Improvement Factors of Usability for E-commerce in Context of Bangladesh

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APPROVAL

This Report titled **"Improvement Factors of Usability for E-commerce in Context of Bangladesh"**, submitted by Umma Khatuna Jannat, ID No: 113-35-228 to the Department of Software Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Software Engineering and approved as to its style and contents.

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DECLARATION

I hereby declare that I have taken this thesis under the supervision of **Dr. Md. Asraf Ali, Associate professor, Department of Software Engineering, Daffodil International University.** I also declare that neither this thesis nor any part of this has been submitted elsewhere for award of any degree.

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I owe my loving thanks to my family. This work would not have been possible without the support and encouragement to help me to continue the way that I have selected.

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LIST OF ABBREVIATIONS

B2C	-	Business to Consumer
E-COMMERCCE	-	Electronic Commerce
SUPR-Q	-	The Standardized User Experience Percentile Rank Questionnaire
SPSS	-	Statistical Package for Social Sciences

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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 are develop by Bangladesh so that the intention of this research is to identify the usability related problem in the e-commerce website of Bangladesh and investigate the factors that improve overall usability of e-commerce websites, 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 each 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 preprocessing 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.

Conclusion: The result and discussion classified of thesis and also identifies research gaps which can be used by researchers to map and carry out future works. The findings from website ranking will help industry people to apply them in their industry oriented activities.

CHAPTER: 1

INTRODUCTION

This chapter briefly sets the scene in this research background. In particular, background, importance, and current issues related usability factor in Bangladesh business to consumer (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 thesis organizations are also included.

1.1 Background

In recent technology time 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 context of Bangladesh e-commerce it develops a great comparison with other countries. They give a new 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 (Wang, Q. .,2011). This interface design is related to usability. Basically usability of e-commerce major role is websites must reach users satisfaction their objectives, efficient and pleasurable (Atoum, I., Bong, C. H., &Kulathuramaiyer, N. .,2015). 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 e-commerce 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 (walker., 2004). 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. Producing the usability factors from the perspective of an online shop or user fragment. This study has been designed to detect and evaluate the major obstacles and benefits in the context of b2c.

1.2 Problem Statement

The usability is involved in e-commerce because the quality of the website (A. Fernandez, E. Insfran, and S. Abrahão.,2011; S. K. Dubey, A. Rana, and Mridu., 2012) is to establish a website estimate. Estimate website, Usability is one of the factors. Estimating the quality of the website, there are many factors. Many researchers have addressed navigation- search, directory, and hyperlinks, use of color and font (Robert J. Nathan·Paul H.P. Yeow., 2010), graphic and multimedia (Abdullah., R 2008) website size, position and color of page elements (Hossain,S.,2012), privacy of information, ease of use (Jamil, R., Imran, M., (2012). On the other hand, a number of studies have investigated the Login/Register, Help/Service (Michael

Bernard.2002,),menu items (Andre,P., Calitz., Marco,P.,& Chris, A.(2015). Thus, it is important to understand the factor of every rapid growth of e-commerce website and its usability performance. Therefore, the present study 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.

1.3 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?

1.4 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 improve overall usability of e-commerce websites

1.5 Research Scope

This thesis 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 paper most priority paper are analyzing 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 evaluate al lest 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 each e-commerce usability of the website. Apply for 500 people who has 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-com (e-commerce) usability which approaches are used in particular, how those designs preprocessing 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.

1.6 Organisation of this Thesis

In this thesis has following six organised chapters:

1. **Introduction**

   This chapter focuses background of the thesis. This includes the Motivation of the Research and Problem Statement,research question and the objectives, Significance of the Research, Delimitations and lastly thesis organisation.

2. **Literature Review**

   The literature review chapter explains the theories and identifying gaps which formulate the understanding of this research. This chapter also provides the previous research work which is correlated to this research.

3. **Research Methodology**

   The research method chapter discus about the research type, using data collection method, data collection procedure, data analysis procedure, measurement and data analysis.

4. **Results**

   The data analysis and explains with some linear regression

5. **Discussion and Implications of Findings**

   Discuss the result and update those results.

6. Conclusions and Recommendations

Conclusion and recommendation with limitation of the thesis overall research, findings, theoretical contribution, practical implication and future research area.

