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MANAGING HUMAN FACTORS IN IMPLEMENTING ELECTRONIC DOCUMENT SYSTEM IN THE PUBLIC SECTOR

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Abstract
Document management underlies the activities of almost every organization. Correctly managed correspondence and organized document circulation characterize successful performance particularly in the public sector organizations. Even though production of documents itself is not the main task of governmental institutions, document creation and processing are crucial processes for the provision of basic functions in public sector. In the 21st century it gets more important to use the new possibilities offered by modern technologies, including electronic document management. Public sector itself is a heavy bureaucratic apparatus in the need of elasticity and ability to change its working processes and habits in order to gradually switch to the digital environment. Western European countries have already turned to electronic document management whilst most of the Eastern European countries, including Latvia, have just recently started a gradual electronization of document circulation. When implementing electronic document management systems in the public sector organizations, it often comes to resistance of the staff and unwillingness to change the accustomed methods of work – paper format document circulation. Both lower level staff and higher level managers put obstacles to electronic document management. In this article author inspects cases of successful practice and analyses possible action mechanisms that could convince public sector personnel of advantages of electronic document circulation and prepare them to switch to work with digital documents.

Keywords: Electronic document management, public sector, document management systems, electronic workflow, educating personnel

1. Introduction

The implementation of any information system is a responsible and important process. The implementation phase largely determines both further users' attitude towards the system and successful performance. When developing and implementing information systems, one must pay attention to great number of elements: business process analysis, financial aspects, platforms to use, system analysis, programming, testing etc. However, often among these important elements another factor tends to be forgotten – system users. Even the best projected and developed systems can fail if during the stages of system development and implementation the work with the users has been neglected.

All organizations, including the public sector institutions, gradually switch to partially or completely electronic document management. In Western Europe the shift was undergone during the last decade, but Eastern and Central European countries have activated the issue right now and are trying to apply principles of electronic document management to public sector. However, this process is not simple and presents several problems, for instance, lack of qualified software developers, financial and technical restrictions, but mainly – the unwillingness of users to change their work practice and habits. Exactly the last reason is one of the most important obstacles in further development of electronic public sector, and this article deals with this issue in a greater detail – how to manage human factors and improve the environment for the implementation of electronic document management systems.

In order to detail the problem scope and offer solutions, the author of the article uses personal experience of system analysis, software development and implementation gained in working in the public sector. Additionally the article contains good practice examples from specialists of implementation of information systems and document management systems' developers.

Many authors of specialised literature have paid attention to involving users into development projects of information system and training for the work with the software. However, mainly there are only some general advices, for instance, to involve the potential system users when running the acceptance testing. User attitude and specific wishes, on their turn, usually do not get special attention. The specifics of the analysed research target group – public sector institutions in Eastern Europe – also has to be taken into account – unfortunately these countries are on a considerably lower level of the IT development, if comparing to Western Europe or USA. Respectively, the workers in the public sector are less keen on using the computers and the attitude towards innovations is often plain aggressive. The author of the article pays special attention to features of document circulation in the public sector institutions in the post-soviet space and outlines directions of further development on the way to e-government.

2. Risks in implementation of electronic document management system

In order to apprehend the problems in question and the sphere of activity, one must first view the possible risk factors. Thorough risk planning during the initial phase of the project

allows avoiding many obstacles in the implementation of the new document management system. In the following we will inspect the most important risk factors related to users and their attitude towards the information system.

- **Weak legislation environment**

Public sector is a specific branch and the actions of its workers are regulated by a large number of legislative documents both on the state and individual institution level. Document management system can also be regulated by, for instance, document circulation regulations, record-keeping rules, safety policy, job responsibilities description etc. Public officials follow such regulation very thoroughly and do not want to change their working habits or accept alternatives – as an electronic document management. Respectively, the implementation of electronic document management system can be negatively influenced by the lack of basic legislative regulations on the state level and unadjusted rules and regulations inside the institution.

