

THE ALFRESCO PLATFORM, A VIABLE AND SUSTAINABLE STRATEGIC OPTION FOR DOCUMENT MANAGEMENT

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Abstract

Document management is the process of organizing, storing, managing, and accessing documents and information in an organization. The main purpose of document management is to ensure efficient file management and their availability whenever it is necessary to quickly access information in documents safely. The purpose of this research is to present and explain what the Alfresco platform consists of, and what are its advantages for efficient document management in an organization. The stages and phases of change management are presented, in general, and those specific to the design and implementation of the Alfresco platform for modern and efficient document management in an organization. The main beneficiaries of the research are managers from public and private organizations, who aim to reduce document costs, increase accessibility to electronic documents, and improve ICT infrastructure to streamline internal communication and decision-making using integrated, durable, and sustainable IT platforms.

Keywords: document management; electronic management systems; Alfresco platform

1. INTRODUCTION

Public and private organizations continuously implement IT solutions to streamline the document management process. These solutions include classic paper-based systems and electronic document management systems (DMS). DMS systems are preferred because of the advantages they offer, such as fast access to information, data security, and electronic archiving of documents. These systems are used to eliminate the need to use paper and reduce the time required to find and access documents. The implementation of document management software is an important step towards creating a digital work environment (Cheng et al., 2022; Barres, 2023). It can bring many advantages to organizations, among the most important being the following: reducing document administration and storage costs; protecting documents in digital files from accidental or intentional deletion; verification to which employee a particular document is; easily finding any document of the organization; maximizing the productivity of an organization; ensuring the security and compliance of files with applicable standards and regulations within each organization (Chaterera-Zambuko, 2023; Yaşar & Özdemir, 2022).

An integrated document management system (ECM) is a software solution that helps organizations manage documents and other kinds of information efficiently and effectively. ECM can be of great help to organizations looking to effectively manage their digital content (Androniceanu et al., 2023). There are a variety of software solutions for document management in an organization. They are designed to help companies manage their documents in a more efficient and organized way. Among the most popular document management solutions (Jorayeva et al., 2022) are the following:

1. CAS Genesis World which is a solution for managing the relationship between organizational management and customers that offers a wide range of functionalities, including document storage, versioning, security, and indexing;
2. Laserfiche process any document, including contract documents;
3. ELO ECM Suite allows users to duplicate, forward information, search, or archive documents with minimal effort;
4. Integrated, interactive, and participatory digital platforms, which are diverse. From these, has been selected the Alfresco platform for presentation and research underlying this paper (Bergljung, 2011; Wahlster, 2023).

2. ALFRESCO PLATFORM, A VIABLE AND SUSTAINABLE MANAGERIAL OPTION FOR THE ORGANIZATION'S DOCUMENT MANAGEMENT

Alfresco is a content and document management platform that provides content and records management solutions for organizations (William et al., 2023). Alfresco Community Edition is a free and open-source version of Alfresco Content Services and Alfresco Governance Services. Alfresco was first released in November 2005. The founders of Alfresco are John Newton (co-founder of Documentum) and John Powell (former COO of Business Objects). Currently, Alfresco offers support for several versions of its products, including Alfresco Content Services and Alfresco Process Services (Shariff et al., 2010). Through rigorous information management, processes are initiated, executed, and completed in a stable, predictable, and measurable way. Alfresco components may vary depending on the specific characteristics of the system, but in general, such a system could include the following functionalities: centralization of all documents in the company, generation of reports and analyses, ability to integrate the solution with other systems in the company, storage of documents in a structured way and more (Leonardi & Not, 2022).

Alfresco Content Services is an enterprise-grade content management (ECM) platform offered by Alfresco. This platform provides support for a variety of use cases, such as governance and content services, contextual search and insight, enterprise collaborations, and easy integration with other applications (Siverstam & Grundin, 2023). This solution is intended for both business users and developers and provides an open-source task-based business process application that can be scaled and configured to handle a wide variety of critical processes (Alyani & Turki, 2022). Alfresco Process Services also offers several enterprise-grade tools and services, such as process editing, process modelling, reporting and analysis, integration with other applications, and much more.

