

USABILITY OF E-COMMERCE WEBSITES: STATE OF THE ART AND FUTURE DIRECTIONS

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ABSTRACT

COVID-19's impact on cross-border e-commerce has been tremendous. What had once been a gentle slope of growth has now taken on a sharp and steep incline, requiring the search for novel approaches to increase the conversion rate. In this context, web usability has gained prime significance and is considered to be the most important aspect that affects the quality and success of any interactive application. Today exists a substantial body of knowledge devoted to the usability of computer-based applications. The purpose of this study is to determine the current state of the art nature of the topic by revealing the research achievements in the scientific literature and to identify possible future directions. The paper claims that there is a pressing need for new techniques for an accurate usability evaluation, tailored explicitly for e-commerce applications.

Keywords: E-commerce, Web Usability, Usability Evaluation, User Experience, Human-Computer Interaction.

I. INTRODUCTION

Just over 30 years since it was born, the World Wide Web has become an indispensable part of everyday life for people the world over [1]. From the first website in 1991, the total number of websites has continued to grow at an incredible pace to almost 2 billion websites we see today [2]. Cisco [3] estimates that by 2023, around 5.3 billion people: nearly two-thirds of the global population will have internet access. The Internet, in this respect, offers capabilities so powerful, and general, and therefore can be used for almost any purpose that relies on information. Consequently, it has led to new opportunities and perspectives on all aspects of business for reaching a broader consumer population.

Continuous technological advancements of the 21st century have resulted in a significant increase in the use of the Internet for commercial purposes [4, 5]. In recent years, several million e-commerce websites have emerged, encompassing a wide variety of data, systems, and tools for online consumers and vendors in attempts to persuade them that technology will make their lives easier [6, 7]. As such, e-commerce is one of the fastest-growing markets [8]. Retail e-commerce sales worldwide are expected to rise from 3.53 trillion US dollars in 2019 to just over 6.54 trillion US dollars in 2022 [9]. Moreover, the impact of COVID-19 on cross-border e-commerce, which shows no signs of slowing, has been one giant leap for the consumer, one massive growth spurt for e-commerce [10].

II. E-COMMERCE

What is E-Commerce?

There are several definitions of e-commerce. Turban et al. [11] define e-commerce, also known as electronic commerce, as "an emerging concept that describes the process of buying, selling, or exchanging products, services, and information via computer networks, including the Internet". Therefore, e-commerce refers to any form of a commercial transaction conducted online.

The purpose of an e-commerce website in the contemporary world is to provide consumers a platform where they can retrieve any information and also can perform other tasks such as add to cart, save for later, checkout, payment, tracking records, and more [12]. Online shopping, which is described as buying and selling products over the internet, is the most common example of e-commerce. However, other types of operations, such as online auctions, payment gateways, online ticketing, and internet banking, may also entail e-commerce.

Types of E-Commerce Models

E-commerce encompasses all online markets connecting buyers and sellers. However, e-commerce businesses are often classified into specific types by the means of indicating which e-commerce category the transaction falls under [13]. Examples of the most common classifications are as follows:

- **Business-to-Business (B2B):** This type describes electronic transactions between businesses, such as between a manufacturer and a wholesaler or retailer [14]. Around 80% of all e-commerce is of this type making it by far the largest form of e-commerce [13, 15].
- **Business-to-Consumer (B2C):** This type is distinguished by the establishment of electronic business relationships between businesses and final consumers [16]. As the second-largest and the earliest form of e-commerce, it corresponds to the retail segment of e-commerce, where traditional retail trade usually takes place [15].
- **Consumer-to-Consumer (C2C):** This type involves electronic transactions that take place between consumers [11]. Generally, these transactions are facilitated by a third-party online platform [14]. Although little information exists to measure the relative size of this market segment, figures of popular C2C sites such as eBay and Napster suggest this market is fairly large [16].
- **Consumer-to-Business (C2B):** This type reverses the traditional B2C e-commerce model, meaning individual consumer makes their services or products available for companies to purchase [14]. It is somewhat similar to a sole proprietorship serving a larger business. Reverse auctions, service provision sites such as UpWork, affiliate marketing, or Google AdSense are common examples that fall under this heading [14].
- **Government-to-Citizens (G2C):** This type refers to the relationships between a government and private individuals or residents [11, 14]. The designation may be used for any relationship between the subject of public administration and the citizen, most commonly used as a simple relationship within e-Government models [17].
- **Mobile Commerce (M-commerce):** This type refers to the use of wireless digital devices to enable transactions on the Web [15]. Handheld devices such as cellular telephones and personal digital assistants (PDAs) are examples of such devices [13]. Japan is currently leading the global m-commerce [16], where most of these advances are accomplished through sophisticated application designs that are constantly developing [13].

