

Implementation of an Electronic Document Management System Based on Network Protocols

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ABSTRACT

Documents are central to the functioning of an organization. They are important as a means of communication in business process or known as workflow. Workflow management is used to keep track of the documents being produced by an organization. This paper discusses the development of a workflow management system based on the network applications protocols such as SMTP, POP3 and HTTP. The application does not require any purchasing of computer equipments such as documents server. It will use the existing e-mail and web server as the documents server.

ABSTRAK

Dokumen merupakan teras kepada fungsian suatu organisasi. Ia penting sebagai komunikasi dalam proses perniagaan atau dikenali sebagai aliran kerja. Pengurusan aliran kerja digunakan untuk menjejaki dokumen-dokumen yang telah dihasilkan oleh organisasi. Kertas ini membincangkan pembangunan sistem pengurusan aliran kerja berasaskan aplikasi-aplikasi rangkaian seperti SMTP, POP3 dan HTTP. Aplikasi ini tidak memerlukan pembelian peralatan komputer seperti pelayan dokumen. Ia menggunakan pelayan web dan e-mail yang sedia ada sebagai pelayan dokumen.

INTRODUCTION

Documents serve many functions in an organization. Everything from providing simple message through memos, recording agreements in contracts, to adding value to a product through complex instruction manual and even to creating a corporate image through brochures and annual report. In the era of electronic communication, the definition of document has been widened to include such as voice mail, presentations, web pages and video clips. All the functions mentioned above have the same reason, they are used for communication. Communication can be defined as information transfer among users or processes, according to agreed conventions. These activities are also called as a workflow.

Workflow in a business can be defined as a process that documents flow from one worker to another. Those documents are usually kept in their folder and the folder is physically moved from one worker to another. During this process, documents can be misplaced or lost. In order to reduce this problem, a workflow management system has to be implemented in the organization.

DOCUMENT SYSTEMS

A document can be described as recorded information structured for human consumption (Levien 1989). According to Sparague (1995), a document can be defined as a variety of symbols, stored and handled as a unit.

A document is created when there is an issue or information to be discussed or may be when there is a decision to be taken by a person or group of people. A contextual model of communication involves a message being sent from a source or sender through a channel to a destination or receiver. The process of transferring the document from sender to the recipient will take some time. If the document needs more than one correspondence, the information for decision-making will be slower. This is because of a long chain of the document process, stretched over people and geography (Keen 1991).

In most cases, documents that are kept in the cabinet need a system for their keeping. This system is important in order to search and to retrieve the documents. In the traditional system, there is a logbook to record the document title, date and the author. The document will be searched by its title or author. Date is very important to ensure that a document is unique, as it can be a few documents prepared by the same person.

ELECTRONIC DOCUMENT MANAGEMENT SYSTEM (EDMS)

The computerized management of electronic as well as paper-based documents is called as an Electronic Document Management System (EDMS). The system generally consists of the major components that are also important in a workflow management system. The components are:

1. A database system to organize stored documents
2. A search mechanism to quickly find specific documents
3. A track mechanism to identify missing documents.

In choosing an EDMS and workflow system solution, the user and system architect look at the required functions of the new business process and then select a type of system and/or product(s) that supports the function. Three of the characteristics which help define the system are:

1. How the documents or information is captured;
2. How the information is processed; and
3. How the information is indexed and accessed. .

An EDMS is said to be "image enabled" if documents can be scanned-in electronically and processed. Most non-Internet EDMSS will have a data capture component which is image based. Internet-based technologies such as electronic forms (e-forms) are rapidly gaining acceptance. Image enabling can be as simple as providing the ability to scan and store a few documents a month in small agencies to large systems which support input of up to 10,000,000 forms in a 1 month period.

There are a few EDMS/Workflow software existing in the market. The production handle by big companies such as Documentum, PC Docs, SoftSolutions form WordPerfect/Novell and FileNet, Visual Recall from Xerox. There are also products with this capabilities offering from Verity, Oracle and Lotus Notes.

Even though there are numbers of documents management system in the market, the systems are not worth buying by most of the small and medium industries because of the cost. Another criteria to be considered is to select an Open Solution application. An open system solution is one in which the hardware and software components that are purchased from different vendors can be integrated into the current system in the organization. This can ensure that the users will use only one system in their work.

CURRENT RESEARCH

To date, there are many people doing research in the EDMS and workflow management system. Most of them focus on the issues of workflow automation. There are three different aspects of workflow management research; workflow and object-oriented technology; lightweight workflow and workflow as a developer's tool.

A studies done by C.Mohan on a large numbers of commercial products, standard and research projects, shows that typically object-oriented technology do not go beyond the implementation of workflow products. Workflow management systems implemented with this technology do not allow users to tailor the system functionality.

Lightweight workflow provides all the functionality that their users may require for workflow management. They offer graphical process builders and monitoring tools, workflow repositories, persistence and transaction services. These workflow applications provide good workflow management tools but the application is very hard to fit with the current computer system in the organization.

