ELECTRONIC DOCUMENT MANAGEMENT OUTSOURCING AND CLOUD-COMPUTING POSSIBILITIES FOR PUBLIC SECTOR

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Abstract: *Over the past few years cloud-computing has become one of the most popular trends in information technologies. Its possibilities are used for the virtualization of different informational systems. Several developers also offer the usage of electronic document management systems "in the cloud", claiming it is a cheaper, safer and more user-friendly solution allowing productivity growth and resource saving. Regardless of many available options most organizations choose to maintain document management as a supportive process with its own servers and staff. Public sector can be viewed as a special group of organizations in this aspect. For them document management systems are significantly more important and complicated than for commercial enterprises. This article deals with the possibilities of document management system development or migration to cloud-computing and outsourcing the document management system as a support process. Special attention has been paid to details of document movement in governmental institutions, as well as to the example analysis from practice. The article inspects electronic document management in Latvian governmental organizations and marks out cloud-computing perspectives in the coming years.*

Keywords: electronic document management, public sector, cloud-computing, outsourcing.

Introduction

During the last few years cloud-computing has become the most popular direction in the IT industry. More and more companies offer cloud-computing services. According to world's most influential analytic company *Gartner*, cloud-computing has been the most important IT sector in 2011 (Pettey, 2010). However, *Gartner* forecasts that in 2012 it will pull back to position 10, giving way to different mobility solutions and gadgets as tablet PCs, smartphones and their corresponding software (Pettey, 2011). Though David Cearley, the Vice President of *Gartner*, claims that next year exactly the cloud-computing will become the most important battle field of such IT giants as *Microsoft*, *Google*, *Amazon* and others. The Vice President of *Gartner* particularly emphasizes the private-public cloud-computing solution development that would increase the level of safety and governance (Cooney, 2011).

Governmental institutions can be viewed as a particularly important group of organisations. Public sector pays special attention to data safety and the consequences of data loss can be very severe. As an analogue in business sector, banks could be mentioned because they also take notice of safety and stability aspects on a very high level. Governmental institutions could also be regarded as the most conservative institutions at all. Their work processes are regulated by huge amounts of different documented procedures and laws and regulations – both on the level of state and the institution itself. IT processes are no exception – actions in informational systems and data safety are regulated by safety policy, data restorability plans, working orders etc. Therefore it is not a surprise that governmental institutions choose to hire staff for the development and maintenance of information systems.

In the last years the global crisis has substantially influenced lots of countries, including Latvia. In order to improve the financial situation it is needed to undergo several consolidation procedures and look for solutions that would allow saving budget resources. Governmental institutions and their bureaucratic apparatus have always been viewed as one of the biggest consumers of state budget. Therefore the consolidation procedures are mainly applicable to the state administration. For several years there have been active discussions about outsourcing a number of state administration functions. One of the most frequent suggestions is the outsourcing of IT services. There is no unambiguous answer to the question if it would be financially beneficial. In this case it would be not enough to count together the costs of software licences, wages for the IT staff and hardware maintenance costs in every institution and compare this number to the one in a contract offered by a big IT company. Several other important aspects have to be taken into account, for instance, service quality, sphere of activity.

Initially cloud-computing services were not intended to be used in document management (DM). The only company developing this idea was *Google* with its office software package on the internet – *Google Docs*. However, in no shape it could be considered as a full-fledged document management tool. Gradually other solutions have been developed and they have started to compete with local document management systems. "After a somewhat primitive start, cloud services have burst onto the marketplace with products suited to just about any DM need, from individual users handling their personal files to huge multinational organizations seeking compliance with document retention and discovery regulations. To take advantage of the cloud's

largesse, however, you have to know what you're shopping for, or you'll find yourself drenched in confusing product pitches." (Beckman, 2010)

Document management is surely the most important supportive process in the public sector. In every institution there are several hundred documents created daily. In order to prepare and structure this amount of information, it is not possible to avoid using electronic document management systems. Mainly document management systems are bought in public purchases, but afterwards they are maintained within the particular institution. Since document management system is only one of several informational systems maintained in every public institution, in theory it could also be migrated to solutions offered by cloud-computing. Would it be necessary? Both followers and opponents of this idea have substantial arguments. In the following we are going to cover the most important advantages of outsourced document management, as emphasized by the service providers, but – viewed through the prism of governmental institutions. In order to comprehend advantages and disadvantages better, it is necessary to subdivide four different options available for document management:

