

The Effect of User-Generated Content Factors on Improvement: Usability for E-Commerce in Context of Bangladesh

¹Ashok K Patil, ²Syed Arif Islam, ³Umma Khatuna Jannat

^{1,2,3}School of Computing and Information Technology, Reva University, Bangalore, India
¹ashokkpatil@reva.edu.in, ²syedarifislam@gmail.com, ³ummakhatunajannat@gmail.com

Article Info

Volume 83

Page Number: 4904-4910

Publication Issue:

May - June 2020

Abstract

Context: Usability is a key success of any e-commerce development. Usability of a software system means its relaunch software with system productivity, reliability, satisfaction and high quality of e-commerce. Human strongly encourage and market place is needed usable system to touch fast growing e-commerce. Unfortunately, usability of e-commerce in Bangladesh it is falling and running situation.

Objectives: Nowadays, most of the e-commerce is develop by Bangladesh with the goal that the expectation of this research is to distinguish the usability related problem in the e-commerce website of Bangladesh and investigate the factors that improve usability. This concept is to increase e-commerce development process to improving usability in business to consumer e-commerce.

Methods: In this study, systematic mapping study used as the methodology and the surveys using SUPR-Q method which has 13 questionnaires, creating for a typical evaluation with more 13 additional questionnaires is established for the survey. The 5-point scale is used to evaluate e-commerce usability of the website. Apply for 500 people who have experience about e-commerce website. Get data from the survey and also collects data from the literature review. Our findings show absence of detailed b2c e-commerce usability which approaches are used in particular, how those designs pre-processing steps that are performed usability and how they relate to the Bangladesh context.

Results: To complete the objectives, fine out the b2c usability factor using T-Stats and p-value <0.05 which is significance level. This result recommends that usability is significantly affected on Bangladesh (b2c) e-commerce website. From the linear regression finds out that $R = .637$. Here, $R = .637$. $R^2 = .406$ measures, 40.6% of the measurement of usability. Adjusted $R^2 = .377$ measure the number of independent variable and the sample size.

Keywords: E-commerce, SUPR-Q, Usability, B2C

Article History

Article Received: 19 November 2019

Revised: 27 January 2020

Accepted: 24 February 2020

Publication: 16 May 2020

1. Introduction

This chapter briefly sets the scene in this research background. In particular, background, importance, and current issues related usability issue in Bangladesh b2c e-commerce is highlighted. In addition, research motivation

and problem are discussed for undertaking this research and the research questions with the research objectives. Finally delimitations and the research organisations are also included.

A. Background

In recent technology era e-commerce is door invitation to human help. The World Wide users are rapidly growing with the technology dependent of e-commerce. Now a day most of developing countries they are popular for their e-commerce cause maintain usable e-commerce website. E-commerce represented this type of network buying commodities throw online. In the circumstance of Bangladesh e-commerce it develops a great comparison with other countries. They give a new good strategy in e-commerce concern with the users they try to develop usability e-commerce with good content of the website. Users are influence e-commerce interface because there is everything what users want. Interface design is more concerned users' expectations, need and how they meet this sort of thing what they are actually wanting [1]. This interface design is related to usability. Basically, e-commerce usability is a major role and it must reach users satisfaction their objectives, efficient and pleasurable [2]. When figuring out usability with e-commerce website in Bangladesh there is some problem because some of business to consumer (b2c) e-commerce website they do not concern about usability that's why the growing development of e-commerce some of are stopping when its start. Basically, more and more consumers are revolving to go shopping on the web so they are interested to test something new implement. So, swift of b2c usability is going down the cause of unable to develop user friendly e-commerce. Users already give time and money to buy a product if they do not find usability they must change their ideas and go to another site. The e-commerce website designing and building website is visually appealing, without regard for usability so the indicate point is b2c e-commerce must build an attractive website where users can feel and buy with loyalty. This research attempts to estimate the improving of e-commerce technology in business to consumer websites in Bangladesh using a SUPR-Q method and design framework to remove current obstacles. Creating the usability factors from the point of view of an online shop or client piece and it has been designed to detect and evaluate the major obstacles and benefits in the context of b2c.

