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Evaluating Determinants of Cloud Computing Acceptance in Croatian SME Organizations

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By

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Abstract

The cloud computing technology has made a tremendous impact on various types of business organizations by enabling fast, easy and cost effective use of information systems, and thus making it available to everyone. Respectively, the cloud computing would be most beneficial for small and medium organizations (SMEs). However, the Croatian SMEs are still reluctant in accepting the cloud computing technology and unleashing its full potential. This research study focuses on exploring how different determinants outlined in extended model of unified theory of acceptance and use of technology (UTAUT2) influence behavioral intention of decision makers within Croatian SME organizations to accept cloud computing technology. The research study revealed that proposed theoretical model could explain 46% of variance in behavioral intention of Croatian SME organizations to accept cloud computing technologies. In addition, the study revealed that determinants under investigation, performance expectancy (PE), effort expectancy (EE), social influence (SI) and price value (PV) are statistically significant predictors of behavioral intention. Therefore, the results of this study have implication both for Croatian SMEs and cloud computing providers as well as for the Croatian government as it will provide insight on how to align different strategies by using results from the study.

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CHAPTER I - Introduction

Introduction to the Problem

This research study will investigate the detrimental factors that influence decision makers in Croatian small and medium organizations (SMEs) to adopt cloud-computing services. The cloud computing technology has redefined how businesses organizations develop, use and deploy new services and thus enabling them to gain unique competitive advantage. This is in line with the cloud computing definition which states that cloud computing is an evolving paradigm, which allows users to access on-demand networks and share computer resources that can be rapidly and cost effectively provisioned with an minimal management effort (Mell & Grance, 2011). The benefits for businesses using cloud computing technologies include: cost reduction and lower total cost of ownership (TCO), easy access to high performance computer resources needed for intensive data computations (e.g. business analytics), flexibility and scalability in resource deployment, change in financial model (e.g. CAPEX to OPEX) and fast service provisioning and deployment (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011).

Statement of the Problem

Even though, small and medium organizations (SMEs) would benefit and have most advantages from using cloud computing technologies they are still quite reluctant in adopting cloud computing technologies in more massive scale (Folco, Bonagura, Laurini, & Kolding, 2012). According to latest statistical data available from Eurostat (2014), the European SME organizations use cloud computing technology for delivering services significantly less than the large organizations. In addition, if we take into account the fact that Croatian SME organization are responsible for 67,4% of overall employment but contribute only with 55,2% of added value. This is under EU average (57,8%), and thus the problem becomes even more discernible

(European Commission, 2015). In addition, in September 2012, the EU commission outlined cloud computing as one of the main factors in EU economy development by adopting a strategy called "Unleashing the Potential of Cloud Computing in Europe" (European Commission, 2012). The strategy outlines actions needed to be taken, which according to the preparatory study performed by IDC for EU commission, would be responsible for net gain of 2,5 million new EU jobs and would contribute to annual growth of 160 billion euros (almost 1% of EU GDP), by 2020 (European Commission, 2012, p.6).

Therefore, there is an exigency to determine what the motivational factors are, that influence behavioral intention of small and medium organizations to adopt cloud-computing technologies.

Purpose of the Study

The purpose of this quantitative survey study is to evaluate what are the determinant factors that influence decision makers in Croatian small and medium organizations to adopt cloud computing technologies evaluating behavioral constructs described in the extended model of unified theory of acceptance and use of technology (UTAUT2) (Venkatesh, Thong, & Xu, 2012). The study will evaluate potential correlation between direct determinants - performance expectancy (PE), effort expectancy (EE), social influence (SI) and price value (PV) in relation to behavioral intention (BI) of accepting the cloud technology.

Significance of the Study

This study will contribute to different number of professionals, organizations and government by helping them to understand the obstacles that lie on path of acceptance of cloud computing technologies. The decision makers within the SME organizations will gain better understanding of how other organizations perceive different motivating constructs (i.e.

performance, effort expectancy, social influence and price value) when it comes to adaptation of cloud technologies in similar organizations to their own. As for their counterparts, the Croatian cloud-computing providers would benefit from the study, as it would help them better to understand customers' viewpoint when it comes to adopting cloud-computing technology. The study will also help Croatian government when developing or aligning Croatian ICT strategy and allow them to make decisions that are more informed.

Rationale

Cloud computing has developed to the point that it has become an essential step on how business organizations develop their information systems (Lian, Yen, & Wang, 2014). The world's largest service providers such as Google, Microsoft or IBM, have made large investments in transforming their organizations towards the cloud (Lian, 2015). In addition, according to Eurostat (2014) data, large Croatian business organizations do not lag behind in cloud computing acceptance in relation to EU average. However, according to the same research, the SME organizations are far more reluctant in adopting cloud computing services into their IT environments. Therefore, this study will focus its efforts on exploring determinants that lead towards behavioral intention of using cloud computing technology within Croatian SME organizations.

This study grounds its approach from construct developed in unified theory of acceptance and use of technology (UTAUT2), which is an extended version of previous UTAUT model (Venkatesh et al., 2003; 2012). According to Venkatesh et al. (2012) UTAUT2 theory, performance expectancy (PE), effort expectancy (EE), social influence (SI), hedonic motivation (HM) and price value (PV) are all key predictors of behavioral intention, but do not influence actual use of technology. This study will explore how these different determinants influence

Croatian SME decision makers' behavioral intention to adopt cloud computing technology, except the hedonic motivation (HM) construct. According to Venkatesh et al. (2012), the hedonic motivation (HM) definition derives from having fun or pleasure from using the technology, which cannot be related with the nature of cloud computing technology. To gain a better understanding of the research model, the constructs under evaluation are graphically presented in Figure 1.

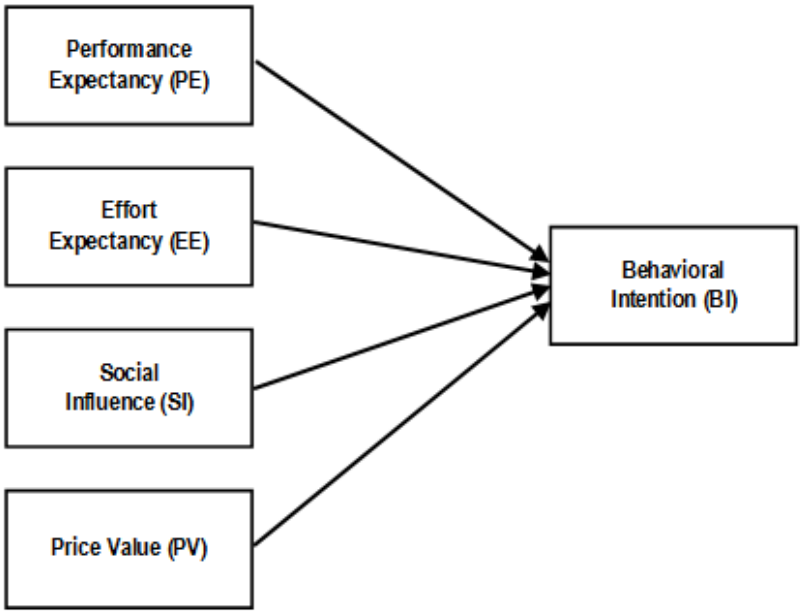

Figure 1. Constructs under evaluation in the research study. Adopted from "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology" by Venkatesh, V., Thong, J., & Xu, X. 2012. *MIS Quarterly 36*, p. 160. Copyright © 2012, Regents of the University of Minnesota. Used with permission.

Hypotheses

$H_0$1 - Performance expectancy, effort expectancy, social influence and price value are not statistically significant determinants of behavioral intention of cloud computing acceptance within Croatian SME organizations.

$H_0$2 - Performance expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

$H_0$3 – Effort expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

$H_0$4 – Social influence is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

$H_0$5 – Price Value is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

CHAPTER II – Literature Review

Introduction to the Literature Review

The cloud computing has become highly important aspect in utilizing computer resources and thus enabling organizations across different industries to make the most of benefits that technology can offer (Marston et al., 2011). In this quantitative research study, extended model of unified theory of acceptance and use of technology (UTAUT2) formulated by Venkatesh et al. (2012) is used to describe determinants that influence behavioral intention toward cloud computing acceptance within small and medium organizations (SMEs) in Croatia.

This literature review focuses on three different constructs considered as key elements of this research. First, the literature review centers on technical aspects of cloud computing technology, focusing on benefits and potential risks that technology offers. Second, it focuses on importance of cloud computing technology acceptance within small and medium organizations by evaluating benefits that technology can offer taking into account previous research studies. Third, it focuses on UTAUT2 theory development and its constructs as theoretical background for this research study.