1. Full outsourcing of all document management processes, starting from the registration, continuing with the document circulation, and ending with the archiving. In this case the role of records managers in the institution itself becomes substantially smaller, but also the institution loses its own power to control its business processes.
2. Outsourcing of all IT services related to document management. In this case software-as-a-service (SaaS) document management systems and IT specialist staff of the service provider are being used. Nevertheless, document management processes take place in premises of the institution using the provided technologies.
3. Using an SaaS document management system but trusting its management to own IT specialists and records managers. In this case one has to reckon that there will not be many options of modifying, configuring and taking actions in the system because the service provider will not give the IT staff of the client access to the data bases or for the additional programming tasks.
4. Using a local document management system maintained by the IT staff of the institution. Until now this solution is the most popular among public sector institutions.

When promoting their SaaS document management solutions, the developers use wide choice of descriptive terms in order to positively characterize advantages of the using of their systems. It is easy to get confused in this amount of offers and to apprehend the promises as reality. However, most of these promises cannot be attributed directly to document management in a cloud and correctly applied to the public sector. Let us take a look at the most important arguments for choosing to outsource the document management process or to use technical solutions of cloud-computing.

1. Main advantages of outsourcing and cloud-computing

1.1. Avoiding technical decisions

Several factors have to be taken into account when choosing a solution for document management system. One of these factors is the choice of servers and platforms. In case of an outsourced solution this has to be fully taken care of by the service provider and the client only sees what end product has been delivered and used. Thus servers and updates of their software is fully the responsibility of the service provider. This is a very important reason if the institution is concerned of its IT competence or it just lacks human resources needed for the server maintenance. Along with this argument we can mention the cost factor because, when maintaining servers for a local document management system, the institution also has to pay for the software licenses of the servers and their maintenance (consumed electric energy, space in the server room etc.). Also the wages for the IT staff cannot be forgotten. However, financial gains cannot be calculated this unambiguously. It has to be taken into account that also the costs of cloud-computing service provider are the same; therefore it is possible that similar costs will come up in the service contract as well. Furthermore it is likely that the same servers in the cloud will be used by other organisations and their performance can thus be influenced negatively.

1.2. Specialist help in the optimization of document circulation process

Large part of companies offering the outsourcing of document management process agrees to assist in arranging the organizational processes and involve their specialists. As a positive aspect of this we need to mention the solution implementation experience of these specialists gathered in other companies. Of course, the overall experience and stability of the service provider have to be considered. As the main disadvantage in this case we have to name the specifics of document circulation in governmental institutions. When optimizing and digitalizing document circulation in public sector, it is not productive to use the same methods as used in the companies of private sector. There are specific document management principles in the governmental institutions and analogues cannot be found in the private sector. Therefore it cannot be guaranteed that external service providers will be capable of fully understanding the situation and using their experience. The experience of the author of this article that has been gathered in developing and implementing document management systems proofs that, even when involving qualified and experienced specialists and protractedly researching

work processes of a governmental institution, it is possible not to obtain an optimal result – an adapted document management system that fully complies with the work processes of the organization.

1.3. Short implementation period

The relatively short time needed for the implementation is often named as one the main arguments for using an outsourced document management solution. Many service providers promise to prepare the environment and implement the system even in a week's time. This can be possible because of the factor that the system does not have to be programmed from a scratch. However, this argument is again only attributed to small organizations with a simple document flow. Document circulation in governmental institutions is that complicated that its implementation into any system, even in a ready one, can take months.

1.4. More comfortable document access for end users

Currently in the public sector one can notice a trend that all the work with the documents is being carried out only by the records managers and particular workers in every department. End users only prepare the documents and deliver them to the mentioned particular workers for further formatting, structuring and classification. This kind of approach is considered as very comfortable by lots of people. However, it does not conform to the best practices of document processing. The main problem is that the document search in this model has to be carried out by using the services of records management division or few workers. End users do not possess the tools and access rights or do not have the interest in looking for the necessary documents themselves. Outsourced document management solutions often emphasize this problem and promise that end users – every worker of the institution respectively – will have access to the document management system and to a wide choice of tools for searching, structuring and developing the documents. Nonetheless we have to take into account that this argument could also be used by any local document management system distributors as well and it is in no way specific for outsourced solutions only. Every contemporary document management system enables creating documents, structuring them into folders or by types, indicating metadata and searching by them, and giving access rights to the end users.