B. Problem Statement

The usability is involved in e-commerce because the quality mark of the website [3][4] is to establish a website estimate. Estimate website, Usability is one of the factors and there are many factors of the quality mark of the website. Many researchers have addressed navigation, search, directory, and hyperlinks, use of color and font [5], graphic and multimedia [6] website size, position and color of page elements [7], privacy of information, ease of use [8]. Rather various examinations have researched the login/register, help/service, menu items [9]. In this way, it is imperative to comprehend the factor of every rapid growth of e-commerce website and its usability

performance. Therefore, in the current investigation aims to examine and solve the unsolved issue. Discovers what thing is adapted and what think shouldn't. We will provide a solution for e-vendor using our systematic mapping and survey. Therefore, in this thesis, including researcher factor activities are designed and investigated in the present study to answer a few interrelated research questions.

C. Research Questions

In this thesis, the research direction is improvement factors of usability for e-commerce in context of Bangladesh. During this research we are driven by the following research question:

RQ1: Is there any usability related problem in the e-commerce website of Bangladesh?

RQ2: What are the factors that improve usability of e-commerce websites?

D. Research Objectives

According to the research questions, a set of objectives are formulated of this work in this thesis: These are:

- To identify the usability related problem in the e-commerce website of Bangladesh
- To investigate the factors that improves in general range usability of e-commerce websites

E. Research Scope

This research focuses on the analysis of Bangladesh b2c e-commerce websites. As this purpose is definitely very large, we expect to limit the scope of our research work within a well defined edge in order to reach at some tangible conclusions. Firstly, our initial finding from the literature study, which we analyze 300 papers and most priority paper is 150. Thus, our study will recommend a business to consumer website evaluated of the various types of inherent usability figure. Again and again experiment with several previous methods and figures. Secondly, Searching large study, evaluate many b2c industry presentations. Each and every website evaluates atleast 10 to 15 minutes. Using SUPR-Q method which has 13 questionnaires, creating for a typical evaluation with more 13 additional questionnaires is established for the survey. The 5-point scale was used to evaluate e-commerce usability of the website. Apply for 500 people who have experience about e-commerce website. Get data from the survey and also collects data from the literature review. Our findings show absence of detailed b2c usability which approaches are used in particular, how those designs pre-processing steps that are performed usability and how they relate to the Bangladesh context. Finally, since the research done, our analysis will be descriptive statistics and linear regression analysis. We will conclude our result and recommend with some suggestion for Bangladesh e-commerce website.

2. Literature Review

This chapter contains a review of the literature on e-commerce usability mechanisms related work. This chapter is separated into two sections. The first is to theories relevant and identify and understand the previous related works on the analysis of the usability factors. The second part, proposes that four website usability factors. This includes web usability and determinants in electronic commerce websites.

The Standardized User Experience Percentile Rank Questionnaire (SUPR-Q) Method: Standardized convenience surveys fundamentally originated from 1980s and are broadly mainstream today [10]. Those questionnaires were suitable for software, hardware, cell phones, and websites and the scores can be thought about paying little heed to the benefit of an innovation skeptic instrument. An association can use a comparative plan of scores to benchmark compact applications similarly as work region interfaces. The impediment of a development skeptic instrument is that it can block critical information that is express to an interface type. For websites ease of use is one piece of the ux (user experience). Yet, not at all like items that are bought and utilized over and over, the run of the website experience includes different factors, for example, trust. Since the literature review.

A. Identification of Factors Related to Search Product in Website

The ease of use in site is imperative for clients to shop on the site. The ease and effectiveness of discovering thing as one of the noteworthy characteristics for evaluation of web based business. The set of usability factors has been identified: searching by product features or categories [11], similarity of search mechanism interfaces with interfaces of commonly used search engines, clarity of search interfaces, the ability of search mechanisms to suggest, ability for users to return to previous search results.

B. Identification of factors related to the product comparison mechanism

Comparison of products is a critical element in an e-commerce experience [11]. It allows customers to choose specific products among alternatives. The set of usability factors has been identified: ability to select the product for comparison, ability to compare products by features, ability to compare products by price, presentation of product comparisons in a tabular format, display of reasonable amount of product attributes in comparison tables, emphasis of differences among products in comparison tables.

