

Application of ICT in a Company after Identifying the Characteristics of a Crisis

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Abstract - The paper proposes the use of information and communication technology required to be applied in a company after identifying the characteristics of a crisis. This paper presents the internal and external causes of corporate collapse. The impact of the crisis on the behaviour of IT managers will also be shown in the diagram. The paper describes in detail possibilities of applying open source, Office in the Cloud and the benefits of using the open-source group. The paper also presents the results of a research based on the data collected from the surveyed employees of companies and institutions (N=53). The displayed information leads to knowledge about which company modules the surveyed employees use the most, and whether they know what Office in the Cloud is. The results of data processing show which feature of Office in the Cloud is important to employees to make a decision on using it.

Keywords - ICT, model, the characteristics of the crisis, open source, e-questionnaire, Google + .

1. Introduction

Every company can fall into a state that slows and limits its growth continuity. Such a state can be defined as a crisis in the company's business activity. If that state intensifies and lasts a longer period of time it puts the company's very existence in jeopardy. A company in crisis crumbles or is threatened to get liquidated. It must be said that a company's collapse or liquidation is not the last biological or natural stop in its life, but rather a crisis which the company management failed to adequately and efficiently deal with. A company that finds itself in a state that slows and limits its growth continuity generates less profit or does not generate any profit at all in a new business period. Small and medium-sized enterprises that find themselves in that state cannot afford making big investments in ICT. It is recommended that such companies use an open source code which will in the end result in larger profit. Open source tools are free to use and are just as functional as Microsoft's applications (Office) which one must pay a license to be able to use them. Companies in the group of small and medium enterprises (SMEs) can use the applications within the so-called Office in the Cloud. Such free service is offered by Google in the set of GoogleDocs application tools. Furthermore, SMEs that want to

manage their own web site do not need to invest large sums of money to create their portal or online applications but can use the possibilities and potentials of Google Plus instead.

Open source code does not just mean access to the source code. The distribution terms of open source software must comply with the following criteria:

- Free redistribution.
- Source code.
- Derived works.
- Integrity of the author's source code.
- No discrimination against persons or groups.
- No discrimination against fields of Endeavour.
- Distribution of license.
- License must not be specific to a product.
- License must not restrict other software.
- License must be technology-neutral.

The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale. The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed. The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software. The license may restrict source-code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different

name or version number from the original software. The license must not discriminate against any person or group of persons. The license must not restrict anyone from making use of the program in a specific field of endeavour. It may not restrict the program from being used in a business, or from being used for genetic research. The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties. The rights attached to the program must not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution. The license must not place restrictions on other software that is distributed along with the licensed software. The license must not insist that all other programs distributed on the same medium must be open-source software [8].

The conducted research with collected information and data that are particularly important for open code procurement and the use of Office in the Cloud is also presented in this paper. The following research methods were used: watching, observation, analysis methods (content analysis methods and analysis methods of applications) and the survey method. Surveys were conducted among SMEs. The questionnaire contained the following questions to determine the importance of features. Subjects had to determine how much importance will be placed in the suggested cloud office features in order to decide on their use. These Office in the Cloud features which the decision-makers take into account when choosing (whether they are going to use the Office in the Cloud or not) are:

total cost reduction of the company, is the installation required or not, what is the speed of operation, does the Office in the Cloud protect electronic information, do the tools within the cloud freeze, how are the tools in the cloud compatible with other office tools, do the tools in the Office in the Cloud have the possibility of providing user support and are they adaptable to new versions of electronic tools, the location of electronic information, the ability to use its own cloud in which the user will have his or her own data, data access restrictions, and the need for additional training.

2. Characteristics of crisis situations in a company and the effect on managerial behaviour

Nowadays if a company in distress wants to survive in a turbulent environment it is above all necessary to determine the causes of the company's decline. If the causes of the decline are determined in time the consequences will not be that severe. There are internal and external causes of corporate failure.

Internal causes are:

- poor management,
- inadequate financial control,
- poor working capital management,
- high costs,
- lack of marketing effort,
- overtrading,
- big projects,
- acquisitions,
- poor financial policy,
- organizational inertia and confusion.

The most common external causes are:

- changes in market demand,
- competition,
- adverse movements in commodity prices [3].

