

Electronic Documents Management in a Software Company

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Abstract - The paper deals with creation, storage and management of the electronic documents in a software company. The main purpose is to organise a flexible structure and to accomplish all necessary information used by departments and offices, concerning software projects, hardware and software resources, archives, finance, administration, etc. An information system is realised on the basis of Windows DNA model to co-ordinate activities of the departments and to ensure actualised data for management of a software company as a whole.

i. INTRODUCTION

Recently many financial institutions and companies take a decision to pursue electronic document systems, which can organise creation, processing and distribution of document-based information. Many different components take part in the operations, hence a computer system is useful to be implemented. It is of great importance to involve appropriate trained persons from the various sectors of the institution to form an implementation team. When a system is realised successfully, some main benefits can be expected, as: lower cost of document creation and distribution, faster document processing, better customer and client satisfaction, etc. [1,2]. A typical electronic document management system (EDMS) consists of powerful, standalone, personal workstations, connected in a network and able to process and exchange local and global information. It integrates the facilities of computer-based message systems and database management systems and deal mainly with structured data. One of the most popular and wide-spread approach in information technology "client-server" is useful as a balance of centralised and distributed resources and is able to make the basic components of the system independent on environment in which the application have to run [3]. In order to realise all functions concerning electronic documents using and managing in distributed area, the elements of the document lifecycle have to bear in mind. After that it is necessary to reveal the role and participation of the processes involved in the document lifecycle and to define the main phases.

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The paper presents an approach to design a system for electronic document management in a software company. For that purpose the structure of a company is analysed and an information system is proposed, which is intended to organise all activities of the department "Information Technologies" (IT), connections between main departments of the company and to ensure actualised data for control and management.

II. FUNCTIONS AND ACTIVITIES OF THE DEPARTMENTS IN A SOFTWARE COMPANY

Each software company has several main departments, as shown in fig.1. The department IT deals with recourses of the company, their interconnections and basic characteristics. Three main types of recourses could be defined:

1. Hardware recourses – this group includes all computers in the software company, workstations of the engineers and administration, servers that ensure local Intranet, Internet-servers, different components of computers and workstations. All electronic documents, concerning statement and behavior of the hardware recourses are processed by the IT-department and are used for the following main operations:

- ◆ Registration of the hardware recourses and control of the guarantee cards;
- ◆ Maintenance and monitoring of changes in computer systems configuration;
- ◆ Monitoring of connection "user-computer system", access control and actualization of necessary data about utilization of different components in the system;
- ◆ Processing the data, obtained from hardware companies – new facilities and tools, peripherals, technical documentation, qualification courses, etc.

2. Software recourses – all products as operation systems, Web-servers, database-servers, additional software are components of this group. Electronic documents, created for software recourses must ensure actualized data about:

- Type and characteristics of software products, used in the company;
- Software delivery;
- Monitoring of software utilization and analysis of the results.

3. Archives – this group includes software, which is designed by engineers and programmers of the software company and usually have specific utilization. All other programs and software products, which are outside software recourses of the system should be defined as archive, as well.

The IT-department must control and manage the processes with archives.

As shown in fig.1, the IT-department is closely connected with the finance department and directors board. These two departments receive electronic documents with actualized data, which are necessary to organize the whole structure of the company, its offices, connections with other companies and institutions, banks, etc. The electronic documents are used also to make analyses and prognoses concerning state and development of the company. Hence, on the basis of the information, obtained from IT-department is possible to realize management of the company. Software projects, their managers and software engineers, who realize separate information tasks deal with different electronic documents. The most important information for managers is as follows:

- Computer systems, used by software engineers, their requirements concerning development and testing;
- Characteristics of the operating systems and other system software;
- Documentation of the software projects and corresponding archives.

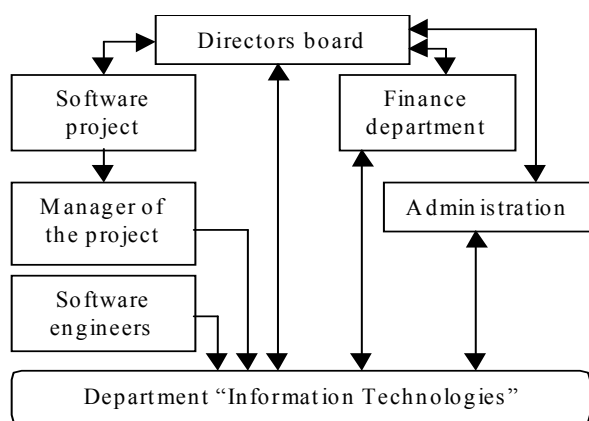


Figure 1.

