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From an analysis of e-services definitions and classifications to the proposal of new e-service classification

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Abstract

We write emails, listen to music online, pay an invoice through internet banking, and have an eID. These all are e-services. But how can we define an e-service? Numerous definitions of e-services generalize their essence, reflect the specific characteristics and certain elements of their production process. They are important for economic theory and practice, but none of them have acquired general acceptance. Supranational institutions, scientists and researchers attempt to seek one definition. A lot of definitions explain e-services only as e-government, e-learning and e-commerce. It is insufficient for further classification. We pay attention to classification of e-services in this chapter. Some of them divided e-services according to the branch, processes etc. Classification as e-co model, e-ladder, E-Diamond model, classification of service and product to the dimensions in a 2 * 2 matrix, and fulfilment-product classification have been introduced. The main goal of our study is to provide an extensive review of e-service definitions and classifications. Based on the findings we propose our own classification of e-services. The result of our work is a new 3D model. The 3D model is constructed according to bases of stages models and Diamond model, but we respect also user's needs and their fulfilment in process. In this empirical analysis of e-service definitions and classifications, we have compared known definitions and classifications and proposed a new model. Most models and schemes only deal with public e-services. We bring a new perspective, the classification is intended for all known e-services.

Keywords: e-services; classification; definition; model.

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1. Introduction

Information communication development changed social human behaviour, the nature of work activities and speed up the process and the life of society. In 1991 saw the advent of the website. Today, the number of websites is estimated at one billion. According to statistics (Miniwatts Marketing Group, 2015) over 70 % of Europe´s population are active users of the Internet. A higher percentage is in North America (87, 7%) and Australia and Oceania (72, 9%). The digitalization of proceeds differently in each country, as well as the perception of what is an e-service is different.

2. E-service definitions

Electronic service, short as e-service, is a general term that refers to services over the information – communication technologies. The term e-service has many applications and can be found in many disciplines. The two dominant application areas of e-services are E-business (or e-commerce) and E-government (or non-commerce). Computer Language Company (2009) defines e-services as an umbrella term for services on the Internet. E-services include e-commerce transaction services for handling online orders, application hosting by application service providers (ASPs) and any processing capability that is obtainable on the Web. Chun Hai (2007) argues that e-services are services on the Internet where it is possible to make a purchase and sale transaction, unlike traditional websites, where only have descriptive information available. Similar Zeithaml and Bitner (2003) defined e-service as web services delivered through the Internet. Wilson (1998) mentioned that „an e-service is an activity or series of activities that takes place during the interaction between a provider and a customer through an electronic channel". Taherdoost et al. (2014) used e-services characteristics and summarized as follows: intangibility, process nature, homogeneous, inseparability, non-ownership, inter action, self-service, non-rival. Methodical instructions (Finance Ministry of Slovak Republic, 2006) defines electronic services as "a service provided electronically by means of information and communication tools". Under the Law (Ministry of Communication of Slovak Republic, 2006) are public online services defined as: electronic communication with obligated persons in dealing with the administration, notification, access to information and to the provision, or public participation in the administration of public affairs. Similarly, e-services defined by the European judiciary, stating that e-service is a service or resource on the Internet, which was set up to improve communication between citizens and businesses on the one hand and the European Institutions on the other side (European Justice, 2015). The definition of e-services is also defined in Council Regulation (European Commission, 2006) „an 'eService' is one that is delivered over the Internet (or an electronic network which is reliant on the Internet or similar network for its provision) and is heavily dependent on information technology for its supply - i.e. the service is essentially automated, involving minimal human intervention and in the absence of information technology does not have viability". Electronically supplied services includes for example website supply, web-hosting and does not include - radio and television broadcasting services; telecommunications services; goods, where the order and processing is done electronically etc.

The available definitions are built on one main idea – the internet or other electronic network. Various laws and experts define that e-services may vary, but all agree on the role of technology in transferring services. Therefore, e-services extend beyond the Internet. The e-services "off-line" can include telephone, fax, personal digital assistant, text messages, picture messages, Bluetooth, tracking system, radio-frequency identifiers, biometrics identifiers, electronic ID cards, e-mail, online chat, and many others (Wikipedia Foundation, 2015).

