

The User Interface as a Supplier of Intertwined e-Services

Göran Hultgren and Owen Eriksson

Department of Culture, Media and Data, Högskolan Dalarna, SE 78188
Borlänge, Sweden and the Research Group VITS. ghu@du.se, oer@du.se.

Introduction

Today, much of the world economy is focused on the service sector (Stafford and Saunders 2004). One of the changes driving service economic growth has been the rapid development in computer technology, mobile technology and the Internet (ibid.). There are e.g. mobile positioning services, traffic information services and intermediary services such as banking services on the Internet. With the help of channels such as the Internet and mobile telecommunications, information and functionalities are delivered by service providers, and are used by customers with the help of information technology (IT) systems. Many of these services have a characteristic where customers can meet and communicate with each other.

The focus of this paper is on services where the service provider and the customer(s) do not meet at the same time, and/or at the same place, i.e. the IT system acts as a service performer and medium in the service delivery process. This is an exciting new area of study which needs new perspectives and new methods which deal with the design, delivery and impact of these services, because they are likely to push the limits of software engineering in terms of analysis, design and testing (Chidambaram 2001). According to Dahlbom (2002) service thinking is focused upon individuals, actions, results and support. This implies a shift of context from the use of the IT system in order to improve the efficiency of routines and work processes of the organisation, to a focus on customers acting in a market receiving occasional services in a flexible way (ibid.).

We chose the term *e-service* to talk about the phenomenon where the IT system is used to offer services to customers in a market. A conceptualisation of the notion of e-service in such a context is presented in Hultgren and Eriksson (2005). This conceptualisation is theoretically based on a social interaction perspective (e.g. Habermas 1984), a view of IT systems as action systems (e.g. Ågerfalk 2003) and on Service Marketing (e.g. Grön-

roos 1998; Edvardsson et.al. 2000). This theoretical base puts emphasis on the social aspects of e-services, i.e. that customers and service providers are communicating and acting through the IT system, and that this interaction is social and not only technical.

The social interaction is performed through the IT-systems *user interface*. This implies that the user interface is used to support the interaction between the service provider and the customer to produce the e-service. This user interface consists of a series of screen layouts providing different functionalities and messages.

It is important to recognise, as a consequence, the usability aspects in developing web interfaces (e.g. Nielsen 2000). These aspects are also closely related to the research on service quality in e-services (e.g. Grönroos et.al. 2000; Santos 2003). One fundamental claim in web design research is the development of user interfaces informing the users both what to do and how by being consequent in the use of functionalities, colours, frames, messages, etc. One claim in service quality research is to be explicit in the service concept offered to the customer. Put in the context of e-services we claim that these usability aspects in designing good user interfaces should easily inform the customer about the e-service concept.

The problem is that there is not a one-to-one relation between a specific e-service and the user interface presenting it. Instead several e-services are *intertwined* with each other and presented by one or several user interfaces consisting of several screen layouts.

A user interface for an e-marketplace (Fig 1), consists (as we will show later in this paper) thus of several e-services and has to be seen as a service conglomerate hosting several e-services where the e-marketplace for ‘advertisers’ meeting ‘readers’ is *one* e-service. The ‘service provider’ view of the e-marketplace is also to benefit from the presence of the “visitors” and use them as resources in other e-services. From this viewpoint, we can see that the existing e-marketplace in Figure 1 also provides functionalities to search for new cars, to obtain financial and car insurance services, to receive information about recommended prices for a specific type of used car, to use search facilities and (to be a subject for) banner marketing (i.e. a “clickable” commercial message). This means that the ‘service provider’ in this example can use the presence of the ‘advertisers’ and the ‘readers’ as important subjects for *other* e-services. This also results in a user interface which hardly can be described as *one* e-service because of its complexity.

We claim that there is a need to be explicit in the design of what an e-service covers and how other e-services are related, in order to be able to design good web-based user interfaces. By having a distinct e-service de-

sign, the criteria laid out in web design research can be applied in order to make different, but intertwined, e-services apparent for the customers.



Fig. 1. One screen layout from the interface of an Internet based e-marketplace.

The purpose of the paper is to present a framework for how intertwined e-services can be analysed as a base to design service apparent user interfaces. The paper is based on a qualitative research method built on both theoretical and empirical studies using the evolving framework for analysis and design of several e-services. The paper is structured as follows: In the next section, the notion of e-service from Hultgren and Eriksson (2005) is described and elaborated with additional aspects necessary for the analysis of intertwined e-services. Thereafter, the existing e-marketplace is presented more deeply and analysed in the following section. Finally, we discuss the analysis and conclude the paper.