CHAPTER: 2

LITERATURE REVIEW

This chapter contains a review of the literature on e-commerce usability mechanisms related work.This chapter is divided into two parts. The first is to present concepts, definitions and theories relevant. The second part is to identify and understand the previous related works on the analysis of the usability factors. This includes an overview of web usability and its determinants in electronic commerce websites.

2.1 The Standardized User Experience Percentile Rank Questionnaire (SUPR-Q) Method

Standardized usability questionnaires first appeared in the late 1980s and are widely used today (Sauro & Lewis., 2012). Those first questionnaires were technology agnostic, meaning the items were appropriate for software, hardware, mobile devices, and websites. The advantage of a technology agnostic instrument is that the scores can be compared regardless of the technology. A company can use the same set of scores to benchmark mobile applications as well as desktop interfaces. The disadvantage of a technology agnostic instrument is that it can omit important information that is specific to an interface type. For websites, usability is one aspect of the user experience, but unlike products that are purchased and used repeatedly, the typical website experience involves other factors such as trust.

There are a number of published instruments that measure various aspects of website quality. Details about them are listed in Table 1. The most commonly used instruments exist technology area

Table 1 Questionnaires, That Measure Aspects of Software and Website Quality, Especially Usability.

Questionnaire	Items	Measures	Global Reliability	Sub-Constructs	Construct Reliability	Source
SUS	10	System usability	0.92	Usability	0.91	Brooke (1996)
				Learnability	0.71	Borsci et al. (2009); Sauro & Lewis (2009)
PSSUQ	16	Perceived satisfaction	0.94	System quality	0.9	Lewis (1992)
				Information quality	0.91	
				Interface quality	0.83	
SUMI	50	Usability	0.92	Efficiency	0.81	Kirakowski (1996)
				Affect	0.85	
				Helpfulness	0.83	
				Control	0.71	
				Learnability	0.82	
QUIS	27	Interaction satisfaction	0.94	Overall reaction	n/r	Chin et al. (1988)
				Screen factors	n/r	
				Terminology and system feedback	n/r	
				Learning factors	n/r	
				System capabilities	n/r	
WAMMI	20	Website usability	0.90	Attractiveness	0.64	Kirakowski & Cierlik (1998)

				Controllability	0.69	
				Efficiency	0.63	
				Helpfulness	0.70	
				Learnability	0.74	
WQ	25	Website quality	0.92	Specific content	0.94	Aladwani & Palvia (2002)
				Content quality	0.88	
				Appearance	0.88	
				Technical adequacy	0.92	
WU	8	Website usability	n/r	Ease of navigation	0.85	Wang & Senecal (2007)
				Speed	0.91	
				Interactivity	0.77	
IS	15	Information satisfaction	n/r	Customer centeredness	0.92	Lascu & Clow (2008)
				Transaction reliability	0.80	
				Problem solving ability	0.77	
				Ease of navigation	0.61	
ISQ	13	Intranet satisfaction	0.89	Content quality	0.89	Bargas-Avila et al. (2009)
				Intranet usability	0.90	
UMUX	4	Perceived usability	0.94	Perceived usability	0.94	Finstad (2010)
UMUX-LITE	2	Perceived usability	0.82	Perceived usability	0.82	Lewis et al. (2013)
HQ	7	Hedonic quality	n/r	Ergonomic quality	n/r	Hassenzahl (2001)
ACSI	14-20	Customer satisfaction	n/r	Quality	n/r	theacsi.org
				Freshness of information	n/r	
				Clarity of site	n/r	

				organization		
				Overall satisfaction	n/r	
				Loyalty	n/r	
CXi	3	Customer experience	n/r	Usefulness	n/a	forrester.com
				Usability	n/a	
				Enjoyability	n/a	
NPS	1	Customer loyalty	n/a	Customer loyalty	n/a	Reichheld (2003)
TAM	12	Technology acceptance	n/r	Usefulness	0.98	Davis (1989)
				sEase of use	0.94	
WEBQUAL	36	Website quality	n/r	Informational fit to task	0.86	Loiacono et al. (2002)
				Tailored communication	0.80	
				Trust	0.90	
				Response time	0.88	
				Ease of understanding	0.83	
				Intuitive operations	0.79	
				Visual appeal	0.93	
				Innovativeness	0.87	
				Emotional appeal	0.81	
				Consistent image	0.87	
				Online completeness	0.72	
				Relative advantage	0.81	

Reliability values are Cronbach alpha. n/r = not reported, n/a = not applicable.