- **Low quality user training**

Nowadays almost every IT project contains user training sessions. Only in cases when the organization acquires a generally known out-of-box software solution, e.g. *Microsoft Office*, no user training is organized. However, user training can be conducted in several ways – both on high level and by paying necessary attention to it, and carelessly, obviously only for the fact of conducting the training itself. Often no direct user trainings are organized at all and the developers prepare a manual instead and assume that it would be enough for a basic user to get to know the new system and accomplish his/her functions in it. Probably this approach is cost-effective for some smaller information systems. However, document management systems are usually huge IT solutions, projected for the usage by several hundreds of even thousands of people and therefore they are complicated and functionally crowded. Thus the potential users when first seeing the voluminous manual even do not want to read it. Direct user training is also not always the optimal solution as many organizations conduct them very superficially in order to mark that there has been a training, e.g. for all the workers at the institution at once, even though there are more than ten or even hundred workers. Obviously this is not the correct approach of quality training and one can assume that after such training most users' attitude towards the system will not be positive.

- **Indifference of managers**

Every IT project is based on humans. Also in public sector the suggestion to acquire one or another information system comes from the staff, usually – from the IT specialists. If in private sector software acquisitions are usually initiated also by managers, then in the public sector higher lever managers are usually occupied with their direct responsibilities and are almost never interested in IT solutions. Often they think that IT solutions function for itself (e-mail, internet). However, it is the higher level managers who are entitled to meet decisions about acquiring new purchases or starting projects. Respectively, it is them whom the IT specialist has to convince of the need to spare some financing and acquire an information system. Though convincing the managers and getting the financing is not enough – the manager has to show

some interest or support to the project during the whole process, but especially – during the implementation. If users see or learn that the manager does not use the new software, they automatically assume that they do not have to do it as well.

- **Traditions of document circulation in the public sector**

Public sector institutions can be regarded as the most conservative organizational group at all. Similar incredulity against new information systems exists only in banking sector. Since ancient times the officials have been used that they work with documents – with paper, respectively. There are papers on the working desks, huge amounts of paper are being printed, coordinated, placed in folders; notes are being taken in paper notepads, and the document search means searching through piles of paper. In the age of modern technologies such approach can seem foolish but one has to take into account that it is not only traditions determining it – in some ways working with paper documents has always been and will be more comfortable than the most elaborate document management system. Miles L. Mathieu and Ernest A. Capozolli even forecast that in the nearest future the situation will not be changing rapidly and electronic document circulation might not come to reality.

> Reality has proven that a paperless office has been impossible to achieve thus far. Today's individuals, computer savvy as they are, have shown they are unwilling to give up the convenience and low cost of paper for more cumbersome and costly digital display devices. Individuals have also relegated printers, copiers and fax machines into the "for granted" category, believing one belongs on everyone's desk. Until digital display devices transfer data from computer to medium as simply as printers do with paper, the paperless office may never be a reality. (Miles & Capozzoli, 2002)

3. Suggestions for a successful transition to electronic document management

Many authors regard involving users into different system development and implementation phases as the key to success. Already in 1995, when different information systems were very far from the highest peak of their popularity, the prestigious magazine *Compuworld* wrote about user involvement in software development: „Involving users early on to speed up systems development isn't exactly new advice. Still, it remains something many IS developers fail to do on a regular basis because „it takes more time initially. You can't just sit down and code"" (King, 1995, pp. 77).

User involvement has also been emphasized in order to ensure positive attitude towards the newly implemented system: "Users do not make best use of information systems unless they feel that these systems have been designed with their involvement and in their interest" (Nolan & Fung & Brown, 2002, pp. 63).

One has to take into account that in an optimal way users have to get involved in the IT project as soon as possible. In many places there is praxis that users (in reality only a minor part of them) first see the system during the phase of acceptance testing. Though this is not the worst case since the users can still express their opinion and indicate errors or mistakes in the system. However, it is not possible to perform any significant changes of the system at this

stage anymore. For user involvement in different phases of an IT project several methods can be used.