The Notion of e-Service

In this section we first describe the notion of e-service presented in Hultgren and Eriksson (2005) in order to understand the fundamental aspects of e-services. Thereafter we present four complementary aspects required to analyse how the user interface presents different e-services.

The notion of e-service from Hultgren and Eriksson (2005) outlines three cornerstones when describing an e-service: the service concept, the relationships and the use situations. The first two cornerstones are necessary in order to define the e-service, while the third cornerstone describes how the involved actors use the IT system. The two first cornerstones are briefly described in this paper because they are needed as a base for delimiting different e-services from each other.

The *service concept* is the result from an e-service produced by the actors involved in the social interaction in order to be beneficial to the customer. The service concept is a product specification which the service provider is responsible for. The service concept can be divided into a description of core services and additional services; where the additional services are complementary to the core services in order to make the service more useful. Fundamental for e-services is that they are produced in the interaction between a service provider and a customer (or several customers) in order to fulfill customer needs, and that the IT system is used in a social interaction context which consists of actors, social relationships, norms, rules, values and expectations.

The *relationships* are created and maintained due to the communication performed between the service provider and the customer(s) mediated and performed by the IT system. It is also important to stress that these relationships are not only technical in character; they are also social, because they are based on interpretation of communication acts performed in a social context. The communication acts are used to create relationships based on information, commitments and expectations. Based on the actor roles, those of the service provider and the customer, there are two basic relationships in the e-service context: the service provider-to-customer relationship; and the customer-to-customer relationship.

The service concept and the relationships described above can be used to describe and understand *one* specific e-service. But in order to delimit one e-service from other intertwined e-services, we have to look closer to the user interface and introduce some further aspects.

The User Interface

The *user interface* for the customer consists of the functionality, the information and the screen layout. The functionalities can e.g. be what action possibilities are available in the user interface; the provided information e.g. about logotypes and other messages; and, the screen layout e.g. about different frames, colors and windows.

The user interface can be consisted by a series of screen layouts. Within web design research this series of screen layouts is recognised as important to keep together in the user interface in order to develop a usable IT system “telling” the user what to do and how (e.g. Nielsen 2000).

The Focused e-Service

As e-services are intertwined with each other we have to decide from which e-service, i.e. service concept, we are starting our analyses. We use

the term of *focused e-service* to talk about a certain e-service. A focused e-service consists of several core- and additional services, i.e. a service concept provided by a service provider. A focused e-service can be presented by several screen layouts and it is therefore important to distinguish between screen layouts which are related to each other and which are not, because this regulates what commitments the involved actors make and determines the usability of the IT system and the e-service.

The Service Environment

It is common that the series of screen layouts presented to the customer in order to use a focused e-service provides several other functionalities and messages out of the scope of the focused e-service. We use the term *service environment* in order to talk about messages and functionalities, i.e. links to other e-services out of the scope of the focused e-service.

Three Types of e-Services

We have to understand that there are *three different types* of e-services co-existing in the user interface:

1. The *focused e-service* (already discussed);
2. *Related e-services* to the focused e-service;
3. *Interrelating e-services* which provide linking facilities from the focused e-service or its service environment to related e-services.

Figure 2 describes how the used terms in this section relate to each other and that the interrelating e-services are used in two different ways: a) to link from the focused e-service to related e-services; and b) to link from the service environment to related e-services.

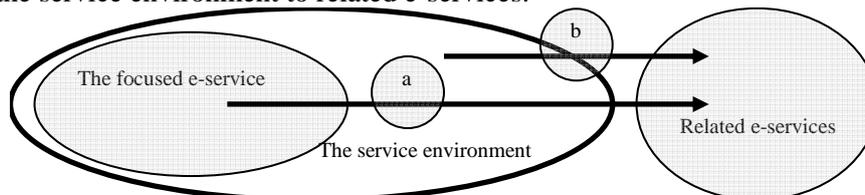


Fig. 2. The two ways of using the interrelating e-services.

Example: The User Interface for the e-Marketplace

In this section we describe the user interface for an existing e-marketplace (www.autos.yahoo.com). The e-marketplace is open for ‘advertisers’ to buy or sell used cars. The ‘advertiser’ provides a textual message and, as

an option, one or several pictures of the car for sale. The ‘service provider’ for the web based marketplace charges a fee for this service by using credit card payment facilities. After payment the advertisement is published on the Internet. The ‘reader’ can then be made aware of the advertisement interactively by using search facilities. If a ‘reader’ is interested in buying or selling a specific car, he can contact the ‘advertiser’ via the website or externally by telephone.