According to the review of definitions, we define e-services as activities provided by provider to a recipient; these services are non-material; they are provided by means of information and communication devices and the result of their consumption can be a benefit, service or acquisition of property.

3. E-service classifications

In this chapter we turn our attention to the classification of e-services. We introduce mainly classifications. The first one is e-co model, created by Lind et. al. (2007), who answered these four questions: •What do I/we want to achieve? (The Vision) • What does the situation look like today? (The current situation) The e-Co Model – Citizen´s Driving e-Service Quality 7 • By which means do I/we go from today in order to arrive at desired goals? (The means

to change) • A rational individual should also be able to reflect over whether the situation has become better after the realization of the three first points (The reflection). The model represents four steps where the last step connects into the first step in a reflection of "did I reach my vision and/ or has my vision changed now so I need to go another round in the model". The underlying assumption in the e-co model is that individuals who develop their "vision" have created a higher value for himself/herself.

E-ladder models introduces a two stage model. Stage ANAO-OGO model of service delivery by the Internet is developed by the Australian National Auditing Office (1999) to categorize the government agencies and electronic service delivery via the Internet. This model divides the delivery of services into 4 categories or stages, indicating that this is a model pivoting the emerging e-services and the development of e-services.

SAFAD model by The Swedish Agency for Administrative Development (SAFAD) (2000) presented model influenced by the Australian model (above). SAFAD model is based on the assumption that technology and service levels are intimately interwoven factors in the emerging eGovernment services. As in the Australian model, there are diagonal stages apparent that according to SAFAD are clearly distinct from each other in functional terms.

Against stage models formulated by Goldkuhl and Person (2006a, 2006b) may suggest new models consisting of three polarities. This model is called e-diamond model. The three identified polarities are initially separate – coordinated e-services, second polarity is general – individualized, last polarity spans from informative to performative e-services. There was a need to distinguish between who the communicator was (citizen vs. government). Based on this need, the e-diamond model was complemented with another polarity "citizen – government" by Lind and Goldkuhl (2008).

The next classification is by Sheth and Sharma (2007), who classified products and services on two dimensions (Figure 1 a). The first dimension is the degree of digitization which is defined in their framework as "the degree to which the product or service can be digitized" and the second aspect is the ability for co-creation which "involves both the marketers and the customer interacting in aspects of the design, production and consumption of the product or service" (Sheth, Sharma, 2007; Sheth, Sisodia, 2000). Similar, the fulfilment-product classification scheme (Figure 1 b) segments Internet retailing into four categories: offline – goods category, offline services, electronic goods and electronic services (Francis, White, 2003).

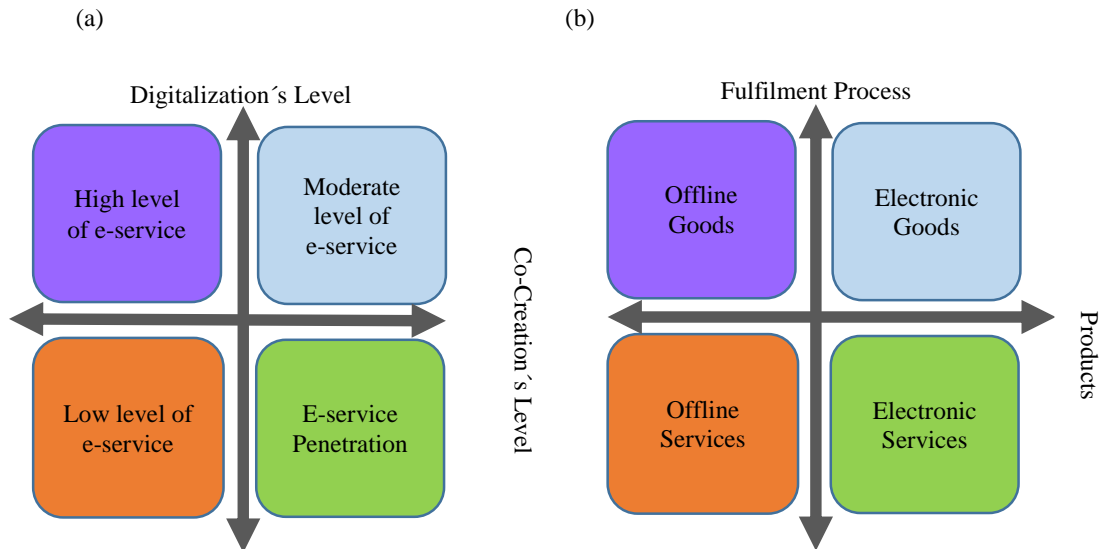(a)   (b)

Fig. 1. (a) Classification of service and product. (b) Fulfillment-product classification.

