Cloud Computing perception and organisational impact on large Croatian enterprises

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Abstract. *Aim of this research is to identify and analyze perception and organizational impact of Cloud Computing (CC) as new and emerging paradigm in ICT to large Croatian enterprises.*
To develop survey questions, interviews with leading CC vendors were conducted and content analysis of global vendors' websites was done. After development of the insight to „cloud promise", and issues which are most discussed between vendors and their partners, survey questionnaire was developed and send to large Croatian enterprises over the internet.

Keywords. Cloud Computing, perception, adoption, Croatian enterprises

1 Introduction

Formal definition of Cloud Computing (CC) is given by NIST in [1]: "*CC 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.*" Gartner [2], identified CC as one of four forces that will shape World-Wide IT landscape of next decade: "*Research over the past several years has identified the independent evolution of four powerful forces: social, mobile, cloud and information. As a result of consumerization and the ubiquity of connected smart devices, people's behavior has caused a convergence of these forces. This user centric convergence raised a warning to senior IT leaders: Their existing architectures are becoming obsolete.*" History of CC and who actually coined the term is ongoing debate and good discussion could be found in [3]. First who propose computing as utility was John McCarthy back in 1961 in his lecture on MIT saying that [4] "*computation may someday be organized as a public utility*". We evidence new computing paradigm which is shaping the business operations and main objective of this research is to give descriptive analysis of CC

perception and impact on business operations of large enterprises in Croatia. So far numerous papers was published addressing CC in Croatian scientific community, such as [5] addressing security issues, [6] addressing evaluation procedures, [7] analyzing concept of GIS data and CC, [8] addressing regulatory aspects, [9] Global Navigation Satellite Systems (GNSS) cloud based distributed system approach, [10] Software as a Service approach in payment systems, [11] providing insight to load balancing algorithms in cloud environment, [12] CC for government, [13] addressing economic issues related to CC, [14] CC ontologies, [15] online collaborative tools for writings, [16] comparing cost of leasing IT services, [17] comparing commercial and open source cloud platforms for scientific communities, [18] delegated information processing, [19] giving insight into application in learning environment, [20] CC and business intelligence and [21] CC and high performance computing just to name few. With this research authors would like to modestly contribute to the existing knowledge corpus providing the results gathered.

2 Methodologies

Professor Dušan Radošević [22] propose thoughts which are still valid after more than 30 years addressing two disciplines, business organization and informatics saying that "*Without appropriate ways of collecting, processing, and evaluation of information and without proper organization man cannot act rationally, no purposeful activity could be conducted and therefore without this man, and not just a man but every living being cannot exist.*" In today business we evidence high need of processing data making it of use for decision making [23]. To respond to such a trend companies have to invest in new technology to increase their competencies. Here we could underline importance of CC, as it offers high performance technology as a service, not as a high initial investment. In a weak economy environment such is

Croatia having access to high end technology without capital investment could be seen as opportunity. With this research we wanted to research deeper what is the perception and organizational impact of CC to large Croatian enterprise. Relationship between competence and use of ICT exist and research was presented in [24]. To gather initial information which was used as a basis for developing questioner for survey, unstructured interviews with leading Croatian suppliers of CC technology were performed. Aim of interviewing was to get insight into large enterprises need and interest toward CC. Was agreed that name of the companies who provided us with insight will not be published. We collected extensive insight into the issues related to CC discussed between vendors and large enterprises in sales process. Such an insight was used to develop questionnaire for survey and in discussion part of this paper will be put in context according the survey results. Along the preparation for survey development, we analyzed "cloud promise" by leading global vendors. We looked content on their web site and done text analysis which provided us with common denominators from their content. They are: no capital investment needed, run applications outside of the company, tools for building applications, services to support application development, IT environment on disposal, focus on core business and give IT away to 3rd party, unlimited computing resources on demand and from capital investment to pay as you go model. After the interviews was conducted and content analysis was done questionnaire was made on those fundamentals. Survey was executed through internet based tool Lime Services[1] sending it to available addresses researches have or was provided by colleagues. Limitations of research are the internet based survey, as we do not evidence environment in which survey was answered. Also we have to admit that response was limited to 84 responses. Goal was to address with research Top 500 companies, and most of the responses are from those companies. A selection criterion was that those people who answer questions have access to corporate information system. As descriptive statistic was used, we believe that evidence into perception and organization impact of CC was gathered. Also we believe that from this research we could develop further investigation towards more precise issues related to large Croatian enterprises and CC. Results from survey are presented are following in next section of the paper.