Alfresco Governance Services is an extension of Alfresco's content management platform, combining Registry Management with Security Control and Classification. This extension is fully compatible with a basic set of DoD 5015.02 requirements (Sousa, et al., 2016).

With Alfresco Governance Services, you can fully automate the lifecycle of records, from capture to retention and final destruction. Users can create records directly from any Alfresco Share site. In addition, security control and document classification provide complete control over who can see the recordings and when they can intervene in their content (Sundaresan & Zhang, 2022).

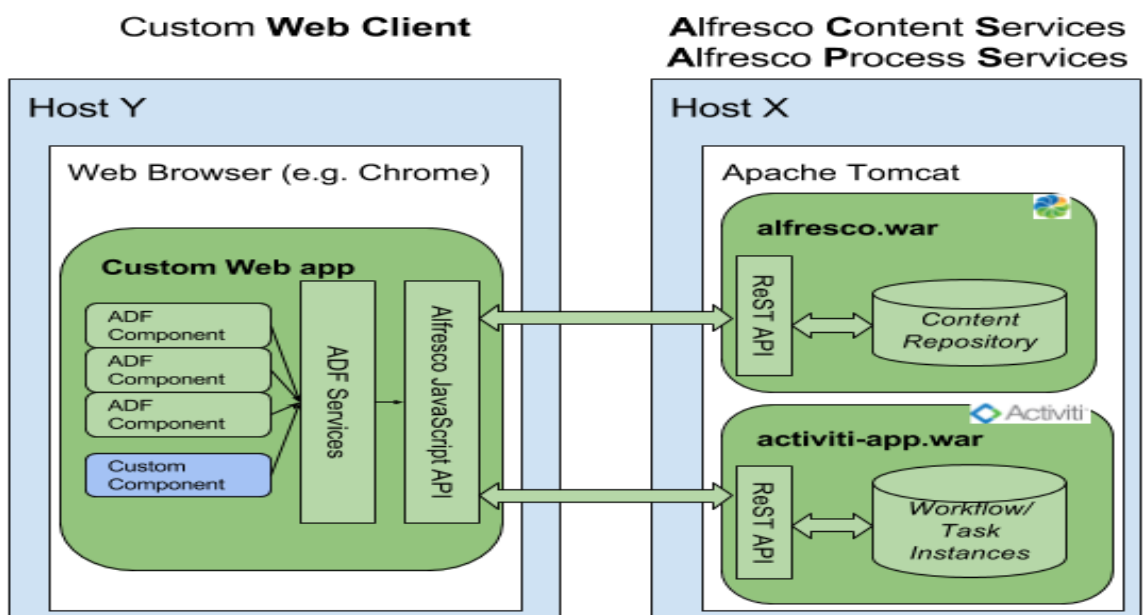


FIGURE 1 - RELATIONSHIP BETWEEN CLIENT WEBSITE AND ALFRESCO PLATFORM

Source: Adapted from Alfresco Hub, 2024, <https://docs.alfresco.com/content-services/latest/develop/software-architecture>

There are several versions of Alfresco. Currently, Alfresco offers support for several versions of its products, including Alfresco Content Services and Alfresco Process Services. Figure 1 is a diagram of the type of relationship between the client's web and the content services of the Alfresco platform (Bhardwaj & Gupta,2022).

Some of the advantages of the Alfresco platform are as follows:

- (1) Effective content management system: Alfresco provides an effective content management system that can be customized according to the needs of the organization;
- (2) Promotes seamless workflow: Alfresco promotes seamless workflow by improving collaboration among team members;
- (3) Improves team productivity: Alfresco improves team productivity by standardizing processes and better access to information;
- (4) Significant expense reductions: Alfresco can help save costs by reducing the time and effort required to manage content;
- (5) Alfresco can be easily integrated with other applications, such as:
 - integration with third-party services: Alfresco can be integrated with third-party services, such as Microsoft Office, through Alfresco Office Services (AOS);
 - integration with existing applications: Alfresco can be integrated with existing applications through the Alfresco Application Development Framework (ADF);
 - integration with other Alfresco services.