> The way to be user-centered is to involve users and pay attention to their views. This can include a variety of approaches, from simply observing users' working practices as part of collecting system requirements, to using psychologically based user-modeling techniques, to including user representatives on the design team. More important, users should be involved in the testing and evaluation of the system during its design and development. (Stone & Jarret & Woodroffe & Minocha, 2005, pp. 17)

In order to comprehend the processes of document circulation in an organization and offer an optimal alternative – electronic document management system, the developers would have to spend lots of time for system analysis and evaluation of the current situation. It is not enough to have discussions with IT staff only (since they are sometimes not related to document circulation) and record managers (who in their turn are so familiar with document circulation that they cannot pictures themselves in the role of a standard office worker). It is necessary to acquire information from other potential users of the system. Interviewing particular workers or groups of workers or surveys might be used as methods for this task. If safety policy of the institution allows and no workers are against it, it is advisable to conduct staff observation. This method can prove to be especially helpful during the implementation and usage of pilot versions of the system (if intended).

> Going to observe users in their natural setting – observing them while they are doing real work in their real working environment or using a home system in their homes – is an essential part of user-centered design. In addition to finding out what users do, you can also discover what aspects of the current system they like and dislike. (Stone & Jarret & Woodroffe & Minocha, 2005, pp. 29)

As one of the most important recommendations we have to mention the need to individually train as much system users as possible. When an organization acquires a new system, usually it is being inspected only by managers, record managers, and possibly IT staff who will have to administer the system in the future. Yet one cannot forget all the other system users. In many institutions there is an opinion that user manual, provided by the developer, is enough for basic users. However, one has to reckon that in the user manual the supplier or the developer describes only the system functions, respectively, which button to press in order to navigate between forms etc. Yet, for the users the context between processes is much more important, since they have to work with specific tasks, for instance, to create a return letter. An instruction on how to do it might as well be *scattered* between different parts of the manual because the description of the process can be found on different programme windows. Another wrong approach is to organize one common user training for all the staff where they are being carelessly informed on the fact the institution now has a new document management system, that it can be used for different functions and from now on everybody has to use it. Even if amongst the staff there are people who are capable of learning to use new software fast, most of the staff will not ask any questions, postponing them to the moment when they will really start working with the system. This is the moment when they call the IT specialists or the office clerks who in their turn have to carry out an individual training on operations of the document management system. The experience of the article author that has been gathered during

several years indicates that document management in the public sector is a process important enough to spare time for individual trainings for the users. Usually it takes up to 30-40 minutes but the prospective time savings are worth the investment. It is very important that the users are being trained according to their position in the institution. For instance, senior officers and other lower lever workers of the hierarchy will be using different options of the document management system than the middle level managers; higher level managers, on their turn, will be interested in functionality of various monitoring options, assignation of resolutions and control mechanisms etc. The only common elements for all users are basic system actions and document search.

For the specifics of public sector institutions – much more than for the private business companies – it is necessary to gain support of the management for the processes in the institution, including the transition to electronic document circulation. Therefore as a very important example of good practice one has to mention management involvement into planning document circulation and implementing electronic document management. In order to achieve it, one could have to go through several stages. First of all, the management has to be convinced of the need for the electronization of the document circulation. Heads of institutions are not always competent with modern technologies and mainly do not fully comprehend the potential gains. Therefore there is a need for a person who is capable of comparing the current situation of an organization with its possible status in the future, when electronic document circulation could be carried out. It is important that this person is not a marketing specialist or software supplier for any of the companies distributing document management systems – in their presentations they basically tend to concentrate on design details and use common arguments, like, “electronic document system will save money for you” or similar. However, a long-term employee of the institution who has full understanding of workflows and organization processes in the institutions is capable of giving real examples and explaining to the management what changes are to be expected. If possible, management has to get involved into process planning, purchase and testing of the electronic document management system. One has to take into consideration the peculiarity of public sector that it is the like or dislike of the head of the institution that determines further destiny and success of the system in the whole institution. If the head of the institution who is the only one having the authority to sign, will not be willing to edit and sign documents electronically, then all the other staff will have to continue creating letters and regulations in paper format. Involving the responsible managers into the project already during planning and testing stages can bring up ideas of how they want to see their electronic workspace to look like and how to structure the information so that it would be comfortable to use.

