Automated and advanced document processing system in the woodworking industry

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Abstract. This article presents a detailed framework for the seamless integration of a new document processing system within the operational workflow of a company. The proposed plan prioritizes both continuity and parallel deployment to ensure minimal disruption during implementation. It includes a thorough decomposition of system use cases, illustrated with block diagrams, along with sample mock-ups of the user interface to facilitate understanding among developers, designers, and technical writers throughout the development process. The primary objectives of this initiative are to boost employee productivity, reduce costs associated with production downtime, and guarantee the system's scalability to meet evolving document processing demands.

1 Introduction

The wood processing sector plays a vital role in the global economy, bridging the gap between raw timber supply and the myriad of products that enrich our daily lives. This industry is responsible for transforming harvested wood into an array of essential goods, including furniture, paper, construction materials, and flooring, among others. With forests covering about 30% of the Earth's land area, the sustainable management and processing of wood resources have become increasingly significant in the context of environmental stewardship and resource conservation.

As society moves towards more sustainable practices, the wood processing sector faces both challenges and opportunities. Efforts to minimize waste, enhance energy efficiency, and develop more eco-friendly processing methods are at the forefront of industry innovation. Furthermore, advances in technology and automation have revolutionized traditional practices, enabling producers to optimize production while maintaining high-quality standards. Navigating regulatory frameworks and consumer demand for sustainable products adds another layer of complexity to this dynamic sector.

In a time where climate change and environmental degradation are pressing concerns, the wood processing industry has the potential to lead in sustainable practices. Through responsible sourcing, waste reduction, and the promotion of wood as a renewable resource, the sector not only supports economic growth but also contributes to healthier ecosystems

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and communities. As this industry continues to evolve, it will remain a crucial player in shaping a sustainable future while addressing the needs of an ever-changing global market.

LesnoyProgress, a prominent enterprise in the wood processing sector, operates a network of branches across various cities in the country. These branches encompass logging sites where timber is both harvested and processed, as well as administrative offices responsible for the management of documentation, layouts, drawings, and other logistical operations. Every day, a substantial volume of paperwork is managed internally, predominantly through manual processes executed by employees within logging centers dedicated to the meticulous handling of numerous documents. This manual processing often involves traditional methods such as the use of written instruments, stamps, and physical transfers of documents among staff members [1-20].

A notable challenge arises when employees tasked with processing specific document sets are stationed at remote logging sites. In such instances, documentation is dispatched via mail to employees who may be at various stages of the production workflow. However, reliance on mailed documents poses legal complications, as confirmed by the company's legal advisors, since copies of documents do not always hold binding validity. Additionally, some employees perform their duties remotely, benefiting from access to company resources yet lacking the ability to directly work with critical documents. This scenario underscores the necessity for enhanced remote access capabilities that would empower all employees to engage with documents efficiently, ensuring continuity and compliance within the operational framework of LesnoyProgress [21-37].

This situation creates a number of acute problems affecting the company's work:

- Because of the significant time spent transporting documents between employees, a business loses not only time, but also potential profits due to potential delays in production areas waiting for the necessary documents to be processed [38-45].
- Employees responsible for document transportation spend considerable time delivering a set of documents to the correct employee or location, as well as mailing documents to other locations.
- During the transportation process, documents may be damaged: torn, crumpled, or flooded with liquids, which can cause them to lose their legal validity.
- In paper format, if a mistake is made, there is no way to discreetly correct the data, so it is necessary to start the entire document processing process over again.
- Paper documents are not protected from unauthorized access, and any employee passing by can gain access to confidential information that is unsupervised, which can cause damage to the company.
- Therefore, LesnoyProgress needs an automated electronic document management system (EDMS) to solve these problems and improve the efficiency of the company.

2 Relevance of system development

An automated electronic document management system (EDMS) helps to efficiently process and store information, including documents, and regulate access to them among employees. It provides quick access to the required documents and keeps them secure.

The main advantage of EDI ACS over the traditional method of processing paper documents is speed. With the ability to access documents anywhere in the world and regardless of the location of employees, the document processing process becomes much faster, especially if employees from different locations are working on it.

For example, in the traditional document approval model, multiple signers from different cities must mail copies of documents to sign them. If errors are detected, the entire process has to be repeated again. Whereas in an EDI ACS all this can be done in a few minutes,

processing documents in electronic format and passing them on without having to wait for mail delivery.

The system also allows employees to quickly access documents through a web interface, avoiding the need to go to the office. Electronic documents are protected from physical damage and allow errors to be corrected without going back to the beginning of the process. In addition, access to documents is regulated based on user roles, ensuring the security and confidentiality of information.

EDI ACS is becoming more and more popular in the modern world, especially among large companies, to whom efficiency and effectiveness of business processes are important. This is confirmed by various studies and publications indicating the advantages of using such systems.

3 System structure

An automated electronic document management system should be designed as a web service with a user-friendly interface for access via company employees' computers.

In addition, this system provides the possibility of automatic processing of necessary information and protection of confidential data from unauthorized access.

If necessary, users have the ability to print documents.

An example of such a hardware system is shown in Figure 1.