The 10-item System Usability Scale (SUS), developed by (Brooke., 1996), is, perhaps, the most used questionnaires to measure perceived usability across products and websites (Sauro & Lewis., 2009). While the SUS was not published with a normative database, enough data have been collected and much of it published, that it is possible to create a set of normed scores (Sauro., 2011). A more recent scale for measuring usability is the Usability Metric for User

Experience (UMUX) developed by (Finstad., 2010). At just four items, it is a reliable and a short questionnaire. A finding also replicated in (Lewis, Utesch, and Maher., 2013) in which a two-item variation, called the UMUX-LITE, was also found to be reliable and correlated highly with the SUS.

Other frequently used technology agnostic instruments for measuring perceived usability includethe Post Study System Usability Questionnaires (PSSUQ; Lewis., 1992), the Software Usability Measurement Inventory (SUMI; Kirakowski., 1996), and the Questionnaire for User Interaction Satisfaction (QUIS; Chin, Diehl, & Norman., 1988). The SUMI contains a reference database maintained by its authors, but at 50 items the instrument is the longest among those researched.

There are other instruments that measure factors other than usability. A standardized questionnaire to measure website quality and related constructs is the Website Analysis and Measurement Inventory (WAMMI; Kirakowski & Cierlik., 1998). The current version of the WAMMI has a set of 20 items covering the five sub scales of Attractiveness, Controllability, Efficiency, Helpfulness, and Learnability and the global WAMMI measure. The WAMMI, like the SUMI, contains a reference database based on data collected from users of the questionnaire and maintained by its authors. Users of the WAMMI can convert their raw score into a percentile rank based on the scores from the other websites in the database. The internal consistency reliability of the WAMMI global score is high (α =.90), whereas the sub scale reliability estimates are generally lower (α =.63 to α =.74). The lower reliability is a tradeoff for using fewer items to measure a construct (Bobko., 2001). The WAMMI uses four items to measure each of the five constructs. Brevity is often critical when participants' time is already limited, so the loss in reliability can be justified by the higher response rates and adoption. Information

about the number and type of websites in the database is not provided in the reports, but this slightly shorter multi factor instrument with a reference database was a model for the current research. The database behind WAMMI makes it appealing to generate comparison scores. The Customer Experience Index (CXi), developed by the consulting firm Forrester is another instrument that generates comparison scores using just a few items. The CXi consists of only three items measuring usefulness, usability, and enjoyability. There is, however, no published information on the psychometric properties of the CXi.

While websites may be treated under the broader category of software, they bring the very salient elements of trust and visual appeal into consideration. Bevan (2009) argued that to encompass the overall user experience, measures of website satisfaction need to account for likability and trust. Other researchers have found that online trust is a major determinant of e-commerce success (Keeney, 1999; Pavlou & Fygensen, 2006; Suh & Han., 2003). None of the standardized usability questionnaires included a component of trust or credibility. But(Safar and Turner., 2005) developed a psychometrically validated trust scale consisting of two factors based on an online insurance quote system. A broader examination of website trust was also conducted by (Angriawan and Thakur., 2008). They found that website usability, expected product performance, security, and privacy collectively explained 70% of the variance in online trust. They also found that online trust and privacy were strong predictors of consumer loyalty, which was similar to findings by (Sauro 2010& Lewis., 2012).

Table 1 also lists, questionnaires that focus on aspects of quality, including extensions of the Technology Acceptance Model (TAM; Davis., 1989) for the web. The WebQual questionnaire by (Loiacono, Watson, and Goodhue., 2002) is a more comprehensive (but longer) 36-item measure that contains sub scales including trust, usability, and visual appeal. The construct of

visual appeal appears in multiple questionnaires, including the WAMMI. The Web Quality (WQ) instrument by (Aladwani and Palvia., 2002) contains an appearance sub scale, and the influential Hedonic Quality (HQ) questionnaire developed by (Hassenzahl., 2001) has an appeal sub scale. Additional instruments focus on narrower aspects of website quality, specifically satisfaction, including questionnaires by (Wang and Senecal 2007& Lascu and Clow., 2008)