C. Identification of the factors are accessibility, information on website, attractive, easy to use, comfortable purchase, clean and simple font,

catalogue, menu bar, downloading speed of the website

A list is displayed, that are needed in the e-commerce websites. These are critical elements in e-commerce usability. Accurate system descriptions [12], detailed product descriptions, display of product numbers as part of the product detailed information, clarity of catalogue descriptions to an ordinary user, display of clean and simple with detailed information, clarity of menu bar, reasonable download speed for product pictures, availability of information about quality of a product, display of accurate warning and caution notices related to a product, availability of product review, presence of an easy-to-find order buttons or links, clarity of ordering button/link labels, illustration of each available color of a product, display of links to the product related accessories and product prices, display of delivery options.

D. Identification of factors related to registration

Information registration is a process that sets up a customer account to store their information, preferences etc. Elimination of unnecessary registrations upon entering the site, the presence of a clearly labeled button or link for new customers to open an account, notifying customers about the benefits associated with registration, short registration forms, inclusion of only necessary data elements in the registration form, distinguishing mandatory fields from optional ones, the ability for customers to exclude themselves from shopping lists at the time of registration, display of reasons when customers are being asked to login, display status after a user log in, the ability to add multiple shipping addresses or remove existing shipping addresses, reuse of previously collected user information such as name, address, etc., user credit card information will not be saved and needs to be re-entered [13], elimination of collection of information that is not necessary to close a sale transaction for registered users, the ability for customers to complete the purchase without registering.

E. Identification of factors related to the online payment system

Security and privacy of customer's information have been distinguished as one of the most significant elements of e-commerce. These elements affect the customer's trust in an e-commerce website. Availability of a privacy policy explaining the use of provided personal information, notifying users that their personal information will not be sold to other parties like mailing list organizations [14], presence of a clearly labeled logoff button or link, ability for users to browse through the site without logging in or registering, implementation of transaction confirmations being sent via email.

F. Identification of Factors Related to Help Mechanism and Live Support System

Since online shopping is available 24 hours a day, customers are expecting a 24-hour support as well, in case of technical difficulties or when they have questions. About 25% of visitors do not visit because of the lack of customer service, particularly because of inability to reach a representative while shopping. Availability of information on where and how to get help, availability of user guides, ability for user to search for customer service related topics, availability of a customer service phone number, availability of an e-mail support, availability of customer service mailing address, availability of a dynamic online helps that changes depending on the current page and context, available help-related information is being helpful to users, the ability for customers to cancel previously placed orders and return.

G. Identification of Factors Related to Navigational Support

Navigation-related features are another most significant factors affecting usability of web sites. Poor navigational support may prevent site visitors to become buyers. Simplicity of navigation for inexperienced users, completeness of navigational links [11], validity of navigational links and avoidance of dead links, self-explanatory, descriptive, and clearly labelled links throughout the site, clearly labelled links to detailed product information, ability for users to identify their current position on a site, ability for users to identify their past actions or navigate to previously visited pages, ability for users to identify where to go next, consistency of navigational menus throughout the site, changes in the cursor appearance to indicate what can be clicked on, reasonable download/navigational speed.

Based on previous discussions, this study proposes that it is posited that four website usability factors are (Trust, Loyalty, Appearance and Non-Functional Requirements) affect the Usability. This four are the independent variables of this study with Usability as the dependent variable. So, Figure 1 showing the research framework.

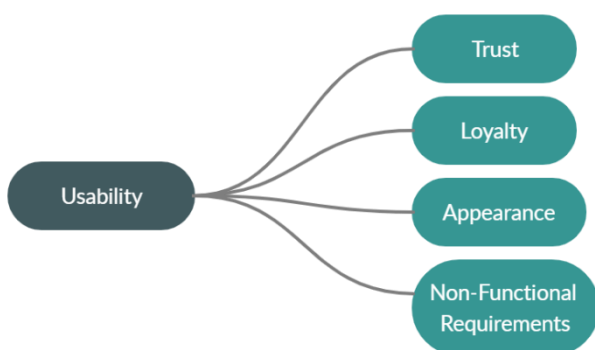


Figure 1: Research Framework

3. Research Methodology

In this section, we will describe about the methods we will use and how we will conduct the study. The chapter includes an explanation of the research purpose, research approach, subjects and sampling procedure, questionnaire design, administration of the survey, data analysis with discussion.