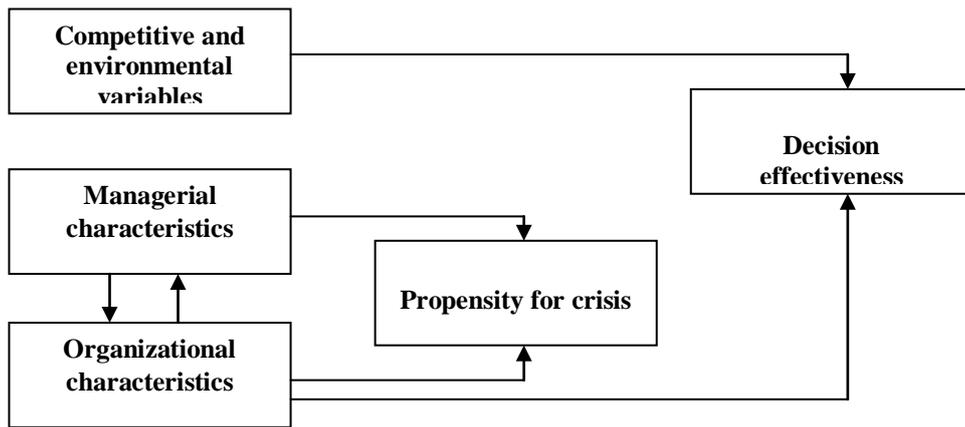


Figure 1. Simple model of crisis susceptibility

There are three groups of causal variables to market performance and susceptibility to crisis:

- competitive and environmental variables (product-market decisions, business cycles, etc.)
- managerial characteristics such as individual capabilities and management styles,
- organizational attributes, such as resources and structures (Figure 1.) [3].

Responses to crisis situations differ from one manager to another and the type of crisis. In crisis some managers improve the quality of their decision-making.

Such managers usually do decision-making in the ICT industry and are more likely to thrive on crisis situations and become turnaround experts rather than being a part of the existing management of a company that is heading towards insolvency. The word “insolvency” comes from Latin and consists of the words “in” (negation) and “solvo /solvere/solventem” (to fulfil an obligation, to perform, to loosen, to pay back, to relieve, to release). A crisis situation can be defined as an unexpected situation which in most cases comes suddenly, does not leave much decision time and is a threat to the company’s highest values.