1.5. Following the advices of good practices

When promoting solutions of cloud-computed document management, their developers often emphasize that document circulation in the target organizations is wrong and does not comply with the so called advices of good practices. Only few of the organizations happen to have enough resources to perform a full-fledged informational governance. As mentioned before, system developers offer the help of their specialists who would carry out an investigation of the system and prepare an exact transition plan that would cover aspects of information safety, life cycle of the documents, potential costs and risks. Same as the previous argument, this aspect also does not refer to the outsourced document management process only. Also when acquiring and implementing a local document management system, the developers almost always offer the help of their specialists for the phase of system implementation. Surely, we have to take into account that it is never advisable to give all the access to external specialists and rely on their competence only – not always do they have the knowledge of complicated document circulation processes of governmental organizations.

1.6. Decrease of the amount of paper documents

When promoting the cloud-computed document management solutions, their developers mainly emphasize general advantages that would arise if transferring to electronic document management. Even though the decrease of the amount of paper documents is one of the objectives when implementing an electronic document system, there is no difference if a local or a cloud-computed document system would be used.

1.7. Document accessibility

We are living in the age of mobility and devices with the access to the internet are very popular – for instance, tablets, smartphones, and laptops. Workers in the public sector also want to access their work information during different workshop meetings, when visiting other institutions or being on a business trip. In this case cloud-computed document management system solution is a very comfortable one because it can be accessed from every part of the world where there is an internet connection. This advantage of the cloud-computing has been noticed by the local document management system developers as well and they are adapting their products so that the information would be accessible also on the public network. Majority of the contemporary document management systems already enable the portal function that makes the information accessible from the internet as well. However, in this case the IT staff of the institution have to spare extra time and find server capacities in order to ensure that the document management system can be correctly accessed from the outside (firewall, access addresses, configuration of user rights etc.). Therefore document accessibility has to be considered as one the most important advantages for choosing a cloud-computed document management system. Nevertheless we

have to take into account the fact that these functions can also be provided by local document management systems.

2. Problems with outsourcing and cloud-computing

As can be seen, there are rather many reasons for choosing a cloud-computed document management system. Nevertheless, there are also significant contra-arguments. In the following we will cover them in a greater detail.

2.1. Data safety

Every organization is worried about the safety of their data. However, in this aspect the public institutions have special requirements and pay particular attention to information safety. If using a local document management system, document safety and usage is the responsibility of the local IT specialists, office clerks and in some cases – internal auditors. Yet when the outsourcing of document management has been chosen or a cloud-computed document management system is being used, the responsibility of data safety has to be transferred to an external company. In their turn the developers are not always ready to accept the strict data safety requirements from the side of governmental institutions. For instance, if the document management system among other things will be used for registering applications and submissions from private persons and their corresponding private data, including the person ID, the system has to comply with the prescribed safety requirements. In Latvia personal data protection and usage is regulated by the Law of Data Protection of Physical Persons (Fizisko personu datu aizsardzības likums): "Clause 13.1. Person identification codes may be processed in case if:

1. The data subject has agreed to it;
2. The procession of the identification codes derives from the objective of personal data processing;
3. The procession of identification codes is compulsory for further ensuring of data subject anonymity;
4. An admission of Data State Inspectorate (Datu valsts inspekcija) has been received." (Fizisko personu datu aizsardzības likums, 2010, Latvian)

As one can see, in order to store personal IDs in the document management system (for instance, for the identification of mail addressees), the only available option is to obtain an admission from the Date State Inspectorate. Before issuing an admission, specialists from the Data State Inspectorate control the systems and server infrastructure safety in question. Therefore it is almost impossible for governmental institutions in Latvia to use cloud-computed solutions offered by foreign companies, but cloud-computing software-as-a-service choice in Latvia is very small or even non-existent. However, we can find offers for infrastructure-as-a-service (IaaS). In this aspect one of the pioneers in the software branch would be *Microsoft* who are going to launch the newest office software version *Office 365* in the cloud.

