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Abstract: The aim of this paper is to present the technical solution implemented in the present context for the management of law firms. The informational system consists of the automation of business processes using a BPM engine and electronic archiving using a DMS. The communication between the two modules is made by invoking web services. The whole system integrates modules like: project management, contract management, invoice management, collection, CRM, reporting.


1. Introduction

The organization, particularly the organization in the economic sense, means all administrative elements, human, operational activities, functional and conceptual elements that form a whole in order to improve the productive activities and increase the effectiveness of people enrolled in it. The entire set of operations of an organization is based on certain processes that are defined in time and end up becoming true procedures, tasks, action streams. They form a system in a broad sense. In this context, the right term is operational management, which extends to the concept of workflow.

The actual state of our society allows the approach of the digital economy (e-economy) which contains workflow processes. In this way, operational systems are starting to appear, sustaining this type of economy. Key instruments of digital economy are being used: Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Business Process Management (BPM) or Business Intelligence (BI).

The management based on processes is a holistic management approach which involves the alignment of the organization objectives to the client requirements. The main key advantages of the management based on processes are: agility, efficiency, training, flexibility, client satisfaction, significant reduction of time-to-market. Technically speaking, the BPM applications' implementation is done using a BPMS (Business Process Management Suite) and the web services are the ones that provide the communication between multiple entities of a BPM solution. One of the most important parts of a BPMS is the Content Management System that facilitates the electronic document management and archiving inside an organization.

2. Problem definition

A law firm is a business entity formed by one or more lawyers to engage in the practice of law. The primary service provided by a law firm is to advise clients (individuals or corporations) about their legal rights and responsibilities, and to represent their clients in civil or criminal cases, business transactions, and other matters in which legal advice and other assistance are sought [6].
Law firms are typically organized around partners, who are joint owners and business directors of the legal operation; associates, who are employees of the firm with the prospect of becoming partners; and a variety of staff employees, providing paralegal, clerical, and other support services.

The most problems that people have inside a law firm are:
- Bad document management;
- Bad client relationship management;
- Lack of standard in daily procedures;
- Lack of structure inside the firm’s library;
- Lack of instruments regarding project management;
- Lack of contract management procedures.

The main groups of activities performed within a law firm are illustrated in the next diagram.

![Figure 1. Group of activities](image)

Business process management allows tremendous efficiency gains as the technology does much of the hard work. No longer an invoice be hidden in someone's in-tray and no longer a staff expense claim is lost. There are three key advantages that BPM can bring to the table:

1. Transparency - BPM makes a business process absolutely transparent, greatly improving visibility and efficiency. Bottlenecks can literally be seen, and removed. It can show where the most delays are occurring, and where is each transaction stuck as it passes from one stage to another.

2. Process refinement - The initial configuration and design exercise coupled with the data that emerges after running processes for some time can allow refinement.

3. Centralization of Data - Data about each and every transaction is logged and can be retrieved as and when required. Therefore, it is possible to analyze accurately what happened. Referencing is also easier as embedded searches allow for data to be picked up as required for study.

An electronic document management system potentially includes intangible benefits such as:
- Improved security through a single secure location for documents and ensuring that the right people are able to access the right documents
- Improved compliance with regulation or legislation
- Central control and management of documentation
- Reduced chance of "losing" documents
- Enhanced competitive situation due to improved internal document processes
- Improved customer service through faster access to and retrieval of important customer information

An electronic document management system potentially includes tangible benefits such as:
- Reduced paper storage - removal of paper by converting paper documents that are stored within the business or in an archive into an electronic form
- Improved retrieval time - obtaining paper from storage or an archive is typically slower than electronic retrieval of documentation. Along with the improved retrieval time comes the ability to perform searches for similar information. This is especially useful when trying to perform major changes or perhaps searching for information subject to litigation
- Saves paper, printer and toner costs - reduced need to print paper documents as electronic versions are available for use or reuse. Whilst the paperless office is still not a reality, it is anticipated that the availability of an EDMS would reduce the need for multiple paper copies of documents. If the EDMS does not have an electronic
signature capability then at least one "master" paper signed document will need to be printed
- Improved staff productivity - less time spent searching for documents or trying to find the current version. Faster document review and approval cycles, particularly where multiple reviewers and approvers are involved in the business process
- Improved disaster recovery - EDMS contains business critical documents and has its own disaster recovery plan that allows the documents to be restored in the event of significant disruption or disaster for the business

3. Problem solution


Business process management activities can be grouped into six categories: vision, design, modeling, execution, monitoring, and optimization.

![BPM life cycle](www.wikipedia.org)

There are four critical components of a BPM Suite:
- Process Engine – a robust platform for modeling and executing process-based applications, including business rules
- Business Analytics — enable managers to identify business issues, trends, and opportunities with reports and dashboards and react accordingly
- Content Management — provides a system for storing and securing electronic documents, images, and other files
- Collaboration Tools — remove intra- and interdepartmental communication barriers through discussion forums,

dynamic workspaces, and message boards

BPM also addresses many of the critical IT issues underpinning these business drivers, including:
- Managing end-to-end, customer-facing processes
- Consolidating data and increasing visibility into and access to associated data and information
- Increasing the flexibility and functionality of current infrastructure and data
- Integrating with existing systems and leveraging emerging service oriented architecture (SOAs)
- Establishing a common language for business-IT alignment

3.2. Business Process Modeling Notation

The Business Process Modeling Notation (BPMN) is a standard for business process modeling, and provides a graphical notation for specifying business processes in a Business Process Diagram (BPD), based on a flowcharting technique very similar to activity diagrams from Unified Modeling Language (UML) [9]. The objective of BPMN is to support business process management for both technical users and business users by providing a notation that is intuitive to business users yet able to represent complex process semantics. The BPMN specification also provides a mapping between the graphics of the notation to the underlying constructs of execution languages, particularly Business Process Execution Language.
The vision of BPMN 2.0 is to have one single specification for a new Business Process Model and Notation that defines the notation, metamodel and interchange format but with a modified name that still preserves the "BPMN" brand.