3 Research results

3.1. Basic characteristics

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[1] http://www.limeservice.com/

Table 1. The Basic characteristics of respondents

		N	%
Gender	Male	72	88,9
	Female	9	11,1
	Total	81	100,0

Of the 81 respondents, which are selected from the population of employees in top companies in Croatia, 88.9% were male, while 11.1% of respondents were female.

Table 2. Respondents Age

	N	Minimum	Maximum	Mean	Std. Deviation
Year of birth	83	1952	1986	1968,19	8,443

Examination of the average year of birth of the respondents shows the average age of respondents is 46 years. The youngest participant is 28 years old and the oldest 62 years.

Table 3. Respondents Education

		N	%
Level of education	High School	7	8,8
	Bachelor	14	17,5
	Master	42	52,5
	Specialization	17	21,3
	Total	80	100,0

More than half of the respondents who participated in the study, the master's degree or a completed university degree (52.5%). Also a large proportion of respondents (21.3%) were completed with a specialization or master's degree. The minimum number of respondents completed only high school (8.8%).

Table 4. Participants Education

		N	%
Management position	Lower level management	26	35,1
	Tactical (middle) management	21	28,4
	Strategic (top) management	27	36,5
	Total	74	100,0

For all target management positions within the company responders are proportionally represented. Total 36.5% of respondents have a position in strategic management, 28.4% in the tactical management level and 35.1% at the operational level.

2. Perception

Table 5. Cloud familiarity - personal

		Not familiar at all	Not familiar	I do not know, neither familiar nor unfamiliar.	Familiar	Fully familiar	M	SD
Are you familiar with cloud computing technology offerings in Croatia?	N	3	3	16	45	14	3,79	0,904
	%	3,70%	3,70%	19,80%	55,60%	17,30%		

The average value given by respondents on familiarity with cloud computing technology offerings in Croatia is 4 (M = 3.79), which means they are considered to be familiar with this technology. More than half of respondents (55.6%) believe that they are familiar with cloud technology. A small standard deviation (0.904), indicating a small variation of other responses, and that most of the results around the average.

Table 6. Cloud familiarity - perception

		Not familiar at all	Not familiar	I do not know, neither familiar nor unfamiliar.	Familiar	Fully familiar	M	SD
Do you think that the business sector is familiar with cloud computing technology offerings in Croatia?	N	2	33	24	21	1	2,83	0,891
	%	2,50%	40,70%	29,60%	25,90%	1,20%		

However, although express their own understanding of cloud technology, most respondents felt that the business sector is not familiar with cloud computing technology offerings in Croatia (40.7%), also a large number of respondents did not know whether business sector is familiar with cloud technology or not (29, 6%).