Customer loyalty plays an important role in business decisions and appears as a construct in multiple questionnaires. The most popular loyalty questionnaire is the Net Promoter Score (NPS). The NPS consists of one item with an 11-point scale (0 to 10) intended to measure customer loyalty (Reichheld., 2003). Respondents are asked to rate how likely they are to recommend a friend or colleague to a product or service. The responses of 0 to 6 are considered "detractors," 7 to 8 "passives," and 9 to 10 are "promoters." The proportion of detractors is subtracted from the proportion of promoters to create the "net" promoter score. Research conducted by (Reichheld., 2006) showed that the NPS was the best or the second best predictor of company growth in 11 out of 14 industries. The NPS questionnaire is used widely across many industries, and benchmark data are available from third party providers. Its high adoption rate makes it a good candidate for inclusion for this current research for developing the SUPR-Q. The most common constructs are measures of usability, trust, appearance, and loyalty. Some research suggests (e.g., Sauro, 2010 and Lewis., 2012) that these are overlapping constructs, as many were found to be correlated (e.g., trust and usability and usability and loyalty). These constructs formed the basis of the items used to create a new website questionnaire the SUPR-Q.

Besides, (Palmer., 2002), he explained that e-commerce usability is significantly dependent to the e-commerce design and performance. Plamer included factors download delay, navigability, content, interactivity, responsiveness. Download delay (Rose, G. & Straub, D.W., 1998) is the

problem that is initiated when need to download images or something what consumer want. Navigation is measured sequencing of the pages, well layout and navigation protocols. Content included in the amount of the variance of use, text multimedia and graphics. Interactivity means that the site look, feel and its content. Responsiveness is feedback to the users on the site.

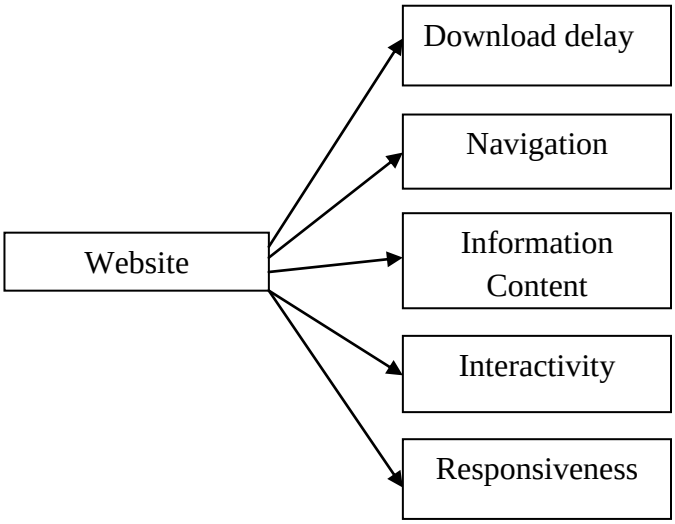

Figure 2.1 Palmer (2002) Web Site Usability Dimensions

Another researcher (Alexander., 2005) identified four common usability problems which are poor content, poor information, poor design of search and using a pdf document. (Lautenbach et., al., 2006) examined the usability of an e-commerce website has two factors that is users' ability to find information on the pages and user satisfactions.

But, different literatures claimed in Bangladesh e-commerce website whereas (Jamil, R., Imran, M., 2012) revealed dissatisfaction about the websites, and proposed the common weaknesses on Bangladesh e-commerce websites. Another researcher identifies the usability factors in Bangladesh e-commerce website (Abdullah, R., WEI, K., 2008) they give some factor to improve e-commerce websites. On the other hand (Hossain,S.,2012&Ferdous,H., Choudhury, F.,

Rifat R., Moutushy,S. ., 2012)these two researchers claimed that Bangladesh e-commerce usability have been an extraordinarily complex situation to live in.

2.2 A Review of the Usability Factor in Research

2.2.1 Identification of Factors Related to Search Product in Website

The usability in website is vital for customers to shop on the site.According to (Brajnik., 2000)considers the ease and effectiveness of finding an item to be one of the important attributes for evaluation of e-commerce sites.