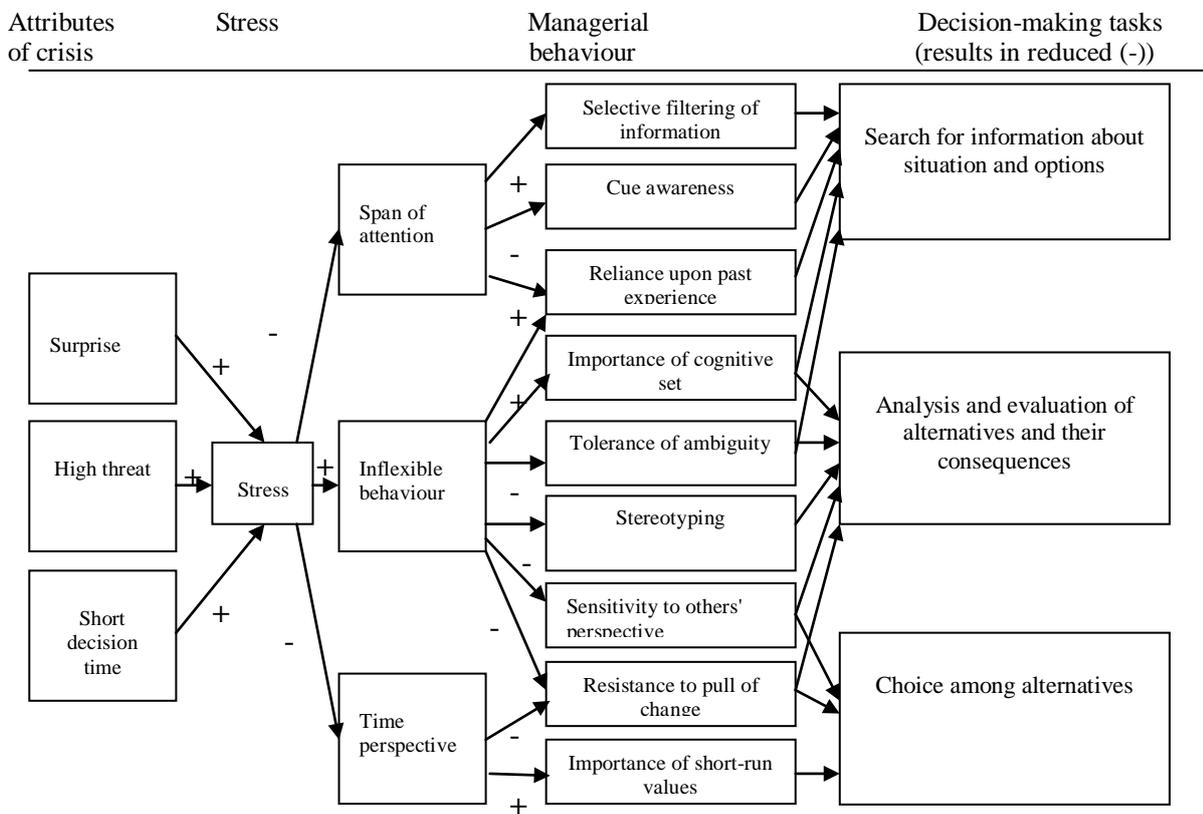


Figure 2. Managerial behaviour in crisis

The effect of these three characteristics of crisis, i.e., surprise, high threat and short decision time leads to increased stress (Figure. 2) in the entire observed company as well as in managers and every employee within the company [3]. A certain degree of stress is indeed welcomed in order to encourage a solution to a problem. Without stress there is not enough motivation to act and solve problems. Stress should not prevail because it can become a cause of anxiety instead of motivation. Stress reduces the span of attention, while at the same time increases managerial inflexibility and reduces their ability to cope with more complex problems. Severe stress focuses all the attention on the present and the immediate future, rather than on the long-term perspective, which makes sense in a severe financial crisis. Perceived time pressure may adversely affect decision-making. A moderate level of deadline pressure (according to Slatter, S. and Lovett, D.'s book *Corporate Recovery*) can enhance the level of creativity and performance of both individuals and managers. When it comes to managerial behavior the span of attention increases selective filtering of information and reliance upon past experience while awareness decreases. Managerial inflexibility results in increased reliance upon past experience as well. An inflexible manager places great importance only to cognitive sets and has got diminished tolerance of ambiguity. At the same time this inflexibility leads to manager's sensitivity to others' perspective and resistance to pull of change.

3. Managing ICT in a company during a crisis and possibilities of using office in the cloud

In a condition which hampers and limits the continuity of growth SMEs cannot afford to invest heavily in ICT. Such companies and IT managers are advised to apply the open source and its tools in their business activity which will generate greater profit at the end of the analyzed business period. Open source tools are free to use and are equally functional as Microsoft applications which one must pay for the license to use. SMEs may use GoogleDocs which contains applications useful for a company in the cloud.

Gartner Research, Inc. defines cloud computing concept as a type of computing where dynamically scalable resources are provisioned as a service over the Internet. Users do not need to have any knowledge, experience or control over infrastructure in the "cloud" neither the computer needs to have a powerful processor to perform database index related tasks. The term "cloud" is being used here as a

metaphor for the internet due to a way of representing the internet in computer network diagrams. The cloud is an abstract term for the complex infrastructure on which it is based [1].

Models of cloud computing delivery are: SaaS, PaaS and IaaS [5].

Typical examples of SaaS model include applications from various fields such as: CRM, ERP, project management, insurance, banking, CAD/CAM, word processing, databases and other fields. It includes several web applications with functions similar to the ones found in traditional office tools, including: Gmail, Google Calendar, Talk, Docs and Sites.

PaaS services provide computing platforms where creation tools are located in the cloud and are accessible from a web browser. They enable the development of web applications without having to install the necessary tools on your computer. The user of PaaS service is responsible for installing and maintaining his or her application. An example of PaaS service is Google App Engine [7].