Table 7. Weak points

For the following characteristics please evaluate whether you think them weak point of cloud computing technology?		Very weak pint	Weak point	I do not know, not a week point, but not a strong one	I do not know, not a week point	Not a week point	Not at all week point	Contrary, it is advantage	M	SD
[Security]	N	9	25	6		17	17	6	3,33	1,557
	%	11,30%	31,30%	7,50%		21,30%	21,30%	7,50%		
[Legal regulations of cloud services]	N	13	19	26		10	4	2	2,72	1,222
	%	17,60%	25,70%	35,10%		13,50%	5,40%	2,70%		
[Maintenance of solutions that are not within your organization]	N	6	9	13		17	16	15	3,96	1,544
	%	7,90%	11,80%	17,10%		22,40%	21,10%	19,70%		
[Data transfer in the event of termination of service, or transition to another supplier]	N	18	21	15		8	10	4	2,78	1,52
	%	23,70%	27,60%	19,70%		10,50%	13,20%	5,30%		

Based on average results in all particles ranging from 2.72 to 3.96, it is evident that any claim respondents do not consider those characteristics as weak point cloud computing technology, but also do not consider them as benefits. The lowest estimate, that the greatest weakness is the legal regulation of the use of cloud services, with 43.3% of respondents believe that it is extremely weak or weak point. Most estimates claim gets to maintain solutions that are not within the organization, and 40.8% believe that the above statement is not a weak spot, or even the technology advantage.

Table 8. Supplier investment

		Yes	No
Have you so far already inquired about the amount of investment that Supplier must invest in its cloud computing Infrastructure?	N	37	40
	%	48,10%	51,90%

It is evident that about half of the respondents (51.9 &) are interested in the amount of investment that a provider must invest in its cloud computing infrastructure, while half of the respondents were not (48.1%).

Table 8. Supplier investment

		Worst possible billing model	2	3	4	Best possible billing model	M	SD
Grading from 1 to 5 evaluate the possibility of monthly billing usage of ICT services.	N	4	9	28	20	14	3,41	1,092
	%	5,30%	12,00%	37,30%	26,70%	18,70%		

Mean values on a scale of evaluation (M = 3.41) of monthly billing model indicates that a majority of the model is evaluated with a mean score of 3.

Table 9. Personal usage

		Yes	N0
Are you using one of the private cloud services you are paying for?	N	26	53
	%	32,90%	67,10%

Majority of responders (67.1 %) privately are not users of any private cloud services they are paying for.

Table 10. Promotion responsibility

Please evaluate the extent to which those subjects are responsible for promoting and informing cloud computing technology of its current and potential users:		Not responsible at all	Not responsible	I do not know, maybe responsible, maybe not	Responsible	Very responsible	M	SD
[Service providers]	N	0	3	3	31	40	4,4	0,748
	%	0,00%	3,90%	3,90%	40,30%	51,90%		
[Individuals (internally) inside company]	N	0	10	18	35	12	3,65	0,908
	%	0,00%	13,30%	24,00%	46,70%	16,00%		
[Media]	N	3	14	22	29	7	3,31	1,013
	%	4,00%	18,70%	29,30%	38,70%	9,30%		
[ICT and/or business associations]	N	1	2	13	37	22	4,03	0,838
	%	1,30%	2,70%	17,30%	49,30%	29,30%		
[Government]	N	15	15	19	23	5	2,84	1,236
	%	19,50%	19,50%	24,70%	29,90%	6,50%		

After examining the results, it is evident that the respondents believe that the Government is at least responsible for the promotion of cloud computing technologies (M = 2.84). Most responsible are service providers (M = 4.4), where more than half of respondents (51.9%) believe that they are extremely responsible. Also respondents (78%) believe that ICT and/or business associations are also responsible or highly responsible for promoting and informing cloud computing technology of its current and potential users.

