ANALYSIS OF USING CLOUD BUSINESS IN BOSNIA AND HERZEGOVINA AND THE REGION

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Abstract: Cloud business is the basic support to operations of modern companies. It enables companies to be more agile and innovative. Such form of digital transformation improves business and company productivity and solves business problems in innovative ways. On one hand, Cloud business makes possible for users to get the best expertise possible which they cannot develop independently. On the other hand, it offers possibilities to reduce the costs related to hardware and software to a reasonable level. The time value of money present in Cloud business is also significant. Namely, companies no longer need to invest large sums of money in equipment or software solutions; it is sufficient to rent those and use revenues for future business investments. Cloud solutions mean that users, using modern technology, access their business software solution through a web browser (web application) thus completing their business processes and accessing the database. Expansion of business leads to a new phenomenon – users are no longer tied to a physical location. In this way, users more frequently work from home or on the move by using different mobile devices. We all use a number of applications (Gmail, outlook.com, Facebook, LinkedIn, Twitter etc.) and take advantage of the Cloud business without being aware of it. We do not install any of the mentioned applications on our devices but access those using an internet browser. Given the lack of IT experts due to economic migrations, as is the situation here, insufficient supply and enormous demand for IT professionals, the traditional model of using business information systems will become practically unsustainable. In this paper, following introductory and general remarks on Cloud business, an analysis was made of using Cloud business IT systems in RS/BH, Serbia and the EU.

Keywords: Cloud business, Business IT systems ICT, Cloud, Digitalization of business.

INTRODUCTION

The modern business environment is characterized by digitalization, development of the Internet of Things, customer support, risk management and the application of sophisticated technology. Therefore, more and more questions are being asked how to respond to the challenges ahead and how technology will affect the business. It is estimated that there were 31 billion devices interconnected through the internet in 2018. According to global projections, there will be 80 billion interconnected devices by the end of 2020. The same estimates suggest that, in two years, each resident on the planet will have 6.5 devices connected to the Internet. Processes aiming to introduce new or, better to say, modern ways of organizing business and social environments can be called the process of digital transformation. Global analyses show that only 10% of companies in the world are completely digitally transformed and ready to operate in an IoT environment. This is to say that one of the most significant manifestations of digital transformation is the use of the so-called Cloud.

Today everyone talks about Cloud computing and there are many definitions from various authors. In 2011, the American National Institute of Standards

and Technology (NIST) published a definition often cited and considered one of the simplest ones: 'Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction'[6]. The RAD Lab publication by Berkeley University of California published a definition that has become very popular: 'Cloud business also applies to applications delivered as online services, and to hardware/software systems in the data centres providing those services'[5].

How does Cloud function as a contemporary business model? The system consists of two physically separate parts. The first, user-controlled part is the so-called front end, while the second part is the service provider's infrastructure called back end. For the system to work, both parts need to be connected into one unit, which is enabled through an internet connection. This use of technology enables companies and individuals to reduce initial investment in equipment and investment in the application. Besides, users may adapt the technology to their own needs in a quick, simple and innovative way. One of the basic differences between the standard business concept and Cloud business is that the load carried by personal computers or servers is shifted to the Cloud provider's servers. The service provider's servers have supreme performances, which enables fast execution of applications, data storage and a special data storage process – backup. Most often it is about storing the same data in several different locations, and copying the same data is done on a daily, weekly and monthly basis.

History and Properties of Cloud Business

The history of Cloud business, especially in the region, is short – it is closely related to the development of the internet and business technologies. In the last century, specifically in the 1960s, Joseph Carl Licklider coined the term 'Cloud business.' Thus, he may be said to represent one of the most significant figures in this field. The history of Cloud business was also influenced by one of the most significant events in 1999 when company Salesforce introduced a new concept of delivering business applications through a website. In 2002, Amazon launched its web services such as human intelligence computing through Amazon Mechanical Turk services. After that, in 2006, Amazon launched a Cloud called 'Elastic Compute Cloud', which allowed businesses or private users to rent computers for running personal computer applications. Following Amazon, many other companies like IBM, Microsoft, Oracle etc. started to develop their Cloud business services. As a result, users today have a wide choice of these services. [8]

Cloud business is intended not only for businesses but also for private users with resources available from service providers. Accordingly, the computer industry has identified models to connect millions of users and make state-of-the-art software solutions available to them. All this will completely suppress traditional approaches of using applications on personal computers and using them in On-premise format.

