

ON THE WAY OR IN THE WAY OF DEVELOPMENT

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—Abstract—

Nowadays we are witnessing a rapid development that is also characteristic for corporate management and corporate information systems. However, as in many other areas, development does not always go smoothly. Not even in the case of such innovations as cloud computing. Even for smaller enterprises, cloud computing significantly expands the scope of available information technology services without requiring large-scale IT investments or significant spending to operate, maintain and update hardware and software tools.

The study focuses on the cloud computing technology as a development opportunity. The study examines the obstacles to development, the potential barriers of the fast-pace spreading of the new technology. It also provides an assessment of the problems generated by the companies and organizations as well as those factors that stand in the way of necessary technological development. The aim is to explore the real problems and to present the causal relations that result in these problems. Moreover, the study evaluates the development opportunities of cloud computing. The research is based on in-depth interviews conducted with the corporate leaders. The results of the interviews are structured and presented according to the authors' professional experience.

Key Words: *cloud computing, development, management, information, systems*

JEL Classification: M15

1. INTRODUCTION

The market of the enterprise resource planning systems can be considered stagnant nowadays, seeing that the purchase orders have not increased in the last period, companies have been updating and servicing their previously acquired systems. Hungary and other countries that are considered to be similarly small markets are all in a vulnerable position when it comes to the market of ERPs seeing that the majority of the sales are generated by the foreign subsidiaries. For this reason the ERP market can be considered saturated in the large company segment, but thanks to cloud technology new possibilities are arising for small and medium-sized enterprises because the implementation costs of such systems is only a fraction of those of the traditional system. As a result, software developers and telecommunication companies are increasingly seeking to please the small and medium-sized enterprises.

Another thing holding back the small and medium-sized enterprises is a fear of big technological investment costs and quite a few doubt their long term reliability. Many respondents felt that the technological changes are too fast and thus feared that their investment would become obsolete fast, while quite a few complained that they don't have enough coworkers' proficient with the computer.

Krauth (2008) brings our attention to the rapid spread of the use of internet services in the human resources (for example recruitment, payroll calculation) work field. The explanation for this, according to Krauth, is that decades ago companies got used to outsourcing certain activities that can be easily be programmed. (Bögel 2009)

This is further intensified by the companies' and other institutions' cost reduction practice, which was forced upon them by the crisis; the services of the IT cloud are viewed as a potential way to reduce costs.

According to James Gray, an expert at Microsoft's development center, there are four essential things:

- *network connection*, where you can ask questions and receive answers;
- *processing*, the transformation of information in order to acquire new information;
- *database accessibility, according to processing needs*;
- *data storage, for long term storage of data.* (Grey 2003)

The new information and communication technologies

- *promise increased speed by the economy's communication processes,*
- *higher quality by processing and by transmission of information,*
- *greater individualization of the information by task orientation, enterprise-orientation and user-orientation.* (Herdon et al. 2011)

Everett M. Rogers presents the following five factors that influence the diffusion (wide spread) of innovations:

- *relative advantage: what advantages does the new solution provide compared to the previous ones;*
- *compatibility: how well does the innovation fit with the existing values, to the previously acquired experiences, to the needs of the users;*
- *complexity: how hard is it to learn the new product and to use it;*
- *trialability: can the novelty be tested easily and without any major risks;*
- *observability: can the application and the effects thereof be seen by others?* (Rogers 2003)

If the prices of computers decrease to such an extent that the initial investment and the utilization of capacities is no longer relevant, less people will use the services of others, on the other hand, were the machines to stay relatively expensive, and the network, telecommunication costs to shrink, it will be worth it to buy services from others.

The costs of telecommunications decreased rapidly after 2000, and the competitiveness of the service model increased. (Bögel 2009)

On the info communication market technical innovations were introduced so the business as the consumer market (consumerization). A web 2.0 phenomenon includes many facilities such as social networking, blogging, file sharing, the use of wikis, other internet forms of communication and collaboration. (Bögel 2009)

Some analysts question the appropriateness of using the term “new paradigm” to cloud computing arguing that this approach is largely dependent on existing technologies and approaches such as utility computing, software as a service (Seas), distributed computing and centralized data centers. Cloud computing's only innovation, according to this view, is that it combines and integrates these approaches (Weinhardt et al. 2009). Other authors equate the service of cloud computing with the practice of “timesharing” that existed in the 1970s when small companies relied on other companies (that had access to mainframe computers) for processing some of their data (e.g., payrolls) for a fee (Campbell-Kelly, 2009). One particular author calls it “Timesharing 2.0” (Campbell, 2009).

It is argued that the main drivers of this computing approach are economics and simplification of software delivery and operation (Erdogmus, 2009). Some see huge potential of the technology in reducing the cost of IT to organizations and freeing them from the expense and hassle of having to install and maintain applications locally (Leavitt, 2009). Providing IT services in the cloud shifts much of this expense to a pay-as-you-go model and consequently offers significant cost advantages according to one view (Lin et al. 2009).