The three types of e-commerce models: Business-to-Business (B2B), Business-to-Customer (B2C), and Customer-to-Customer (C2C) are currently the main channels of online business [6]. This research focuses on B2C e-commerce.

The Impact of E-Commerce

The meteoric growth of e-commerce at the turn of the last century is truly baffling. This market space has expanded in a variety of ways over the last decade. Almost all businesses are profoundly affected by the internet. Millions of people around the world are using the Internet to do everything from research to purchasing products online [18]. As a result, an increasing number of businesses are choosing the Web as an alternate medium for developing a brand reputation, for servicing and transacting with customers and investors, or simply for public relations purposes [19]. While e-commerce currently represents a relatively small share of overall commerce, it is making substantial progress into specific market segments [20] and is projected to continue to grow exponentially in the coming years [10, 21].

As e-commerce grows, so will its impact on the overall economy. The benefits of which can be classified into three groups: firms, prices, productivity [18]. E-commerce allows businesses to reduce costs, boost demand, and develop new business models, which would be infeasible given earlier technological constraints [20]. Thus, it has the potential to benefit all consumers through reduced prices, improved products, and superior means of transmitting the information. Several studies suggest that information and communication systems have been a significant influence in improving the overall efficiency of labor and capital [22, 23], which implies that users of these technologies also benefit from increased productivity.

In e-commerce applications, a whole variety of activities can take place without having buyer and seller in close physical proximity, offering significant opportunities for both developing and developed countries [24]. In this respect, countries that are open to imports from high-income economies can benefit from knowledge spillovers. In addition, e-commerce is also projected to produce new jobs, both directly and indirectly, as well as to cause job losses [18]. As a result, the growth of e-commerce is expected to have both direct and indirect impacts on international trade as well as the labor markets. New employment opportunities will be developed in the

information and communication technology industry, while indirect job growth will take place via increased demand and productivity [18]. The net gains and losses in jobs, however, would depend on the market for those skills.

III. USABILITY OF E-COMMERCE WEBSITES

In the early days of web development, it was acceptable not to have a clear understanding of the consumers or the goals of the website - because just having a website was considered an achievement [7]. The process by which engineering principles are applied to web development has only recently begun [25]. Usability, in consequence, has received a great deal of attention and has been recognized as a crucial asset for the success of web applications [25, 26].

“The most important aspect that regulates the worth of a website is Usability.” - Kaur et al. [27]

For many e-commerce websites in recent years, usability has been the focus of attention [28, 29] which measures how easy it is to use [24, 30]. The ease or difficulty faced by consumers with these e-commerce applications greatly determines their success or failure [6]. To be successful, websites need to have good usability [31], which applies in spades for e-commerce sites. Studies suggest that poor usability is no longer tolerated by consumers who simply choose to shop elsewhere [7, 32]. Studies show that more than 83% of Internet users are likely to leave a website if they feel they have to make too many clicks to find what they're looking for [33]. Moreover, a consumer dissatisfied as a result of poor usability is likely to become a competitor's customer [26]. E-commerce websites must therefore allow users to achieve their objectives in an efficient, effective, and satisfactory manner.

“The only problems worth fixing are those that your customers have.” - Travis [7]

Since e-commerce websites have to sell products in a competitive market, usability is considered a key issue for the differentiation of websites [34], which commonly drive away almost half of the repeat business by making it difficult for visitors to find the information they need [33]. Accordingly, in addition to increasing sales on an e-commerce website, improved usability will provide e-commerce websites with greater survival and competitive advantages [29].