The difference in the very concept of Cloud business is whether it is used by IT experts or ordinary users. Ordinary users will define it as a new and less expensive way to use software solutions to be hired as needed, while IT professionals define it as a new business model or a new technology platform for storing, launching and using state-of-the-art technology. [2]

A publication titled 'Benefits and Challenges of Cloud ERP Systems – a Systematic Literature Review' published in 2017 by Mohamed Ali Abd Elmonem, Eman Nasr and Mervat H. Gheith comprises 31 papers published in the period 2011 – 2016. A systematic analysis of the papers shows the advantages and disadvantages of Cloud business given in the table below.

Table 1. *Advantages and disadvantages of Cloud business [3]*

ADVANTAGES	DISADVANTAGES
Lower initial costs	Subscription costs
Lower operating costs	Safety risks
Faster implementation	Performance risk (long implementation)
Scalability	Limited scalability and integration with other on-premise applications
Focus on key competences	Strategic risks
Use of advanced technology	Compliance risk

Fast update/upgrade	Loss of IT competence
Advanced accessibility, mobility and usability	Limited functionalities
Easier connection with Cloud services through the internet connection	Service Level Agreement (SLA) issues
Improved system availability and disaster recovery	Information sensitivity
Cost transparency	Control of ERP in Cloud
Sales automation	Hidden contractual costs
Use of safety standards	Loss of technical skills
Demo versions	Choice of ERP in Cloud
	Need for service standards and ERP regulations
	Knowledge about Cloud
	Organizational challenges

SERVICE PROVISION DISTRIBUTION MODELS AND TYPES OF CLOUDS

As for Cloud business, these are the following three different service provision models:

- Software as a service (SaaS) platforms.

SaaS is software offered by a third party – remotely configured service provider available on-demand, most often through the internet. SaaS is a model where an application is hosted as a service to users accessing it through the internet. When software is hosted off-site (in a user-independent location), users are not required to provide maintenance and support. This type of a Cloud service offers a complete functionality of an application covering everything from basic applications (e-mail, Office 365 etc.) to applications like ERP system (EcoOne by Lanaco).

- Platform as a Service (PaaS) enables users to develop new applications using the API (Application Programming Interface). The offered platforms have development tools, configuration management and platforms for development and application.

Some examples of PaaS services are Microsoft Azure, Force and Google App Engine.

- Infrastructure as a Service (IaaS)

IaaS provides virtual machines and other abstracted hardware and operating systems controllable through API service. Some examples of IaaS are Amazon EC2 and S3, Terremark Enterprise Cloud, and Windows Live SkyDrive in Rackspace Cloud.

Types of Clouds

- Public Cloud – a Cloud that is based on Cloud computing service provider renting their resources to users and charging them by the scope of use. The resources include the processing power, data storage space and applications that exist on the Cloud. Depending on the provider and type of service, the applications may be free of charge or charged as used. The resources are shared among users and accessed through the Internet.
- Private Cloud – a type of Cloud created for a single client only. The infrastructure is virtualized with additional elements making it user-friendly, manageable and compatible with other Clouds. This is a system that entirely belongs to the user and is controlled and handled by the user's IT service.
- Joint Cloud – it has the same infrastructural properties as the public Cloud but is created as a closed solution for a certain community i.e. group of companies. The community usually gathers companies with common needs, safety requirements and other properties. A good example is a school Cloud or public companies' Cloud. This type of Cloud is managed by companies alone or the service provider.
- Hybrid Cloud – this solution allows the user who has his/her private Cloud to expand the existing infrastructure with certain services from the public Cloud to form an integrated entity. This makes it impossible for service users to detect which part of the infrastructure is used by individual services. In addition, this ensures complete mobility of the service between the private and public part as well as the integrated management of the available infrastructure.