Workflow as a developer's tool is a commercial system which attempts to target wide range of users. They provide visual tools for non-technical users and sometimes open APIs for software developers. Although existing commercial workflow system may be adequate for end-users, the cost of buying and develop the software are not necessarily appropriate for all organizations.

A workflow application that will be discussed in this paper is an alternative solution of buying the workflow management systems that are mention above. One of the main differences between this application and the current workflow management systems is the scale of the process. The application will make use of all the existing applications used to create documents in the workflow system such as MS-Word, e-mail and the browser. These applications will be plugged and linked together with a few of existing network protocols such as smtp, http, pop3, ftp and html.

THE IMPORTANT MODULES

A document is prepared with a desktop computer's word processor. MS-Word is the most well accepted word processor application in the market. When the document is ready, another system that is used to send the documents is needed. In the traditional system, documents are sending via post or by the company's dispatch. A copy of the document will be kept for reference in the organization that issued the document. The person who receives the document should acknowledge the sender for confirmation. This can be done by a letter or through a phone call.

There are two types of documents to be kept in an organization. The documents that are send for processing, are referred as active documents and the documents that are already action taken on them, are referred as non-active documents. The cabinet system must be able to recognize these two types of documents. The system must also capable to update the document status from active to non-active.

The active documents will keep on moving from one person to another person and therefore it is important to have a system to keep track of this movement. The tracking system will give the location of the document whenever there is enquiry from the personal that is concerned (Mohd Juzaidin 2000). It will also ensure that the documents will not halt during the process. Figure 1 shows the flow of the components, discussed above.

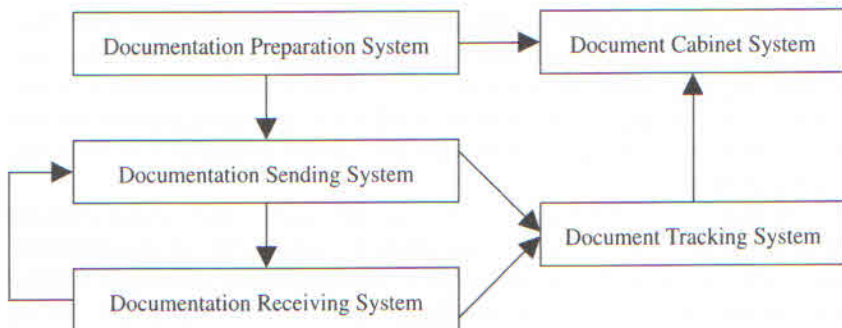


FIGURE 1. A Flow of the components of a workflow management system

As mentioned in the earlier section, there are a number of applications that provide the solution for a workflow management system. Almost all the applications provide a new system for all of the workflow management system components. As a result, the organization will have extra systems for desktop computing such as word processing and e-mail, or may be an extra server, just to cater the document management system, which is not economical for the organization.

The paper is motivated by the claim that the computer equipments that are being used in the organization can be used as tools for an enterprise workflow managements system. We use the term “enterprise” to show that the system is a simple and can be developed in a short period. The proposed system is discussed in the next sections.

SYSTEM ARCHITECTURE

The system will make use of all the equipments used in the current system such as e-mail server, web server, MS-Word and the web browser. MS-word will be used as the application for preparing the documents. E-mail server will keep the information of the documents’ movement (for monitoring) and the web server will be acted as the electronic document cabinet. The system is using web browser to display the system interface. The overall layout of the system architecture is shown in Figure 2.

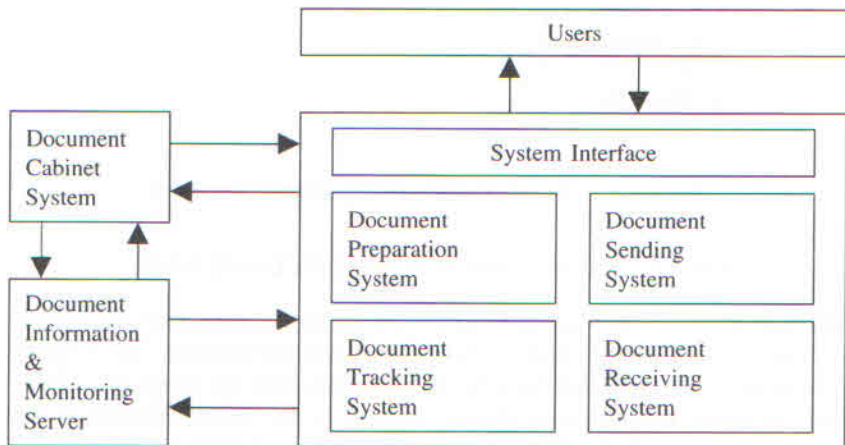


FIGURE 2. An overall layout of the proposed workflow management system

DOCUMENT PREPARATION SYSTEM

Figure 3 shows the process in the document preparation system. This system works as a normal MS-Word application with an additional function to be

used for sending the document with no e-mail application. There are two things happen when the function is called:

1. The system will be transferring a copy of the document to the cabinet system. From the cabinet system, the information of the document will be sent to the document information and monitoring system.
2. The document Sending System will be called.