The Overview of Cloud Computing Technology

The cloud computing is considered to be a new paradigm in sharing computing resources that enables fast and easy on demand provisioning process with minimum effort from the user and with the cost oriented business model (e.g. pay-as-you-use) (Mell & Grance, 2011; Buyya, Broberg, & Goscinski, 2011; Kushida, Murray, & Zysman, 2015). Even though, cloud computing is considered as relatively new technology as it started appearing in literature in 2007, the idea behind the computer resource sharing dates back to 1959. (Aymerich, Fenu, & Surcis, 2008; Rajaraman, 2014).

The virtualization of network infrastructure (e.g. physical servers, storage, etc.) is an essential part and key enabler of cloud computing technology (Intel, 2013). In technical terms, the first step to building scalable cloud environment abstracts from deploying virtual machines (VMs) that utilize computer resources, storage and networking resources. The virtual environment is managed through the hypervisor layer, which enables deployment of multiple VMs that are sharing the same physical resources and also allowing implementation of guest operating systems used for an application deployment (Intel, 2013).

The Cloud Computing Services Layers and Deployment Models

The literature distinguishes three cloud services layers (infrastructure-as-a-service – IaaS, platform-as-a-service – PaaS and software-as-a-service – SaaS) and four deployment models (public cloud, private cloud, community and hybrid cloud) (Rajaraman, 2014; Buyya et al., 2011).

Infrastructure as a service. The infrastructure-as-a-service (IaaS) is a service model in which service providers' offer virtualized on demand computer resources (i.e. virtual machines, storage or networks) that users provision over the Internet (Buyya et al., 2011). The physical

computing infrastructure located in service provider data centers use virtualized software layers that enable multiple users to access computing resources at the same time (Rajaraman, 2014).

Platform as a service. The platform-as-a-service (PaaS) is a service model that offers additional layer on top of infrastructure service such as operating system or development environments, and allows users to provision and install their own applications (Buyya et al., 2011).

Software as a service. The software-as-a-service (SaaS)is a service model that enables users to access software applications provisioned on virtualized infrastructure that can be accessed any time over the Internet (Buyya et al., 2011). These applications include a wide range of utilities such as customer relationship management software - CRM (e.g. Salesforce) or enterprise resource planning software – ERP (e.g. SAP) (Benlian, Hess, & Buxmann, 2009).

Public cloud. The public cloud is a model of enabling access to cloud computing infrastructure to anyone by using pay-as-you-go model (Armbrust et al., 2010). Service providers usually offer free (e.g. Google Drive) and paid public clouds (e.g. Microsoft Azure) (Rajaraman, 2014).

Private cloud. The private cloud is a model of enabling access to cloud computing recourses exclusively to a single organization that is not available to general public (Armbrust et al., 2010). The cloud computing infrastructure may be owned and maintained by the organization itself or it can be provisioned on demand from service providers (Rajaraman, 2014).

Community cloud. The community cloud is a model of enabling access to cloud computing recourses to a closed group of organizations with a shared interest (e.g. universities) (Rajaraman, 2014).

Hybrid cloud. The hybrid cloud is a model of combining two or more different deployment models (e.g. private and public cloud) (Rajaraman, 2014). Organizations usually acquire additional public cloud services to extend their own private cloud services such as cloud storage services as addition to their own infrastructure services.

The Potential Benefits of Cloud Computing

The cloud computing has transformed how we acquire computing resources and made them cost effective, scalable, easy to access and thus abundant (Marston et al., 2011; Kushida et al., 2015). As argued by Armbrust et al. (2010) cloud computing not just enabled a high level of elasticity both when it comes to resource planning and utilization but it also redefined the financial model and enabled it to shift from high one-off payment to a monthly payment model in pay-as-you-go model (i.e. CAPEX to OPEX). The cloud computing also eliminates problems related to long procurement as in relation to traditional computing infrastructure (Islam, Keung, Lee, & Liu, 2012). As cloud computing, enables organizations fast and cost effective service provisioning it has changed how value is created and perceived by all peers involved in supply chain (Daas, Hurkmans, Overbeek, & Bouwman, 2013). The cloud computing also enables cost reduction, standardization, new market reach as well as new business opportunities (European Commission, 2012). On the other side, cloud computing enables software vendors to bypass potential piracy issues that concern illegal use of intellectual property (e.g. games, productivity software, etc.) (Bhanoo, 2009)

The Potential Risks of Cloud Computing

The research studies show that information security is the main concern of organizations that are considering using cloud-computing technology (Benlian & Hess, 2011; Folco et al., 2012). The major information security concerns are storage isolation failure as all cloud services

use multi-tenancy or shared resources that could lead to inadvertently accessing other organization information, lack of procedures and standards for data migration, security compliance risks and potential malicious insider (European Network and Information Security Agency, 2009; European Commission, 2012). Even though security is major drawback in using cloud technology there are other drawbacks such as data location if necessary, local language support, insufficient Internet connection in terms of capacity or reliability and legal jurisdiction over data stored in the cloud (Folco et al., 2012).

The Importance and Advantages of SMEs Cloud Computing Acceptance

As small and medium organizations play a vital role in countries economic development and growth, it is of utmost importance to understand advantages that cloud-computing technology offers (European Commission, 2015). The development of cloud computing technology has enabled small and medium organizations to deliver products and services in same manner as large enterprises and thus enabling equality in the competing market (Alshamaila, Papagiannidis, & Li, 2013). The cloud computing technology can gain competitive advantage to SME organizations by raising level of efficiency and productivity and thus enabling them better organization throughout the supply chain (Moghavvemi, Hakimian, & Tengku Mohd Faziharudean, 2012). In addition, SMEs usually do not possess financial and technical resources needed to build robust and scalable IT support system that would enable them equal market competitiveness (Huang, Li, Yin, & Zhao, 2013).

A limited number of research studies explores challenges of cloud computing adaptation in SME organizations. For instance, Alshamalia Papagiannidis, and Li, (2013) conducted a qualitative research study on a set of 15 SME organizations located in north east of England, evaluating problems of cloud computing adaptation in that region. The researchers used

Tornatzky, Fleischer, and Chakrabarti's (1990) technological, organizational and environmental (TOE) framework as the theoretical background to describe determinates that influence cloud computing adaptation in SME organizations. The findings of the study have identified that a significant role in SMEs adoption of cloud computing technology plays relative advantage (i.e. perception in which one solution or idea is better than the other one), uncertainty, geo-restriction, compatibility, trial-ability, size, top management support, prior experience, innovativeness, industry, market scope, supplier efforts and external computing support. On the other hand, the study did not find enough evidence that competitive pressure plays significant role of cloud computing adoption in SME organizations (Alshamalia et al., 2013). The research itself allows for different communities (e.g. cloud computing vendors, decision makers) to better understand, why some SME organizations are more prone to adopt cloud computing technology, while at the same time similar organizations, with similar market conditions do not. The study has also revealed the fact that three constructs in TOE framework (technological, organizational, and ecological) are all interconnected.

Aharony (2014) conducted research study exploring adaptation of cloud computing technology in two groups located in Israel, information professional and educational technology experts. The theoretical background was established using TAM (technology acceptance model) developed by Davis (1989). First, the research study revealed that individuals' personal characteristics play a vital role in accepting new technologies and thus suggesting it to be an important part when cloud computing adaptation is concerned. Second, the research study revealed that information professionals are aware of cloud computing importance but do not see it as determining factor for their work. Therefore, the researcher suggest that if an organization wants to enable faster adaptation of cloud computing it should take into account both personal

characteristics of and individual and also they should present the "ease of use" of new technology they are introducing to the organization (Aharony, 2014, p.657)

Benlian et al. (2009) developed their own model based on the theory of planned behavior to test the adaptation of software-as-a-service in a set of large German organizations. The researchers divided the sample to adopters and non-adopters that in the end consisted of 349 organizations. Benlian et al. (2009) discovered that the cost of the service plays significant role in technology adaptation followed by flexibility and quality improvements.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The acceptance of new information technologies (IT) has been extensively researched in the past and thus several theories have been generated that describe relations between different sets of determinants that influence behavioral intention towards the acceptance and use of technology (Venkatesh et al., 2003). Venkatesh et al. (2003) in their longitudinal research study reviewed and empirically tested eight theoretical models to formulate a new unified theory that integrates determining elements across all theoretical models. The newly formulated theory named the "unified theory of acceptance and use of technology (UTAUT) consists of four core constructs that describe behavioral intention and use (performance expectancy, effort expectancy, social influence, and facilitating conditions) and up to four moderators (gender, age, experience, and voluntariness of use) that describe key relations between constructs (Venkatesh et al., 2003). Venkatesh et al. (2003) proved that the UTAUT could explain 70% of the variance in behavioral intention to accept new information technology, which is much higher than in previous theoretical models.