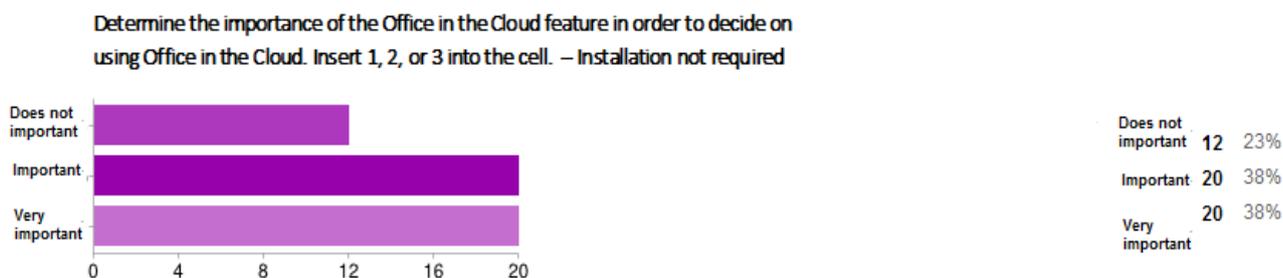
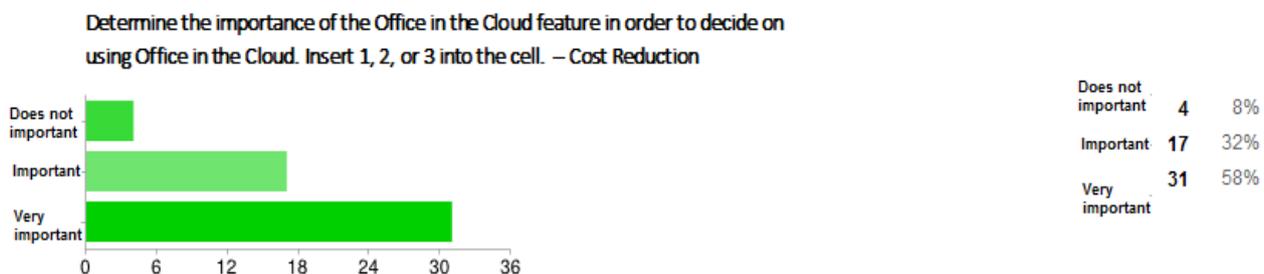
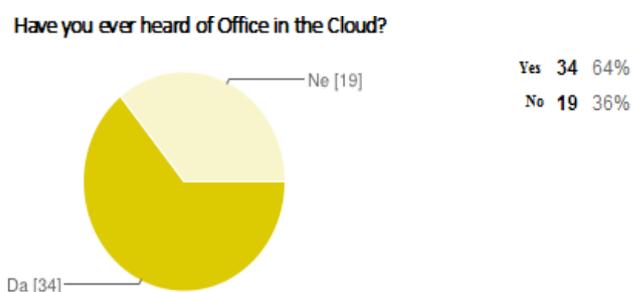
IaaS – here we are talking about the delivery of hardware infrastructure like servers, network equipment, RAM, storage space [6]. The most notable example of an IaaS service is Amazon Elastic Compute Cloud [4].