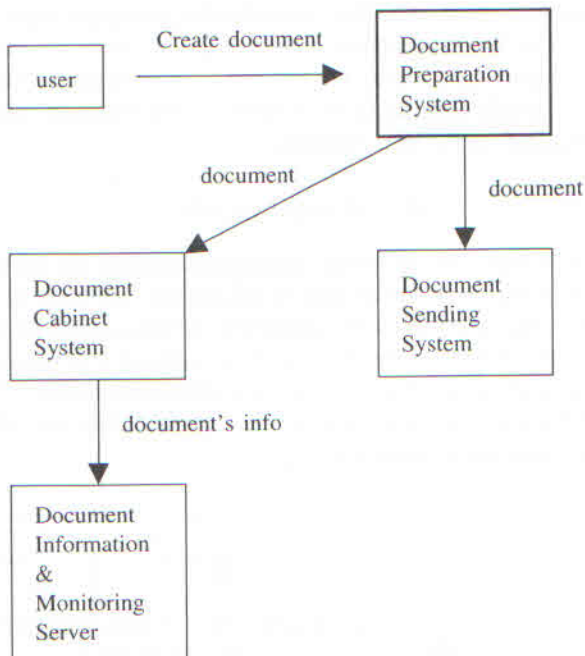


FIGURE 3. Activities in the document preparation system

DOCUMENT SENDING AND DOCUMENT RECEIVING SYSTEM

The system is used to send and receive the document via e-mail but neither sending nor receiving system is using the e-mail applications. The sending system will be embedded into MS-Word application by using its' Marco features while the receiving system appears in the main interface of the workflow management system. It is good to have a separate system between this system and the e-mail system because there are lots of documents in an e-mail system. Most of the documents are informal documents.

The sending system uses the SMTP and the MIME protocols and the receiving system uses POP3 protocols. Figure 4 shows how the document sending and receiving system works.

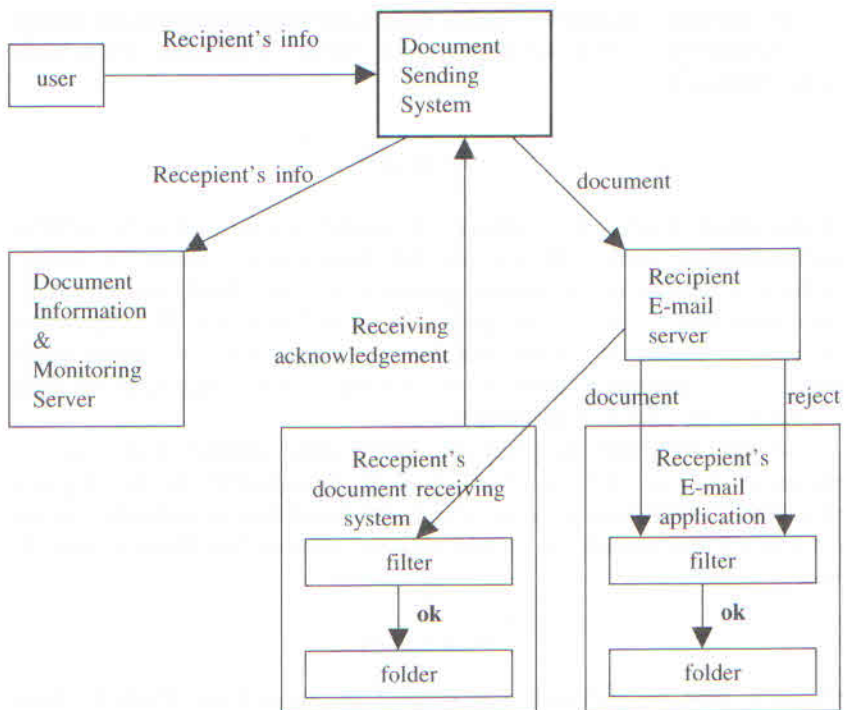


FIGURE 4. The document sending and receiving system

The recipients of the document will receive the document from their e-mail application. If they use similar workflow management system, the e-mail application will filter all the documents and it will block the documents from entering the workflow management system. The recipient will get the document via the document receiving system. The document receiving system will then send acknowledgment to the sender.

DOCUMENT TRACKING SYSTEM

The Document Tracking System is used to track simple documents or other forms of resources. Each of these systems comes with complete menus, data entry screens, query screens, and report templates. Generally, the system adequately ensured data integrity and accuracy. There are two types of tracking that can be done by the system:

1. to track an active documents
2. to track an inactive documents.

By creating a document tracking system, we can retain the major benefit of computerised systems and remove some of the deficiencies of the traditional approaches.

CONCLUSION

Organisations depend on documents for general management and communication and have traditionally used standard manual filing systems for storage. In large organisations, significant quantities of paper-based and electronic documents need to be filed for later retrieval and reference. The importance of accurate document storage and retrieval is obvious. For organisations which have branches or agencies in different locations, the need for some common filing system is imperative.

In order to reduce the problems, all the folder creation, folder routing, document creation, document routing can be automated by the development of in-house workflow application. The development will be using the existing computer's components in an organization, such as MS-Word and the E-mail's server.

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