ANALYSIS OF USING CLOUD BUSINESS IN BOSNIA AND HERZEGOVINA, SERBIA AND THE EUROPEAN UNION

Most companies in the environment are still underusing the benefits of the Cloud business. Despite

having the software bought from the same IT supplier, regional companies do not have integrated financial management on the corporate level. Their data exchange is still executed via Excel sheets and emails. The use of Cloud business would enable those companies to save significant resources for sharing and consolidating financial data for reporting across the group. The challenges faced by regional companies operating in the international market are numerous, one of the most important ones being the establishment of an integrated business and information system and a centralized database by using Cloud technology. The technological conditions for deploying Cloud technology do exist but need to be implemented. This would provide a simpler and faster financial analysis of the regional markets i.e. companies could perform daily analysis of inventory and receivables. It is also very important for BH companies with subsidiaries in the region and vice versa to establish an appropriate level of control. For example, if the controlling function in the parent company can directly access the financial information in the subsidiary, which the Cloud business certainly enables, any irregularities can be more easily detected and corrected. The irregularities in operation do not have to be intentional; however, they demonstrate that the accounting staff of the subsidiary lack know-how and skills, which needs to be improved. Cloud business would also provide these companies with additional security in terms of data storage. We have witnessed many tragic events in this turbulent area. Such unforeseeable circumstances, as well as natural disasters, conflicts and the like, may lead to the mother company suffering losses and damages of not just material nature (loss of stocks, damages etc.) but also immaterial damages such as the loss of financial data and documents in its subsidiaries. If such companies choose to operate using Cloud business, electronic data and document archiving for the whole group can be carried out at the mother company or another safe location.

Bosnia and Herzegovina

Cloud business is slowly becoming a part of our everyday life here. According to the BH Statistical Institute [1], the use of online Cloud services is a relatively new technology in the country, used by only 13% out of the total number of observed companies in Bosnia and Herzegovina. Based on the data obtained by analysing the use of information and communication technologies in Bosnia and Herzegovina – the subject of research was the use of Cloud services – we concluded that only 5.1% of companies use Cloud services.

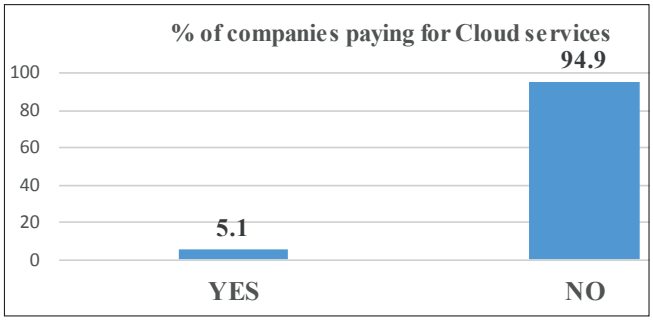


Figure 2: *Percentage of companies paying for Cloud services*

When reviewing the above analysis of companies using the Cloud, it is important to distinguish between the sizes of the companies. The largest companies are always the main drivers of new technologies as they possess the human and technical resources allowing them to adopt new technological advances. Below is an overview of Cloud technology users based on the size of companies.

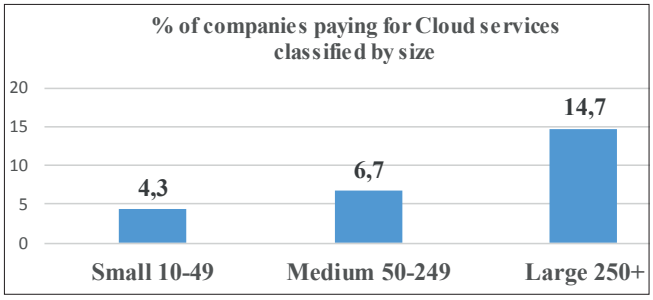


Figure 3: *Percentage of companies paying for Cloud services (by size)*

The use of Cloud technology in Bosnia and Herzegovina is still very poor. There are many reasons to be recognized as indicators for such situation. Some of the key reasons are the low level of technology, lack of information and lack of staff dealing with information and communication technology.