Many factors may motivate providers. The most important of these factors is the profitability ensuing mass interest which can stem from many sources: the unit costs may be lower by data centers using the virtualization process, the development costs of complex softwares can be distributed amongst more users, the computer infrastructures built for personal purposes can be better utilized. Another important incentive is the defense against new entries, overtaking competitors, protecting market shares. (Bögel 2003)

Virtualization refers to abstraction of logical resources from their underlying physical characteristics in order to improve agility, enhance flexibility and reduce cost. (Golden 2008) Virtualization in the cloud may concern servers, client/desktop/applications, storage (e.g. Storage Area Network), network, and service/application infrastructure. Quality of virtualization determines the robustness of a cloud infrastructure. Good virtualization can effectively assist sharing of cloud facilities, managing of complex systems, and isolation of data/application.

The rapid spread of such technologies has made it increasingly difficult to determine where IT ends and telecommunication starts.

From the point of view of our topic these are collective activities that are made possible with internet services. Large masses have gotten accustomed to using useful services very easily with the internet not giving it a second thought where and on whose computer the software runs. Companies are more cautious, they weigh the risks, but upon seeing the business benefits which are available and the massive popularity, more and more enterprises open their doors to Web 2.0. (McAfee 2006)

The purpose of the research is to outline the true nature of the current situation and the future, furthermore to systematize the factors which hinder the development that may disable the fast spread of the new technology.

2. MATERIAL AND METHODOLOGY

The study examines the situation of the enterprise resource planning systems in the Hungarian and international agricultural medium and big enterprise segment, furthermore it outlines a vision and how these different scenarios will be welcomed.

Out of the qualitative research methods I employed personal in-depth interviews. The individual interviews were essentially informal discussions in the given topic with people selected for this purpose. During the research the test method was expanded with in-depth interviews past the secondary research.

3. RESULTS

Information technology gets integrated in to the agricultural decision making work processes through the planning of information systems. The system provides a framework for the collection, processing and transmission of information, serving a specific task which can include the combined use of the above mentioned technologies.

It is a great challenge for the developers to create applications with the help of deterministic systems which, can follow, help or predict the operation of a plausible system such as an agricultural company for which the amount to be produced cannot be determined, as the result is affected by several factors (weather, biological processes, human factors etc.) so the results can be determined with certain ranges of probability.

In spite of that nowadays there are various solutions for the companies to find their way in the stream of information and to base their decisions on the best possible basis.

The most current solutions are related to the parcel books. That derives from the strict rules and regulations that require the exact and up to date accounting even if it is a support program or participation in the agricultural-environment management. These days paper based accounting is a rare phenomenon the few exceptions are stemmed from feeling of security and the aversion towards new technical solutions, and applied as a backup solution in accounting.

It is a fact that the various applications are not isolated but they can communicate and exchange data with each other. Administrative departments do not have to carry the burden of dual data entry.

Based on that principle, modules from different developers such as the farming book and the spraying book can connect to the parcel book. These programs can not only record the agricultural events but they are able to follow the simplified frames of the parcels, storing soil examinations, keeping record of supplies, machines, buildings, moisture, compiling plant protection reports, maintenance of machines and use of gasoline. With their graphic layout they make the entered data more picturesque and transparent, and we would like to emphasize at that point that with the simplified operation boards it can be applied by a wide range of users.

With the precision farming and the improvement of GPS technology, the demand for the complex management systems has grown immensely. In many cases the jointed characteristics of the parcels hinders the implementation and the economic operation of these systems. It is particularly interesting in the light of the land regulations soon to be enacted which will constrain the total are of farmlands.

Higher quality systems can not only support decision making on management level but can comply with financial and accounting tasks. These can do the accounting and can follow the movements deriving from different activities.

These systems on the other hand require considerable hardware to create data (GPS transducers), process data (server and client computers), and for precise usage (automatic control for set of assets).

With the improvement of cloud technology a considerable proportion of the expenses could be cut back. For example expenses coming from the operation and maintenance of the main server, leasing softwares instead of purchasing them all these contribute to launch and maintain a system in an economic way.

Besides cultivation of plants, in the field of livestock farming one can find precise and sophisticated field control systems. Most of the systems are translations of foreign systems. Their advantage is that they are widely used and can be operated on a wide range without failure but meeting special requirements might be source of problems.

The constant development and application of information systems makes the operation of production organizations much easier. Members have the option to make their data more exact, keep them up to date, and to follow their production results and to settle their accounts.