The theoretical models originally researched by Venkatesh et al. (2003) to develop UTAUT were: the theory of reasoned action – TRA (Fishbein & Ajzen, 1975), technology

acceptance model – TAM (Davis, 1989), motivational model – MM (Davis, Bagozzi, & Warshaw, 1992), theory of planned behavior – TBP (Ajzen, 1991), combined TAM and TPB (Taylor & Todd, 1995), model of PC utilization – MPCU (Thompson, Higgins, & Howell, 1991), innovation diffusion theory – IDT (Rogers, 1995) and social cognitive theory – SCT (Bandura, 1986).

Theory of reasoned action. The theory of reasoned action (TRA) formulated by Fishbein and Ajzen (1975) is a model that evaluates beliefs and subjective norm as key factors in predicting behavioral intention and actual behavior. The theory also states that attitude toward behavior and subjective norm play as crucial factor in behavioral intention (Fishbein & Ajzen, 1975). For example, if the individual believes that adopting new information technology could be beneficial for the organization, and a social norm within organization is opposite, behavioral intention and actual behavior is influenced by a social norm. In the later research, Ajzen (1991) improved the theory as it demonstrates certain limitations and constraints.

Theory of planned behavior. The theory of planned behavior (TPB) is enhancement of theory of reasoned action formulated by Ajzen (1985; 1991). The newly formulated theory took into account previous limitation and introduced perceived behavior control as an important facilitating construct in addition to attitude toward behavior and subjective norm (Ajzen, 1985; 1991). The researchers discovered that perceived behavioral control has direct influence to behavior as well.

Technology acceptance model. The technology acceptance model (TAM) formulated by Davis (1989) describes how perceived usefulness (PU) and perceived ease of use influence (PEOU) influence behavioral intention and actual use when subject is confronted with new

information technology (Davis, 1989). Davis (1989) also proposed that external factors have direct influence on perceived usefulness and perceived ease of use.

Motivational model. The motivational model (MM) formulated by Davis et al. (1992) explains computer use in business environments. Davis et al. (1992) in their research study used motivation theory construct to describe why people use computers. The perception of usefulness of using computers is an extrinsic motivator and perception that people use computers as gratification is an intrinsic motivator (Davis, Bagozzi, & Warshaw, 1992). The research study discovered that people's intention to use a computer in a workplace is mainly influenced by performance usefulness at increasing job performance and secondly as an enjoyable tool.

Combined TAM and TPB. The combined TAM and TPB formulated by Thomson, Higgins, and Howell, J. (1991) combined construct described in both theory's to determine how level of expertise influences behavioral intention towards adopting new information systems.

Model of PC utilization. Thompson et al. (1991) formulated the model of PC utilization (MPCU) to predict PC utilization within the organization. Thompson et al. (1991) discovered that social factors, complexity, job fit and long-term consequence had direct impact on participants to use personal computers opposite to proposed facilitating conditions.

Innovation diffusion theory. Rogers (1983) formulated the innovation of diffusion theory (IDT) to explain determinants that influence on an adoption rate when introducing new technology. Rogers (1983, p.232) refers to the adoption rate as a time that is needed for or environment to adopt innovation. The variables that influence on the adaptation rate are relative advantage, compatibility, complexity, trial-ability and observability (Rogers, 1983).

Social cognitive theory. The social cognitive theory (SCT), formulated by Bandura (1986) argues that people learn their behavior by observing others. Later on researchers,

Compeau and Higgins (1995) used social cognitive theory and put it in a context of using computer technology. The theory used self-efficacy and outcome expectations (personal and performance) constructs as main construct in addition to secondary construct anxiety and attitude to describe computer usage.

Unified Theory of Acceptance and Use of Technology (UTAUT2)

The researchers Venkatesh et al. (2012) revised the UTAUT model and formulated extended version of the model, adding three new constructs that take into account consumer aspects, naming it UTAUT2. The model itself, has been developed while investigating consumer acceptance and use of mobile Internet on a set of population in Hong Kong (Venkatesh et al., 2012, p. 173). The researchers introduced three new constructs (hedonic motivation, price value and habit) in addition to constructs from the existing model (performance expectancy, effort expectancy, social influence, and facilitating conditions). The UTAUT2 has only three moderators that influence constructs (age, gender and experience). The model suggest that construct impact on behavioral intention is moderated by different factors. Accordingly, hedonic motivation is moderated by age, gender and experience, price value is moderated by age and gender and habit which is moderated by age, gender and experience but differs across individual ranges (Venkatesh et al., 2012, p. 174). In the UTAUT2 model the link was added that connects facilitating conditions and behavioral intention and thus does not include “voluntariness of use” that was used as a moderator in the original UTAUT theory (Venkatesh et al., 2012) (Figure 2).

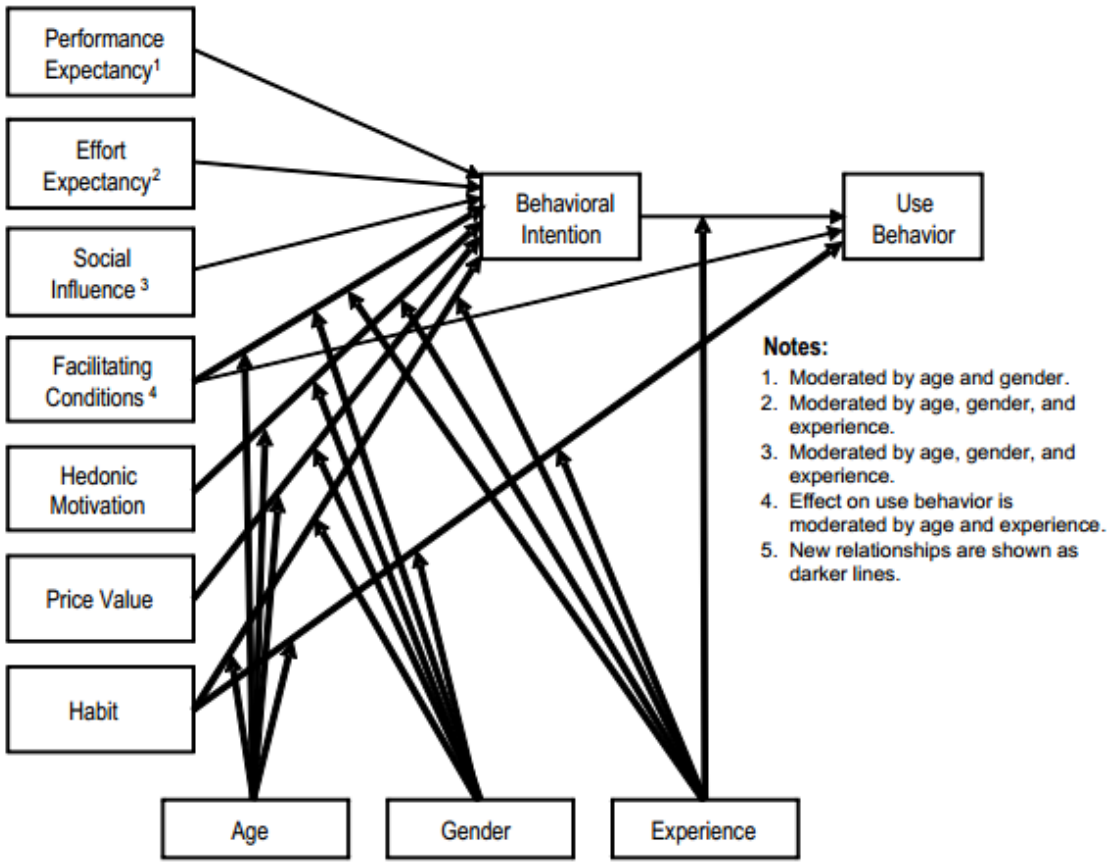

Figure 2. Extended model of unified theory of acceptance and use of technology (UTAUT2). Reprinted from "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology" by Venkatesh, V., Thong, J., & Xu, X. 2012. *MIS Quarterly 36*, p. 160. Copyright © 2012, Regents of the University of Minnesota. Used with permission.

When comparing it to the existing model, UTAUT2 produced significantly better results in variance explaining users' behavioral intention towards using technology, raising it to 74% and 52% in actual use (Venkatesh et al., 2012). The theory was verified by conducting data from two-stage online survey that was performed four months apart (Venkatesh et al., 2012).