Table 11. Miscellaneous

Please evaluate the degree of agreement with the following statements:		I totally disagree	I disagree	Neither agree, nor disagree	I agree	I totally agree	M	SD
[Global business practices is an important factor in the acceptance of cloud computing]	N	1	5	14	43	16	3,86	0,858
	%	1,30%	6,30%	17,70%	54,40%	20,30%		
[Government as a major beneficiary would encourage smaller companies to use cloud based solutions]	N	6	20	8	30	15	3,35	1,261
	%	7,60%	25,30%	10,10%	38,00%	19,00%		
[Widespread use of cloud computing would have an impact on the price of services]	N	1	3	7	40	29	4,16	0,834
	%	1,30%	3,80%	8,80%	50,00%	36,30%		
[More users of cloud computing technology would reduce the cost of services]	N	1	3	9	37	30	4,15	0,858
	%	1,30%	3,80%	11,30%	46,30%	37,50%		
[Rental use of ICT services would make easier the management of ICT services]	N	4	7	20	28	21	3,69	1,109
	%	5,00%	8,80%	25,00%	35,00%	26,30%		
[Fear of the new is an important factor in decisions about moving to cloud computing]	N	2	11	5	37	23	3,87	1,073
	%	2,60%	14,10%	6,40%	47,40%	29,50%		
[Cloud computing offerings are too many, which makes the choice difficult]	N	10	44	19	6	0	2,27	0,78
	%	12,70%	55,70%	24,10%	7,60%	0,00%		

After examining the results, we see a high agreement with the majority of claims.
Respondents agree with the statement that the global business practice is an important factor of acceptance of cloud computing (75.7% of respondents agreed or fully agreed with the statement), and believe that widespread use of cloud computing would have an impact on the price of services (even 86.3 % of respondents agreed or totally agreed with the statement). Also, respondents express high agreement with the statement that more users of cloud computing technology, would reduce the cost of services (M = 4.51), and that the fear of the new is an important factor in decisions about moving to cloud computing (M = 3.87), as well as rental use of ICT services would make easier the management of ICT services (M = 3.69).
In contrast to the other agreement with the statements, respondents stated very low agreement with the statement that the cloud technology offering is too big and makes a difficult choice (M = 2.27). Over half of the respondents disagreed with the statement (55.7%).

Table 12. Purchase decision

When buying cloud services, the extent to which these characteristics influence the decision to purchase?		Not influence at all	Not influence	Neither influence, nor influence	Influence	Inluence a lot	M	SD
[Price]	N	1	2	2	44	21	4,17	0,742
	%	1,40%	2,90%	2,90%	62,90%	30,00%		
[Understanding the benefits of cloud technology]	N	1	1	4	50	19	4,13	0,684
	%	1,30%	1,30%	5,30%	66,70%	25,30%		
[The cost of that is due to changes of the technology in use (meetings, evaluation, selection, internal communication, negotiations with suppliers)]	N	3	17	10	38	10	3,45	1,089
	%	3,80%	21,80%	12,80%	48,70%	12,80%		
[Monthly fee or posting as an operating expense rather than a capital investment]	N	2	7	18	36	15	3,71	0,968
	%	2,60%	9,00%	23,10%	46,20%	19,20%		
[When a problem arises, and already appeared to be an urgent need for software solution, then cloud computing is the fastest way to solve the problem.]	N	3	11	17	28	14	3,53	1,094
	%	4,10%	15,10%	23,30%	38,40%	19,20%		

It is evident that the decision to purchase cloud services is most affected by price (M = 4.17). Even 30% of respondents believe it influences completely, while 62.9% of respondents believe that it influences the decision. As an essential component of purchasing cloud technology proved to be an understanding of their benefits are almost the same (M = 4.13). The majority of respondents, 66.7% believe that it affects the decision when purchasing. Also, a big influence and has a monthly fee or posting as an operating expense rather than a capital investment (M = 3.71), and the fact that when a problem arises and already appeared to be an urgent need for SW solution, then cloud computing is the fastest way to fix the problem (M = 3.53).
The smallest, but not so small effect has a cost that occurs due to changes in the technology in use (meetings, evaluation, selection, internal communication, negotiations with suppliers (M = 3.45)).

