

Adoption of u-commerce in Croatia -a preliminary study

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Abstract. *U-commerce (ubicom) is defined as combination of e-commerce, m-commerce, e-commerce using interactive digital television as communication media, voice commerce and silent commerce. Each u-commerce element uses positive characteristics of other elements and modifies it according to newer and sophisticated customer needs. This article describes preliminary study conducted to investigate u-commerce understanding and usage among enterprises in Croatia. Questionnaire preparation and construction as well as study pursuit are described. Study results indicate that degree of u-commerce knowledge and usage is relatively low. In order to answer customer's needs enterprises should familiarize more quickly with new technologies like u-commerce.*

Keywords. U-commerce, adoption, Croatian companies

1 Introduction

Ubiquitous or pervasive computing is rapidly progressing since the first conceptualization two decades ago. Ubiquitous computing has enabled new e-marketing paradigm that goes beyond traditional e-commerce [12]. New type of e-commerce is called „u-commerce“. U-commerce has ability to interact and to transact anywhere and anytime, with anytime and

anyone. Therefore u-commerce is pervasive and becoming a part of everyday life [9]. U-commerce is going to be next wave in digital commerce, after e-commerce and m-commerce. It is important to stress that u-commerce is addition of current types of commerce, and not their replacement.

For users and business u-commerce brings two principal benefits: (1) increased convenience and (2) more personalized services [4]. U-commerce can provide higher degree of personalization, which can bring additional values to the customers but can be one of major drivers in customer relationship management [5]. There are many attempts to develop and implement u-commerce systems. These systems are diverse in nature. They are based on devices that recognize speech, gesture or physical interactions. Owing their complexity they are very difficult to evaluate. Relatively little prior empirical research exist on users willingness to use u-commerce systems and whether users perceive that technological benefits meet their needs. In order to design and develop u-commerce system there is need to investigate are users interested in using this kind of system. The research issue is to which extent u-commerce has penetrated in Croatian enterprises. This paper is presenting the results of preliminary study of u-commerce adoption by Croatian enterprises.

The remaining of paper is organized as follows. Section 2 presents theoretical framework and literature overview. In section 3 research issues and methodology are presented. Section 4 gives preliminary results of survey.

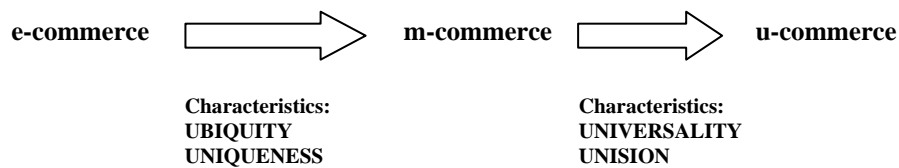


Figure 1. Transition between e-commerce, m-commerce and u-commerce and u-constructs [6]

2 Theoretical Framework and Literature Overview

U-commerce will be defined in this chapter. U-commerce will be described through its major components. In addition U-City construction will be presented.

2.1 U-Commerce Definition

U-commerce could be described as combination of (1) e-commerce, (2) wireless business, (3) e-business through iDTV channel (inter-active digital television channel), (4) voice telephony business (voice commerce) and (5) so called silent commerce. This combination enables interaction and transaction anywhere and everywhere without online connection. Junglas and Watson [5] are arguing that u-commerce is opening new era in e-business, starting with e-commerce and continuing with m-commerce.

U-commerce can be viewed as a logical extension of e-commerce and m-commerce [12].

A example of u-commerce application is Speedpass introduced by ExxonMobile, an RFID-based system. Waving Speedpass transponder in front of a gas pump customers are paying the gasoline. Speedpass can be used to pay purchase by ExxonMobile petrol stations and at more than 400 McDonalds restaurants in SAD [12].

2.2 From e-Commerce to u-Commerce

U-commerce represents the next phase in e-commerce and m-commerce development. E-commerce and m-commerce enabling technologies integration we are defining as u-commerce. However beside known technologies, u-commerce is including new ones which are in development phase. Figure 1. shows the transitions between e-commerce and m-commerce, and m-commerce and u-commerce. Also, u-constructs that describe main characteristics of u-commerce are shown. Four u-constructs are: ubiquity, uniqueness, universality and unision.

Ubiquity allows users to access network and to be reachable at any time and any place. Uniqueness allows users to be uniquely identified. Universality allows that all devices can be multifunctional and universally used. Unision allows data integration across multiple application and irrespectively to the used devices [6]. According to some of authors u-commerce is integrating five types of business models:

1. *traditional e-commerce* – usage of Internet for both communication and business transactions;
2. *wireless commerce* – usage of mobile and wireless devices for both communication and business transactions;
3. *voice commerce* – usage of voice digitalization such as voice recognition, voice identification and voice-to-speech (voice-to-text) transmission.
4. *television commerce* – usage of iDTV.
5. *silent commerce* – radio frequency identification-RFID usage in order to achieve intelligent and interactive communication between users.

