The nature of public e-services and their quality dimensions

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ABSTRACT

In this paper, we argue that our understanding of the concept of 'e-service' is incomplete and that this inadequate understanding blurs important differences between distinct types of interaction between a government and its citizens. This in turn creates difficulties when assessing the quality of 'e-services', as we cannot specify precisely what we are measuring. Based on a literature review, we argue that it is neither feasible nor fruitful to provide an unambiguous, precise understanding of the concept of e-service. However, in our context, 'e-services' is understood as a sequence of digital interactions between a service provider and service receiver which add some value to the receiver. We will accordingly inquire into the 'e-service' concept and examine its distinct types of communication in order to provide a better understanding of its basic characteristics. As a result, we outline a framework for categorizing the different types of digital communication that are denoted 'e-services' by identifying their basic service elements. This framework will also help to specify their distinct quality dimensions. We can thereby identify and model various types of interaction between citizens and public agencies based on a consistent set of service elements. As an illustration of its usefulness, we describe one of the life event services in the EU eGovernment benchmark framework in terms of our framework, including its quality dimensions.

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1. Introduction

The service concept is widely used but causes much confusion because the meaning is different in different fields. *E-service*, or digital service, is even worse; it is broadly used for almost all types of electronic communication between citizens and government (Lee, 2010; Lindgren & Jansson, 2013). Is the government offering us a 'service' when we pay taxes or a business is reporting information decreed by law to public agencies, just because Internet is used as a communication channel? There is little consensus on the meaning of the concept 'e-service'; hence, the literature is full of synonymous terms and concepts (Lindgren & Jansson, 2013). Such confusion also creates difficulties when governments carry out benchmarking in order to assess the quality of online services, an important work because of the increasing attention to quality assessment of services from Governments around the world. The EU eGovernment benchmarking framework is a good example of the transition from availability of online services to the quality of these (Halaris, Magoutas, Papadomichelaki, & Mentzas, 2007).

Goldkuhl (2007) questions the use of service in all governmental tasks, while Alter (2008) points to the different definitions of service across communities. Baida, Gordijn, and Omelayenko (2004) propose an ontology for describing services and service bundling, while Lee (2010), on the other hand suggests a conceptual frame of reference including metaphors and themes to be used when evaluating e-government development. Papadomichelaki and Mentzas (2012) state that the subject of e-service quality is very rich in content of definitions, models and measurement instruments, but although there is agreement on the quality being a multidimensional construct, the content of what constitutes e-service quality varies across studies. These contributions have inspired our development of a framework for describing the different types of interaction (called "e-services") that take place when a public agency provides services to its various users and stakeholders. This framework consists of four basic (service) interaction categories: i) *information provision or static communication*, ii) *secure interaction*, iii) *secure contraction* and iv) *complete transaction process*. In addition, there is a *support function category*. Furthermore, an interaction can be viewed from different perspectives, including i) its purpose, ii) its content or structure, iii) its result and effect. In addition, we discuss the quality requirements to these distinct categories.

Our framework is based on the conceptualization of Goldkuhl and Röstlinger (2000); Goldkuhl and Persson (2006) and Jansen and Ølnes (2014). We have also benefitted from Lee's (2010) eGovernment analysis of different stage models. The inclusion of quality attributes is much influenced by the European Commission's work on defining a framework for evaluating digital services (European Commission, 2012) the e-GovQual framework (Papadomichelaki & Mentzas, 2012) and Kohlborn (2014).

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Our research objectives are:

- *To provide a better understanding of the 'e-service' concept by analysing the different types of interaction between a government and its citizens and businesses*
- *Propose a framework for assessing or measuring the quality of 'e-services'.*

The structure of the paper is as follows: After describing our method, we discuss the 'service' and 'e-service' concepts and their relation to various stage models, followed by a description of our own framework for categorizing types of interaction between a government and a citizen or business. Section 4 includes an analysis of existing service quality models that constitute the basis for our framework for quality assessment in Table 7. This framework has been tested on one of the life events in the EU eGovernment benchmark measurements, as shown in Table 8. Finally, we present our conclusions and suggest further research in this quite fundamental part of eGovernment.

It is important to use consistent terminology and especially to distinguish between concept, term, and referent, as illustrated in the semiotic triangle in Fig. 1, based on Ogden and Richards (1923).

In our context, 'e-services' is understood as a sequence of distinct digital interactions between a service provider and service receiver which add some value to the receiver. We use the terms "e-service", "digital service" and "online service" interchangeably as they basically refer to the same concept. We use double quotes ("..") indicating the term while single quotes ('..') refer to the concept. "e-service" is thus the name of the 'e-service' concept. In titles, however, we omit the quotation marks, as well as when citing other authors.