A. Research Purpose

Every researcher has his/her own personal motivation to perform a scientific study while, in general, according to [15] the types of research purpose can be classified in three categories: exploratory research, descriptive research and explanatory (or causal) research.

1) Exploratory Research

Exploratory research is utilized to explain and comprehension of an issue. The objective is to investigate something and is suitable for when the exploration issue is hard to delimit. Exploratory methodology ought to be applied when the scientist can't about the right model to utilize and the sort of relations and qualities that are increasingly appropriate. Exploratory examinations are utilized to explain and characterize the idea of an issue. They are utilized to dissect a circumstance, to increase a superior comprehension of the components of an issue. The reason for existing is anyway not to decide a specific rule. Exploratory research is rather led with the desire that resulting examination will be required to decide the correct strategy. Exploratory research is identified general idea of the issue and the factors that identify with it and it is portrayed by a significant level of adaptability, that has expect to depend on optional information, accommodation or judgment tests, little scope reviews or straightforward trials case examinations, and emotional assessment of the outcome. Exploratory structures are worried about recognizing the genuine idea of research issues. Exploratory examinations are significant methods for discovering "what's going on; to look for new bits of knowledge; to pose inquiries and to survey marvel in another light". An explorative research is reasonable when an issue is hard to separate and when there can't clear anxiety about what model to utilize and which attributes and relations are significant.

2) Descriptive Research

This is focused on the correct explanation of the variables in the problem model. Consumer profile contemplates potential investigations item use considers disposition studies deals examinations media research and value reviews are instances of descriptive research. Descriptive studies, in contrast to exploratory research, stem from substantial prior knowledge of marketing variables, for this type of research to be productive, questions should be designed to secure specific kinds of information, related,

perhaps, to product performance, market shares, competitive strategies, distribution, etc.

3) Explanatory /Causal Research

The examination can be explanatory when the focus is on cause-effect relationships. Explanatory (or Causal) research seeks to discover circumstances and logical results connections between factors. It accomplishes this goal through laboratory and field experiments. In these studies the emphasis is on studying a situation or problems in order clarify the connections between variables. Considering these three various sorts of research we can say that this research is an exploratory research in its scenery.

B. Research Approach

In this study, we used qualitative and quantitative research method. Combination method used as a systematic literature review and paper collects, process using systematic mapping study for searching publication. For paper selection used snowballing. Qualitative research focuses on words and observations; stories, visual portrayals, meaningful characterizations, understandings and other descriptions. The researcher's perception and understanding come into focus and any source of information may be informally investigated to clarify which qualities or characteristics that are associated with an object, situation or issue. The reasons for quantitative research decide the amount of some wonder as numbers that can be analysed statistically. Quantitative research is more organized than qualitative.

C. Subjects and Sampling Procedure

The respondents in this study area between 18 and 35 years old with 1 to 5 years or more experience of using websites and the Internet and that are engaging in online to purchase. Selecting the website this is randomly used by respondents from Bangladesh. When they fill questionnaires give an instant briefing, conduct to the Bangladesh (b2c) e-commerce. Five hundred participated are complete questionnaires with the hope they are selecting from vital section. The demographic characteristics of the sample are given below.

Table I: Demographic profile of respondents (n=500).

Variable	Frequency	Percent
<i>Gender</i>		
Male	300	66
Female	170	34
<i>Age</i>		
18-20	163	32.6
21-30	236	47.2
31-35	101	20.2
<i>Years of Experience</i>		
1-3	361	72.2
3-5 or More	139	27.8

D. Questionnaire Design

Tables based on prior literature review and research framework is developing our questionnaires. These sections comprise questions in the interview about their personal experiences on e-commerce (b2c) websites. This interview is asking for professionals combines with specific questions and open-ended question and gathers expected and unexpected types of information. Skype and face to face work also use to complete interview. There are three parts of designing research questionnaires. The first part detailed the demographics users and their percentage rate about b2c. The second category is used the SUPR-Q rank questionnaire. This method is measuring user Usability, Credibility/Trust, Appearance and Loyalty for this method we are used for data collection and survey. The third category is used 13 questionnaires is existing that completes the websites critical factors. For users help we listed b2c e-commerce websites. They can easily find out what actually the basic need of e-commerce's. Using SUPR-Q method, 13 additional questions used. We measured each item using five-point scale by 1 = "strongly disagree" and 5 = "strongly agree".