Table 1 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
	Searching by product features or categories	Nielsen	2003b	Usability 101
	Similarity of search mechanism interfaces with interfaces of commonly used search engines	Barnard &Wesson	2004	Conference of the South African institute of Computer Scientists and Information Technologists on IT Research in developing countries Held in 2004
	Clarity of search interfaces	Callahan & Koenemann	2000	ACM
	The ability of search mechanisms to suggest additional keywords similar to those specified	Rohn	1998	Communications of the Association for Information Systems

	by a user			
	Presence of obvious links to advanced search options when multiple search screens are provided	Chariton & Choi	2002	ACM
	Ability for users to return to previous search results	Lyardet, et al.	1999	European Conference on Pattern Languages of Programs

2.2.2 Identification of Factors Related to the Product Comparison Mechanism

Comparison of products is a critical element in an e-commerce experience (Nielsen., 2003a). It allows customers to choose specific products among alternatives.

Table 2 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
1	Ability to select the product for comparison	Araujo & Araujo	2003	Conference of the IBM Center for Advanced Studies Conference on Collaborative Research
2	Ability to compare products by features	Barnard & Wesson	2004	Conference of the South African institute of Computer Scientists and Information Technologists on IT Research in developing countries Held in 2004

3	Ability to compare products by price	Callahan & Koenemann	2000	ACM
4	Presentation of product comparisons in a tabular format	Fang & Salvendy	2001 & 2003	ACM
5	Display of reasonable amount of product attributes in comparison tables	Rohn	1998	Communications of the Association for Information Systems
6	Emphasis of differences among products in comparison tables	Tilson, et al.	1998b	Conference on Human Factors and the Web

2.2.3 Identification of the Factors are Accessibility,Information on Website, Attractive, Easy to Use, Comfortable Purchase, Clean and Simple Font, Catalog, 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.

Table 3 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
1	Accurate system descriptions	Araujo & Araujo	2003	Conference of the IBM Center for Advanced Studies Conference on Collaborative Research
2	Detailed product descriptions	Barnard &	2004	Conference of the South African Institute of Computer Scientists and

		Wesson		Information Technologists on IT Research in developing countries Held in 2004
3	Display of product numbers as part of the product detailed information	Fang & Salvendy	2003	ACM
4	Clarity of catalog descriptions to an ordinary user	Keevil	1998	ACM
5	Display of clean and simple with detailed information	Lohse & Spiller	1998a	ACM
6	Clarity of menu bar	Lohse & Spiller	1998 b	ACM
7	Reasonable download speed for product pictures	Nemetz	2000	Conference on Human Factors and Computing Systems
8	Availability of information about quality of a product	Nielsen & Norman	2000	Information Week
9	Display of accurate warning and caution notices related to a product	Rohn	1998	Communications of the Association for Information Systems
10	Availability of product reviews	Rossi, Lyardet, &	2000	Conference on Pattern Languages of Programs

		Schwabe		
11	Presence of an easy-to-find order buttons or links	Nemetz	2000	Conference on Human Factors and Computing Systems
12	Clarity of ordering button/link labels	Nielsen & Norman	2000	Information Week
13	Illustration of each available color of a product	Rohn	1998	Communications of the Association for Information Systems
14	Display of links to the product related accessories	Rossi, Lyardet, & Schwabe	2000	Conference on Pattern Languages of Programs
16	Display of product prices	Schafer, et al	1999	ACM
17	Display of delivery options	Schaffer and Sorflaten ;Spiller & Lohse	1999 &1998	ACM & ACM
18	Display of a reasonable number of additional links without overwhelming users	Tilson, et al.,; Tilson, et al.	1998a &1998b	ACM & Conference on Human Factors and the Web

2.2.4 Identification of Factors Related to Registration

Information Registration is a process that sets up a customer account to store their information, preferences etc.

Table 4 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
1	Elimination of unnecessary registrations upon entering the site	Grose, et al.,	1998	Human Factors and Web Development (1st ed.)
2	The Presence of a clearly labeled button or link for new customers to open an account	Renaud & Van Dyk	2001	International Computer Software and Applications Conference
3	Notifying customers about the benefits associated with registration	Rohn	1998	Communications of the Association for Information Systems
4	Short registration forms	Renaud & Van Dyk	2001	International Computer Software and Applications Conference
5	Inclusion of only necessary data elements in the registration form	Grose, et al.,	1998	Human Factors and Web Development (1st ed.)
6	Distinguishing mandatory fields from optional ones	Rohn	1998	Communications of the Association for Information Systems
7	The ability for customers to	Grose, et	1998	Human Factors and Web