It has been proven that the failure of many e-commerce sites to attract consumers is attributed to a lack of usability [35]. Poor usability means that the training costs of customers go up, productivity goes down, and the total cost of ownership (TCO) rises. For e-commerce it means visitors leave in frustration never to return, customer dissatisfaction increases, and bad news is spread by the trade press, online forums, and email groups [33]. In other words, disregarding consumers' need for usability typically causes great loss to e-commerce websites [29], and the business runs the risk of losing customers and opportunities, which would have a significant negative impact on the business [36].

“People ignore design that ignores people.” - Frank Chimero

Recent research shows that price and promotion are no longer the key attractions for consumers to make a purchase decision [37]. More sophisticated online consumers would rather pay a higher rate to a high-quality service provider [38]. The most experienced and successful e-commerce companies are beginning to realize that not just web presence or low price, but delivery on a high-quality website are key determinants of success or failure.

Despite the recognition of the importance of usability, some researchers assert that many e-commerce websites today still do not meet the usability requirements of consumers [6, 26]. This may be partly attributed to the fact that traditional software engineering methodologies do not explicitly address usability within their life cycles [25]. Consequently, the developers rarely acknowledge the role that usability plays in an e-commerce website and the business process [29]. It is well known that people rarely use the recommended engineering approaches for usability [39]. The usability of e-commerce applications has often been assessed in an ad hoc fashion, based on common sense, intuition, and the expertise of the developers [40]. While usability can be measured like every other engineering attribute, many developers, without denying its importance, consider usability to be a soft measure that cannot be quantified, like 'brand value' [7]. Understanding which design elements make for effective web design is still largely based on managers' intuitions or, at best, ad hoc A/B testing [41].

Most software managers see usability costs as extra effort and expense, but more commonly the reverse is true [33]. In reality, usability is a process: it is not something that can be piled at the end of the development [7]. Since usability approaches help keep the product aligned with organizational objectives, when key system-design decisions are taken, 90% of the cost and performance of the project will be determined by the first 10% of the design phase [42]. Reports have shown that it is far more economical to consider consumer requirements in the early stages of design than it is to overcome them later [33]. Therefore, we can infer that incorporating usability into your products ultimately saves money and returns many benefits.

The necessity of evaluating the usability of e-commerce websites is well established [43]. But e-commerce presents a distinct challenge when it comes to usability evaluation. Unlike most other applications, which have a relatively well-defined audience with a small range of tasks that a user can perform, consumers arrive at an e-commerce website for a multitude of reasons [19]. Defining strategies for ensuring usability is, therefore, one of the current objectives of web engineering research [25, 28].

It is essential to build a well-designed, highly usable website. The question is, what constitutes a usable website and how to evaluate the same [44]? Today exists a considerable body of knowledge dedicated to the usability of computer-based human-computer interfaces [34]. A myriad of standards has been devised by the growing website usability experts [26]. While appropriate website design and evaluation techniques help ensure the usability of websites, they are often so numerous; it is difficult to know which ones are best suited for specific websites [26]. In general, certain guidelines are not accurate enough to apply unambiguously and to evaluate them objectively after they have been applied [34]. Furthermore, different categories of websites present different characteristics to be evaluated [45]. E-commerce being one of those categories, it can be concluded that there is an obvious need for new usability evaluation techniques tailored explicitly for e-commerce applications [40].

IV. CONCLUSIONS

Usability evaluation for applications based on emerging information technology brings new challenges. It is indeed obvious that traditional usability evaluation methods do not consider the particularities of e-commerce. Many approaches for usability evaluation have so far been proposed, but they are not well incorporated and struggle to address all facets of usability for specific domains. This leads to the need for new techniques for an accurate usability evaluation, or at the least, for the use of traditional evaluations in novel ways. Usability evaluation frameworks, including appropriate methods or a combination of methods, should be established to obtain more efficient and effective evaluations of more specific paradigms of interaction. Certainly, further attempts will be made at establishing such methods to evaluate e-commerce applications.

V. REFERENCES

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