Performance expectancy. This construct determines the level in which an individual is confident that using new information technology is going to make them perform their job more efficiently, make them more productive and overall increase their job performance (Venkatesh et al., 2003).

Effort expectancy. This construct determines the level in which an individual is confident that using new information technology will be difficult or how much effort will it require them to become proficient in using new technology (Venkatesh et al., 2003).

Social influence. This construct determines the level in which an individual is confident about how his environment will support implementing or using new information technology (Venkatesh et al., 2003).

Facilitating conditions. This construct determines the level in which an individual is confident that resources exist that will enable successful implementation of new information technology (Venkatesh et al., 2003).

Hedonic motivation. This construct determines the level in which an individual is confident that using new technology will be pleasurable or fun (Venkatesh et al., 2012).

Price value. This construct determines the level in which an individual is confident that using new information technology will be beneficial in relation to its monetary compensation (e.g. good value for the money) (Venkatesh et al., 2012).

Habit. This construct determines the level in which an individual is confident that using new information technology, taking into account its previous experience, will become an everyday routine (Venkatesh et al., 2012).

The new research model revealed that interactions between motivation and different construct proposed by the theoretical model are quite complex, thus making it important to pay

special attention to each of moderators that influence behavior of an individual (Venkatesh et al., 2012. P. 174). However, the UTAUT2 model's main advantage is that it gives completely new perspective to individuals' behavior, taking into account consumer aspects of acceptance and technology use, making new constructs as an essential in this field of research (Venkatesh et al., 2012).

CHAPTER III – Methodology

Introduction to the Methodology

The methodology described in this research study identifies Croatian SME organizations as a primary population, exploring determinants of cloud computing technology acceptance within context of UTAUT2 theory. This research study correlates UTAUT2 theory construct (performance expectancy, effort expectancy, social influence and price value) scores in relation to the SMEs decision makers' behavioral intention to accept cloud computing technology. The instrument of inquiry used in this quantitative research study employs modified questionnaire, adopted from Venkatesh et al. (2012) while developing UTAUT2 theory. The questionnaire was administered to participants by email in two different points in time. In addition, the sample randomization was used to overcome issues related to potential observer bias.

Research Design

The research study adopted quantitative design and used postpositivist or scientific assumptions to describe relations between constructs (Creswell, 2014). As suggested by Creswell (2014), the postpositivist approach should be used when studying and numerically measuring human behavior (p. 7). The research study focuses on understanding how constructs performance expectancy, effort expectancy, social influence and price value, defined in UTAUT2 theory by

Venkatesh et al. (2012), influence behavioral intention of an SME organizations in accepting cloud-computing technology.

The study identified three primary audiences that would benefit from better understanding of obstacles that influence cloud-computing acceptance. First, Croatian SME organizations, as they would gain better understanding of the adaptation issues in organizations similar to their own. Second, Croatian cloud service providers, as they would gain better understanding of customers' viewpoint when it comes to adopting cloud-computing technology and allow them to create new marketing strategy. Third, the study also identifies Croatian government as they would benefit from conclusions of the study when developing or aligning Croatian ICT strategy and allow them to make decisions that are more informed.

Research Methods

The data gathering method used in this research study utilizes an online survey administered to participants by email. The instrument of inquiry used modified close-ended questions used to describe constructs described by Venkatesh et al. (2003; 2012) when developing UTAUT and UTAUT2 theory. The survey consisted of 18 close ended questions that used a 7-point Likert-scale with scores: 1 = Strongly Disagree, 2 = Mostly Disagree, 3 = Slightly Disagree, 4 = Nether Agree or Disagree, 5 = Slightly Agree, 6 = Mostly Agree, and 7 = Strongly Agree. In addition, four more questions were added to determine demographics (gender and age), experience, and a size of the organization, which are moderators that influence behavioral intention and actual use (Venkatesh et al., 2012). As suggested in the research study developed by Woltz, Gardner, Kircher and Burrow-Sanchez (2012) if Likert-scale is used, the variables could be reported as interval variables, and therefore, multivariate analysis, including multiple linear regression and analysis of variance (ANOVA) can be applied.

Even though, Venkatesh et al. (2003; 2012) determined reliability and proved validity of the instrument of inquiry, Vogt (2007) suggests that instrument should be tested again for reliability if applied to new set of population. The appropriate statistical tool for measuring reliability is Cronbach's alpha test (Vogt, 2007). In addition, Vogt (2007) also suggests that Cronbach's alpha coefficients higher than .70 are considered as satisfactory measure of tests reliability. Therefore, first stage of data collection was used to determine reliability and validity of the instrument of inquiry. The validation was performed on a sample of 40 respondents from a first set of population.

To remove any ambiguity over the questions containing in the instrument of inquiry, participants were provided with the description of different cloud computing models defined by the National Institute of Standards and Technology (NIST) (Mell & Grance, 2011). The provided description also contained examples of different publicly available cloud services (e.g. Cloud Servers, Cloud CRM, Cloud Data Base, etc.) for each of the cloud computing deployment models.

Definition of Variables

The research study analyzed relations between different constructs developed by Venkatesh et al. (2003; 2012), in order to describe SME behavioral intention toward accepting cloud-computing technology. The performance expectancy (PE), effort expectancy (EE), social influence (SI) and price value (PV) are identified as independent variables and behavioral intention (BI) is considered as dependent variable. The level of measurement for all variables was an interval.

Population and Sampling

The survey research study targeted Croatian decision makers within Croatian small and medium organizations (SMEs). According to European Commission (2015) report, Croatia has 150.192 SME organizations operating on territory of Croatia. The European Commission (2012) identifies a SME organization as one that has less than 250 employees and turnover less than 50 million EUR or balance sheet total less than 43 million EUR. The random sampling was used to achieve freedom from bias as this is considered the most important characteristic of a good sample (Pyrczak, 2010).

Sample Size

The sample size consisted of 131 Croatian SME organizations collected for the purpose of this research. The sample size was determined by using specialized software G*Power version 3.1.9.2 retrieved from Heinrich-Heine University website (Buchner, Erdfelder, Faul, & Lang, 2014). A priori power analysis using F test was performed in order to calculate sample power.

The input parameters used for the calculation are as provided by the application. The base parameters were set as follows: effect size was set at $f^2 = .15$, the probability of accepting alternative hypothesis when the null hypothesis is true (α) was set at .05, probability of falsely accepting the null hypothesis when the alternative hypothesis is true (1-β) was set at .95 and the number of predictors were set to 4 as this is number of behavioral determinants explored in theoretical background. The statistical software calculation suggests that sample of 129 participants has actual power of .9505747.

Data Collection

The data collection was conducted by performing two-stage self-administered online survey. The survey was distributed over the email using relay server, with one month between

first and second survey administration. The survey was hosted on a SurveyMonkey website, which specializes in distribution and gathering of survey information. The first set of population consisted of 2.000 participants with response rate of .02 and the second group consisted of 2.800 participants with response rate of .0325. The database used for population sampling was provided by Metronet telecommunication plc. acquired from the Bisnode company which specializes in business intelligence information distribution (Bisnode, 2015). To assure that a set of population involved in this research study is relevant for this research, all that received the online survey were marked as decision makers within their organizations in Metronet's Customer Relationship Management system (CRM).

As suggested by (Creswell, 2014; Hubbard 2014), in order to overcome systemic error or bias, the random sampling should be applied when targeting the research population. Therefore, the random generator formula in Microsoft Excel was used to determine which of the SME organization was receive the instrument of inquiry. The procedure included entering all available SME organizations containing email address in Microsoft Excel and applying the "=RANDBETWEEN" formula, to determine which organization will receive the email containing the survey. The distribution mail server address istrazivanje@metronet.hr was used to deliver the survey (Eng. research@metronet.hr). The "metronet.hr" domain was used to increase probability of the higher response rate from the participants of the survey. In addition, the access to survey data information was password protected to assure high ethical standards (Creswell, 2014).

Data Analysis

The research data was analyzed using IBM SPSS 22 statistical package software and by performing three different statistical procedures (IBM, 2015). However, before performing all of

the statistical procedures, the data sample collected from the first stage of data collection was used to test instrument reliability and validity by applying Cronbach's alpha test. Following instrument reliability test, the descriptive statistics were used to describe, present and summarize collected data. Second, inferential statistics using linear multiple regression was used to analyze the prediction potential of combined independent variables (performance expectancy (PE), effort expectancy (EE), social influence (SI), and price value (PV) in relation to behavioral intention (BI). Third, measure of correlation (Pearson *r*) was used to analyze strength of relationships between pairs of independent and dependent variable and to test the hypothesis.

