

PrimaDoc - Enterprise Information Management System: the project creation and implementation

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Abstract: The analysis of the problems that arise when implementing electronic document management systems at domestic enterprises. Shown incomplete and their functional difficulties that arise when implementing such systems. Therefore proposed to extend the scope of the processes of information management companies. A use project approach to implementation of information management companies.

Keywords: project approach, electronic document management, information management, knowledge base, implementing systems.

I. INTRODUCTION

It is impossible to talk about the transition to an information society while domestic enterprises not will effectively manage their information. In practice more than 40% of the time staff management structures spend searching for relevant information, whether the project documentation, records, etc. Realizing this domestic enterprises are increasingly paying attention to electronic document management system. The domestic market has formed systems such as UkrDok, Askod, DocsVision, Megapolis. Document, 1C: Document, Prof. Doc and others. [1-4]. But if you pay attention, and the extent to which these systems are used in various sectors of the economy, the picture will not joyful. For example, so far in higher education institutions (HEIs) electronic document management system - a rarity. This is due to several reasons: lack of available funds that universities could to provide for the acquisition of such systems; lack of electronic document that is created at the university. This system distributed as boxed software products are not satisfied with the administration of the university; the limited functions of software. They are mainly focused on the transfer of functions and control the storage of documents, rather than information management companies; Implementation of such systems often performed by specialists in IT most universities, not experts on IT project management (which are usually in higher education are not available).

In 2016 the leadership of the Kyiv National Taras Shevchenko University was issued to implement the task activities in the university system of electronic document. The authors examined existing electronic document management system, allowing them to allocate the above disadvantages. Given these shortcomings, it was decided not to go the

traditional way, and by employees of a university not just a system of electronic document, and management information system (MIS) University. This design approach applied during its implementation in the subsidiaries. The results of this project and the subject of this scientific work.

II. THE PRIMARY RESEARCH MATERIALS

For the development and implementation of information management concept was proposed, which included several fundamental decisions:

1. Management Information System should be able to: manage data communication at the university; implementation plan requests for information; manage electronic documents; control tasks (as reflected in electronic documents); conduct information storage.
2. The system should be cheap. Thus was created on a free platform: LINUX operating system; RDBMS PostgreSQL.
3. There must be two versions of the system: WEB-version for normal end users; Network version - to administer and work with documents that are not desirable to place outside the enterprise network (University).
4. Since there are different conditions of use of the system, different users vocational training system should be as protected from errors. You must make it as autonomous. Downloaded all the necessary information to work in "their" memory. The user worked with documents. Convinced that everything is done correctly. Sent to the server. Requires strong local cache.
5. The system should be as simple as minimum forms, fields, buttons modes. This is due to the fact that end users universities do not always work well with computers.
6. Inability to create a "good" system in isolation from end users (written terms of reference without developers are doomed to failure) to apply a flexible methodology of creating and implementing IT (eg, Scrum). This allows you to create and implement a system of continuous interactions of project management, developers, consultants, administration, end user.
7. To manage the creation and implementation of the system is necessary to attract professional project managers.
8. System should not just "distribute" documents, but also to control the process control tasks related to these documents.
9. Since this is a management information system it must maintain the structure and archive documents. For example: a

contract applications to the contract, acts of acceptance, bills, etc. And all should be interconnected.

10. Check the "boxed" version. Developed together with users must be responsible for the implementation of the system - adapt, adjust, supplement the functionality of the software to the needs of enterprises that implement the system.

Based on these conceptual solutions performed all the steps in the project creation and implementation of information management - PrimaDoc. Let us consider them in the context of the formal components of professional project management [5].

1. Organization Breakdown Structure (OBS).

Based on the fact that the project involved the university administration, service development software, support logistics, service system administrator, Center for maintenance and support of information systems, heads of departments, personnel departments OBS structure reflects the components that implement in terms of functions (Fig. 1): project management; system engineering; system implementation; teaching; operation; administration.

These functions are implemented by workers who carry out roles shown in Figure 1. Top-level roles performed by the authors of this work. In addition, every unit was responsible for 1-2. In total the project were about 40 people. End users was 650. Of these, 168 - active (those who receive information and make a) and 482 passive (those that only receive information).

The relationship between the roles and functions shown in Table 1. Usually these functions are performed at different times, at different stages of the project.

Due to the fact that end users about 700 people, their training, the establishment of workplace software, the transition to electronic processing different types of documents was carried out in stages. Consider these steps.