U-commerce is a new commerce model, which is bringing profound changes in internet marketing, customer relationship management and supply chain management.

U-commerce technologies are enabling interactivity and marketing communication with individual customers, i.e. with “segment-of-one”. Marketing activities could be much more efficient through usage of u-commerce technologies.

In the field of inventory management and logistics, RFID technology already plays a huge role. Researcher [8] are suggesting that RFID technology can be very successfully used in sales and distribution process. U-commerce enable dramatic improvements in m-payment as well as in CRM processes.

U-commerce can be implemented in services sector, particularly in travel, entertainment and tourism industry [2]. Suh et al. [13] considered the u-commerce as new distribution channel for financial services industry.

2.3. U-Government, u-City

New mobile communication devices today have the computing power equivalent or higher to laptops. Governments are considering ubiquitous technologies in order to communicate and interact with enterprises and households in efficient and effective manner. The literature [1] is proposing a framework of enablers and outcomes of u-government.

Recently has been developed a U-City construction, as an integrated set of ubiquitous services [14]. U-City is defined as a next generation urban space that includes an integrated set of u-services: a convergent form of both physical and digital spaces [7].

3 Major Research Issues and Methodology

U-commerce creates an economy that is more flexible, interconnected and more efficient. U-commerce technology is already available in transition economies like Croatian economy. Major research issue is to which extend u-commerce penetrated in Croatian economy. Therefore we hypothesized as follows:

H 1. Croatian large enterprises are familiar with u-commerce technologies.

H 2. Croatian large enterprises are using u-commerce technologies as enabler in marketing and sales activities.

H 3. Croatian large cities are implementing U-City concept.

3.1 Research Methodology

Questionnaire had two major parts: enterprise u-commerce and local government (city) u-commerce. The questions for business were measured on a 5-point Likert like scale from 1 (unfamiliar) to 5 (fully familiar), as well as from 1 (non of u-commerce components use) to 5 (full u-commerce use).

The questions for government (city) u-commerce were measured as well as on a 5-point Likert like scale from 1 (none of public services offered by usage of u-commerce technologies) to 5 (full set of public services offered by usage of u-commerce technologies).

Two stage e-mail survey has been performed. An initial e-mailing was sent to IT managers in a random sample of 20 companies within population of top 500 Croatian enterprises and to IT managers in city halls of major Croatian cities: Zagreb, Split, Osijek and Rijeka. Target respondents were IT managers or IT professionals. Initial e-mail gave brief description of study and questionnaire. We received total of 12 responses from sample of Croatian companies and 2

responses from targeted 4 city halls IT managers. Although low this is considered as normal for email surveys [3].

In the second stage of survey will be encompassed total of 500 top Croatian companies and 20 major Croatian cities.

4 Preliminary Results

This paper is presenting preliminary results of the first survey.

Of the 12 received respondents, 2 indicated that they are fully familiar with u-commerce technologies, 6 that they are partially familiar with u-commerce technologies. Of the 12 respondents, 4 indicated that they are unfamiliar with u-commerce.

Of the 12 received respondents, 2 indicated that they are using one of u-commerce components as an enabler in marketing activities, 10 indicated that they are using non of the u-commerce technologies in marketing process.

Of the 2 received respondents from city halls IT managers, both indicated that they are not implementing u-commerce in the process of provisioning public services to enterprises and households.

Based on preliminary results analysis none of three hypotheses can be supported.

Our preliminary research indicated that neither enterprises nor local government are familiar with u-commerce. The survey has limitation in very small sample. Therefore it is very important in the second survey to encompass total population of top 500 enterprises.

Further research should focus on enablers and drivers of u-commerce adoption by Croatian enterprises and public services providers. Another possible research avenue could be implementation of u-commerce applications in various marketing contexts.

5 Conclusion

This preliminary research is based on the definition of u-commerce by Junglas and Watson [5]. U-commerce will have strong influence on businesses, households and public sector. It will improve efficiency and effectiveness of business operations and public sector services provisioning. Customer services and customer relationship management can be enhanced by continuous interactivity, connectivity and personalization.

Academic literature and researchers ([7], [10], [11], [14]) have been focusing on following areas:

- U-commerce technologies such as pervasive computing, sensors, locators and data synchronization technology;
- U-commerce applications supporting marketing operations, CRM processes, SCM processes;

- U-commerce applications supporting ubiquitous government and wireless city;

Our preliminary study is focusing on recognition of u-commerce concept by major Croatian enterprises and city halls. This paper is presenting preliminary results and announcing deeper second wave survey which should provide empirical evidence to support hypothesis that Croatian enterprises, households and public services providers are following global trend of increasing u-commerce technologies international importance and penetration.

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