The structure, described above, shows that the IT-department has several main functions, intended to coordinate all activities of the rest departments and their staff. Each computer system of the software company can access the information system of the IT-department, which is designed to organize electronic documents creating, processing and distribution. All computer systems of the company are connected in a local network, use TCP/IP protocols and have web-based interface to send and receive necessary data, storage in the information system. In this way IT-department is able to manage electronic documents in a software company.

III. REALISATION OF AN INFORMATION SYSTEM FOR ELECTRONIC DOCUMENT MANAGEMENT

The information system is organized using Windows DNA model, which is designed especially for applications in MS Windows and specifies the mechanisms and methods for distributed database management. This model is useful also

to realize a flexible structure on the basis of "client-server" technology, which could be easily integrated and used by Internet-users. One might say, that the architecture, proposed by Windows DNA is able to be at the root of today's business information systems and will have wide application in the future, as well.

The information system deals with electronic documents, concerned to activities of the IT-department and corresponding electronic documents, used by other departments in the software company, which take part in management of the company. The general diagram of the information system includes users' registration, access control, users' identification and main modules, as shown in fig.2.

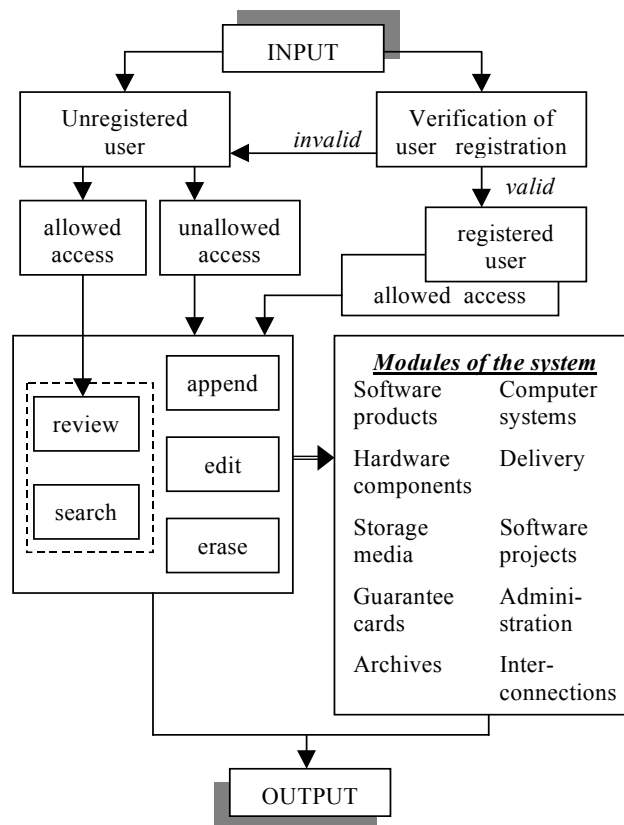


Figure 2.

Each user of the software company employs web-browser and can use the information system after successful registration. If any person is not registered, he has restricted access – he can only review and search electronic documents. These operations are included in a group number one – using them, it is impossible to modify data and users of this group are defined as visitors. The second group of operations includes the group number one and three other procedures – append, edit and erase. They are allowed to registered users, that are preliminary identified by the system and the system turns into so called administrative regime – an identified user can deal with all electronic documents using modules of the system and operations of group one and two. Every registered user employs his e-mail and a password to log in the system and after their validation can access the main modules. Using them, it is possible to create, modify and

erase electronic documents or only to obtain the necessary information concerning the following ten objects:

- ♦ Software products – the information about type, name, version, manufacturer, license, vendor, price, serial number and invoice number of each software product is proposed;

- ♦ Hardware components – information about name, characteristics, manufacturer, model, serial number and price are included for separate components;

- ♦ Storage media – it is defined by media number, type, capacity and free space;

- ♦ Guarantee cards – these cards are concerned to the hardware components, so corresponding data in the electronic document are: warranty number, vendor name, purchased data, expiration data, serial number of the component and internal warranty number (using only by the software company);