The informational system implemented in order to answer the necessities previously presented consists of two technological approaches:
- WebRatio BPM
- Alfresco CMS

### 3.3. WebRatio BPM

WebRatio is an innovative Model-Driven development environment for building business applications in a Web/SOA environment. The tool allows capturing requirements in abstract models and automatically generating a full-featured, industrial-strength, business application. The models are based on the BPMN standard and the WebML modeling language. The result is a perfectly standard Java Web application, with no proprietary runtime or components that can be deployed on any Java application server. The development environment is open: generation rules can be extended and customized at will.

![Figure 4. Model driven process deployment](image)

WebRatio lets process analysts and application functional analysts work together with web designers and developers, thus optimizing collaboration within the work team.

WebML is a high-level notation for data-, service-, and process-centric Web applications. It allows specifying the data model of a Web application and one or more hypertext models (e.g., for different types of users) used to publish and manipulate the underlying data. Each hypertext is a graph of pages, consisting of connected units, representing at a conceptual level the primitives for publishing contents into pages. Units are connected by links that define navigation paths and carry data to allow computation of the hypertext. Hypertexts also include operations that specify business actions, such as content management operations on the data or other kinds of tasks.

![Figure 5. Java components and XML descriptors for WebRatio units. Source [www.wikipedia.org]](image)

The WebRatio GUI defines a special Eclipse perspective designed to better suit the needs of visual modeling. It comprises several panels, which include:
- Model diagram editors for the design of the WebML data model and hypertext models. The diagram editors are based on the GEF framework and libraries. GEF is a very powerful framework for visually creating and editing models;
- Advanced text editors for the design of XML descriptors, Java components, and so on. The editors provide typical features like syntax highlighting, auto completion, and so on;
- Form-based editors for the specification of new components and for the properties of components instances;
- Wizards for the support of the most common design tasks (e.g., new projects).

### 3.4. Alfresco CMS

Alfresco is one of the most popular and acceptable Java-based open source Enterprise Content Management System. Alfresco ECM combines the novelty of open
source technology with the durability of a real enterprise level platform. It provides document management, Web content management, records management, knowledge management, web content management, Imaging and Content Repository.

Alfresco provides the following set of Web Services:
1. Authentication - login and logout
2. Repository - query and model manipulation
3. Content - content manipulation
4. Authoring - collaborative content creation
5. Classification - apply classifications and categories
6. Access Control - roles, permissions & ownership
7. Action - manage actions and rules
8. Administration - user management, export & import
9. Dictionary - model descriptions
10. CMIS - CMIS

3.5. Implementation

The implementation process of the BPM solution using the above concepts consists of the following steps:

1. Designing the business process: This step is implemented using WebRatio Studio by defining process roles, process lanes, user tasks, service tasks, automated notifications, jobs.

2. Designing the process and application database: All data used inside the system is stored in four databases, each having a direct correspondence to a module inside the application: the BPM database, the core database, the CRM database and the financial database
   - The input data for the system consists of: client submissions, documents, invoice parameters, contacts, clients, special initialization parameters.
   - The output information is made up by: automated mail notifications, invoices, reports, expenses and electronic documents.

3. Designing the Web Application based on WebML using WebRatio’s web perspective: This step consists of creating the portal’s structure, user perspectives, activity modules, data model.

4. Synchronizing the Web Application with the BPM process: This step consists of linking all user tasks that are included in the web interfaces of the portal with the tasks inside the business process.

5. Configuring the service tasks that use Alfresco’s web services in order to create folders, upload files, upload/update metadata. The initial testing phase is made using SoapUI.

6. Configuring the service tasks that generate PDF documents: This step consists of compiling projects using iReports based on JasperReports from JAVA. This tool allows the communication between the process parameters from WebRatio and the JAVA classes in order to generate Jasper files that are further used to generate reports, contracts, invoices, payments.

7. Implementing a file plan that is further imported into Alfresco as XML document. The file plan contains all documents used inside the law firm [7]. All objects are unified into a specific hierarchy that uses metadata in order to define a specific document.

3.6. System architecture

The system architecture consists of the following components:

![Figure 6. System architecture](image-url)
1. Terminals – Used in order to access the Web interface of the application by Internet Browsers;

2. Web Server & Process Engine – The web application resides on this machine. Also, the business process is executed from this server, after deployment;

3. The CMS Server – Alfresco resides on this server and communicates with it’s on proprietary MySQL database;

4. The application and process databases that are MySQL repositories aimed to store all information within the law firm.

4. Conclusions

The paper illustrates how technology can be combined in order to gain real business value and to automate at almost 90% a full set of activities, reaching a high level of effectiveness. WebRatio is a CASE tool based on the Eclipse framework that allows the model-driven specification of a complex Web application, including process management primitives, calls to Web services, and integration of heterogeneous data sources. Creating a communication layer via SOA between the WebRatio project and the Alfresco CMS one gains the capability to use a unified system that allows the users to work in a completely cooperative environment based on virtual elements.

BPM and SOA boost the system's capabilities and generate a full set of benefits for the users like:
- Virtual project management;
- Effective contract management;
- Transparency in the lawyer-client relationship;
- Standard procedures;
- Unified CRM platform;
- Integrated DMS module;
- Efficient collection and invoicing process with automated notifications.

References
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