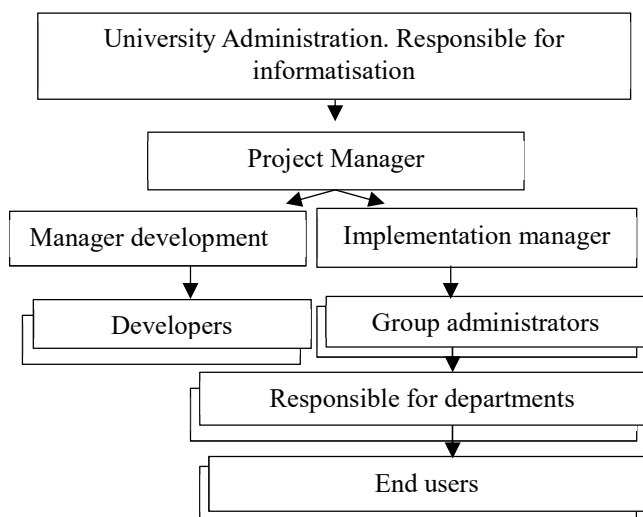


Fig.1. Organization Breakdown Structure

TABLE 1. The link between the functions and roles in the project creation and implementation MIS PRIMADOC

Function	Raleigh
Project management	Responsible for informatisation. Project Manager.
Development of the system	Manager development. Developers.
Implementation of the system.	Manager implementation. Group administrators. Responsible for units. Manager development. Developers.
Teaching	Group administrators. Responsible for units. End users.
Operation	Group administrators. Responsible for units. End users.
Administration	Group administrators. Responsible for units.

2. Project Life Cycle (PLC).

To minimize resistance university officials decided to perform system implementation stages. In addition to project management methodology used Scrum [6]. Using manifesto agile methodologies (Agile Manifest) [6] authors laid the basis of the following principles: focus on people (university staff) and improve communications between them, instead of building nadzhortkyh processes; focus on the product, not the writing elegant design documents that nobody reads; and those who develop the system, and those who will use it a team whose members interact and improve the product; should always be ready to change, because the system looks at users in the course of its use will vary.

Based on these principles in project creation and implementation of MIS were formalized following steps:

1. Create the demo system. Demonstration in front of key users and the university. Although the demo most of the features have not been implemented, but it shows what functions and how will be implemented. Thus it was confirmed autrans correct way and received clarification on the functionality of the system.

2. Development of the network version of the system, gradually training and the introduction of the work in key departments in the processing of external documents. This stage is describing the trends shown in Figure 2 and Figure 3. Figure 2 shows that the first study was conducted in key departments. And as the willingness of staff expanded the types of documents that are processed in the system.

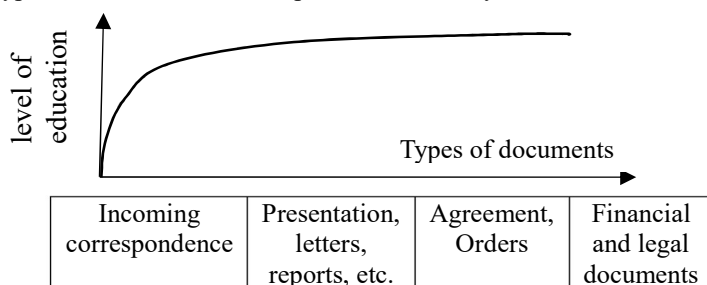


Fig.2. The relationship between level of education and the start of the MIS PrimaDoc with different types of documents

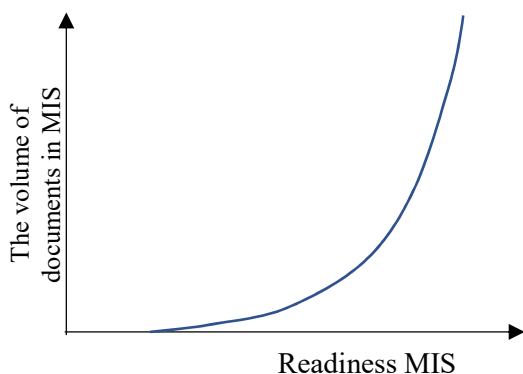


Fig. 3. The connection between MIS readiness and volume of documents processed in MIS PrimaDoc

Figure 3 shows the relationship between the readiness of the system and its use in the university. Indeed, even without a WEB-version, some functions are not implemented in the network version (eg archiving, automatic processing of emails, etc.) system is used in real life. It is important that in the process of giving users of sensible observations and thus improved the system itself. It was a joint project of developers and users.