	exclude themselves from marketing lists at the time of registration	al.,		Development (1st ed.)
8	Display of reasons when customers are being asked to login	Rohn	1998	Communications of the Association for Information Systems
9	Display of logon status after a user logs in	Grose, et al.,	1998	Human Factors and Web Development (1st ed.)
10	The ability to add multiple shipping addresses or remove existing shipping addresses	Perzel & Kane	1999	Pattern Languages of Programming Conference
11	Reuse of previously collected customer's information such as name, address, etc.	Vora	2003	Human Factors and Web Development (2nd ed.).
12	Notifying customers if certain information (like credit card information) will not be saved and needs to be re-entered	Vora	2003	Human Factors and Web Development (2nd ed.).
13	Elimination of collection of information that is not necessary to close a sale transaction for registered users	Vora	2003	Human Factors and Web Development (2nd ed.).
14	The ability for customers to	Rohn	1998	Communications of the

	complete the purchase without registering			Association for Information Systems
15	The ability for users to recover forgotten passwords	Perzel & Kane	1999	Pattern Languages of Programming Conference
16	The ability for customers to access and modify their personal information	Perzel & Kane	1999	Pattern Languages of Programming Conference

2.2.5 Identification of Factors Related to the online Payment System

Security and privacy of shoppers' information have been identified as one of the most important elements of e-commerce (Rose, et al., 1999). These elements affect the customer's trust in an e-commerce website.

Table 5 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
1	Availability of a privacy policy explaining the use of provided personal information	Araujo & Araujo	2003	Conference of the IBM Center for Advanced Studies Conference on Collaborative Research
2	Notifying users that their personal information will not be sold to other parties like mailing list organizations, etc.	Barnard & Wesson	2004	Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in developing countries Held

				in 2004
3	Presence of a clearly labeled logoff button or link	Brajnik	2000	Proceedings of the 6th Human Factors and the Web Conference Held in June 19, 2000, Austin, TX.
4	Ability for users to browse through the site without logging in or registering	Egger,Fang & Salvendy	2000 &2003	ACM
5	Implementation of transaction confirmations being sent via email	Fogg, et al.	2000, 2001	CHI 20001Conference on Human Factors in Computing Systems

2.2.6 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 become customers because of the lack of customer service, particularly, due to inability to reach a representative while shopping.

Table 6 The set of usability affecting factors has been identified:

SL	Factors	Author	Year	Publication
1	Availability of Information on where and how to get help	Barnard & Wesson	2004	Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in developing countries Held

				in 2004
2	Availability of user guides	Grose, et al	1998	Human Factors and Web Development (1st ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers
3	Ability for users to search for a customer service related topics	Lohse & Spiller	1998	Communications of the ACM
4	Availability of a customer service phone number	Wallace; Vora	2002;2003	Human Factors and Web Development (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers and In Haynes, J.D. (Ed.), Internet Management Issues: A Global Prospective. Hershey, PA: Idea Group Publishing and Human Factors and Web Development (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers
5	Availability of an e-mail support	Araujo & Araujo	2003	Conference of the IBM Center for Advanced Studies Conference on Collaborative Research
6	Availability of a set of FAQs	Barnard & Wesson	2004	Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in developing countries Held

				in 2004
7	Availability of customer service mailing address	Brajnik	2000	Proceedings of the 6th Human Factors and the Web Conference Held in June 19, 2000, Austin, TX
8	The ability to reply to email inquires within 24 hours	Becker & Mottay	2001	A Global Prospective on Web Site Usability. IEEE Software
9	Availability of a dynamic online helps that changes depending on the current page and context	Chin, et al	1988	IEEE
10	Available help-related information is being helpful to users	Fang & Salvendy	2003	ACM
11	The ability for customers to cancel previously placed orders	Keevil	1998	ACM
12	Availability of a shipment tracking information online	Lohse &Spiller	1998a	ACM
13	Email notifications about the shipping status of ordering goods	Lohse & Spiller	1998b	ACM
14	Availability of	Mayhew	2003	IEEE

	information about how to order items	& Bias		
16	Availability of return and exchange policies	Nielsen & Tahir	2000	Web Techniques.
17	Availability of payment policies	Rohn	1998	Communications of the Association for Information Systems
18	Availability of vat collection policies	Spiller & Lohse	1998	International Journal of Electronic Commerce
19	Availability of an assistance to customers to recover forgotten passwords 1-7	Vora	2003	Human Factors and Web Development (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers

2.2.7 Identification of Factors Related to Navigational Support

Navigation-related features are one of the most important factors affecting usability of web sites. Poor navigational support may prevent site visitors to become buyers.