3. Organization

Table 13. Implementation status

Please indicate the phase of implementation of individual cloud technology within your organization		Already implemented	In implemen-tation phase	Planed within 3. years	Planed within 1. year	Not in the plan	I do not know
[Storage]	N	21	5	5	3	35	1
	%	30,00%	7,10%	7,10%	4,30%	50,00%	1,40%
[Data Back-Up]	N	22	3	6	4	33	2
	%	31,40%	4,30%	8,60%	5,70%	47,10%	2,90%
[Security Solutions]	N	15	3	5	2	39	2
	%	22,70%	4,50%	7,60%	3,00%	59,10%	3,00%
[Data Base Management]	N	11	4	4	2	43	3
	%	16,40%	6,00%	6,00%	3,00%	64,20%	4,50%
[Web Servers / Portals]	N	30	3	4	3	27	1
	%	44,10%	4,40%	5,90%	4,40%	39,70%	1,50%
[E-mail]	N	27	1	4	5	30	2

	%	39,1 0%	1,40%	5,80%	7,20%	43,50%	2,90%
[Messaging / Collaboration]	N	20	0	3	4	36	2
	%	30,80%	0,00%	4,60%	6,20%	55,40%	3,10%
[Personal Productivity (Office, Google Drive...)]	N	12	1	6	5	39	3
	%	18,20%	1,50%	9,10%	7,60%	59,10%	4,50%
[Business Applications (ERP, CRM, e-commerce...)]	N	12	3	5	3	36	6
	%	18,50%	4,60%	7,70%	4,60%	55,40%	9,20%

It is evident that within the organization cloud technology is widely used for e-mail (39.1% of respondents stated that the implementation phase is already realized), web services and portals (44.1). Also, the large number of respondents said that cloud technology in their organizations is used to data back-up (31.4%), and storage (30.00%). Also, cloud technology is used for messaging (39.1%).

However, although a large proportion of respondents who stated that the specific items are already introduced in the organization, the greater the percentage of those who believe that these items are not in the plan for implementation within the organization. Thus, more than half of the respondents claimed to not plan to introduce cloud technology for Data Base Management, Security Solutions, Personal Productivity, Messaging / Collaboration, Business Applications and Storage (> 50%).

Table 14. Implementation strategy

In your organization you deploy a new cloud service:		Never	Rarely	Often	Almost always	Depending on situation
[Upon introduction of new service (NEW)]	N	15	15	4	5	19
	%	25,90%	25,90%	6,90%	8,60%	32,80%
[Upon service replacement (REPLACE)]	N	14	19	4	4	15
	%	25,00%	33,90%	7,10%	7,10%	26,80%
[Upon upgrade with new required functionalities (UPGRADE)]	N	19	14	9	1	14
	%	33,30%	24,60%	15,80%	1,80%	24,60%

A large number of respondents (24.6 to 32.8%), a new cloud service are introducing depending on the situation. Thus, we can conclude that they are adapting to the needs of the organization.

However, the most rarely a new cloud service is introduced when upgrading existing service (33,3%).

Table 15. Show stopper

Below are possible reasons why a cloud service is not introduced (show stopper). The extent to which the stated reasons affect the lack of service introduction?		Not at all affecting the decision	Not affecting the decission	Neither affects nor not-affects	Affects the decission	Totally affect the decision	M	SD
[The risk of non-acceptance (internally)]	N	3	11	9	35	14	3,64	1,092
	%	4,20%	15,30%	12,50%	48,60%	19,40%		
[Security]	N	2	9	9	32	21	3,84	1,067
	%	2,70%	12,30%	12,30%	43,80%	28,80%		
[Lack of budget]	N	2	11	16	27	18	3,65	1,091
	%	2,70%	14,90%	21,60%	36,50%	24,30%		
[organizational inflexibility]	N	3	8	9	31	20	3,8	1,103
	%	4,20%	11,30%	12,70%	43,70%	28,20%		

The fundamental reason why the cloud services do not introduced is security (M = 3.84), with 71% of respondents believe that security affects the process of introducing cloud services. Also of great importance are

other items as demonstrated by the high arithmetic means on all scales of assessment. So, they consider that the reason of not introducing cloud services is internal risk of non-acceptance (M = 3.64), lack of budget (M = 3.65), and organizational inflexibility (M = 3.8)