E. Administration of Survey

This survey is working on self administered and questionnaires pass the users. Users must complete this questionnaire with honesty and must be completed on the spot. But some of the people are not complete this work because they don't know about e-commerce that moment they left. These questionnaires are complete with paper-pencil. 90% users complete their task with full satisfaction.

F. Data Analysis

Complete answers to conducting data for data analysis, filtering data are performed by removing data. We have 500 data for finalized the analysis. The respondents answered are checked. If respondent's answer right that should be collected if respondents answers mistake the data will be removed during the filtration process. A total of 542 questionnaires are distributed. 500 data are collected and 42 data are input wrong, so it removed the data. We select different categories 20 b2c websites in the context of Bangladesh. In the wake of gathering information through the survey these data have been analyzed using SPSS software.

4. Results and Discussion

Analysis

In this study, Descriptive statistical analysis and multiple regression analysis are used for outcome factor. Each variable is measured through a sample size of 500. The participated who respondents in this research are female and male; hence, more website evaluations are collected from female and male respondents. The 4 independent and 1 dependent variables are also run for descriptive

analysis. Independent variables are Trust, Loyalty, Appearance, and Nonfunctional Requirements. Dependent Variable is Usability. Table II displays the Frequency results.

Table II: Mean Statistics Analysis

Variables	Mean
Usability	2.2207
Trust	2.5020
Loyalty	2.4333
Appearance	2.4020
Non-functional Requirements	2.5509

Interpretation: The value of mean in Table II suggests that the mean scores show a more than average scores for usability factors.

Table III: Application of Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637 ^a	.406	.377	.89748

a. Predictors: (Constant): Trust, Loyalty, Appearance, Non-functional Requirements.

Interpretation: The value of R square in Table III suggests that 40.6% impact made by independent variables on the dependent variable. The significance level is the average between dependent and independent variables.

Table IV: Application of ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	261.982	23	11.391	14.142	.000a
Residual	383.400	476	.805		
Total	645.382	499			

a. Predictors: (Constant): Trust, Loyalty, Appearance, Non-functional Requirements
b. Dependent Variable: Usability

Interpretation: Here significant level is 0.000 which is less than .05; it means that here is a positive association between independent variables (Trust, Loyalty, Appearance, and Non-functional Requirements) and dependent variable (Usability).

Table V: Application of Coefficients Coefficients^a

Model	Unstandardized Coefficients		T-stats (α=0.05)	Sig.
	Beta	Std. Error		
(Constant)	.316	.151	2.099	.036
Trust	.464	.047	9.858	.000
Loyalty	.198	.049	4.040	.000
Appearance	.151	.039	3.825	.000
Non-functional Requirements	.106	.02	2.717	.000

a. Dependent Variable: Usability

Interpretation: The value of coefficients Table IV, following research framework suggests that trust has a positively affects on usability, loyalty has a positively affects on usability, appearance has a positively affects on usability, non-functional requirements has a positively affects on usability.

5. Conclusions and Recommendations

This chapter summarizes the main findings and the major contributions of the presented research which was improving business to consumer e-commerce usability. This section summarizes the research findings in response to the research questions. Its finishes with the examination restrictions, proposals for future works, and the limitation section.

RQ1: Is there any usability related problem in the e-commerce website of Bangladesh?

The answers to the research question 1 are consolidated in Table II and III. Following this 2 tables, first tables show the mean score in an average, second table, we use linear regression to complete the objectives and find out the b2c usability factor using T-Stats and p-value <0.05 which is significance level. From the linear regression finds out that R=. 637. Here, R²=. 406 measures, 40.6% of the measurement of usability. Adjusted R²=. 377. This result recommends that Bangladesh (b2c) e-commerce website has less usability. So need to increase the usability of b2c e-commerce websites.