According to Vogt (2007), performed statistical procedures are the basis for exploring prediction potential of the dependent variable, when independent variables are unknown. In addition, performed statistical procedures were conducted under parametric data analysis and linear regression assumptions which include that: scale item scores are normally distributed, variables are represented as an interval data, there is a presence in linearity of relationships between variables, there is normality in residual distribution, that data homoscedasticity exists, there is an absence of statistically significant outliers, there is an independence of observations, and that there is an absence of multicollinearity between variables. In order for linear regression to produce statistically valid results, the data must satisfy all these regression analysis assumptions (Field, 2009; Weiner, Schinka, & Velicer, 2012). The data verification was performed during the initial phase of data analysis using different statistical tests performed in IBM SPSS 22 statistical software (IBM, 2015).

The basic assumption for all of the statistical procedures is represented from a fact that Likert-scale results produce interval data required for performing statistical tests. According to Cooper and Schindler (2008), Joshi, Kale, Chandel, and Pal (2015) and Spector (1992) the

Likert-scale items that measure the same variables can be summed up to create new composite metric scale. The researchers also suggest that summed up Likert-scale items, oppose to single Likert-scale items produce interval data appropriate for performing parametric tests such as Pearson *r* correlation test and regression analysis. In addition, according to Joshi et al. (2015) the mean and standard deviation can be used as a measure of central tendency and a measure of dispersion for the research results. However, the researcher Spector (1992) argues that new summated scale must support four characteristics in order to support validity for new composite scale. First, the scale must contain multiple items that describe a single variable. Second, the scale must measure something that can be quantitatively expressed and not just qualitatively. Third, there is no "right" or "wrong" answer and thus multiple choice answers cannot be a part of the instrument of inquiry. Finally, all items used in the scale must represent a statement of their own and not add new information to the previous item. As instrument of inquiry adopted from Venkatesh et al. (2012) supports all four criteria, the results were measured on interval scale.

CHAPTER IV – Results

Introduction to the Results

The results are presented following the order described in data analysis chapter. First, the data was presented determining the instrument of reliability using Cronbach's alpha test. Second, the data was presented determining assumptions required for performing parametric data analysis. The test included review of histograms, Q-Q plots and performing skewness and kurtosis test. Third, the data was presented determining assumptions required for application of linear multiple regression tests. The tests include scatterplots to verify linearity of relationships among variables, P-P plots and histogram to determine normality in residual distribution, plot of z-residuals to determine data homoscedasticity, z scores and Mahalanobis distance tests to

determine absence of outliers in univariate and multivariate variables, Durbin-Watson test to determine independence in observation, correlation matrix of all predictor (independent) variables and variance inflation factor (VIF) to determine absence of multicollinearity. Fourth, the demographics was presented and the data was summarized using descriptive statistics (mean and standard deviation). Finally, the data was presented summarizing the results of the hypothesis testing using Pearson *r* to determine strengths of relationships, linear multiple regression to determine prediction potential of summed and linear regression to test individual determinants under investigation.

Instrument Reliability and Validity

The reliability and validity used in this research study was performed by applying Cronbach's alpha test on a set of population of 40 respondents acquired during first stage of data collection. The test was performed, producing scores above .70 both for individual scale and for the entire scale.

The reliability coefficients were observed as follows: performance expectancy – PE (4 items) scored .96, effort expectancy – EE (4 items) scored .92, social influence – SI (4 items) scored .88, price value – PV (3 items) scored .93, behavioral intention – BI (3 items) .96 and all items in the scale (18 items) scored .95.

Assessing Assumptions for Parametric Data Analysis

The investigation of normality in data result distribution was conducted in order to satisfy assumptions for performing parametric tests. The investigation performed included visual interpretation of Q-Q plots, histograms and skewness and kurtosis test in order to determine the shape of the distribution. The result of skewness and kurtosis presented in table 1 suggest that the

data scores for all variables were slightly negatively skewed and deviate from normal distribution.

Table 1

Skewness and Kurtosis Test

Variable	*N*	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
Performance Expectancy	131	-.629	.212	-.260	.420
Effort Expectancy	131	-.311	.212	-.568	.420
Social Influence	131	-.421	.212	-.105	.420
Price Value	131	-.337	.212	.097	.420
Behavioral Intention	131	-.492	.212	-.607	.420

Notes. The skewness and kurtosis result ranges from -.311 to -.629 on skewness test and .097 to -.607 at kurtosis test.

According to Field (2009) the "rule of thumb" can be applied to interpret the results of skewed data by calculating *z*-scores. It states that if the results of skewness and kurtosis divided by its standard error produce *z*-scores between -1.96 and 1.96 the data can be considered normally distributed. The *z*-scores results for variables under investigation were as follow: performance expectancy (PE) – 2.96, effort expectancy (EE) – 1.46, social influence – 1.98, price value (PV) – 1.58 and behavioral intention (BI) – 2.32. The results for effort expectancy (EE) and price value (PV) indicate normality in data distribution and results in performance expectancy (PE) variable, social influence (SI) and behavioral intention (BI) indicate non-normality in data distribution. However, according to McDonald (2015), even though results deviate from normality, the parametric test such as analysis of variance (ANOVA) can be used,

as moderate deviation from normal data distribution have negligible effect on validity of the results. Therefore, the data analysis in this research study was conducted using parametric tests.

Assessing Assumptions for Multiple Regression Analysis

The linearity of relationships between predicted (independent) variables (PE, EE, SI and PV) and outcome (depended) variable (BI) was explored using matrix scatterplot chart. According to Figure 3, the data indicates positive linearity between variables.

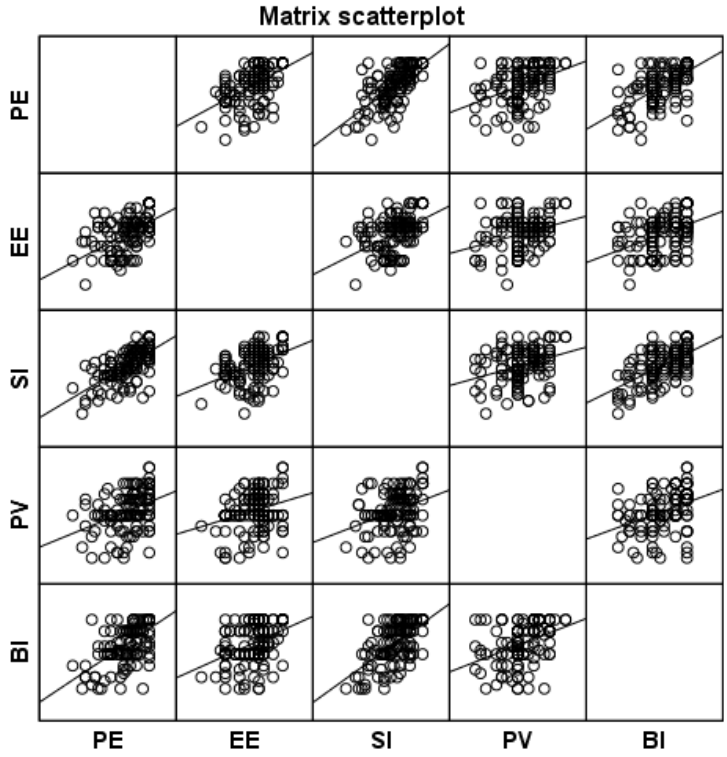

Figure 3. Matrix scatterplot. This figure shows the level of linearity between independent variable - Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Price Value (PV) and dependent variable - Behavioral Intention (BI).

The assumption of normality distribution of residuals was tested using P-P plots and histogram. According to Field (2009), the residuals are considered normally distributed when all

points in P-P plot diagram are very close to the ideal linear line. The P-P plot indicated the normality in residuals as it is presented in Figure 4.