Table 16. Importance criteria – positive characteristics

Rate the importance of following the positive characteristics of the introduction of cloud Services:		Not at all important	Not important	I do not know, neither important, nor important	Important	Very important	M	SD
[Availability and accessibility]	N	3	0	4	22	48	4,45	0,911
	%	3,90%	0,00%	5,20%	28,60%	62,30%		
[Flexibility]	N	3	0	7	34	31	4,2	0,915
	%	4,00%	0,00%	9,30%	45,30%	41,30%		
[Adaptive price]	N	2	1	11	32	29	4,13	0,905
	%	2,70%	1,30%	14,70%	42,70%	38,70%		
[Location independence]	N	4	8	17	28	17	3,62	1,119
	%	5,40%	10,80%	23,00%	37,80%	23,00%		
[Agility of services introduction]	N	2	2	6	40	27	4,14	0,869
	%	2,60%	2,60%	7,80%	51,90%	35,10%		
[Unburdening of IT organization]	N	2	5	14	34	20	3,87	0,977
	%	2,70%	6,70%	18,70%	45,30%	26,70%		
[Clearer cost management]	N	2	3	9	38	22	4,01	0,914
	%	2,70%	4,10%	12,20%	51,40%	29,70%		

All the positive characteristics of introduction of cloud services are important, and they were rated an average score of 4 on a scale estimates of 1 to 5. Even 62.3% of respondents believe availability and accessibility are very important. Also, flexibility is important to them (86.6% of respondents believe flexibility is important or very important), and speed of placement services at a business function (agility) (87% - important or very important). Also, respondents mention the very high estimates of the importance of the adaptive price (M = 4.13), territorial independence (M = 3.62), relieving the pressure on IT organizations (M = 3.87), and a clearer managed costs (M = 4.01).

Table 17. Importance criteria - negative characteristics

Rate the importance of following the introduction of the negative characteristics of cloud Services:		Not at all important	Not important	I do not know, neither important, nor important	Important	Very important	M	SD
[Higher cost of ownership]	N	3	10	22	24	13	3,47	1,074
	%	4,20%	13,90%	30,60%	33,30%	18,10%		
[Service reliability]	N	2	2	5	31	36	4,28	0,903
	%	2,60%	2,60%	6,60%	40,80%	47,40%		
[Internet dependence]	N	0	9	5	29	33	4,13	0,984
	%	0,00%	11,80%	6,60%	38,20%	43,40%		
[Security]	N	0	5	1	33	37	4,34	0,809
	%	0,00%	6,60%	1,30%	43,40%	48,70%		
[Local IT lack of control]	N	1	13	19	27	14	3,54	1,036
	%	1,40%	17,60%	25,70%	36,50%	18,90%		

		1	6	13	30	26		
[Lack of support]	N	1	6	13	30	26	3,97	0,979
	%	1,30%	7,90%	17,10%	39,50%	34,20%		
[Vendor lock in]	N	1	5	12	28	30	4,07	0,971
	%	1,30%	6,60%	15,80%	36,80%	39,50%		

All the negative characteristics, except for the increased costs of the ownership, on the estimation scale of 1 to 5, were rated grade 4, suggesting that almost all of the negative characteristics are considered important. Most important is security (M = 4.34), with nearly half (48.7%) subjects said security is a very important characteristic. Also, respondents very high rated importance of service reliability (M = 4.28), and dependence on the Internet (M = 4.13). Given these characteristics, the respondents were the least worried in increase of cost of ownership (M = 3.47).

4 Discussions

Only 11% of responses coming from women shows us trend about inequality in women's employment on management positions [25]. This is maybe not directly related to the CC phenomena, but we evidence globally discussion about such inequality, especially in Silicon Valley. Stanford professor Wadhwa from Stanford is very active in raising such questions [26], [27], [28].