Serbia

Unlike Bosnia and Herzegovina, where the use of services is at an extremely low level, the situation in

Serbia is significantly different. The number of companies subscribed to Cloud services is considerably larger, which is also confirmed by the fact that the number of observed companies in Serbia is much higher.

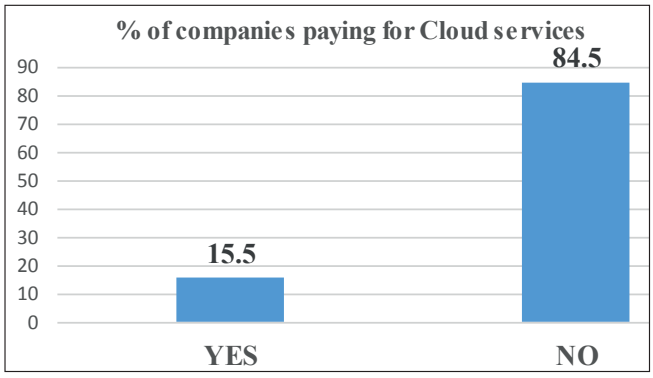


Figure 4: *Percentage of companies paying for Cloud services*

According to the Serbian Statistical Institute 2018 survey [7], 31.5% of surveyed companies (each having over 250 employees) declared to pay for Cloud service, which is significantly higher compared to 2016, with only 13.2% companies being subscribed to Cloud. This indicates that an increasing number of companies consider Cloud an integral part of the modern business rather than mere business optimization facilitator. The main reason for this is the multiple benefits this solution offers to the company business.