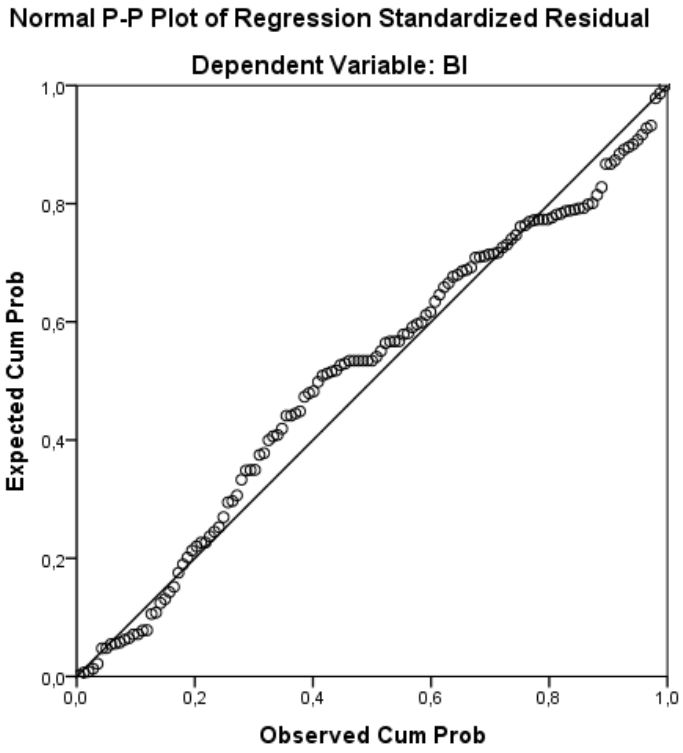

Figure 4. P-P plot of residuals in distribution. This figure shows distribution of residuals in linear regression.

In addition, the normality distribution of residuals is present if histogram displayed normal distribution curve (Field, 2009). The histogram indicated the normally distributed residuals as presented in Figure 5.

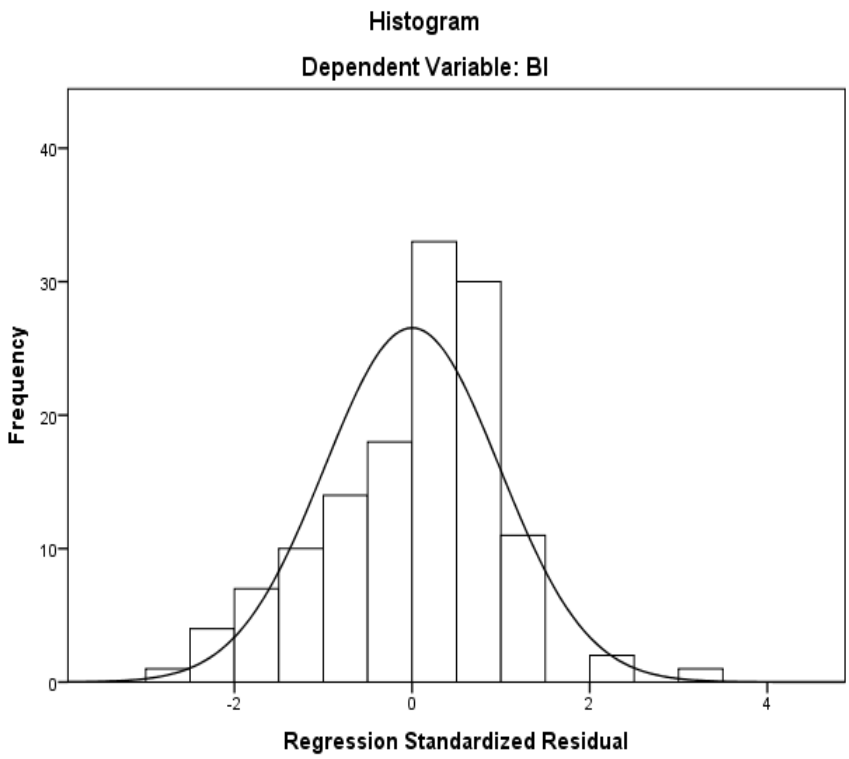

Figure 5. Residual normality test using histogram. This figure shows distribution of residuals in linear regression.

The assumption of data homoscedasticity was tested using plot of z-residuals. According to Field (2009), the data points variance have to be spread randomly around zero and avoid either positive or negative funnel shape patterns. The plot in Figure 6 of z-residuals indicated existence of data homoscedasticity.

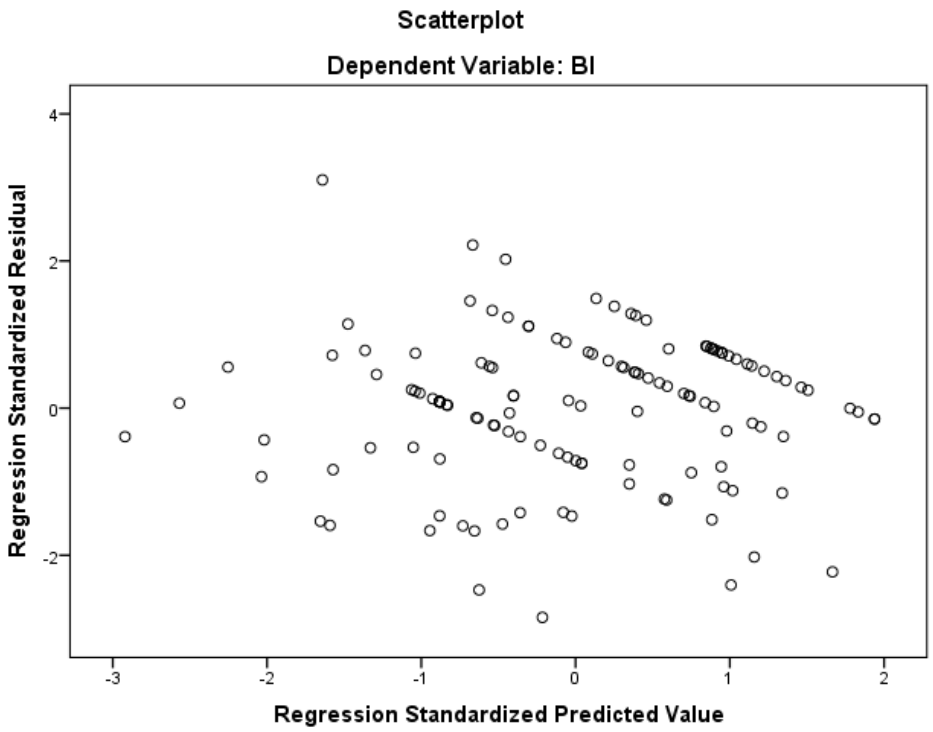

Figure 6. The plot of z-residuals. This figure shows the data points spread attained from the research results.

The assumption of absence of outliers was determined by performing *z*-scores analysis for detecting univariate variables (observed value for a single independent variable), and Mahalanobis distance for multivariate variables (observed value for all independent variables combined). According to Weiner et al. (2012), the existence of outliers can be excluded if *z*-scores are between values of -3.0 and 3.0, if the sample size is larger than 80 and if the data is measured on interval or ordinal scale. The *z*-scores test indicated the absence of univariate outliers as presented in Table 2.

Table 2

Univariate Z-scores

Variable	*N*	Minimum *z*-score	Maximum *z*-score
Performance Expectancy	131	-2.96	1.20
Effort Expectancy	131	-2.81	1.67
Social Influence	131	-2.95	1.71
Price Value	131	-2.44	2.27
Behavioral Intention	131	-2.26	1.20

Notes. Z-scores range from -2.96 to 2.27.

The data was also tested for existence of multivariate outliers in observed data. According to Weiner et al. (2012), the multivariate outliers can be detected by measuring the distance of data points from the calculated centroid or performing Mahalanobis distance test. The cases that have Mahalanobis distances with probability value less than .001 are to be considered as multivariate outliers (Weiner et al., 2012). The observed values resulted with minimum value of Mahalanobis distance D^2 with probability $p > .005$, and therefore indicated absence of multivariate outliers.

The assumption for independence of the observation was conducted by performing Durbin-Watson test. According to Field (2009), the Durbin-Watson values ranging between 1 and 3, ideally leaning towards 2, indicate that the residuals are uncorrelated. The results observed show value of 1.83 and therefore indicated independence of the observation.

The assumption of absence of multicollinearity among independent variables was explored performing correlation on all independent (predictor) variables and measuring variance inflation factor (VIF). The observed VIF factors for predictor variables ranged from 1.15 to 2.06.

According to Field (2009), the predictor variables are highly correlated if reported value is above .90 and if the largest reported variance inflation factor (VIF) is above 10. The correlation values summarized in table 3 and VIF factor bellow 10 indicated absence of multicollinearity.

Table 3

Correlation Matrix of Independent Variables

	PE	EE	SI	PV
PE	1			
EE	.53	1		
SI	.67	.45	1	
PV	.39	.28	.32	1

Notes. Correlation is significant at the 0.01 level (2-tailed). PE – Performance Expectancy, EE – Effort Expectancy, SI – Social Influence, PV – Price Value.