3. Development of WEB-version of the system, training and implementation in all parts of the university.

4. Expanding the range of documents that are processed by the system.

5. Implementation backup mode information (before the new year).

6. Creating a maintenance document structures.

The establishment of a management structure of documents. When no matter what process is related to those or other documents, the user can obtain their relationship with each other (as already cited an example with the agreements, applications, certificates of completion and payment documents).

The relationship of the stages of system implementation are summarized in table 2.

TABLE 2. НАПОВНЕННЯ ЕТАПІВ ВПРОВАДЖЕННЯ MIS PRIMADOC

№	System status	Documents	Departments
1	2	3	4
1	Demo version	-	Rectorate
2	Depleted network version	-	The administration
3	Network version	External correspondence	Service of the rector, Vice-rectors, office of the
4	Network version and a prototype WEB version	External correspondence	The administration
5	Network and WEB-version	External correspondence	Faculties, institutes
6	Network and WEB-version	External correspondence	Faculties, institutes
7	Network and WEB-version	External correspondence	institutes

1	2	3	4
8	Network and WEB-version	Internal documents: submissions, letters, reports, minutes	All units
9	Network and WEB-version	Internal documents: contracts	All units

3. Reproductive structure of the project.

The project is developed by the information management system and implemented on the basis of the University information technology electronic document management. The macrostructure of the system is shown in Fig.4.

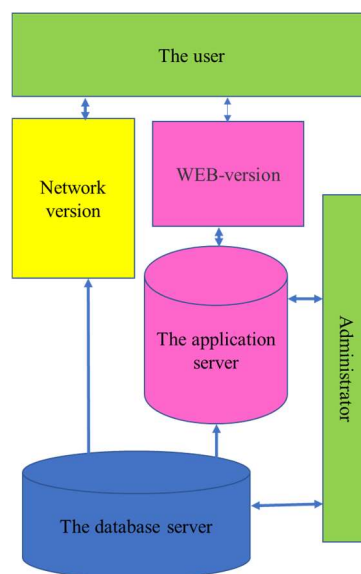


Fig.4.Macrostructure IMS PrimaDoc

This approach – in small steps, while developing, implementing, tuning, modifying allowed in a relatively short time (6 months) to develop and implement the system in all departments for the processing of all external and some internal correspondence (submissions, letters, reports, greetings, and messages).

And once again confirmed that agile is really a convenient tool for the creation and implementation of information systems and technologies.

TABLE 3. THE PURPOSE OF THE TABLES IN THE DATABASE IMS PRIMADOC

Table 1	Appointment 2
Table of the main database	
Dok	Register of documents
Dok 1	Attached files
Dok 2	Tasks
Manager	Reference users
Otdel	Reference units
Otvets	Reference responsible
MON	Directory of organizations

1	2
Stanv	The directory of state jobs
Status	Reference status of the documents
Outlook	Emails
Write Admin	The Protocol system work
Grup	Table of groups of correspondents
Grup_1	The content of the group of correspondents
Database tables of user data (local cache)	
T Dok	The registry of the user's documents
T Dok 1	Attached files
T Dok 2	The task of the user
T Bud 1	User-created files
T_Bud_2	User-created tasks

Notes:

1. Not described in the table that provide user authentication and data encryption.
2. In the local cache of the user table includes all of the system directories.

When the system information from reference books and information related to the field of user experience is downloaded to their browser (if it works in the WEB version), or network version of the system and becomes available for further work. In the database it is indicated that download information to the local cache. Until the user will return the data (this is done by pressing the "execution"), or they won't fire (button "cancel job") they are unavailable for change. However, if the same user logs on from another computer, the information will be forwarded to a new workplace.

In the software environment of the system are allocated to the communication with application servers and database; authenticating the user; determining access rights to the database and the permitted actions in the system; recording of all actions in the system; registration of documents; cancellation of documents; closing documents; creating documents; creating tasks; monitoring task execution; attaching files; management of addressees for the attached files; - creates the structure of documents; access documents via their structure, filtering and viewing of previously issued tasks; working with archive documents; system diagnostics; monitor the performance of users with the system (including statistics on work).

All these modules are implemented and developed in the environment of the PostgreSQL PL/PgSQL functions. Their total number is 66. WEB interface system receives data from the user and passes them to the application server to handle these functions. This provides a sufficient level of autonomy of the capabilities of the user and the required level of protection as software, and information.

4. Functionality IMS PrimaDoc.

System PrimaDoc is a simple, convenient, reliable and cheap. It was created not with a commercial purpose, and in order to streamline the document management in Kyiv national University named after Taras Shevchenko.

