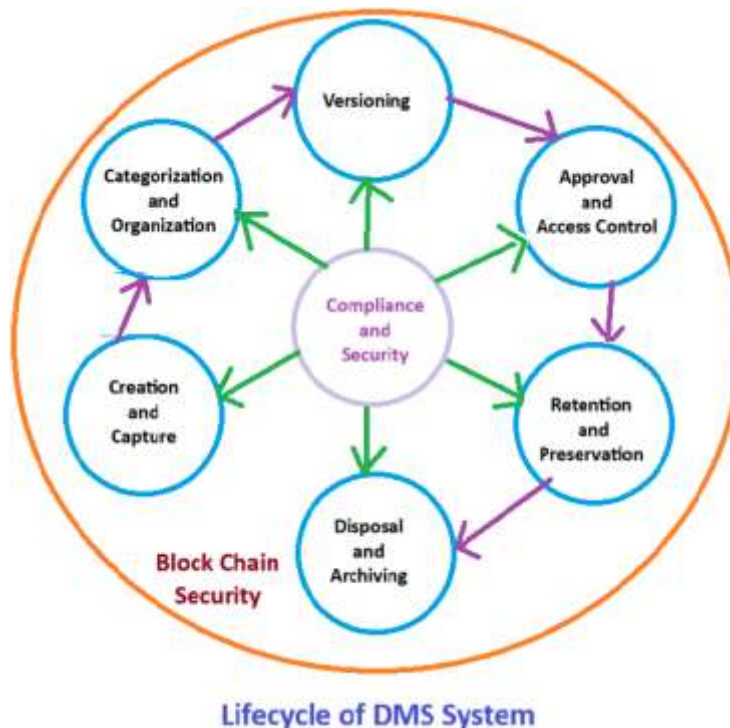


LIFECYCLE OF DMS SYSTEM

In an DMS System the document or digitized from of document has multiple phases to travel right from its creation to storage to its final archive or disposal this stages are refer as lifecycle of the document. However sometimes the lifecycle stage varies as per the need of organization or organizational document work flow management processes. Moreover DMS system become challenging if there are provisions to have the customized DMS workflow system as per the changing need of the organization.

Thus, we can see there are lots of functionality which get added to make the DMS system completely automated without much manual interventions. Modern DMS system are based on user custom needs serving to map various phases such as automated workflow, version control, filters, sharing, and efficient way to collaborate with coworkers and many more.

Further, the complete DMS lifecycle can have multiple access depending upon how the organizational need, we can have multiple access points such as desktop based application, LAN / WAN based applications, Cloud based application or hybrid arrangement. Also we can have mobile apps supporting DMS applications.



**KEY COMPONENTS OF A DMS WORKFLOW****1. Document Creation and Capture**

This is the First stage of the DMS lifecycle. The New document can be created in different formats such as Word, Excel, etc. directly in the DMS system. Other way to have document in DMS system is by the way of uploading the image or scan form of document also we can import the document from the existing sources.

By introduction to the block chain technology we can have multiple user authentication on the document at this stage so that more security and relevance can be maintained.

2. Document Categorization and Organization

The DMS system facilitate to create multiple categories of a single document each such category get an automatic access to the assigned document for particular group / category or access level. Moreover searching become faster with relevant document under one head which also improves the performance of the DMS systems.

3. Document Versioning

The DMS system of an organization as become older we can have multiple existence or same document with minimum of modification thus to keep track of document we have version control system so that tracking of the history of the document become easier.

The other benefit of versioning is that it can be restored with the previous versions when ever required.

4. Document Approval and Access Control

Any document in the DMS system has its availability depending upon the user role in the organization also every document uploaded to the DMS system are not essentially valid documents hence forth to confirm the document validity and also user level access the DMS system has approval stage which is mostly done by the Administrator of the DMS systems. Also there can be single approval or multiple approval for the document which required to be shared to the respective users.

To maintain the approval stages at granular level we can introduce the block chain at this stage so that we can have the multiple levels of approval for the document so that the document can be with the correct user or group to access.

5. Document Retention and Preservation

The organization retention polices are very important for this phase as the DSM system are mapped as per the document policies of the organization so that each document has been preserved and available when and where required. The retention time of the document has been consider the maximum time for which the document exists in the DMS system.

Here also we have block chain implementation so that any document can be retained or preserved with the combined decision approach.

6. Document Disposal and Archiving

The document has certain age after which it become not at all required to the organization need. The document age or scraping or archiving decision varies from organization to organization. In this step we scrutinize the legal or regulatory requirement of the document and if find not to be used further such document can be completely disposed from the DMS system or keep in archiving mode. The other advantage of archiving or disposal is that we can have fewer burdens on database and the search will be much faster increasing the overall performance of the system.

In this stage we can invoke block chain functionality so that we can have multiuser decision capabilities either to dispose or archive the respective document.

**DMS WORKFLOW EXAMPLES**

- a) Invoice Processing
- b) Employee On boarding
- c) Legal Processing
- d) Bid Management

CONCLUSION

The proposed DMS system provides an electronic form of crating, storing, retrieving, and controlling document via workflow management features. Thus we can achieve complete office automation with the help of the DMS system by which the organization increases its productivity and brings automation to achieve the goal of digitization.

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