The start page for the e-marketplace was shown in Figure 1. From this page the possibility to search for a used car and to sell a used car can be chosen. This page renders also the possibility to link several other functionalities, e.g. to search for a new car, to obtain financial and car insurance services, to receive information about recommended prices for a specific type of used car and to be subject to banner marketing. The ‘reader’ can use the search facilities in order to obtain a list of cars (as in Fig. 3). The ‘reader’ can click on a specific advertisement in the list in Figure 3 and a more detailed presentation of the car is shown (Fig. 4). This page also renders the possibility to contact the ‘advertiser’.

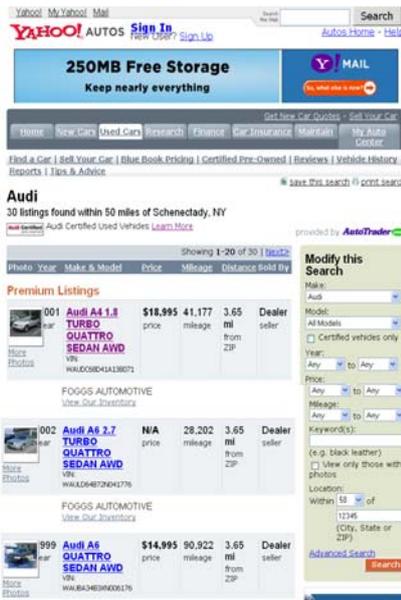


Fig. 3. The list of used cars.



Fig. 4. The description of a specific car.

If the option to click on the ‘Finance’ button is chosen, a list of possible financial companies are presented (Fig. 5). After choosing one specific financial company, the layout given in Figure 6 is presented. If we use the option to click on the ‘Blue Book Pricing’ button in order to get a recom-

mended price for a specific type of used car, the information shown in Figure 7 appears after choosing a specific car type and answering some questions. Clicking on a banner results for example in Figure 8.

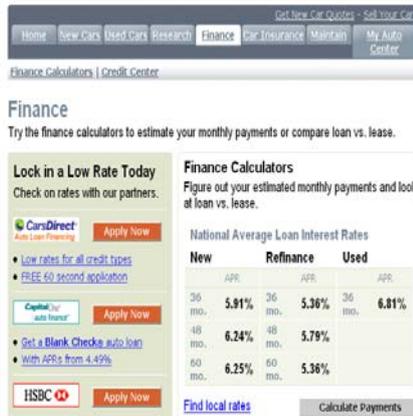


Fig. 5. A list of financial companies.

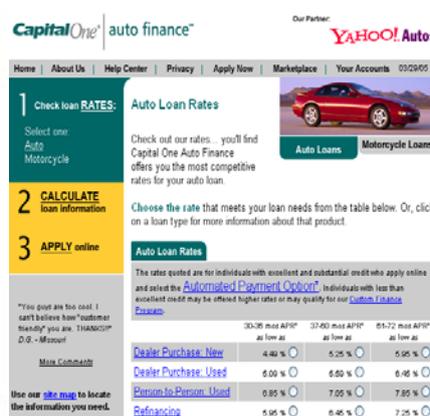


Fig. 6. A specific financial company.



Fig. 7. “Blue Book Pricing”.



Fig. 8. “Banner” marketing.

Example: The e-Services Intertwined in the e-Marketplace

In this section we illustrate how the perspective on e-services can help us to analyse the user interface for the existing e-marketplace.

The Focused e-Service and its Service Concept

The focused e-service is an e-marketplace for ‘advertisers’ of used cars to expose “for sale” or “want to buy” items searchable by potential ‘readers’.

The aim of the e-service is to let ‘advertisers’ and ‘readers’ meet. This means that the e-service has both ‘advertisers’ and ‘readers’ as customers. The core service for the ‘advertiser’ is to publish advertisements which he wants to buy or sell and to make contact with ‘readers’. The core service for the ‘reader’ is to search for advertisements, access them and to make contact with the ‘advertisers’. There are also additional services such as the presentation of a list of financial institutions (the ‘Finance’ button). The reason for describing the service concept in this way is that it represents a thematic wholeness building on a complete set of relationships.

The Focused e-Service and its Basic Relationships

The relationships for the core services are built on three actor roles – the ‘advertiser’, the ‘reader’ and the ‘service provider’. The social interaction performed through the IT system between those actors creates three basic social relationships (Fig. 9, left). The additional service (the lists of financial and insurance institutions) is built on the social relationship between the ‘reader/advertiser’ and the ‘service provider’ (Fig. 9, right).