These developments occur on a wide range of production covering almost all kind of activities, contributing to a more effective management and more transparent

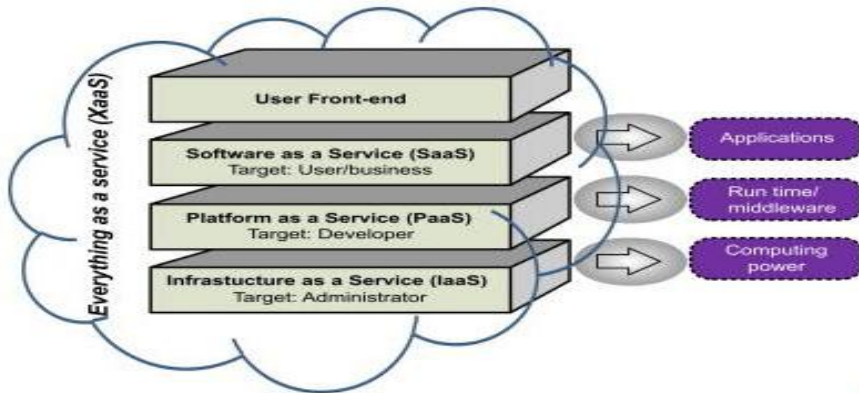
follow up systems in a way that they relieve users from a great amount of administrative burdens. The D-e-meter intelligent parcel registering system could be also mentioned. Its aim was to improve parcel evaluating systems, and to change the outdated Golden Crown based system with a modern IT system. Based on that we can say that great developments were made not only in the field of complex control systems but the basics of registration have received new background.

On the other hand several factors can hinder these developments to prevail. It turned out during the interviews with company leaders that the idea and approach towards technological achievements are not the same. The younger generations are more opened to use and implement new solutions. The more experienced, old fashioned leaders feel more secured to go with the usual system and schemes when processing, evaluating data even if it requires more work. In the case of this group it was noticed that IT investments were considered as a necessary cost and did not see the opportunity to improve that could contribute to a more efficient operation. Several companies use separate systems for accounting, storing, moreover, a lot of them use unique Excel sheets to follow the incoming and outgoing items. This is not efficient as the same data need to be processed over and over again the risk of losing data is high. Not to mention that this way it could take weeks for the colleagues to compile a broad account – if they can do that at all.

Companies were against using ERPs as they found it extremely expensive to implement them. These days they can be purchased at lower a cost especially if they lease them from an ASP service. In such cases hosting costs can be saved too as the softwares run on the hardwares of the service provider. The widely used system of Google operates as such system too.

It could indicate a twist in current trends that in the past few years several ERP developers came out with products that cannot be purchased only leased. In such cases the softwares can be leased as a „service”. The point of this so called SaaS (software as a service) model is that the user does not own neither installs the software at his/her depot; the application usually runs on a remote server (Figure 1). CEO of Computacenter a British IT service provider, Andrew Vize says this is the future: it can be ten times cheaper to use the systems in the „cloud” than to purchase, install and maintain them. Cloud is not a completely new level, but it is rather a change of view: the main product of the IT sector is not the machine but solving tasks, handling a database for instance.

Figure 1: Everything as a service (XaaS)



Source: Pallis, G. (2010): Cloud computing: the new frontier of internet computing, IEEE Internet Computing (14:5: 5562494:70-73)

However, there are different opinions about the cloud technology as with the cloud, downtime from regular updates and deriving costs can be avoided because for the leasing fee the most recent updates are available and because of that the costs for the ERP can be calculated in a more efficient way. On the other hand companies that has spent considerable amount of money on purchasing a system for which the employees got used to, might not make the decision about switching easily. One of the concerns with cloud is that those who do not have their own hosting center, all of their data goes to China as the service is cheap there- as printing and toy production also have a tendency to move there.

In the agriculture, medium-sized enterprises and major companies the age of the employees is quite old. On the one hand it derives from the long learning process until a company running complex operations can be transparent, the low rate of fluctuation, which is stemmed from the appreciation of the employees and that the employees feel safe about their situation, as well as from the fact that younger generations do not see perspective in this field of work. For this reason in this segment the usual processes and fear from the new both have an important role.

Improving efficiency, competitiveness – to which one of the key elements comes from the development of technological applications – must be the aim of every agricultural company. In my experience most of them live with the confidence that everything has been good so far, incomes are good, realizations have been successful therefore they are safe. But these days this is not the proper attitude. There is competition out there and one has to be the best.

4. CONCLUSIONS

According to experiences we can state that implementing settled technologies is crucial to keep a company's competitiveness, but the newest technologies carry a great risk as well which must be considered. In international scenario we can state that for example the Netherlands is opened towards new developments, uses and develops the most recent technologies while in Hungary the implementation of widely used solutions meets hardships on a regular basis mostly because of the adherence to the solutions of proof that are usually outdated and of the seclusion from learning new methods.

On the whole we can say that an immense improvement can be seen in the field of business managing systems in the field of agriculture, especially among the medium-sized enterprises and the major companies. Although the well known basics come back in the most recent developments, the time needed for data processing is only a fragment of what was needed before and the accuracy of the data show constant improvement and the number of the analysis and examinations went sky high. Transparency and usability is getting better and better with the development of graphic technology. If we could leave all the prejudice towards new systems or the cloud technology behind, it would mean a great advance in the field of developments. It is also certain that we will spend more and more of our lives online as that the fact that we will see it less and less dangerous. A lot find it impossible that because of the constant online presence we live in an entirely opened society where everyone knows everything about each other.

Fear from the new hinders development in a lot of countries such as Hungary thus in our opinion cloud computing is rather the future than reality but within a few years utilization of the opportunities in cloud computing can be expected.

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