2.2. Emergency reaction time

However good an information system would be, one still has to consider several possible risk factors anyway. For critical information systems in business it is especially important to ensure the runtime uninterruptedness; and document management systems in public sector are ranked exactly in this category. In case of serious errors (server failures, for instance) the IT staff can immediately start the problem elimination in a local document management system. If a cloud-computing solution is being used, it takes time to report the problem, review it on the side of the service provider, and start its elimination. Moreover – it takes even more time while the provider reports the problem is solved, and the client checks if everything is working properly now and reports back on the status to the system provider. It is clear that emergency reaction time is much shorter in the case of a local document management system, if compared to an SaaS solution.

2.3. Performance

During the last few years Latvia has been one of the world leaders in internet speed, according to the latest data by Net Index: beginning of 2012 – fourth in the world after Estonia, South Korea and Lithuania (Net Index, 2012). However, we have to take into account that in case of identical parameters, system requirements and server devices a local software solution will always be significantly faster than a software being used via public network. This is caused both by the internet speed that is not always stable, connection speed on the sides of provider and client, and also by the relatively lower technological performance of the internet sites if compared to locally installed software solutions (most of the SaaS document management solutions are constructed in the web page view).

3. Global and local tendencies of the transition to SaaS document management

The significant impact cloud-computing has on the IT industry in general has been noticed also by the institutions regulating the policies and regional development directions, for instance, European Economic and Social Committee. In their report "Cloud computing in Europe" they emphasize the necessity to develop a legal

basis and standards for the usage of information systems in the cloud: "The global character of cloud computing calls for global principles and standards to be elaborated. The European Union must continue to work together with international organisations on developing such principles and standards. The EU must spearhead efforts to develop global principles and standards and stand as guarantor to ensure that these provide the high level of personal data protection intended by EU legislation." (European Economic and Social Committee, 2011) However, the report also indicates that the cloud-computing branch is not yet fully developed and it has many flaws regarding its usage in public sector:

"Cloud computing has, to date, shown that it lacks maturity and has a number of weaknesses:

- the profusion of standards designed to regulate and control the use of CC;
- the absence of an identifiable European governing authority to enforce these;
- users, especially private individuals, lack the broad perspective needed to assess the benefits and, above all, the risks involved;
- the intrinsically fragile nature of the internet (interrupted service due to incidents, cyber attacks etc.);
- internet congestion: sluggish performance and strong growth in traffic (audio, video, spam). Limitation of the address system (IP);
- server congestion: the pooling of server resources and the resultant overbooking can trigger bottlenecks;
- the risks relating to the outsourcing of data and processing to a third party;
- the risks relating to the relocation of data and processing to another country which has another system of law;
- the social risk arising from the concentration of development, hosting and operating activities;
- the rights and obligations of both users and providers of cloudware are still unclear;
- there is no unambiguous distinction between the person responsible for processing personal data and the person actually doing the processing;
- service-level agreements are complicated and even incomprehensible for non-experts with respect to the composition, processing and transfer of user data and to users' legal rights." (European Economic and Social Committee, 2011)

During the time the leading institutions are still resolving if it is necessary to evaluate advantages of cloud-computing, the service providers have already formed their opinion and it is clearly in favour of SaaS solutions for the public sector: "Choosing Document Management solutions in the form of Software-as-a-Service is a smart option for many government agencies. After all, federal and state governments produce large amounts of paperwork and electronic documents that need to be tracked and organized. However, developing complex systems to manage documentation can take up a great deal of time and money. Choosing SaaS Document Management allows these organizations to save money and implement their systems quickly and more effectively. Plus, Document Management as SaaS means that important documents can be accessed at any time, from more locations other than just the office computer. As more employees work remotely and need to access document while traveling, this improves efficiency." (Greif, 2010)

If considering other groups of organizations with equally high requirements as public sector institutions, it can be seen that they are not hastening the transition of document management systems to cloud-computed solutions as well. Banks that are always mentioned as a striking example are usually maintaining all of their information systems locally – because of safety issues. Another instance could be organizations in the legal sphere, for example, law offices that are also vitally concerned about the safety of their data. The company *The American Lawyer* issued its annual study on companies in the legal sphere and their development of the IT (The American Lawyer, 2011). It is interesting that the study emphasizes the progression towards the cloud-computed solutions – because of lower costs. However, if inspecting the results in a greater detail, one can see that only few of the companies have chosen to transfer their document management solutions to the cloud (see Figure 1), and the reason behind it is the low level of data safety.