- ♦ Archives – they are intended to keep the data about software projects of the company, which have been used and include label, type, date and content of the archive, media number and set number;

- ♦ Computer systems – the most important data concerned to separate computers and computer systems are: machine name, net name, usability, type, domain and user of the computer system;

- ♦ Delivery – there are two aspects that have to bear in mind: the first is information about deliveries – date, product, price; the second is information about vendors – name and type. They are at the root of electronic documents, which are used by the software company to control this final phase of a purchase;

- ♦ Software projects – the data are closely connected with those of software products and have an additional information concerned to authors of the projects, scope, term, cost price and efficiency;

- ♦ Administration – this object is intended to process information about registered users – name, e-mail, occupation, position and password;

- ♦ Interconnections – the data are used to define hardware and software components of the computer systems to remove or add new components and give an opportunity to control usability.

The proposed information system for electronic documents management could be implemented in an international software company and the diagram in fig.3 demonstrates an approach for integration. Two additional servers are necessary to enhance efficiency and scope of the system as follows:

- ♦ Web-server with the operating system MS Windows NT Server and the Intranet server Internet Information Server, where all interface files of the system are stored;

- ♦ Database server with the operating system MS Windows NT Server and the Database management system MS SQL Server.

The clients of the system are two types:

- ♦ Local clients – they use the same local network as the servers used by the information system;

- ♦ Distance clients – clients, that can not use the same local network and access the system only by Internet.

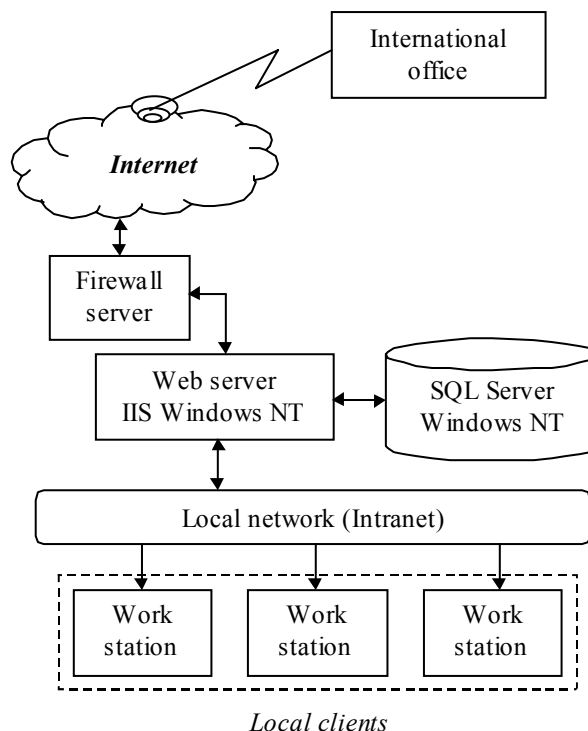


Figure 3.

As shown in fig.3, many users of an international office of the company belong to the second type of clients, hence the following two security levels could be used:

- Internet Information Server (IIS), which is an essential part of the Windows DNA-architecture. It must ensure high level security of the information system;

- Firewall server – the main role of this server is to isolate the local network from Internet. Thus it can control who has access to the private corporate network from the outside and is able to protect the electronic documents of the system against unallowed access.

IV. CONCLUSION

Electronic document management systems could be considered as a new class of information systems which deals with creation, management, distribution and updating of document-based information. The system, proposed in this paper is an approach to organize data processing in a software company using up-to-date methods and technologies and new tendencies in information systems development. The structure of different types electronic documents, which are processed using the system is in conformity with concrete requirements and could be easily transformed when it is necessary. In this way the system realizes a flexible mechanism of electronic document creation and management and is able to enhance the scope of the activities in the company. Recently two main aspects of authentication processes influence on Electronic Data Interchange. The first is authentication in the sense that the data content is correct and complete and the second – that the

correct identified person has issued the electronic document. Authentication as a whole could be realized by using cryptographic algorithms and protocols. In this connection, the proposed system could be accomplished with a PKI-system (Public Key Infrastructure) for digital signature generation and verification. The choice of a PKI-system depends mainly on the requirements of the public law for electronic document and digital signature and standards, announced by international institutions.

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