The software architecture of the Alfresco platform is shown in Figure 2.

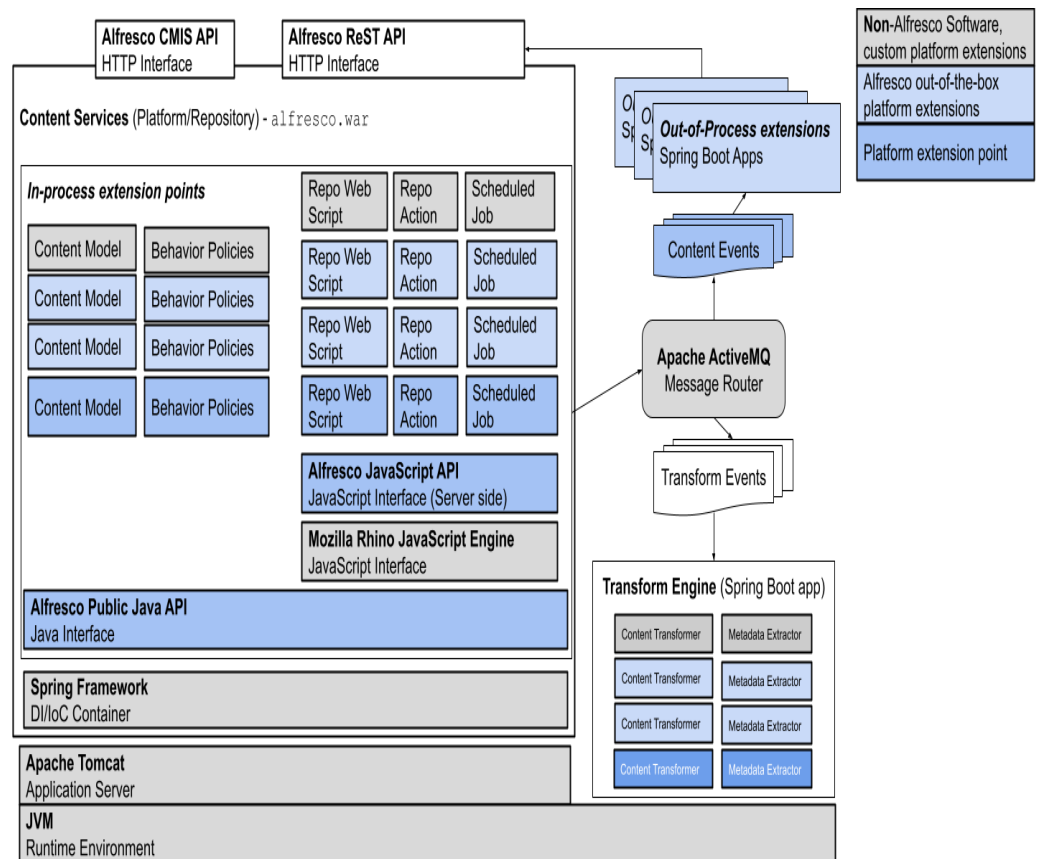


FIGURE 2 - ALFRESCO PLATFORM ARCHITECTURE

Source: Alfresco architecture (2024), <https://docs.alfresco.com/content-services/latest/develop/software-architecture/#platformarch>

3. MANAGEMENT OF ORGANISATIONAL CHANGES RELATED TO THE INTEGRATION OF THE ALFRESCO PLATFORM IN DOCUMENT MANAGEMENT, THE MAIN STAGES

Organizational change management is the systematic approach and application of knowledge, tools, and resources to cope with change in an organization. The main goal in change management is the successful implementation of new processes, products, and business strategies that reduce costs and increase the efficiency of the organization. There are many details and information that need to be conveyed, and the people involved want to understand what this change means for them. Through a well-established HR policy, and with the adoption of the right strategies, moving on to new situations and ideas will be easier for everyone. Human resources staff can be the link between management and employees (Androniceanu & Georgescu, 2023a; Androniceanu & Georgescu, 2023b).