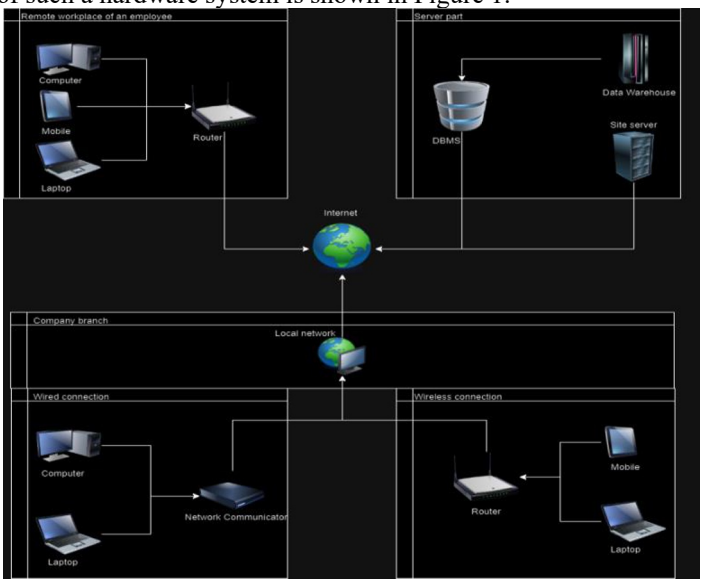

Fig. 1. Hardware system

The automated electronic document management system includes basic components such as documents, document sets, company groups, document handler roles and a list of handlers.

The content structure of the system is shown in Figure 2.

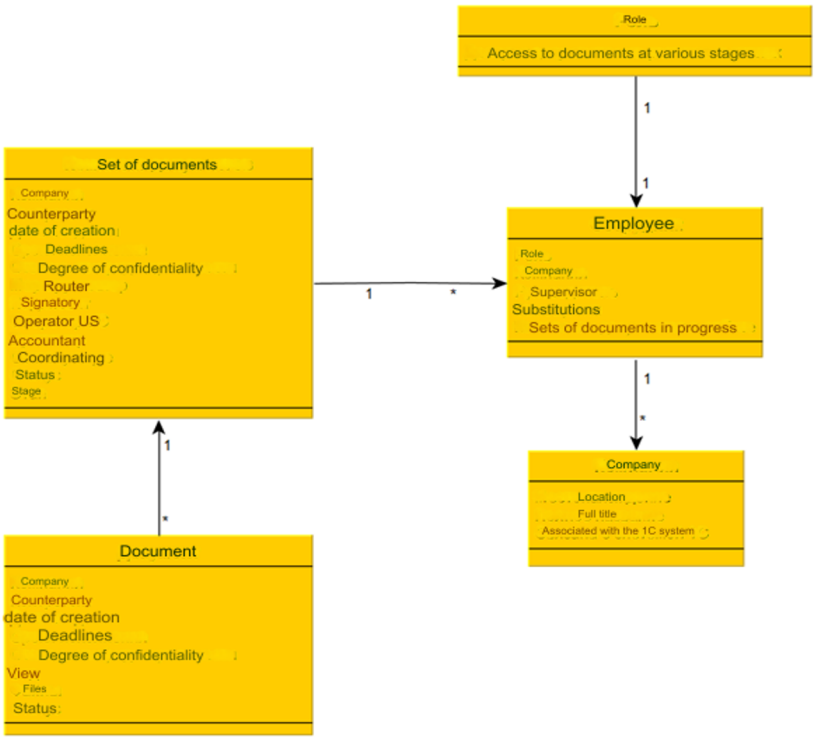

Fig. 2. Structure of the system

4 System requirements

The web interface of the system is designed so that different employees will have the same functionality and visual interface, but their capabilities and permissions to work with documents will differ.

From the main page of the interface, which is a filing cabinet, employees can select, sort, and filter the sets of documents they will be working with. This interface is depicted in Figure 3.

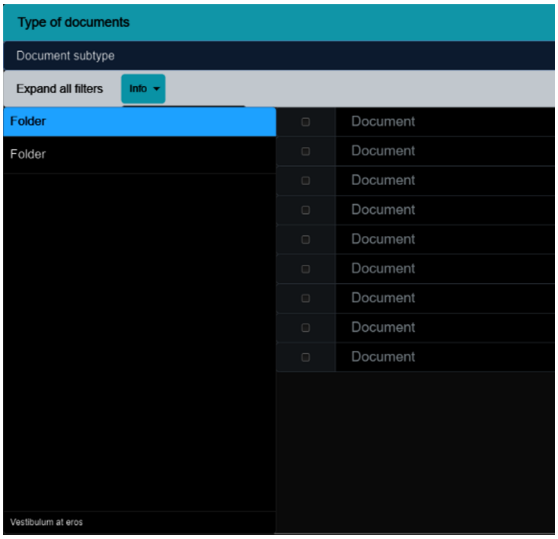

Fig. 3. Example of interface

5 Conclusion

The work involved analyzing, evaluating, updating and designing an automated electronic document management system for LesnoyProgress.

This system will allow the company to speed up the process of document processing, as it will be instantly accessible to all the necessary users through a web interface that can be accessed in seconds. In addition, the data will be protected from unwanted access, and due to the lack of physical form, documents cannot be damaged or lost, which will also increase employee productivity by eliminating the need for repeated actions to create new copies of documents.

The system will be available from different types of connection: employees of the company's branches will be able to connect via the company's routers or network communicators with a wired connection. Also, an employee working remotely will be able to access the system via a router.

A plan was developed to introduce this system into the company's document workflow in such a way as not to disrupt the existing document workflow and to deploy a new one in parallel to it, gradually migrating to it.

Decompositions of system use cases were developed with block diagrams depicting the stages of work of different roles in different situations.

Sample mock-ups of the web interface have also been created for easy display and presentation of ideas to the developers who will be working on the system. These diagrams and mockups will be useful to developers, designers, and technical writers at all stages of system creation.

Ultimately, the implementation of such a document processing system will allow the company to increase employee productivity and reduce the cost of unnecessary production downtime. This system will be extensible and will be able to easily add new functionality for different types and subtypes of documents.

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