Demographics Data

Collected demographic data were represented by four factors including gender, age group of the participants', participants' total years of experience with using or recommending cloud computing technology, and the organization's size based on number of employees. Of the 131 participants in the research study, 80.2% (N = 105) were male and 19.8% (N = 26) were female. In terms of age, 9.2% (N = 12) of participants were in the group of 21 – 29 years old, 37.4% (N = 49) were in the group of 30 – 39 years old, 35.1% (N = 46) were in the group from 40 – 49 years old, and 11.5% (N = 15) were in the group of 50 – 59 years old, 6.9% (N = 9) were in the group more than 60 years old. Demographic data related to the total years of experience that participants had working with cloud computing resulted in the following: 34.4% (N = 45) reported having less than 1 year of experience, 19.8% (N = 26) reported having 1 – 2 years of

experience, 21.4% (*N* = 28) reported having 3 – 4 years of experience, and 24.4% (*N* = 32) reported having over 5 years of experience. In relation to the size of the organizations based on employee count, 48.1% of participants (*N* = 63) reported working in organizations 10 and less employees, 27.5% (*N* = 36) worked in organizations with 11 – 30 employees, 9.9% (*N* = 13) worked in organizations with 31 – 50 employees, 3.8% (*N* = 5) worked in organizations with 51 – 100 employees, 3,8% (*N* =5) worked in organizations with 101 - 150 employees, 1.5% (*N* = 2) worked in organizations with 151 – 200 employees, and 5.3% (*N* = 7) worked in organization with 201 – 250 employees.

Descriptive Statistics

The summary of descriptive statistics uses mean as a measure of central tendency and standard deviation as measure of dispersion to present the findings. The results suggested that participants scored highest results on items related to effort expectancy – EE (*N* = 131, *M* = 5.41, *SD* = .94), and lowest on price value – PV (*N* = 131, *M* = 4.26, *SD* = 1.20). In other areas, the results are as follows: performance expectancy – PE (*N* = 131, *M* = 5.26, *SD* = 1.43), social influence – SI (*N* = 131, *M* = 4.79, *SD* = 1.28) and behavioral intention – BI (*N* = 131, *M* = 4.92, *SD* = 1.72).

Multiple Regression and Correlation Analysis

The multiple regression analysis was performed to test how combined independent variables (performance expectancy – PE, effort expectancy – EE, social influence – SI and price value – PV) influences dependent variable (behavioral intention – BI). In addition, the regression results were used to explore amount of variance and prediction level of combined and single variables in relation to outcome variable. The multiple linear regression was performed by applying “Enter” method in IBM SPSS 22, which forces all predictors into calculation even if

they do not statistically contribute to the prediction model (Field, 2009; IBM, 2015). In addition, multiple linear regression was used to test the hypothesis $H_0$1 .The summary of the results obtained are presented in table 4.

Table 4

Multiple Linear Regression Results

	R	R^2	R^2_{Adjusted}	*B*	β	*t*	*p*
PE	.67	.46	.44	.30	.33	3.46	.001
EE				.08	.05	.74	.457
SI				.30	.30	3.38	.001
PV				.18	.12	1.79	.075

Notes. PE – Performance Expectancy, EE – Effort Expectancy, SI – Social Influence, PV – Price Value, *R* – multiple correlation, R^2 – multiple correlation squared, $R^2_{Adjusted}$ – multiple correlation squared adjusted, *B* – unstandardized beta coefficient, β – standardized beta coefficient, *t* – t statistics coefficient, *p* – probability.

The Pearson *r* correlation and linear regression analysis was used to determine the level of associations and strength between pairs of independent and dependent variables under investigation. In addition, the correlation was used to test the hypotheses $H_0$2, $H_0$3, $H_0$4 and $H_0$5. The results of the Pearson correlation tests are presented and summarized in table 5.

Table 5

Pearson r Correlation Results

	BI	PE	EE	SI	PV
BI	1				
PE	.61	1			
EE	.41	.53	1		
SI	.59	.67	.45	1	
PV	.37	.39	.28	.32	1

Notes. Correlation is significant at the 0.01 level (2-tailed). BI – Behavioral Intention, PE – Performance Expectancy, EE – Effort Expectancy, SI – Social Influence, PV – Price Value.

The results of the linear regression tests between single independent variables and dependent variables are presented and summarized in table 6.

Table 6

Linear Regression Results

	R	R^2	R^2_{Adjusted}	*B*	β	*t*	*p*
PE	.61	.38	.37	.55	.61	8.94	.000
EE	.41	.16	.16	.56	.41	5.12	.000
SI	.59	.35	.35	.60	.59	8.43	.000
PV	.37	.14	.13	.54	.37	4.61	.000

Notes. PE – Performance Expectancy, EE – Effort Expectancy, SI – Social Influence, PV – Price Value, *R* – multiple correlation, R^2 – multiple correlation squared, $R^2_{Adjusted}$ – multiple correlation squared adjusted, *B* – unstandardized beta coefficient, β – standardized beta coefficient, *t* – t statistics coefficient, *p* – probability.

Hypothesis Testing

$H_0$1 - Performance expectancy, effort expectancy, social influence and price value are not statistically significant determinants of behavioral intention of cloud computing acceptance within Croatian SME organizations.

H_a1 - Performance expectancy, effort expectancy, social influence and price value are statistically significant determinants of behavioral intention of cloud computing acceptance within Croatian SME organizations.

The multiple regression model using the enter method indicated that performance expectancy, effort expectancy, social influence and price value can explain 46% of the variance in behavioral intention (R^2 = .46, F(4, 126) = 26.792, p < .000). The data analysis also indicated that performance expectancy significantly contributes to predicting behavioral intention (β = .33, t = 3.46, p < .001), and so did the social influence (β = .30, t = 3.38, p < .001). However, effort expectancy had no statistically significant contribution to the model in predicting behavioral intention (β = .05, t = .74, p < .45) and neither did the price value (β = .12, t = 1.79, p < .07). Overall, the models prediction was statistically significant in predicting behavioral intention of Croatian SME organizations to accept the cloud computing technologies. Accordingly, the null hypothesis, $H_0$1, was rejected and the alternative hypothesis, H_a1, was accepted.

$H_0$2 - Performance expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

H_a2 - Performance expectancy is statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

The hypothesis evaluation was performed using Pearson *r* and linear regression analysis. The Pearson's *r* correlation revealed a statistically significant positive correlation between

performance expectancy and behavioral intention: r (131) = .61, p < .000, indicating that if the scores of performance expectancy raise, so do the scores of behavioral intention. The data analysis also indicated that performance expectancy significantly contributes to the prediction of behavioral intention of Croatian SME organizations to accept cloud computing technology (β = .61, t = 8.94, p < .000). In addition, the linear regression model revealed that performance expectancy was capable of explaining 38% of the variance in behavioral intention (R^2 = .38, F(1, 129) = 79.945, p < .000). Overall, the model indicated that performance expectancy is statistically significant determinant of behavioral intention of Croatian SME organizations to accept cloud computing technologies. Accordingly, the null hypothesis, $H_0$2, was rejected and the alternative hypothesis, H_a2, was accepted.

$H_0$3 – Effort expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

H_a3 – Effort expectancy is statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

The hypothesis evaluation was performed using Pearson r and linear regression analysis. The Pearson's r correlation revealed a statistically significant positive correlation between effort expectancy and behavioral intention: r (131) = .41, p < .000, indicating that if the scores of effort expectancy raise, so do the scores of behavioral intention. The data analysis also indicated that effort expectancy significantly contributes to the prediction of behavioral intention of Croatian SME organizations to accept cloud computing technology (β = .41, t = 5.12, p < .000). In addition, the linear regression model revealed that effort expectancy was capable of explaining 16% of the variance in behavioral intention (R^2 = .16, F(1, 129) = 26.209, p < .000). Overall, the model indicated that effort expectancy is statistically significant determinant of behavioral

intention of Croatian SME organizations to accept cloud computing technologies. Accordingly, the null hypothesis, $H_0$3, was rejected and the alternative hypothesis, H_a3, was accepted.

$H_0$4 – Social influence is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

H_a4 – Social influence is statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

The hypothesis evaluation was performed using Pearson *r* and linear regression analysis. The Pearson's *r* correlation revealed a statistically significant positive correlation between social influence and behavioral intention: $r\ (131) = .59$, $p < .000$, indicating that if the scores of social influence raise, so do the scores of behavioral intention. The data analysis also indicated that social influence significantly contributes to the prediction of behavioral intention of Croatian SME organizations to accept cloud computing technology ($\beta = .59$, $t = 8.43$, $p < .000$). In addition, the linear regression model revealed that social influence was capable of explaining 35% of the variance in behavioral intention ($R^2 = .35$, $F(1, 129) = 71.065$, $p < .000$). Overall, the model indicated that social influence is statistically significant determinant of behavioral intention of Croatian SME organizations to accept cloud computing technologies. Accordingly, the null hypothesis, $H_0$4, was rejected and the alternative hypothesis, H_a4, was accepted.