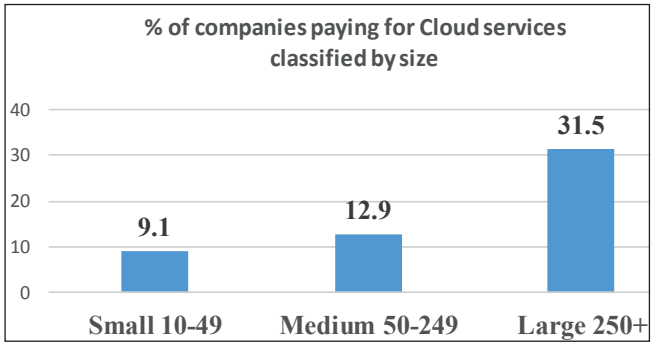
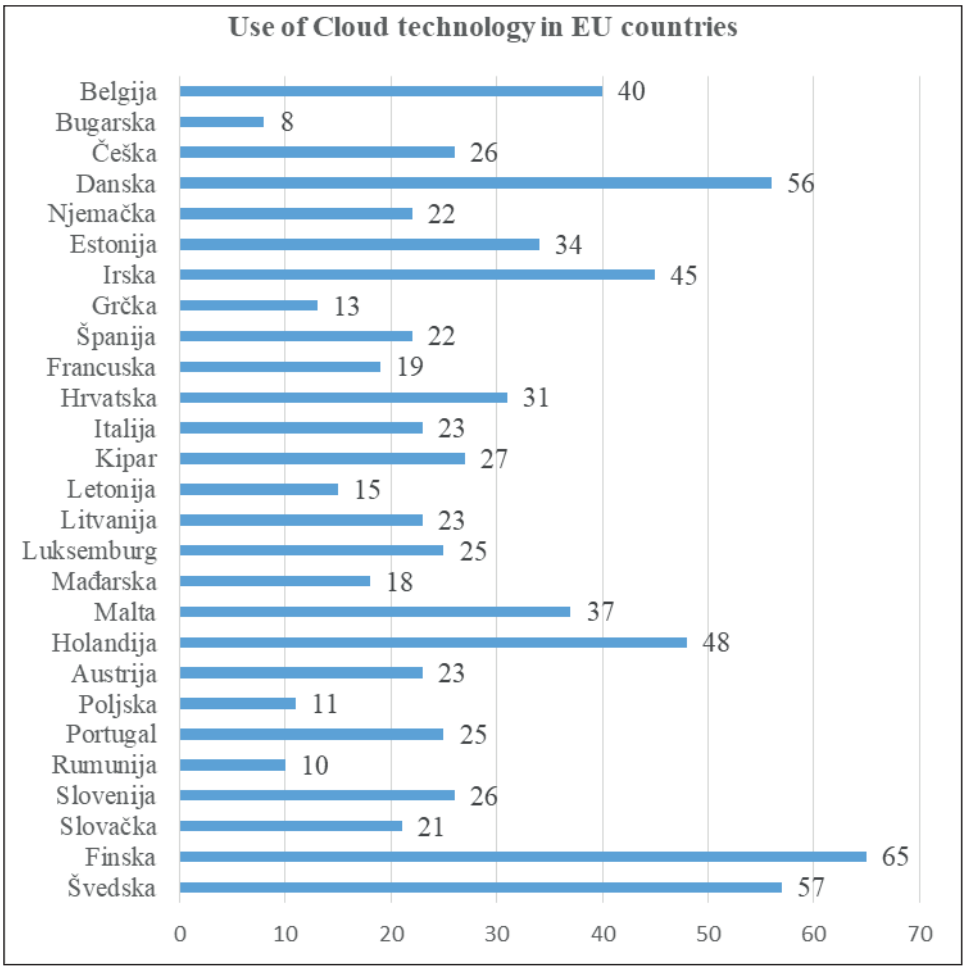


Figure 5: *Percentage of companies paying for Cloud services (by size)*

Although the use of Cloud technology in Serbia is above the percentage recorded in Bosnia and Herzegovina, this is still significantly below European countries. This means that many different measures need to be taken to make Cloud business an integral part of daily life. An important feature of using such forms of distribution is the legislative framework that allows the use of technology. The GDPR adopted at European Union level guarantees the protection of EU citizens' data. As to using solutions via Cloud distribution model, there are limiting factors for non-EU countries such as Bosnia and Herzegovina or Serbia. Namely, the GDPR further complicates the situation given that EU citizens' data must be stored on the territory of the European Union. Another important feature is that there are not many Data Centres in the region that can adequately respond to the needs of Cloud Business in terms of data protection security and adequate data storage.

European Union

According to Eurostat data for 2018, 26% of companies in the European Union with at least 10 employees used Cloud services [4]. The use of Cloud services has increased in recent years compared with 2014 and 2016 when only 19% and 21% of the respective companies used such services. Companies with more than 250 employees tend to use Cloud business more than companies with 10 to 49 employees (56% compared to 23%). In the last four years (2014 – 2018), the major increase in the use of Cloud services was reported in large enterprises (+21%) compared with +12% and 6% in medium and small enterprises respectively. In regional terms, the Cloud business is most used in Nordic companies (over 50%); 65% in Finland, 7 % in Sweden and 56 % in Denmark. The countries with the lowest percentage of companies using Cloud services are Bulgaria (only 8 %) and Romania (10 %). Below is an overview of EU countries using Cloud technology (in %). For our region to keep up with EU countries, it is necessary to align domestic legislation to EU norms and regulations in the future. Another important thing is permanent training and informing both citizens and businesses to recognize the benefits of using Cloud services.