Table 7 The set of usability affecting factors has been identified

SL	Factors	Author	Year	Publication
1	Simplicity of navigation for inexperienced users	Mayhew & Bias	2003	IEEE
2	Completeness of navigational links	Nielsen	Nielsen, 2003b	IEEE
3	Validity of navigational links and	Araujo	2003	Conference of the IBM Center

	avoidance of dead links	& Araujo		for Advanced Studies Conference on Collaborative Research
4	Obvious, self-explanatory, descriptive, and clearly labelled links throughout the site	Chang, et al.	(1997)	IEEE
5	Obvious, self-explanatory, descriptive, and clearly labelled links to product listings	Chin, Diehl, & Norman	1988	ACM
6	Obvious, self-explanatory, descriptive, and clearly labelled links to detailed product information	Fang & Salvendy	2003	ACM
7	Ability for users to identify their current position on a site	Paolini	1999	IEEE
8	Ability for users to identify their past actions or navigate to previously visited pages	Renaud & Van Dyk	2001	International Computer Software and Applications Conference
9	Ability for users to identify where to go next	Rohn	1998	Communications of the Association for Information Systems
10	Consistency of navigational menus throughout the site	Schaffer &	1999	ACM

		Sorflaten		
11	Changes in the cursor appearance to indicate what can be clicked on	Tilson, et al.	1998b	ACM
12	Reasonable download/navigational speed	Lohse & Spiller	1998b	ACM

All the literature review above summarized find some importance and necessary factors of usability of e-commerce websites. The studies were useful in identifying the common usability problem of e-commerce websites.

CHAPTER: 3

RESEARCH METHODOLOGY

In this chapter, 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.

3.1 Research Purpose

Every researcher has his/her own personal motivation to perform a scientific study while, in general, according to Yin (1994), Wiedersheim-Paul and Eriksson (1999) the types of research purpose can be classified in three categories: Exploratory research, Descriptive research and Explanatory (or Causal) research.

3.1.1 Exploratory Research

Exploratory research is used to clarify and understanding of a problem (Saunders et al, 2003). The goal is to explore something and is appropriate for when the research problem is difficult to delimit. Exploratory approach should be applied when the researcher is not sure about the correct model to use and the kind of relations and characteristics that are more suitable. Exploratory studies are used to clarify and define the nature of a problem. They are used to analyse a situation, to gain a better understanding of the dimensions of a problem. The purpose is however not to determine a particular guideline. Exploratory research is instead conducted with the expectation that subsequent research will be required to determine the proper course of action (Zikmund, 2000). Exploratory research is related to discover the general nature of the problem

and the variables that relate to it and it is characterized by a high degree of flexibility, that has intend to rely on secondary data, convenience or judgment samples, small-scale surveys or simple experiments case analyses, and subjective evaluation of the result. Exploratory designs are concerned with identifying the real nature of research problems and, perhaps, of formulating relevant hypotheses for later tests (Chisnall, 1997). Exploratory studies are a valuable means of finding out "what is happening; to seek new insights; to ask questions and to assess phenomenon in a new light". An explorative research is suitable when a problem is difficult to demarcate, and when there is not a clear apprehension about what model to use and which characteristics and relations are important. (Eriksson, Wiedersheim-Paul, 1997).

3.1.2 Descriptive Research

Descriptive research is focused on the accurate description of the variables in the problem model. Consumer profile studies, market-potential studies, product-usage studies, attitude surveys, sales analyses, media research, and price surveys are examples 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. (Chisnall).

3.1.3 Explanatory /Causal Research

The study can be explanatory when the focus is on cause-effect relationships, explaining what causes produced what effects (Yin 1994). Explanatory (or Causal) research seeks to find cause and effect relationships between variables. It accomplishes this goal through laboratory

and field experiments. In these studies the emphasis is on studying a situation or a problem in order explains the relationships between variables.