$H_0$5 – Price Value is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

H_a5 – Price Value is statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations.

The hypothesis evaluation was performed using Pearson *r* and linear regression analysis. The Pearson's *r* correlation revealed a statistically significant positive correlation between price

value and behavioral intention: r (131) = .37, $p < .000$, indicating that if the scores of price value raise, so do the scores of behavioral intention. The data analysis also indicated that price value significantly contributes to the prediction of behavioral intention of Croatian SME organizations to accept cloud computing technology ($\beta = .37$, $t = 4.61$, $p < .000$). In addition, the linear regression model revealed that price value was capable of explaining 14% of the variance in behavioral intention ($R^2 = .14$, $F(1, 129) = 21.228$, $p < .000$). Overall, the model indicated that price value is statistically significant determinant of behavioral intention of Croatian SME organizations to accept cloud computing technologies. Accordingly, the null hypothesis, $H_0 5$, was rejected and the alternative hypothesis, $H_a 5$, was accepted.

CHAPTER V – Conclusions and Recommendations

Conclusions

The objective of this research study was to explore determinants of cloud computing technology acceptance within context of Croatian SME organizations. In particular, the study focused its effort in exploring how different predictors influence decision makers' behavioral intention to adopt cloud computing services, both from the organizational and from the consumer perspective. The determinants (performance expectancy, effort expectancy, social influence and price value) explored in the study were adopted from Venkatesh et al. (2012), extended model of unified theory of acceptance and use of technology (UTAUT2).

The research study reviled that performance expectancy, effort expectancy, social influence and price value play statistically significant role in explaining behavioral intention of decision makers within Croatian SME organization to accept cloud computing technology. Accordingly, the null hypothesis ($H_0 1$) which states that performance expectancy, effort expectancy, social influence and price value are not statistically significant determinants of

behavioral intention of cloud computing acceptance within Croatian SME organizations was statistically unlikely and therefore alternative (H_a1) hypothesis was accepted. In addition, the regression model reviled that these determinants when combined can explain 46% in variance in behavioral intention.

In reference to the $H_0 2$ hypothesis, the results reviled that performance expectancy has highest prediction power of behavioral intention within Croatian SME decision makers, as it can explain 38% of variance in behavioral intention. In addition, the performance expectancy scored highest in correlation test ($r = .61$, $p < .000$), among all explored determinants. Therefore, null hypothesis ($H_0 2$) which states that performance expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations was highly unlikely and therefore alternative ($H_a 2$) hypothesis was accepted.

In reference to the $H_0 3$ hypothesis, the results reviled that effort expectancy was statistically relevant determinant of behavioral intention within Croatian SME decision makers and it can explain 16% of variance in behavioral intention. In addition, the effort expectancy scored moderately in correlation test ($r = .41$, $p < .000$). Therefore, null hypothesis ($H_0 3$) which states that effort expectancy is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations was highly unlikely and therefore alternative ($H_a 3$) hypothesis was accepted.

In reference to the $H_0 4$ hypothesis, the results reviled that social influence is statistically important determinant of behavioral intention within Croatian SME decision makers and it can explain 35% of variance in behavioral intention. In addition, the social influence scored high in correlation test ($r = .59$, $p < .000$). Therefore, null hypothesis ($H_0 4$) which states that social influence is not statistically significant determinant of behavioral intention of cloud computing

acceptance within Croatian SME organizations was highly unlikely and therefore alternative (H_a4) hypothesis was accepted.

In reference to the H_05 hypothesis, the results reviled that price value is statistically relevant determinant of behavioral intention within Croatian SME decision makers and it can explain 14% of variance in behavioral intention. In addition, the price value scored moderately in correlation test ($r = .37$, $p < .000$). Therefore, null hypothesis (H_05) which states that price value is not statistically significant determinant of behavioral intention of cloud computing acceptance within Croatian SME organizations was highly unlikely and therefore alternative (H_a5) hypothesis was accepted.

Implications

The research study results reviled that decision makers from Croatian SME organizations are willing to accept cloud computing technology, as long as they perceive that using cloud computing will benefit them and their organization by raising productivity and efficiency. In addition, the research reviled that statistically second most important determinant of cloud computing acceptance was how other people in organization and top management perceive usefulness of cloud computing technology. Therefore, Croatian SME organizations can incorporate these findings to support and accelerate adaptation of cloud computing technologies within their own organization.

The Croatian cloud computing providers could also benefit from this research findings as it will enable them to better position their product and services. The study research results suggested that Croatian cloud computing providers' should pay special attention on delivering competitive pricing as well as to try and educate the market of the potential benefits that cloud computing technology can offer. Therefore, research results suggested how cloud computing

vendors should align their marketing strategy to improve cloud computing acceptance from their counterparts, Croatian SME organizations.

Finally, the Croatian government could benefit from these research findings, as it will enable them to align their ICT strategy to accommodate SMEs transition to cloud. In addition, each of determinants explored in this research study, should be individually addressed, paying special attention on educating SME organizations and raising awareness of potential benefits of cloud computing technology.

Limitations and Recommendations

The research study reviled several limitations. First, the theoretical model used to explore behavioral intention of Croatian SMEs to adopt cloud computing technology was just partly able to describe acceptance of the technology. In addition, the research limitation could be observed from the perspective of generalizability as study does not take into consideration how different vertical industries are affected by the studies research findings. It is possible that different vertical industries are more likely to adopt cloud computing technology then others. Another important limitation of the study concerns is, too broad population sample. As by definition SME organization is defined as any organization that has between 1 and 250 employees, this can be a limitation itself, especially if take into account that smaller SME organizations usually do not have IT departments. As effort expectancy is one of the significant determinants of cloud computing acceptance, the organizations without specialized IT departments maybe more reluctant to accept cloud computing technology than those who do.

Therefore, the future research studies should focus on expanding the theoretical model by introducing new determinants in order to contribute to better understanding of behavioral intention to accept cloud computing technology. The future research should also explore how

presented theoretical model behaves within different vertical industries (e.g. healthcare, tourism industry, consumer, etc.) and different surroundings in terms of size of the SME organization.

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Appendix A

Survey Instrument

1. Please select your gender [ ] Male [ ] Female
2. Which category below includes your age [ ] 18-20 [ ] 21-29 [ ] 30-39 [ ] 40-49 [ ] 50-59 [ ] 60 or older
3. Select years of experience using, recommending, approving, installing, consuming cloud computing solutions [ ] Less than 1 Year [ ] 1-2 Years [ ] 3-4 Years [ ] Over 5 Years
4. Select approximate number of employees in your firm [ ] Less than 10 [ ] 11-30 [ ] 31-50 [ ] 51-100 [ ] 101-150 [ ] 151-200 [ ] 201-250 [ ] Over 250

PERFORMANCE EXPECTANCY

5. I will find using cloud computing services beneficial in my job
6. Using a cloud computing services will enable me to accomplish tasks more quickly
7. Using the cloud computing services will help me raise my productivity level
8. Using the cloud computing services will make me more efficient

EFFORT EXPECTANCY

9. My use of cloud computing services will be clear and understandable
10. Learning to work with cloud computing services will be easy for me
11. It will be easy for me to become skillful using cloud computing services
12. I will find cloud computing services easy to use

SOCIAL INFLUENCE

13. People who influence my behavior think that I should use cloud-computing services
14. People who are important to me think that I should use cloud-computing services

15. The senior management in my company will be helpful and supporting the use of cloud computing services

16. In general, the organization will be supportive of the use of cloud computing systems

PRICE VALUE

17. Cloud computing services are reasonably priced

18. Cloud computing gives good value for the money

19. At current price, cloud computing provides good value

BEHAVIORAL INTENTION

20. I intend to use a cloud computing services in the next 3 months

21. I predict I will use a cloud computing services in the next 6 months

22. I plan to use a cloud computing services in the next 12 months

Note: Survey adapted from "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology" by Venkatesh, V., Thong, J., & Xu, X. 2012. *MIS Quarterly 36*, p. 160.

Appendix B

Permission to Adapt and Reprint Survey and Figures

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Permission is hereby granted for Damir Vrsajkovic to use material from "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology," V. Venkatesh, J. Thong, and X. Xu, *MIS Quarterly* (36:1), March 2012, pp. 157-178, specifically the modified survey instrument and Figure 1 (UTAUT2 Model), and additional material as needed, in his Master's thesis paper.

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