

CHECKLIST FOR USABILITY EVALUATION AND DESIGN OF SUSTAINABLE eCommerce SERVICES

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Abstract

A checklist for usability evaluation of eCommerce services (ECS) is developed. It is integrating eCommerce quality and usability. The checklist can be used for usability evaluation and design of eCommerce services based on data collected from customers while performing tasks, for instance, searching for products, registering with website and buying merchandise. They support the allocation of usability problems and the defining of relevant redesign measures. Significant sustainable improvement of the usability of eCommerce services is expected after implementation of redesign recommendations. The advantages of the checklist are: (1) measuring of both usability and quality of eCommerce services, (2) supporting allocation of usability problems and (3) defining of eCommerce services redesign recommendations.

Key words: eCommerce, usability, quality, web services, evaluation, design, checklist

Introduction

Sustainability assumes that human well-being is better served if the value of all combined assets is preserved, rather than giving special attention to maintaining natural capital, since technology may be able to substitute for lost ecological services [25]. Since the early 1990s there has been interest in exploring the essence of sustainability of competitive advantage for information technology and eServices, [1, 7, 9, 11, 13, 14, 24], although this domain of study is not well developed. From an eService system perspective, sustainability can be defined as an organization's ability to continually deliver explicit business value from eService systems investments. It is this ability that is enduring rather than any outcome, for example, a new system that provides advantage, which is likely to be short lived. [2] notes that eService systems capability „is not so much a specific set of sophisticated technological functionalities as it is an enterprise-wide capability to leverage technology to differentiate from competition“ (cf. Fig. 1.). Surviving and newly formed companies are re-evaluating their strategies and struggling to build a sustainable business model [23]. A shift from economic (shareholder wealth) maximizing behavior to sustainable development (decisions taking into account the economic, social and environmental consequences of alternatives) in business is required [19]. Three recent methods of business modeling aimed to create sustainable eHealth services are proposed [31]. With the advent of eCommerce, the use of technology is becoming just an accepted, often

expected, way of conducting business transactions—what has been referred to as the ‘strategic necessity hypothesis’ [7, 12, 28]. Consequently, commercial organizations are increasingly looking towards the innovative application of technology to provide them with a source of competitive advantage [26].

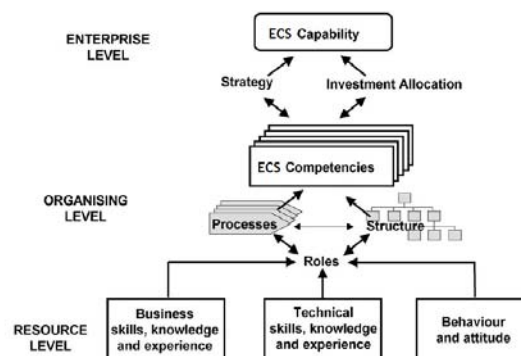


Fig. 1. A model of the ECS capability [2]

This has led to both a constantly increasing number of modern web sites and an increase in their functionality, which in turn makes them more complicated to use [22, 29]. Since eCommerce services (ECS) surpass the traditional offline methods, usability of the eCommerce websites is vital to facilitate customers in finding needed product information effectively and efficiently. The usability criteria such as navigation that include hyperlinks, length of page, search engine and user location indication is usually assessed. Under page layout criteria, usage of colors and images, consistency and attractiveness can be evaluated. [4] showed

that the ease of navigation to product information on a company's website was related to positive general impressions of the organization under investigation. Similarly, [8] demonstrated that favorable usability perceptions were associated with participants' increased inclinations to find and recommend a product to their friends. [27] investigated the effects of system speed and website user-friendliness on customer evaluations of company image after these customers (who were in sales positions) completed buying products from these companies. Results revealed that both usability variables were positively correlated with customer-to-company image evaluations. Additional research investigating the effects of website usability on organizational attractiveness, website attitudes or evaluations [6], and satisfaction with website use have been similarly supportive. The usability of eCommerce sites (as perceived by customers) affects whether or not the site effectively facilitates the desired services [29]. It is important for online services such as these to analyze applicants' perceptions, and consequently design services in a way so as to meet their needs.

Usability of the eCommerce websites is an important feature that needs to be taken into account to ensure the effectiveness of the buying process. This implies that users of online eCommerce sites should be able to navigate around the site and find relevant information quickly and easily. Directions on how to create or edit profiles, search through product lists and submit desired products should be presented logically and in clear language. In addition, forms available online should be presented in a consistent, logical and comprehensible format thus making it easier to collect information from customers in a systematic way. The more competent services from eCommerce websites provide flexibility to users to purchase their products with a single click and provide additional after sale services, for example, order tracking.

eCommerce services enable customization of the company's website, which is often the first contact point between potential buyers and the company. So while designing the website's pages, it is important to acknowledge the importance of its usability for customers. Customers should be able to buy products easily and track their progress through the checkout process through a user-friendly interface.