In general, change management focuses on three essential aspects:

1. **Effective transition** management through change management: A company may experience a major change at some point, achieved to remain competitive and to achieve its business objectives more easily. Therefore, change management acquires significant importance so that everyone's adaptation to change is easier and communication with employees is carried out properly.
2. **Facilitate optimal communication** and adapt to change: Changes in organizations are not always received easily and can generate concerns for team members who are affected by them. Therefore, optimal communication ensures easier adaptation to change.
3. **Continuous implementation, coordination, monitoring, and adaptation** of changes are necessary and extremely important. This facilitates the intervention of the organizational change management team to make the necessary adjustments to successfully implement the planned changes.

The main stages of the global (all areas) or partial (one domain) organizational change management process are as follows:

- **Identifying the need** for change by analyzing the economic, financial, and managerial situation of the organization. This can be done using diagnostic analysis, SWOT, STEP, PESTEL, etc., centered on the causes that determine the weaknesses of the organization or field analyzed.
- **Establishing management objectives** (from strategy, managerial programs, etc.)
- **Presentation and detailing** of activities to be changed and ways to change
- **Estimation of resources** (own and attracted) necessary to implement changes (financial, material, informational, and human)
- **Change implementation** program (activities, deadlines, executors, responsible)
- **Continuous monitoring and adaptation** of the organization to change.

Below is a customization of the stages of organizational changes determined by the implementation of an integrated document management system using the Alfresco platform.

These are: (1) *scanning*; (2) *indexing*; (3) *storage*; (4) *retrieval*; (5) *distribution*; (6) *security*; (7) *workflows*; (8) *collaboration*; and (9) *versioning and searching*.

- **Scanning** generally involves scanning and processing paper documents using scanners or multifunction printers.
- **Indexing** refers to the use of indexes and a database capable of handling large indexes. This is essential in retrieving documents quickly. Indexing can be simple - a unique number assigned to each document - or complex, allowing complex searches using combined metadata searches, and FULL TEXT search (using CLOB indexes). Indexing is mainly done to support and support fast document searches. Indexing must be done according to search criteria.

- **Storage** of electronic documents and digital copies of paper documents. By their nature, document management systems use large and very large storage capacities, and use database systems capable of handling a large volume of data. The centralized storage of documents also ensures a unitary backup of all documents managed by the system. The systems store documents in two ways:
 - BLOB file - storing documents in a database;
 - File Server - storing documents on a file server and storing pointers to files in the database.
- **Retrieval** of electronic documents from the storage area. DMS systems provide complex search criteria, metadata searches, and full-text-search text searches. Searches use combined criteria between general metadata and specific metadata, Boolean expressions, and search operators (=, <>, >=, <=, LIKE, !=).
- **Distribution** refers to documents, which must be published in a format that blocks easy modification of the document. DMS systems ensure the distribution of documents to their recipients (and only to them) based on groups, roles, access rights and document (information) flows. The distribution mechanism shall ensure that the reception and reading of the distributed document by its recipients is audited.
- **Document security** is vital in many document management systems. DMS must provide secure access to documents and encryption of authentication data. Some systems also encrypt the contents of files in the database to block them from opening outside the system. DMS can also include additional components to block documents from opening outside the organization (for example: a word document cannot be opened if it has been copied using a memory stick).
- **Workflows** are a complex issue and some DMS have modules included for modelling. Other systems use specialized software to model flows and processes (for example: BPEL). The document path on the workflow can go through steps of the following types: approvals, information, assignments, resolutions, sequential organization, and parallel organization.
- **Collaboration** must implicitly be inherited from the electronic nature of DMS systems. Access to modify a document must be blocked for the rest of the users for as long as a particular user modifies the document (check-in, check-out).
- **Versioning** is useful for documents that change over time and need modification. The number of historical versions kept within DMS is configurable + the more versions are stored, the greater the storage capacity must be. Search for documents within the stored document container using attribute values (metadata) or full-text search. Documents can be retrieved by multiple criteria or by content.