In the process of creating IMS PrimaDoc there is a need not only to streamline and automate the workflow, but the management of all information flows of the University. Including maintaining the structures of the documents for easy retrieval and safe storage. Also important is the monitoring of

implementation of the instructions contained in various documents or even arbitrary correspondence. Therefore, this system covers more functions than a conventional electronic document management system. In fact it is the information management system of the organization.

The system is designed based on open source (free) platforms: LINUX operating system, PostgreSQL DBMS. Has a very simple WEB interface (development language JavaScript), you can join through the most popular browsers: Mozilla Firefox, Opera, Google Chrome. Has budget merezhevi interface, which is based on MS Access (development language Visual Basic, Access). Network version is mainly used for system administration. To work with enough documents and WEB version.

Features and functions of the system:

1. Working with incoming, internal and outgoing documents.
2. Automatic registration (procedure and registration rules set by the user).
3. Encrypted locations and file names of the documents (by the user can encrypt any information that is in the system).
4. Work with a local cache. When users use all the necessary information is written to the browser. Therefore, even if it is disconnected, the user can do all the work. No information will be lost. Have pressed For follow up, and information is rewritten to a server (PostgreSQL).
5. Absolutely all user actions are logged. On the Protocol see: who, what and when did with the system. But the Protocol only sees the administrator.
6. Automatic distribution of documents in categories: not completed, completed, closed, created, templates, cancelled.
7. Unlimited number of users.
8. Each user can appoint a stand-in (supervisors – secretaries). Working under your login process the documents head.
9. You can specify alternative correspondents. The one who first opens the document, he is working with him. This is true at the level of heads and their first assistants.
10. Access by personal password even the administrator can not reveal.
11. You can set the order of consideration of the document, with the return, clarification, redirection, etc.
12. You can create groups of contacts for quick documents redirection.
13. You can check the implementation of the issued orders.
14. Processing both paper and electronic correspondence (emails are automatically downloaded into the system and routed to the document system by the reporters, which is set by the user).
15. All the documents reside on the control system. Controlled by who, when and what to do with the document (even if the user only opened it to view and do nothing with it).
16. There is a function diagnostic system of the database (who and what did wrong).
17. You can always get a Protocol to work with the system in the context of the chief correspondents on the subject: how many documents are issued or received, how many were revised, how many completed, etc.).

18. There are different modes of working with documents (read, forwarded, completed, canceled, returned, etc.). The administrator can introduce new regimes.

19. The system can each job to duplicate by e-mail to the contractor.

20. Have the opportunity to work with the structure of the documents in isolation from the processes in which they were created.

III. RESULTS OF THE RESEARCHING

As a result of implementation of the project was developed and implemented the information management system PrimaDoc.

The growth in the number of documents in the system shown in Fig.5. Features of the process of creating the system is that all actions carried out by a team of professional project managers and it professionals. Their cooperation allowed within the limited time and virtually zero financial resources to create, and most importantly to implement the multi-technology information management higher education. The experience gained and the developed software allow to hope for the dissemination of ideas, scientific and methodological developments, software and organizational mechanisms for the implementation of other projects.

Including the introduction of IMS PrimaDoc in other organizations of Ukraine. Order today for the introduction (and the team is not "boxed" version, and the project of implementation of IMS PrimaDoc) is already there.

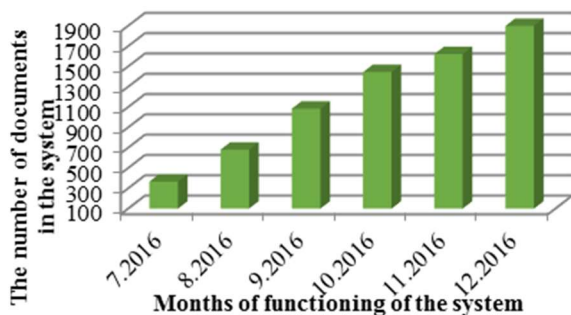


Fig.5. Monthly intensity of processing of documents in IMS

IV. CONCLUSION

Information is the main resource of any enterprise or

organization. Especially those who provides their livelihoods through development. And very dangerous is that sometimes the cost of finding the necessary information, its ordering, storage, handling exceed the benefits of its use. To avoid this it is necessary to implement specialized systems and technologies management of information resources of enterprises and organizations. The result of the work of the authors in this direction has shown that a truly effective system of information management of enterprises and organizations can be established on the basis of an integrated approach to the processes of development and implementation, to working as a team of experts in the field of project management and it professionals to participate in the development of both programmers and users, integration network system versions with WEB version, to realize the functions of information processing as the means, which contact with the user and in the environment of modern DBMS. And all of this can be established on the basis of open platforms. This system created by the authors of this work.

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