Website design features investigated have primarily included usability (i.e., ease of navigation of the website), the attractiveness of eCommerce websites in terms of their colors, fonts, pictures, and bulleted versus paragraphs of text [4, 8].

Time and mental workload required to complete searching and buying tasks with Internet-based service providers can significantly impact overall service quality evaluations. Thus, they should be monitored and benchmarked when possible, as poor service quality perceptions can ultimately impact customers' willingness to buy products. If websites are able to determine the underlying dimensions of service quality that are relevant to eCommerce services, they may be better able to design their websites to provide customers with the highest service quality possible. In addition, if they have a tool for measuring a customer's perception of their service quality, they may be able to adjust their service to retain current potential customers and attract new customers to use their site [3].

From these findings can be concluded that usability and quality factors are positively related to helping the sustainability of online eCommerce firms and their services offerings. Measurement of these factors by a checklist can contribute to better customer relations by enhancing their user experience with better services and hence contributing to increased profitability and resulting long term sustainability. In the following a checklist for usability evaluation and design of eCommerce services will be presented.

1. Checklist Design

The objectives of the checklist are to support the creation of a world-class and credible website that will attract customers. The website will provide an enhanced experience for customers and so will draw many visitors, leading to increased business. It will simplify and speed up the eCommerce process (necessary to cope with the expected large increase in customers). The website will increase the company's credibility within the online retailing industry. This will have a significant impact on the profitability of the business. An increased presence in global markets, improved marketing, as well increased sales and net profit are expected.

The checklist aims at developing innovative design for eCommerce services allowing online companies to effectively set up and maintain

web sites which can better address customer needs. Using the checklist can be developed a method for evaluating eCommerce services usability, based on modern computational intelligence techniques, which allows the discovery of usage problems of customers resulting in an improvement of its design. Based on this method the eCommerce website can be redesigned.

The empirical basis for usability testing is based on a validated understanding of the „customer performance in context“. Studies show that checklist data can be both reliable and valid for the assessment of customer satisfaction with websites or computer-based applications [20] (cf. Fig. 2.).

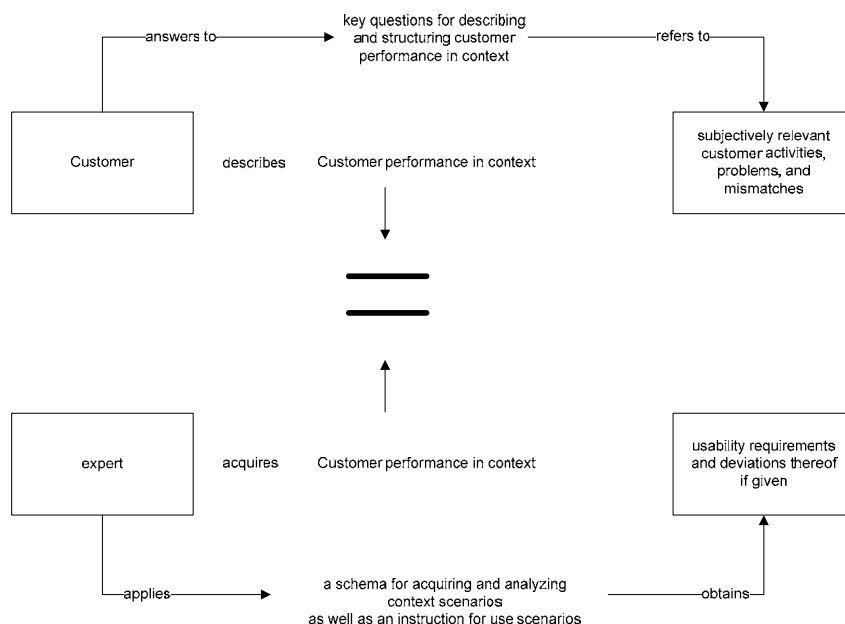


Fig. 2. Model for acquiring data for usability evaluation [10]

There are both unique and overlapping dimensions in the fields of eCommerce service quality and eCommerce usability. From extant literature most comprehensive are the following:

- eCommerce usability dimensions and items [5, 30];
- eCommerce service quality dimensions and items [16, 22].