The five stage maturity model is the last one we introduced. This model reflects how businesses and citizens can interact with public authorities. Governments' service delivery processes are described according to the following stages: (i) information, (ii) one-way interaction (downloadable form), (iii) two-way interaction (electronic forms), (iv) transaction (full electronic), and finally (v) personalisation (pro-active, automated). The fourth and fifth stages can be referred to as 'full online availability' (Cap Gemini, 2010).

4. The 3D model

The 3D model abstracts from the fact that the provider must be a government agency. This categorisation should classify all e-services, from non-commerce as well as e-commerce.

We agree with Goldkuhl and Person (2006a, 2006b). According the e-Diamond model we use the polarities such as Individualized – General, Separate – Coordinated. Even though we added new polarity, which spans from Unpaid e-services to Paid e-services. There are lot of services offered for free, but we cannot forget for a lots, which are paid. Then our changed e-Diamond model, which is the base of 3D model, looks like hexagon.

We removed the polarity Informative – Performative. Goldkuhl and Person thought that informative e-services are only aimed at reading information – so it means, that the receiver of information (customer) can only get information, any other necessary act must be done personally, and these are performative e-services. We agree with it, but for classification it is more important to know if the performed service fulfils customer´s needs than how many tasks he/she has to do. We believe nowadays that it becomes more important the technology level, digitalization of e-service (online process and service delivery fulfilment). In many countries, government agencies offer hundreds of e-services. In reality, citizen only have to visit agencies personally, or send documents per post same as before the e-services being introduced. Therefore, we add the vertical axis with range $0 – 5$, which shows real level of electronisation (e-level); how much are e-services electronic (0 – off-line – 5 – 100% online). We used 5 main questions with two possible answers: yes, no, to create the range 0 - 5. With each additional "yes" answer increases the level. If the question is unnecessary, then skip it. If the answer on the first question will be "no", it is going on offline e-service. We understand under "action" any customer activity, which is important for the e-service fulfilment, for example write some comment, ask question, fulfil questionnaire/form, etc. Questions are below:

1. Are information about the e-service available electronically?
2. Does the e-service require/allow customer´s action, which can be done electronically?
3. Does customer receive the re-action from provider electronically?
4. Does the consumption of e-service meet customer needs (without the additional e-service / further action)?
5. Is the e-service automatically executed fully electronically and without the presence of the customer (with his/her approval)?

Below are some examples of e-services according the 3D model:

I. Bank payment order – customer allows the bank transfer, then the debit operations are automatic if necessary. This could be paid or unpaid, but we imagine in this case that it is an unpaid service. This e-service is than individualized, separate, unpaid and on 5th on-line level. When the customer sets it up, the service is repeated automatically.

II. On-line newspapers – customer reads news on website, the access is paid, it is necessary to login first. This e-service is individualized, separate, paid and on 4th on-line level. We skip over level 2 and 3, because they are unnecessary for this e-service. The customer needs has been satisfied.

The 3D model is dimensional model of hexagonal cuboid.

5. Conclusion

The main goal of our study was to provide an extensive review of e-service definitions and classifications. Based on the finding we propose our own classification of e-services – The 3D model, which is constructed according to bases of stages models and the Diamond model, but we respect also user's needs and their fulfilment in process. Most models and schemes only deal with public e-services. We bring a new perspective, the classification is intended for all known e-services.

E-services and e-solutions can make our lives easier, more efficient, and bring less bureaucracy. The technology will develop and many traditional services will be transformed into new electronic services on a daily basis. The definition and classification of e-services will also change. It shows a need for further continuous research.

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