4. PHASES AND STAGES RELATED TO THE IMPLEMENTATION OF THE ALFRESCO PLATFORM

The main components of the information system in an organization interacting with the Alfresco platform are shown in Figure 3.

In order to implement successfully the Alfresco platform, the Alfresco implementation methodology (AIM) is presented below. The methodology contains three phases: preparation, launch, and expansion. These are presented and briefly explained below.

1. Preparation phase: In this phase, existing processes or use cases, current architecture and priority requirements are evaluated. It is also planned to develop competencies and skills for taking over the roles determined by the changes generated by the introduction of the Alfresco platform. Thus, a detailed plan is defined for the first 90 days to implement priority changes in the organization.

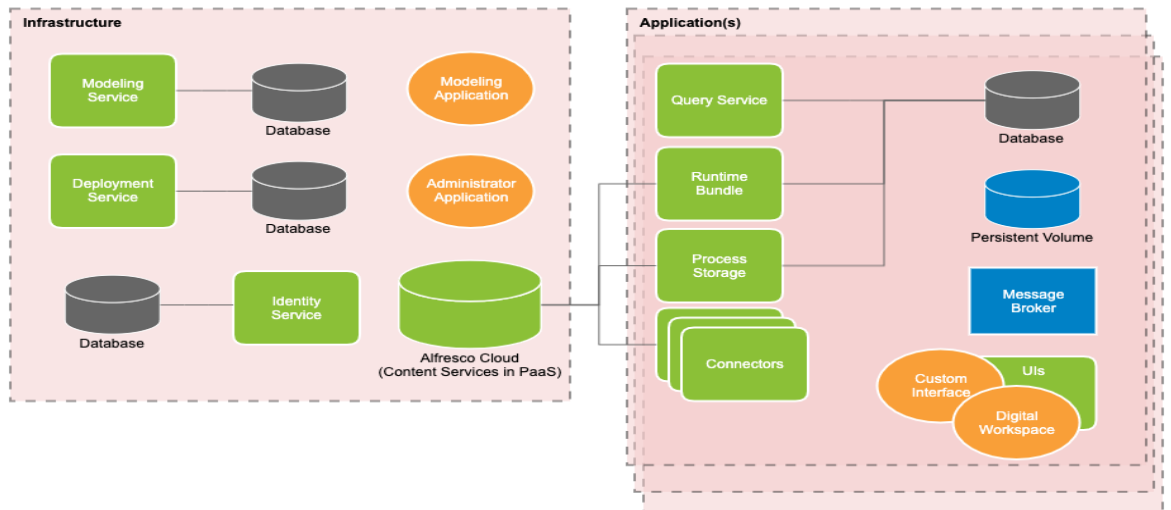


FIGURE 3 - IT INFRASTRUCTURE AND THE MAIN APPLICATIONS

Source: Alfresco Process Automation, <https://docs.alfresco.com/process-automation/latest/admin/architecture/>

2. Start-up phase: In this phase, the project is initiated, including coordination and control processes. It executes role-based development activities, sprint development, testing and implementation of the phase 1 purpose. It is planned to build the Alfresco Center of Excellence.

3. Expansion phase: In this phase, the operational aspects of supporting the implementation solution with the continuous execution of the initiative map are combined. New changes and initiatives are planned that will use the platform.

To successful implementation of the Alfresco platform is determined by the degree of flexibility and openness of the implementation team. There is a real need for updating future versions easily. It is also important to consider integration with other third-party applications and services.

To prepare the team for the implementation of the Alfresco platform, it is recommended to follow the following steps:

- Identify organization needs: Identify business needs and define goals. It is necessary to ensure that all stakeholders are involved in the process of identifying needs.
- Team formation: The team must include members from all relevant departments with skills and knowledge about the Alfresco platform.
- Implementation planning: Implementation planning is recommended to be based on an open and flexible approach, allowing for updating to a future version without problems. Also, integration with other third-party applications and services must be considered already at this planning stage.
- Team training: the team must be prepared to use the Alfresco platform and any third-party applications or services with which it is integrated. Each team member must have a clear understanding of processes and workflows.
- Solution testing: Before implementation, the solution should be tested for finding and solving different issues.
- Solution implementation: The implementation of the solution must be monitored for all processes and workflows to function properly.