The resulting dimensions and items extracted here will be persistent, because even though the underlying technology can change, the base evaluation criterion will be the same. For example, „ease of finding products“ may be dependent on tab structuring, layering of information and number of clicks. These may change with advances in technology, but the criterion „ease of finding products“ will remain the same. The result was extracted eCommerce usability and service quality dimensions (cf. Fig. 3.).

For usability study participants have to complete tasks using the eCommerce website

and to answer the checklist questions. The checklist was constructed based on five-point Likert rating scale [21]. Users are asked to rate agreement with the statements, ranging from strongly disagree to strongly agree (cf. Fig. 4.).

2. Usability Evaluation

The usability of eCommerce services can be evaluated and designed by a checklist. Usability evaluation aims at weaknesses of an eCommerce service and gives hints for improving its usability. Most usability evaluations gather both objective and subjective quantitative data in the context of realistic scenarios-of-use. Objective data are measures of participants' performance. Subjective data are measures of participants' opinions or attitudes concerning their perception of usability. Subjective measures assess impression of the customers towards the design of the website as well as the effect of the website design towards customer interaction.

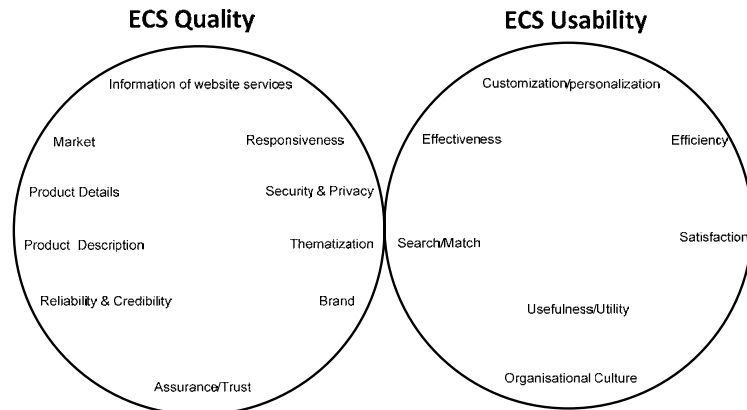
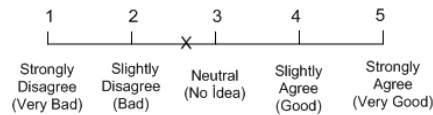


Fig. 3. eCommerce services usability dimensions

Sample Checklist questions

Please answer the checklist questions by marking your choice for each question with a cross (X) expressing your opinion as shown below.



Dimension – Organisational Culture Q1:Q4	1	2	3	4	5
1. The website gives me enough information regarding the organisation's line of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The website gives me enough information on the work ethics within the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The website gives me enough information on the goals of the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The website design features (such as a virtual tour) conveys information concerning the culture of the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 4. Organisation culture sample checklist questions

Overall, usability measures the quality of a customer's experience when interacting with an eCommerce system as „the extent to which a system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” [17].

The usability dimension *effectiveness* measures usability from the point of view of the output of the interaction, for example, quality of output or quantity of output in relation to a target [17]. For example, with a quantitative answer to the following question, an evaluation of this usability dimension is possible:

1. Are users able to select the correct path to find products?

The usability dimension *efficiency* measures relating to the customer’s effectiveness of interaction to resources expended, for example, time taken to perform tasks [17]. Quantitative

answers to the following questions give a measure of this dimension:

1. Are users able to accomplish the purchasing of products quickly?
2. How does the number of pages viewed compare to the number of pages required to find the desired products?

The usability dimension *satisfaction* measures the comfort or level of enjoyment of the customer, while interacting with the website [17]. Subjective answers to the following questions indicate user’s opinion of a website:

1. Do users enjoy shopping on the web site?
2. Are users frustrated or confused when shopping on the site?

On the Internet, rapid technological change is stressful for many customers and often developers focus on the newest advancements rather than on what is most useful and important from the customer perspective. Customers are

often not part of the website development process which creates difficulties for them to understand some of the website resources, when the site is made available online. According to International Organization for Standardization (ISO), „Human-centered design is characterized by: the active involvement of users and a clear understanding of user and task requirements; an appropriate allocation of function between users and technology; the iteration of design solutions; multi-disciplinary design“ [18].

Conclusions

For measuring the most important dimensions of usability for users of eCommerce services, a checklist is created, which integrates dimensions and related items from eCommerce usability and eCommerce service quality. After usability testing is done, evaluation results will be used to obtain the most important usability problems and relevant eCommerce services usability design improvements. Such an approach can enhance product strategies, product services and create roadmaps to identify potential eCommerce services usability issues that would result in reaching better customer satisfaction and increased company profits.

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