As one the examples of good practice document management system developers, for instance, *Optical Image Technology, Inc.* (Docfinity, 2012) often name the possibility to implement document management solutions gradually. Thus functionality modules can in the beginning only get used partially. One can start with document input, saving and output. In this case there is the problem that users will learn how to work with the system *incorrectly*. And in future it can be much harder to make them change habits and start using additional functions of the document management system. For instance, the institution decides to start using the document management system and create and store documents in the classified folders

electronically. However, this workflow functionality will have to be started by the next year. Therefore the users get used that after creating a document it has to be printed out, reconciled and signed on paper. Also the managers get used to this process and afterwards they do not want to reconcile documents electronically. Therefore the author of the article recommends to thoroughly consider if there are significant obstacles and the system has to be implemented partially, thus distorting business processes of the institution. Perhaps a far better solution would be to spare some more time for staff training on all functions of the system and migrate to an electronic document management somewhat later – when everyone conceives what and how has to be done and what is expected of them as of system users.

For the institution staff to support the electronic document circulation and system, it is valuable to start using the system for their everyday tasks, replacing e-mail. Nowadays in public sector most of the information circulates in two ways. First one is e-mail that is being used for forwarding huge amounts of documents and their different versions. Another one is shared server folders, far less used for the sheer process of workflow organization. They are mainly used for the storage of completed documents or their final versions. A modern document management system supports document editing in groups or collaboration. There is, for instance, such project function that allows organize documents as electronic environment of a particular work group. In this case there would be much less data sent per e-mail (one cannot forget the fact that there are backup copies created for e-mails and the increase of their number reduces performance of both servers and user computers) and documents would be accessible to all group, not only to some of its members. Any modern document management system surely supports versioning of documents and therefore anyone can use document management system for a gradual document creation with options to view what changes have been done, by whom and when. In the coming years it will be hard to prevent the fact that people will continue to prefer printing the documents and reading them on paper – most people think it's more comfortable. "In fact, studies have even shown that people are able to retain 30% more information if it is shown to them on paper than if they see it on a computer screen" (Miles & Cappozzoli, 2002).

One of the most important factors that have to be paid attention to in the development of electronic document management system is the usability of it. The system can be exceptionally rich and voluminous with function but still the first thing the users see is its interface. The fact that the usability is closely related to user satisfaction has been emphasized also by Debbie Stone, interface specialist.

> A computer system that is usable in one context, may be unusable in another. As a user interface designer, it is important to consider the context in which the system will be used. A user interface that users find pleasurable is likely to be more acceptable than one that annoys them. Users are more likely to use a computer system that they enjoy than one that irritates them. Contented users are likely to be more productive, so usability is clearly related to user satisfaction. (Stone & Jarret & Woodroffe & Minocha, 2005, pp. 7)

Undeniably significant role in gaining users' trust is played by high-speed performance as well – nobody likes being held up. Ralph Stair and George Reynolds mention that user satisfaction with the system is directly related to its quality, or precisely, to four properties:

"User satisfaction with a computer system and the information it generates often depend on the quality of the system and the value of the information it delivers to users. A quality information system is usually flexible, efficient, accessible, and timely" (Stair & Reynolds, 2011, pp. 59). Developers of document management systems do not always rank usability in its list of highest priorities. This is caused by the principles of public sector purchases – when purchasing an information system, the requirements are mainly functional and technical (high-speed performance, maintainability, restorability etc.). As can be seen, the emphasis is on measurable criteria, not usability – it is hard to measure or cannot be measured at all. Therefore the developer will never decrease the performance of the system if that would be necessary to improve its usability. This has to considered as a significant problem that indicates lack of comprehension during the transition process to an electronic document management system. Also Wilbert O. Galitz emphasizes that a system has to cover the needs of the customer's users, not developers.