2. Research approach and literature review

Our research approach is exploratory, proposing a framework for modelling public e-services, including a set of quality dimensions. It is rooted in the eGovernment research field, but also borrows from computer science and also from the business science and service management literature. The research process consisted of several steps; including a literature review, a development phase and an evaluation phase.

We have conducted a systematic literature search and review (Briner & Denyer, 2012) in addition to an ordinary literature review, using well known papers about the subject as a starting point; often called the snow-ball method (Briner & Denyer, 2012), going through references of papers already included. Our literature search and review were done to give a broader picture of the work done in the areas of "service quality" and "e-service quality" and similar expressions. We
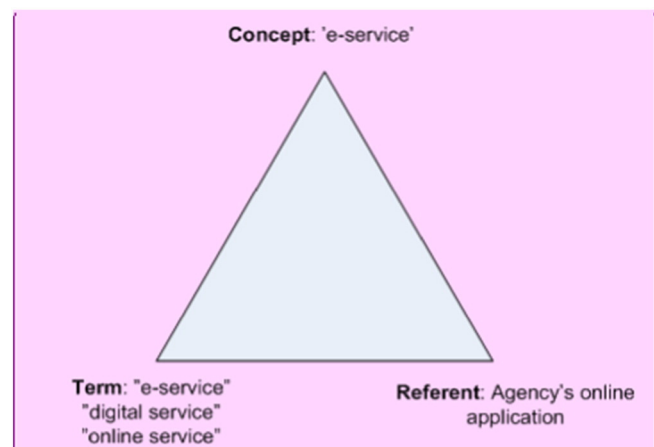
searched for the same terms both in the newly updated e-Government Research Library[1] EGRL) v. 11.5, and the broader Thompson Reuters' Web of Science. The EGRL library was chosen because of its extensive overview of e-Government related research and Thompson Reuters' Web of Science was chosen because of its overall coverage of academic literature. The results from the literature search are given in Table 1. In the appendix, we have listed more detailed results from our searches and indicated the papers we deemed relevant for our work.

Our literature review shows that there is an abundance of published papers dealing with the subject of "service quality", and also "service performance". However, when we search for literature on "e-service quality", the result shows significantly less work done. We searched for the terms in the title field of the publications as this would be a strong indicator of what the paper was about.

The results show that there are few papers in the EGRL discussing e-service quality, and the 'service' and 'e-service' concepts. The Web of Science index, on the other hand, has more papers dealing with the subject, but most of them are outside the e-Government research field and are thus less relevant.

We examined the papers containing the term "e-service quality", "online quality", and "e-government service quality" and the details can be found in the appendix. However, most of the papers turned out to be irrelevant for our paper, as these papers either do not discuss the 'e-service' concept, but take it for granted, or that the concept is used in a domain and context that does not add to our understanding in an eGovernment context. In addition to our own systematic literature review, we have based our framework on reviews by other authors, in particular Baida et al. (2004) on the e-service concept, Lee (2010) on stage models, Papadomichelaki and Mentzas (2012) and Kohlborn (2014) on e-Government quality indicators.

Based on these reviews, we have developed the framework that is illustrated in Table 4. Furthermore we have identified a set of quality dimensions that is described in Table 7. Finally, we have used the European Union's eGovernment benchmarking measurements for testing our framework. More specifically, we chose the service "applying for student grant" as part of the life event "study" as a test case.

3. Analysing the e-service concept

3.1. The ambiguity of the concepts services and e-services

'Service' is a concept loaded with different meanings in different circumstances, mostly depending on who uses it. A number of definitions of the concept 'service' exist, both lexical and from other sources. Starting with the encyclopaedia, the word "service" comes from the Latin word "servus" which means slave (Webster's, 1979). A first definition of service is the occupation or condition of a servant, corresponding appropriately with how service is understood in computer science: A program that offers a service to other programs through a well-defined user interface, such as in Service–oriented architecture (SOA).

Hill (1977) defines service this way: "A service is a change in the condition of a person, or a good belonging to some economic entity, brought about as the result of the activity of some other economic entity, with the approval of the first person or economic entity". Although not very precise, this definition has been adopted by the U. S. government. It puts weight on the action rather than the substance or the quality. Thus, 'service' is used to indicate an action and also the type of action (the act or method). The definition also covers the output of a service (the quality) and the organization acting to carry out the service.

Goldkuhl and Röstlinger (2000) discuss the determinant properties of services, often being contrasted to the properties of goods, and they reject the main characteristics of services that are frequently mentioned, being *intangible* (immaterial), *inseparable* (in production and

Fig. 1. The semiotic triangle applied on the concept 'e-service'.