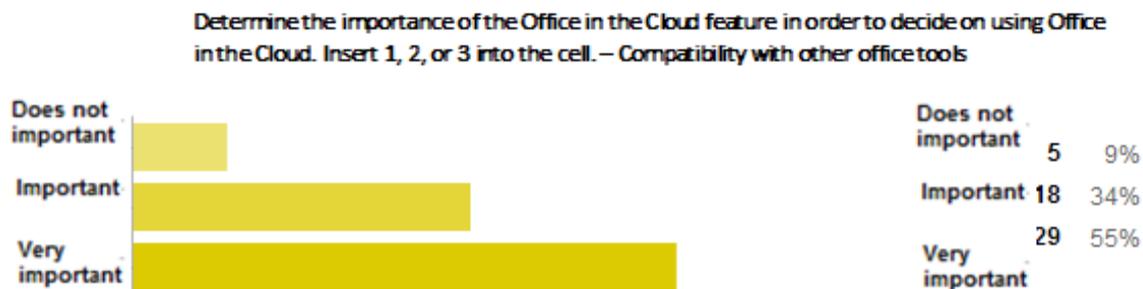
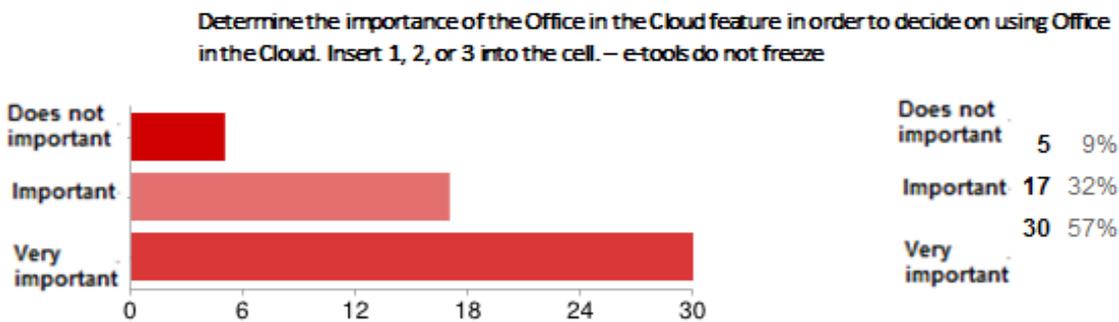
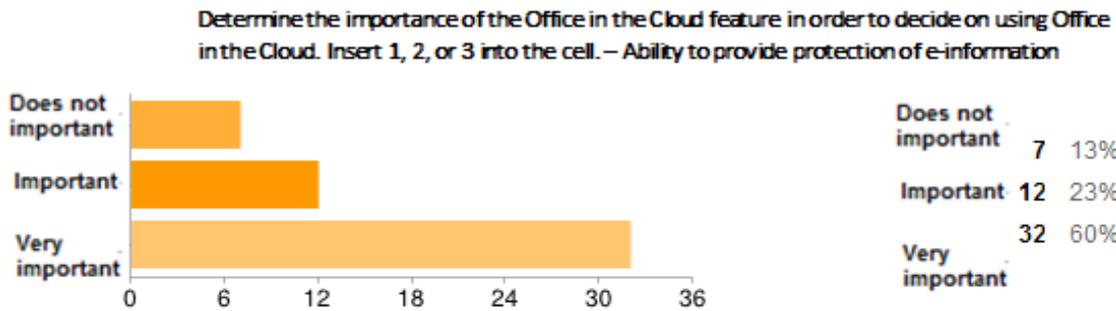
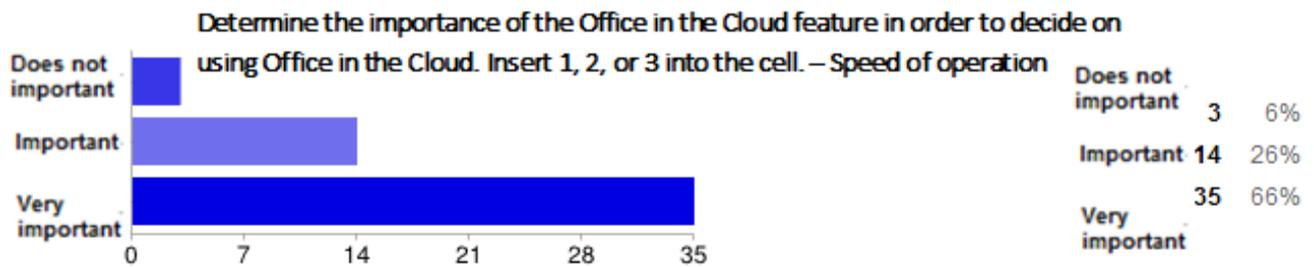
Some of the important features that could make SMEs decide to use cloud computing and open source tools instead of programme applications where one must pay the license are: cost reduction, no installation required, quick accessibility of tools, data and information, compatibility with other office tools, the ability to provide user support (Office in the Cloud), adaptability to new versions of the tools. When analyzing the functionality of the tools and the ability to save documents in certain formats with the same extensions, it can be concluded that OpenOffice, MS Office, LibreOffice and GoogleDocs are compatible. Advantages that GoogleDocs offers to SMEs are: online application which can be accessed at any time, the tools are easy to use, toolbars menu is very well laid out and common, the ability to create documents (memos), the ability to share documents, quick search for important documents, the ability to create online surveys, the ability to create a website, the ability to quickly collect relevant data from a larger number of samples, analytical processing of data using standard functions, the ability to store and edit photographs, no installation, reinstallation and upgrade required.