Similar results have been achieved by AIIM, one of the biggest research companies of IT trends. In their industry report of 2011 "State of ECM Industry 2011" they analyse the transition of different enterprise content management (incl. document management) functions to cloud-computed solutions (Miles, 2011). As can be seen in Figure 2, currently the content management functions are being outsourced relatively seldom. Moreover – document management ranks in one of the lowest spots on this list.

Globally there are relatively many options of different document management systems based on the SaaS principle. Most notable of them can be seen on the webpage of SaaS Directory – „Compare the Best Document Management Software" (SaaS Directory, 2012).

The situation in Latvia is crucially different because until now most of the local IT companies have not set cloud-computing as a priority. Didzis Šimis, CEO of *HORTUS Digital*, provider of multiservice IT solutions , says: "In Latvia, there are almost no specialists capable of building up a "cloud". Building of an internal "cloud" (for one company only) is unreal. "Cloud" efficiency requires dimensions." (Nozare.lv, 2010, Latvian)

Currently from cloud-computing services in Latvia you can find mainly Customer relationship management (CRM) solutions in the cloud – for instance, VivaCRM - https://www.vivacrm.lv (VivaCRM, 2012). Wide choice of solutions for e.g. book-keeping is offered by the company *Hortus Digital* (Hortus Digital, 2012). However, the user reports on the internet, when evaluating the experience of using the SaaS services based in Latvia, are mainly negative.

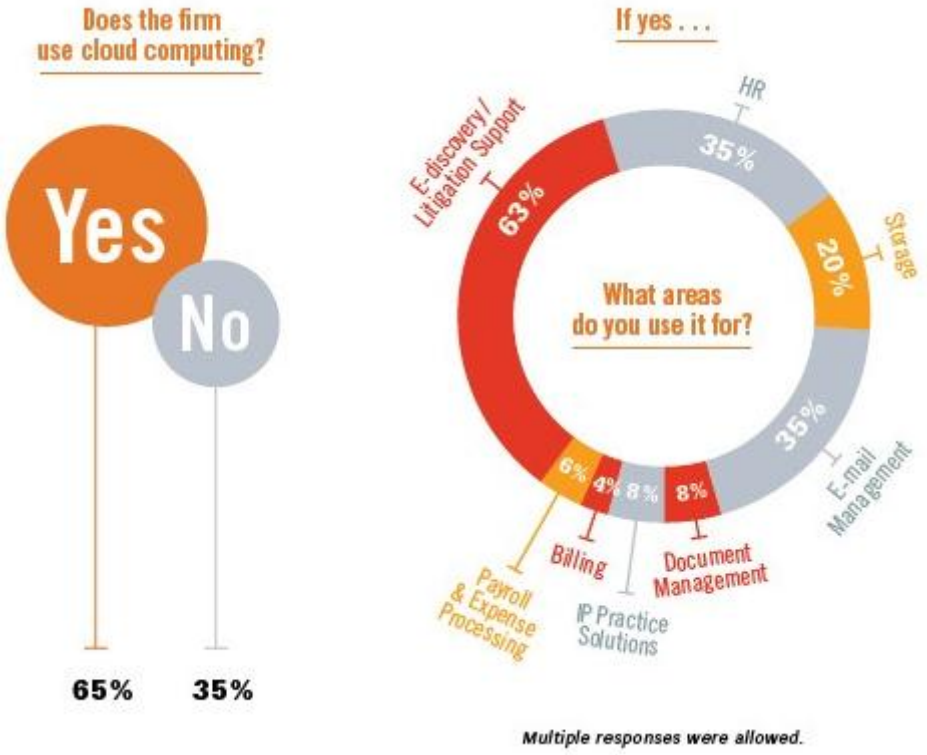

Fig. 1. **Usage of cloud-computing (**The American Lawyer, 2011).