RQ2: What are the factors that improve usability of e-commerce websites?

The answers to the research question 2 are in Table V because the findings of the research provide ample evidence that Bangladesh e-commerce website has less usability. The major factors of trust, loyalty, appearance, nonfunctional requirements hold the strong relationship with usability. Therefore, using four factor usability of e-commerce can improve easily.

6. Recommendations for Future Works

Additional efforts are needed to refine the portion of the instrument that assesses criticality of factors related to product listings. Future research opportunities may also include conducting similar studies using random samples and samples of larger sizes to confirm the generalization of the results. This study may also be expanded by conducting an experiment to evaluate an e-commerce site using the developed metrics and comparing the results with evaluations of the same site conducted by usability experts. In addition, future research initiatives may focus on determination of multiple levels of usability affecting factors criticality. For example, each factor may be judged on a 5- or 7-point Likert scale. Finally, future studies may be conducted using samples containing international representatives to factor in cultural differences and confirm that the results of the study can be generalized internationally.

7. Limitations

In this research there are some several delimitations on our work. First, there is a lot of e-commerce but we have only worked on business to consumer (b2c). So, this is our first limitation in our work. But in this research, our main object of this study is to improve Bangladesh b2c e-commerce. So this survey will complete only Bangladesh. Second, we only focus on e-commerce usability. So this is our second limitation. E-commerce has lots of things that can measure, but we only work on Bangladesh e-commerce usability. Therefore, we have another limitation to cover all existing literature within this area. Due to time and financial constraints, we complete our survey in Bangladesh.

References

- [1] Wang, Q. (2011, May). Usability research of interaction design for e-commerce Website. In *2011 International Conference on E-Business and E-Government (ICEE)* (pp. 1-4). IEEE.
- [2] Atoum, I., Bong, C. H., & Kulathuramaiyer, N. (2015). Towards Resolving Software Quality-in-Use Measurement Challenges. *arXiv preprint arXiv:1501.07676*.
- [3] Fernandez, A., Insfran, E., & Abrahão, S. (2011). Usability evaluation methods for the web: A systematic mapping study. *Information and software Technology*, 53(8), 789-817.
- [4] Dubey, S. K., & Rana, A. (2012). Mridu, "Analytical comparison of usability measurement methods", 39(15), 11-18.
- [5] Nathan, R. J., & Yeow, P. H. (2011). Crucial web usability factors of 36 industries for students: a large-scale empirical study. *Electronic Commerce Research*, 11(2), 151-180.
- [6] Abdullah, R., & Wei, K. T. (2008). Usability measurement of Malaysia online news websites. *International Journal of Computer Science and Network Security*, 8(5), 159-165.
- [7] Hossain, M. S. (2012, May). Performance evaluation web testing for ecommerce web sites. In *2012 International Conference on Informatics, Electronics & Vision (ICIEV)* (pp. 842-846). IEEE.
- [8] Jamil, M. R., & Ahmad, N. (2009, December). Present status and critical success factors of e-commerce in Bangladesh. In *2009 12th International Conference on Computers and Information Technology* (pp. 632-637). IEEE.
- [9] Bernard, M. (2002). Criteria for Optimal Web Design. Software Usability Research Laboratory.
- [10] Sauro, J., & Lewis, J. R. (2016). *Quantifying the user experience: Practical statistics for user research*. Morgan Kaufmann.
- [11] Nielsen, J. (2003). Jakob Nielsen's Alertbox, August 25, 2003: Usability 101: Introduction to Usability. *Useit.com*.
- [12] Fang, X., & Salvendy, G. (2003). Customer-centered rules for design of e-commerce web sites. *Communications of the ACM*, 46(12), 332-336.
- [13] Vora, P. R. (2003). Designing friction-free experience for e-commerce sites. *Human factors and web development*, 225-240.
- [14] Barnard, L., & Wesson, J. (2004, October). A trust model for e-commerce in South Africa. In *Proceedings of the 2004 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries* (pp. 23-32). South African Institute for Computer Scientists and Information Technologists.
- [15] Yin, R.K. (1994), *Case Study Research – Design and Methods*, Sage, Newbury Park, CA.