4. The importance of features of Office in the Cloud for business organizations

There were 53 representatives of business organizations (N = 53) interviewed in the presented survey (Figure 3). This electronic questionnaire survey technique has a number of advantages. The electronic questionnaire enables the collection of data by desktop computers, laptops, iPhones, tablets and other mobile devices. The advantages of electronic survey and electronic questionnaire are: the desired information is collected quicker, a larger sample of subjects can be covered in a shorter period of time, research costs are lower, saving on paper because no

paper printing of questionnaires is required, the ability to edit and correct the questions during the survey, the ability to simultaneously observe the results and the chart analysis of the results, data can be collected using mobile technology. The results of data processing are displayed just in time (JIT) using GoogleDocs chart. GoogleDocs allows quick creation of electronic questionnaires and fast collection of data from respondents who may use different technologies when filling in the questionnaire.





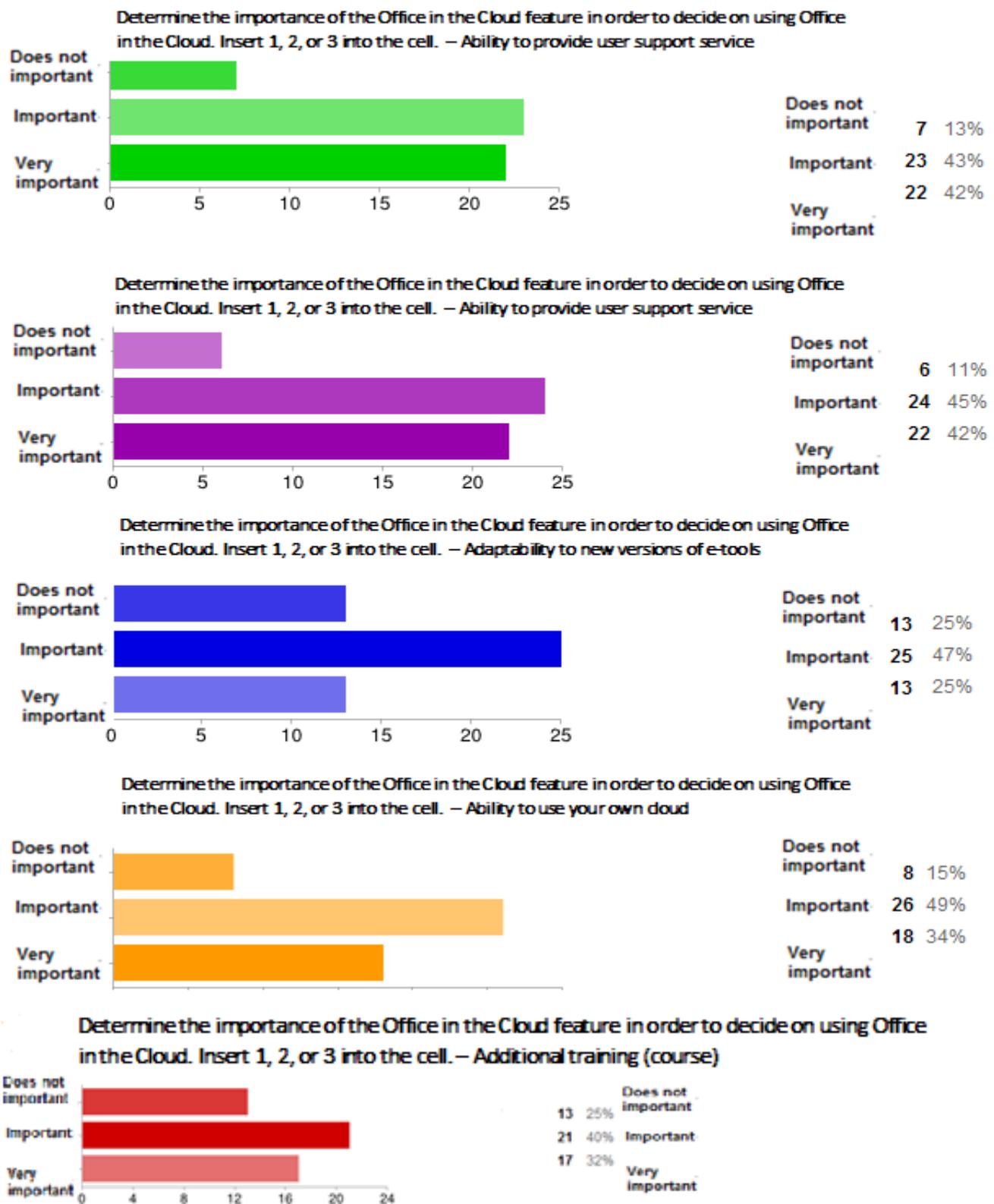


Figure 3. The importance of features of Office in the Cloud.
 Made by the author in GoogleDocs based on the data collected by the electronic questionnaire. URL:
<https://drive.google.com/?tab=mo&authuser=0#all>. (8.11.2012.).

Figure 3. shows that 64% of respondents have heard about Office in the Cloud and one can conclude that in the survey named *e-Office in the Cloud* all features of Office in the Cloud are more or less very important. One of the more important features for the respondents to decide on using Office in the Cloud is cost reduction (58%). Likewise “the ability to provide user support service” is also very

important (43%) or important (42%). The electronic questionnaire indicates respondents do not think it is important (25%) that electronic information is located at (to them) an unknown location. A large percentage of respondents (25%) think that additional training in order to be able to use Office in the Cloud tools is not important for making the decision to use Office in the Cloud. It makes sense since the respondents already have IT qualifications and are of high formal education. Similarly “the possibility of using your own cloud” is not important to some respondents (15%), which is very interesting because of numerous security alerts on computer crime. “Security protection of electronic information” is also not that important according to the respondents (13%) [9]. Based on the bar graph we can see that the respondents did not select an answer on some questions about the features.