Figure 4 shows the implementation scheme of the Alfresco platform, available on Alfresco Hub. This is a graphical representation of the structure and relationships between entities in the Alfresco system database. This can be useful to better understand system architecture and quickly identify relationships between different

entities. The Alfresco database schema is an assembly of models. These models describe how data and metadata should be stored and associated with the contents of the folders contained in the model.

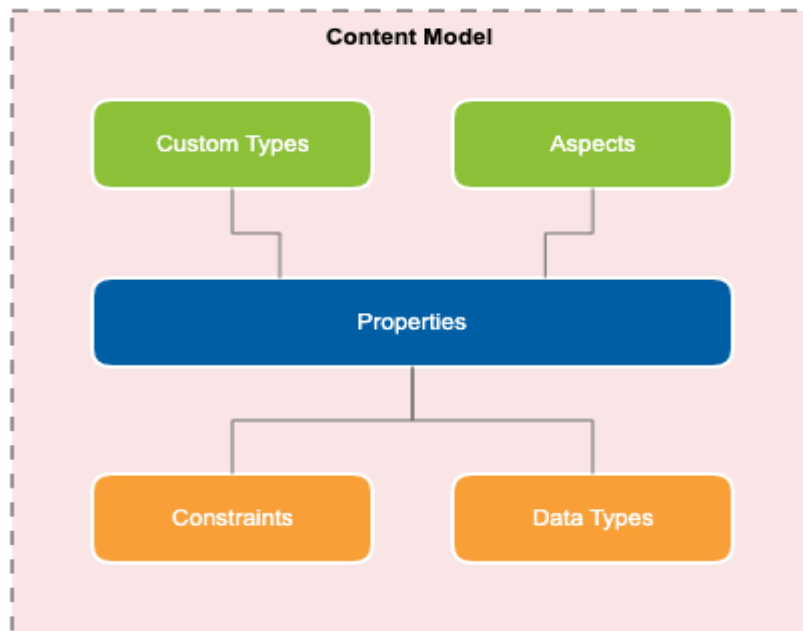


FIGURE 4 - FRAME CONTENT OF MODEL REPLICATED IN ALFRESCO PLATFORM

Source: Alfresco architecture (2024), <https://docs.alfresco.com/content-services/latest/develop/software-architecture/#platformarch>

This diagram can be useful to understand the structure of the system database. There are also other resources available, such as the Data Model Editor and JSON Editor, that can be useful for creating and visualizing data schemas.

In order to successfully implement the Alfresco platform in an organization, the following measures are required:

(1) Planning: Planning is essential for a successful Alfresco implementation. The plan must take into account the current position of the organization, include individuals capable of managing implementation, and ensure that each person involved understands and assumes the assigned tasks.

(2) User convenience: Before starting the Alfresco development process, the organization should consider a consensus from its users about the change to be implemented. Users who will use the solution should be comfortable in adopting the process change. Implementation will not be of much help if users prefer the old methods instead of the newly implemented solution. The process change should aim to reduce or eliminate problems faced by users while using the solution and not to burden them with additional tasks.

(3) Support for continuous improvement: Alfresco consulting firm must plan implementation using an open approach. The solution should be flexible enough to allow upgrading to a future version without any tedious tasks involved.

Task workflows should be designed with future changes in mind that could occur in any organization or department.

(4) Data security: Data security is of paramount importance to every organization. IT departments work day and night to protect an organization's private data and confidential information and ensure that what happens in an organization stays within the organization. Alfresco consulting partners should have designed the solution so that permissions can be set at the file level and folder level for each employee.

5. CONCLUSIONS

A high-performance document management system allows employees to be more efficient and gives managers a much clearer picture of the organization. Thus, they have at hand and well-organized all the documents and data necessary for the proper management of the activity. The Alfresco platform is a viable and sustainable option for document management, which will be explained and exemplified by the author in a future paper.

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