Examples of Large Global Companies Transferring Their Operations to Cloud

We are already surrounded by many examples of Cloud business changing the world of business forever. The Japanese automotive manufacturer Toyota has recently transferred its whole organization of 200,000 employees to the Cloud. Toyota's CTO Yack Hicks said they had done it to do something important for their clients and their business. By doing so, Toyota created more room for their IT staff to focus on cost-effective projects rather than deal with data storage, maintenance and upgrade. This resulted in the following important innovations: semi-autonomous vehicles that can assist the elderly with transportation, a steering wheel that measures the vital signs of the driver and transmits them to a health facility, cars that can alert the police that the driver's health is ill, vehicles that offer many connected online applications, search for parking spaces and the like. The famous media giant Netflix, which accounts for nearly a third of North American internet traffic on an average weekend night, operates in the Cloud. It may sound strange that a company involved in selling print and digital document products is on the list, but Xerox has also recognized the Cloud business trend. In addition to offering Cloud printing service a few years ago, they now have their Cloud service. One of the fastest-growing social networks, Pinterest, has been operating in the Cloud right from the very start as well as Instagram, which has been doing business in the Cloud since 2010 when it began to grow to an undreamed-of level. Apple also opted for the Cloud when developing Siri. Although the majority of users recognize Siri due to its voice, the real magic takes place in the Cloud, where all questions to be answered by Siri are directed. Three out of five companies in the USA applies new knowledge in using Cloud technology.

It is anticipated that it will be impossible to operate without Cloud in five to ten years and that all relevant global companies will follow Toyota's example. Moving to Cloud has begun and this is why

companies in the region should consider transferring their business to Cloud if they want to keep up with other companies.

CONCLUSION

IT trends show an increased use of Cloud applications. The number of mobile technology users is growing and, consequently, the number of Cloud-customized applications. The value of public Cloud services in the world in 2019 is USD 214.3 billion. Gartner predicts that the value of public Cloud services will rise to USD 331.2 billion by 2022. The same reports indicate that 'Software as a Service' will rise from USD 94.8 billion to USD 143.7 billion in the same period. Cloud business application developers are offering new functionality on a daily basis. However, companies using such business systems need to be convinced of the functionality of such a service and evaluate their business value before fully embracing it. Cloud business information systems will enable lower initial costs, rapid system responsiveness, easier integration with other technologies and global connectivity for organizations. Given the importance of the Internet in every business, one of the biggest benefits of using this type of service is that the user pays the service provider a fee according to how much service is used, as opposed to purchasing their resources but not using them in full. Cloud business is ideal for start-ups because they do not have to invest in their infrastructure as they use Cloud services. It is particularly important to emphasize that the costs of using such technology are acceptable to the smallest users. Given all this, Cloud could be considered a revolutionary solution, and its application in our region will increase in the future. By following the trends of highly developed countries, working and using technology in this way will undoubtedly become commonplace.

Cloud business in Bosnia and Herzegovina is just about to grow and therefore companies need to be more informed about Cloud services. It is also necessary for the competent authorities to adopt a Cloud business strategy. To successfully manage finances, especially in the case of international business and corporate governance, companies in Bosnia and Herzegovina need to provide up-to-date financial information, the application of adequate business communication tools and the coordination of synchronized financial reporting activities. These reasons – financial management and control – are the very benefits of deploying a Cloud business, which primarily reflects in user-friendliness of an integrated business information system and centralized database for analysis, planning and reporting.

Owing to the advantages of Cloud computing, the initial investment in IT has nowadays been significantly reduced and the benefits are multiple. The service provider guarantees the system availability and is likely to provide a 24/7 technical support 365 days a year. The end price is several times lower than the price of own information system. Today, every serious IT company emphasizes the development and sales of products and services related to Cloud.

We hope we have brought closer one of the fastest-growing trends in the IT industry and business in general. Cloud business is still a growing technology which is used for business and private purposes every day. Cloud business will, by all means, become more and more available and simple for end-users and, at the same time, the range of services on offer will become wider. It certainly remains to be seen how successfully RS/BH companies will be able to keep up with the present trends.

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