5. Google Plus in business

Google Plus is a social network that enables you to share photos, videos, links, and locations with friends. The real advantage, unlike in other social networks, lies in the Google Plus tool called Circles. The idea of Google Plus differs from the most popular social networks because Google Plus essentially allows the user not to share his or her published material with the masses of people, but with certain social groups, circles. Google Circles as contact viewer provides many advantages over other popular social networks. Circles on Google Plus help you set up a meeting with a person of the same or similar business interests in real life.

After circles with the desired individuals are made one can share relevant content with the appropriate people in the form of text, images and videos and find things that are interesting. Circles let us share the announcement of new products and services only with circles where our friends or business partners are, and enable us to find a post of a friend from the circle of fans of books about management for example. We can decide who can see every piece of personal information on our Google Plus profile. For example, our contact details and information about certain products and services can be visible to the circle of friends, while classified employment history and education information can be visible only to the circle of our former colleagues and classmates.

Free services offered by Google Plus can be used to promote your business company or community non-profit organization, and to promote products or services. Google Plus allows online communication, as well as social network update using mobile technology.

Renowned businesses and non-profit organizations are also using Google Plus to display news and information on Google Plus web pages. Notable world organizations that use Google Plus services are: The Corcoran Group, Intel, Dallas Cowboys, Scholz & Friends, Focus, NASA (Figure 4), etc.[2] on Google Plus pages fans of non-profit organizations and users of business companies can see photographs, videos and links to other interesting things related to the same or similar field.