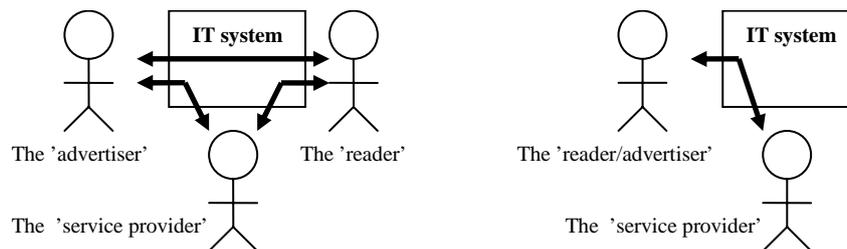


Fig. 9. Relationships within the e-Marketplace’s core- and additional services.

The relationships between the ‘service provider’ and the ‘advertiser’, and between the ‘service provider’ and the ‘reader’ is based on information, social commitments and expectations. The relationship between the ‘advertisers’ and the ‘readers’ is important because the real value of the e-service is that it acts as a meeting place for customers. The relationship for the additional service between the ‘service provider’ and the ‘reader/advertiser’ is, in this analysis, built on the interpretation that the list is an impartial list of *recommended* financial or insurance companies.

The Service Environment to the Focused e-Service

Figures 1, 3, 4 and 5 describe the user interface, i.e. the series of screen layouts for the focused e-service. In all the figures the layout is similar: similar functionalities, the same service provider and similar colors, buttons, frames, etc. The layout tells the user that they are using one e-service. The layout also includes several functionalities out of the scope of the described service concept, such as banner marketing, the “Blue Book Pricing” button and the “New Cars” button. These possibilities are closely related to the focused e-service, belonging to its *service environment* and representing intertwined e-services.

The Focused e-Service and the Intertwined e-Services

The focused e-service and its service environment depict several intertwined e-services, which are of two types:

1. *Related e-services*, e.g. the ‘Blue Book Pricing’, e-services provided by the banner marketing companies and the financial offering e-service;
2. *Interrelating e-services*, e.g. the clickable banner marketing messages and the logotypes of the financial companies presented in the list of recommended institutions.

Related e-services

The ‘Blue Book Pricing’ e-service is an example of an *related* e-service. After clicking on the “Blue Book Pricing” button in Figures 1, 3, 4 and 5, the e-service renders the possibility for the ‘reader’ to get information on the recommended price levels for used cars. Yahoo takes no responsibility for what Kelly, as the ‘service provider’ of this e-service, offers. This e-service is presented outside the focused e-service environment (Fig. 7) and a new relationship is created between the Kelly company as ‘service provider’ and the ‘reader’. The service concept for the customer is to obtain information regarding the price level for a specified car. The layout for this e-service also informs the user that it is another e-service.

E-services provided by the banner marketing companies are also related to the focused e-service via the service environment. Such e-services provided by actors other than Yahoo are easily viewed as related e-services. The e-service in Figure 8 is provided by Yahoo, but is viewed in a new layout indicating the offer of another service concept out of the theme for the focused e-service concept. The ‘reader’ is linked to the banner marketing company’s e-service outside the focused e-service environment and a

new relationship is created between the 'company' as service provider and the 'reader' as a 'potential customer'. The service concept for the 'reader' is to get more information from the company.

The financial service (after a specific company has been chosen from the list of appropriate companies in Figure 5) is a new e-service provided by the chosen 'financial company'. This e-service is presented by the 'financial company' outside the focused e-service environment and another relationship is created between the 'financial company' as service provider and the 'potential customer' (the former 'reader'). The service concept for the customer is to obtain a financial offer. The layout also informs that it is another e-service.

Interrelating e-services

Yahoo Autos provides also several *interrelating e-services* intertwined with the focused e-service and its service environment. All the interrelating e-services are building on a set of relationships where Yahoo is the 'service provider', and the 'advertiser/reader' and the companies are the customers. The service concepts for those e-services are to allow the customers to come into contact with each other by linking visitors to the companies. The clickable banner messages and the 'Blue Book Pricing' button are interrelating e-services linking from the service environment to related e-services. The clickable financial companies in the list of appropriate companies presented in the additional financial e-service are interrelating e-services linking from the focused e-service to other e-services.

Discussion

Both the focused e-service and its service environment determine the quality of the focused e-service from the customers' point of view. This means that the actual mix of both the focused e-service and its intertwined e-services provided by the user interface can lead to an improved or a deteriorated customer experience of the focused e-service as a whole. We claim that in order to design the focused e-service it is important also to design the service environment presented by the same user interface.