Interesting point for discussion is that almost 80% of respondents stated they are familiar with CC and at the same time almost 45% stated that industry in overall is not familiar with CC. A phenomenon of comparing with others, which is not anchored on fact, producing economic losses was well discussed in [29].

Security and legal regulatory was stated as a weak point of CC as 43% of respondents agree on that. Such a regulatory issue particularly in Croatia was covered in [30], [31]. Addressing the "cloud promise" denotations extracted from content on the web sites of CC vendors, we are not evidencing strong message about legal and security issues. This is significant difference, because from the interviews data we could see that legal issues are important topic which is discussed by Croatian vendors with potential clients. Almost equally (48% and 52%) response to the question about interest about price of CC, show us that Croatian market is still with full of potential, as almost half of the market was not researching prices of CC solutions. Interview and "cloud promise" data shows us that important value proposition of pay as you go model for CC solutions, but in the responses we could see very neutral attitude towards such possibilities.

In the interviews with vendor was underlined issue about importance of ICT and business associations in promoting clouds and responses in the interview show that their role is important, as 78% of respondents believe that they have important role in promotion of the CC in Croatia. Connecting dots between statement that government is not responsible for promotion of the CC (40%), and that wider use of CC will reduce the price (86%), considering that advanced ICT technology could improve national competitiveness, we could see opportunity for Croatian government to become proactive player and even think of some tax reduction incentives, like Singapore government recently did [2].

Most of the respondents stated that price (92%) and understanding CC (91%) are the characteristics which influence purchasing decision, but most of responded see that fear from the new has negative impact (77%). From the perspective mentioned already that ICT improve competitiveness of Croatian companies, we could evidence space for action toward promoting CC as a national business competitiveness initiative in which all stakeholders will be involved. Following competitiveness issues, we evidence that CC is mostly used for storage (37%) and data backup (35%), while personal productivity (19%) and business application (22%) are on the low level which should be seen as clear business opportunity as indicated as major CC opportunity [32].

On asking when Croatian companies are typically introducing cloud services - upon introduction of new service, upon service replacement or upon upgrade with new required functionalities, we concluded that there is neither clear strategy nor preferred situation. New cloud services are introduced depending on the current situation (24.6 to 32.8%). Assumptions that CC is not implemented because of security (71%), risk of acceptance of new technology (68%) and organizational inflexibility (72%) shows us importance of considering both social and technical aspects when implementing new technology. At the end it's not about technology and its advances it's about people who use it. Such issues were well discussed in [33], [34], [35].

Positive characteristics of the cloud, which we evidence in "cloud promise" analysis and interviews findings such as availability and accessibility (90%), flexibility (86%), price adaptability (80%) and fast

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[2] http://www.spring.gov.sg/NewsEvents/ITN/2011/Pages/Cloud-computing-is-tax-deductible-20111026.aspx - retrived 02.05.2014

implementation of new business functions (86%) recognized as important positive characteristics of CC. We could argue that in long run end users have positive beliefs toward outcomes [36], but users still have to address subjective norms and evaluation of the outcomes.

We would like to propose that further research in the area of technology acceptance models based on CC phenomena is needed. In the question about negative characteristics, of the CC, we could evidence that respondents are aware of all negative aspects of CC which was also addressed in interviews as important issues.

As is not possible to perform comparison to similar CC country specific researches, it is still valid to conclude as in the 2012 Singapore SME research (37): "*Our findings show that the adoption of such emerging technologies is still in its early days amongst our companies*", so it is necessary to invest in further understanding of the upcoming era of ubiquitous computing.

5 Conclusion

Overall awareness and perception are aligned with information gathered in interviews, but to achieve considered impact on business organization, in terms of competitiveness of large Croatian enterprises, additional activities on popularization of CC should be approached by all stakeholders.

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