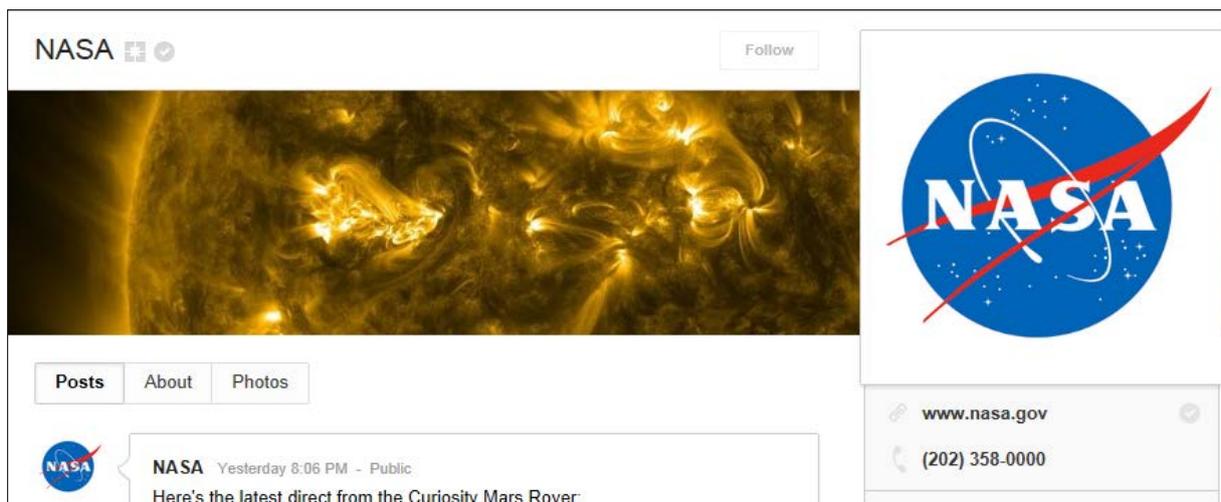


Figure 4. Google Plus – NASA.

Taken by the author based on Google Plus tools and NASA Google Plus web page

Figure 4. shows NASA Google Plus web page where one can see fascinating videos, pictures and

images of astronauts as well as current information, settings and comments on NASA plans.

6. Conclusion

The paper states benefits and advantages of using Office in the Cloud and open source code in SMEs and companies that do not have the money to set up their own ICT infrastructure. There are about seven commercial providers of e-Cloud services on the internet today: Google, Salesforce, Microsoft, Amazon, Rackspace, Yahoo and Zoho. GoogleDocs tool is a ground-breaking creation of the present and in the future we should encourage similar efforts and development of free tools in the cloud. The survey *e-Office in the Cloud* (N=53) tells us that all features of e-Office in the Cloud are important. According to the respondents (58%), one of the key features for making the decision to use the Office in the Cloud is cost reduction that ICT technology provides. Another very important feature is “the ability to provide user support service” (42%) while 43% of respondents selected the option *important*. The electronic questionnaire demonstrates respondents do not think it is important (25%) that electronic information is located at (to them) an unknown location. A large percentage of respondents (25%) think that additional training in order to be able to use Office in the Cloud tools is not important for making the decision to use Office in the Cloud. Similarly “the possibility to use your own cloud” is not important to some respondents (15%), which is very interesting because of numerous security alerts on computer crime. “Security protection of electronic information” is also not that important according to the respondents (13%). Considering the increased popularity of Office in the Cloud, and increasing number of service providers of such business support model it is essential to ensure the high level of quality of service. At the end of the paper there are examples of free service by Google Plus used for self-promotion of business companies or community non-profit organizations and promotion of products or services. The ability to update Google Plus social network using mobile technology is also mentioned.

Furthermore the paper recommends that SMEs use free service on Google Plus web pages for self-promotion and the promotion of their products and services on the internet. It is not recommended that companies, after identifying the characteristics of the crisis, invest large sums of money in the development of web portals and applications when there are viable free options available, such as Google Plus which is being used by renowned organizations.

References

- [1]. Beard, H. Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing. Applications and Data centers in the Cloud with SLAs. London. UK. 2008.
- [2]. Brogan, C. Google+ im Business. Wie das soziale Netzwerk von Google auch Ihr Geschäft verändert. Addison-Wesley, 2012.
- [3]. Slatter, S. i Lovett, D. Corporate Recovery. Managing Companies In Distress. BeardBooks, 1999.
- [4]. Amazon Elastic Compute Cloud. URL: <http://aws.amazon.com/ec2>. (9.11.2012.).
- [5]. Cloud Computing Use Cases White Paper. (2010). URL: <http://www.scribd.com/doc/18172802/Cloud-Computing-Use-Cases-Whitepaper>. (6.7.2012.).
- [6]. D2 - The European Software Industry. (30.7.2009.). URL: http://cordis.europa.eu/fp7/ict/ssai/docs/study-sw-2009v2_en.pdf. (7.7.2012.).
- [7]. Google App Engine. URL: <http://cloud.google.com/products>. (9.11.2012.).
- [8]. The Open Source Definition. URL: <http://opensource.org/docs/osd>. (2.11.2012.).
- [9]. The electronic questionnaire. URL: <https://drive.google.com/?tab=mo&authuser=0#all>. (8.11.2012.).

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