Evaluating the exemplified e-marketplace we can easily recognise the focused e-service concept which is offered. The layout is consistently designed (Fig. 1, 3, 4 and 5) and the messages regulate the commitments made by the involved actors (the 'advertiser', the 'reader' and the 'service provider'). However, the status of the list of appropriate financial companies provided by the additional financial e-service is unclear. Is the list im-

partial or is it more to be seen as an e-service for the (paying) companies to get in contact with potential customers (like conventional banners)?

The interrelating e-services like the clickable banner messages and the 'Blue Book Pricing' button are easily recognised as intertwined e-services, where Yahoo as the 'service provider' mediates contact between the visitors and the companies. The interrelating e-services result in the start of other e-services out of the scope of the focused e-service and its environment. E-services provided by the banner marketing companies are opened in new windows indicating that they are other e-services. The user interface for the 'Blue Book Pricing' e-service provided by Kelly could, as an example, be improved because it does not open in a new window.

The two cornerstones defining the e-service according to Hultgren and Eriksson (2005): the service concept and the relationships, can be used when discussing how existing e-services can be developed. In the exemplified e-marketplace we described the "Blue Book Pricing" e-service as an related e-service because of its different interface and that another service provider (the company Kelly) was responsible for the e-service and not Yahoo Autos. There is a potential to enhance the value of the focused e-service concept in the example by *internalising* the "Blue Book Pricing" e-service as an additional e-service. To do this, Yahoo would have to take responsibility for the service as the service provider instead of Kelly and to develop the interface in Figure 7 in a way similar to the series of interfaces shown in Figures 1, 3, 4 and 5.

Conclusions

Designing e-services is about designing IT systems and their user interfaces. However in a service context customers occasionally use the e-service navigating through the IT system if it is beneficial in some sense. The main problem facing the IT system's design in a service context is to design the user interface, i.e. the series of layouts, informing the customer what e-services, i.e. which value adding activities, the IT system at the moment is delivering and which commitments and responsibility the involved actors have; both the service provider and the customers.

When designing e-services there are various possibilities to intertwine several e-services to each other and obtain advantages in different settings; both for the service providers and the customers. However, it is important to make these intertwined e-services explicit via the design of the service concepts and the user interfaces. To design *good* IT systems interfaces which present *distinct* e-services, we have to have ideas of what e-services

the service provider offers and takes responsibility for and how the offer of other e-services can be related and provided by other service providers without creating confusion, irritation etc for the customers.

We claim that the framework presented in this paper combined with established web design criteria can be used in order to analyse and design user interfaces for the focused e-service, its service environment and the intertwined e-services. We also claim that the framework can be used as a tool in e-service development, analysing e.g. how to internalise intertwined e-services into the focused e-service and thus enhancing the value for customers.

References

- Ågerfalk PJ (2003) Information Systems Actability: Understanding Information Technology as a Tool for Business Action and Communication. Department of Computer and Information Science, Linköping University, Sweden.
- Chidambaram L (2001) The editor's column. *E-Service Journal*, 1(1), <http://www.e-sj.org>.
- Dahlbom B (2002) From systems to services. [www document] <http://www.viktoria.se/~dahlbom/>.
- Edvardsson B, Gustafsson A, Johnson MD, Sandén B (2000) New service development and innovation in the new economy. Studentlitteratur, Lund, Sweden.
- Grönroos C (1998) Service marketing theory – back to basics. Swedish School of Economics and Business Administration, Helsingfors, Finland.
- Grönroos C, Helnomen F, Isoniemi K, Lindholm M (2000) The NetOffer model: a case example from the virtual market space. *Management Decision*, Vol. 38 No. 4, pp. 243-252.
- Habermas J (1984) The theory of communicative action. Volume One. Reason and the Rationalization of Society. Boston: Beacon Press.
- Hultgren G and Eriksson O (2005) The concept of e-service from a social interaction perspective. In Ågerfalk et.al. (Eds.) *Proceedings of the Action in Language, Organisations and Information Systems*, pp. xx-xx, Limerick, Ireland.
- Nielsen J (2000) *Designing web usability: The practice of simplicity*, New Riders.
- Santos J (2003) E-service quality: a model of virtual service quality dimensions. *Managing Service Quality*, Vol 13. No.3, pp 233-246.
- Stafford TF, Saunders C (2004) Introduction. *E-Service Journal*, 3(1), <http://www.e-sj.org>.