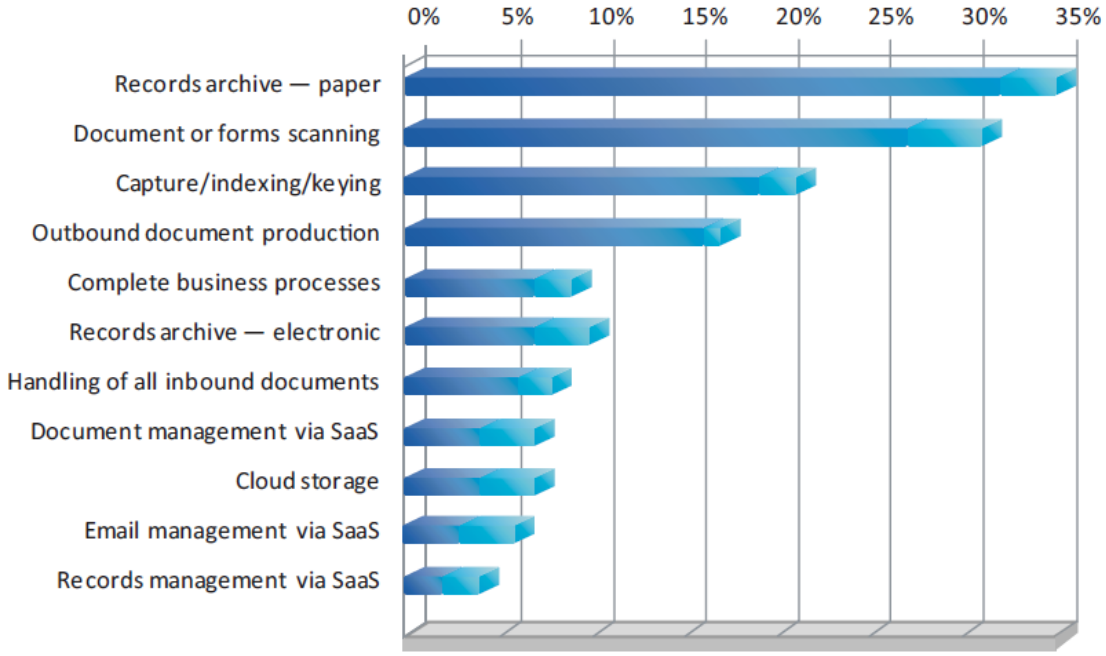

Fig. 2. **ECM functions in cloud-computing (**Miles, 2011).

Conclusion

The role of cloud-computed services in the IT market will only increase in the coming years but the institutions in the public sector will utilize them with great caution and will possibly remain the last of organizations sticking to maintaining local document management systems, including the ones for document management. As main

reasons behind it we can mention the mistrust towards external service providers and incomplete base of laws and regulations both in the European Union and in Latvia. The only way how to hasten the outsourcing of different state institutional processes is the pressure from the above – change of a unified IT policy of state (or even of EU) declaring the outsourcing compulsory in order to save resources in the public sector. However, this is not likely to happen, unless some significant studies of wide scope emerge on the state level shedding light on the cost-efficiency of IT processes. Even though the service providers claim that using their products means saving resources and offer different estimations, they are mainly misleading and do not show the overview.

Considering the document management as the most important supportive process in the public sector, it is not possible to foresee a full outsourcing of it in the nearest future. As the main argument not the costs of technical reasons can be mentioned, but the traditions. In public sector there is a generally approved opinion that everything about the documents within the framework of the institution has to be known by the records manager and exactly this worker is mainly responsible for them. Only the records manager has full comprehension of the whole life cycle of documents and their circulation. According to that, governmental institutions are not ready to accept even the idea that document management could be transferred from institution's records managers to a completely external company. However, even if the outsourcing of document management is not likely, there is still future for the usage of software-as-a-service type document management systems. Already now when acquiring document management solutions in public purchases, it is not prohibited to offer cloud-computed solutions. However, problems emerge if they are obviously not ready to ensure all the document management functions required by the governmental institutions. We have to take into account also the fact that in Latvia there is no real supply of SaaS document management systems. There are a few different software products based on the engine of *Microsoft SharePoint* that are capable of ensuring simple document storage and circulation functions not on a large scale, but none of them can fulfil all requirements for document management in the public sector.

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