> All users, including customers and other interested parties, today expect a level of design sophistication from all user interfaces, including Web sites. The product, system or Web site must be geared to people's needs and the system's goal, not those of the developers. (Galitz, 2007, pp. 62)

In order to make electronic document management system reality, it is not always necessary to start with projecting an information system. Almost always when migrating to electronic document management system, the public sector institution has to change its business processes. There is no need for a system that only duplicates paper document circulation and thus causes more work, or a system that is complicated to use and cannot be fully used in conformity to usual document circulation model in the institution. Often business process optimisation is needed. For instance, electronic document reconciliation has almost no sense if afterwards the document in question anyway has to be printed and signatures have to be collected on paper. Optimizing business processes could gradually lead to creation of automatic work flows in the document management system that would in the future facilitate processes of document registration or creation. In frames of the same business process optimization it is necessary to create and always maintain a clear vision on who is responsible for document management. People in the public sector have to understand which person or at least which structural unit is responsible for document circulation. Especially important it is for new members of the staff who have until then not worked with the bureaucratic apparatus in the public sector and who do not have the comprehension what difference there is between a regulation, order, instruction or a letter. Mainly in ministries record-keeping sections are responsible for document management and it is also their task to develop an order for document circulation that can be then presented to all staff members.

In order to standardize information exchange between interested parties, a mutually accepted document management terminology has to be used. Problems arise when staff members connected to document circulation cannot understand each other because of differently used terminology. For instance, an records keeper and an IT administrator (who possibly administers the document management system) have fundamentally different opinions on what is to be called a 'file'. A basic user often sees no difference between 'putting a visa on' and 'reconciliation'; however, from the document circulation point of view these are

two different processes with different purposes. In order to avoid potential misunderstandings it would be recommended to include a chapter with definitions and explanations into the order for document circulation. Misunderstandings can significantly influence future prospects also when the institution purchases or develops new document management system and uses different terms than those used by the suppliers/developers of the new document management system. In such cases before starting the project it is recommended to agree on a common basic vocabulary.

4. Conclusions

Managing human factors is one of the most important tasks to make a document management system get recognized and used at all. Public sector institutions are not typical business organizations whose workers are profit-guided. Unlike them, to motivate staff in the public sector it is not enough to present a return-on-investment chart showing that the system will pay off in one year. Habits and traditions are more important in the public sector. However, as everywhere else also in the public sector there will be both supporters and opponents of the implementation of new information systems.

> In the worst of cases, individuals will react negatively to change and they will resist using the new system. In best cases, they will incorporate the new system into their work habits as long as they perceive that the supplementary effort needed to learn it and to use it is worthwhile given the perceived usefulness of the system. (Carey, 1997, pp. 163)

When planning the transition to electronic document circulation, it is not enough to purchase or develop a document management system. It is a long-haul project making the institution to perform both organizational and technical changes. In fact, it is a continuous and never-ending process since the technological progress persistently asks for changes also in the institutions that have long undergone the transition to electronic document management. For example, for states of European Union it is now especially current to ensure mobility and public sector workers want to access the documents of their institution from anywhere, using mobile phones, tablet PCs or notebooks. Therefore it is necessary to adapt the document management systems for operations in public network. However, despite the rapid development of technologies, there is still a long way to a completely electronical document management system.

> Modern society may be far away from the day when one can reach into a pocket and unfold a viewer in order to show a store clerk, boss or friend notes made on a digitized piece of paper. Office workers are closer, however, to the day when they can plug a viewer into their computer, access the daily paper of choice, and download the information before they go to work and society accepts this as the normal routine. But until the day when digital viewing devices are as simple to use, disposable, storable, and as widespread as paper, there will never be a truly paperless environment. (Miles & Capozzoli, 2002)

In spite of different sceptical opinions, electronic document circulation will sooner or later reach public sector institutions. However, in order to make it happen, it is necessary to head towards e-government both on the level of the state, as well as in every separate institution. As

recommendations for further research the author can mention electronic document management development trends regarding the IT progress, problem scope of the electronic signature, as well as possible case studies about transition to electronic document circulation in different governmental institutions – both in ministries, and in state agencies and services. The topicality of the research subject remains intact as public sector institutions have always worked with documents and document management will always be the main supportive process in public sector.

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