Considering these three different types of research we can say that this research is an exploratory research in its nature.

3.2 Research Approach

In this study, our research design method is using qualitative and quantitative research. Combination method used as a systematic literature review from (B. Kitchenham, O. P. Brereton, D. Budgen, M. Turner, J. Bailey, and S.2009).And paper collects, process using Systematic Mapping Study (K. Petersen, R. Feldt, S. Mujtaba, and M. Mattsson., 2008) for searching publication. Basically, snowballing used for paper selection. 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 purpose of quantitative research on the other hand is to determine the quantity or extent of some phenomenon in the form of numbers that can be analysed statistically. Quantitative research also tends to be more structured than qualitative that on the other hand is more flexible (Zikmund, 2000).

3.3 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 booty activities. 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 3.2.1 Demographic profile of respondents (n=500)

Variables	**Frequency**	**Percent**
Gender		
Male	330	66
Female	170	34
Age		
18-20	163	32.6
21-30	236	47.2
31-35	101	20.2
Years of Experience		
1-3	361	72.2
3-5 or more	139	27.8

3.4 Questionnaire Design

Based on previous 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 (S.E. Hove., 2005). Skypee 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 Standardized User Experience Percentile Rank Questionnaire (SUPR-Q) method. This method is measuring user usability, trust, appearance, and loyalty. This method we are used for data collection and surveys.

The third category is used13 questionnaires exist that completes the websites critical factors. For users help us 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 in this study. We measured each item using five-point scale, anchored by

1 ="strongly disagree" and 5 ="strongly agree. Questionnaires are included in Appendix A.

3.5 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.

3.6 Data Analysis

A complete answer to conducting data for data analysis, filtering data is 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 is distributed.s500 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. After collecting data, through the survey these data have been analyzed through Statistical Package for Social Sciences (SPSS) software version 23.

3.7 Proposed Model

In summary, it is posited that four website usability factors are (Trust, Loyalty, Appearance and Nonfunctional Requirements) affect the Usability. This four are the independent variables of this study with Usability as the dependent variable. So, Figure 1presents the research framework.

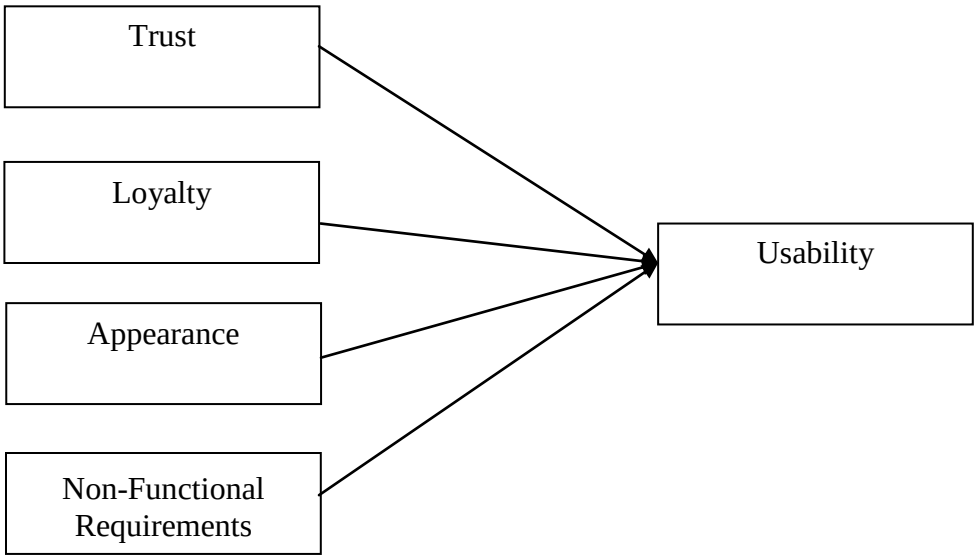

Figure 3.7 Research Framework

CHAPTER: 4

RESULTS AND DISCUSSION

In this chapter, the main findings and its relevance to the observations found in previous studies are discussed.

4.1 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 majority of the respondents who participated in the study were female and male; hence, more website evaluations were 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 4.1.1 displays the Frequency results.

Table 4.1.1: Frequency analysis

Usability in Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	176	34.9	35.2	35.2
	Disagree	188	37.3	37.6	72.8
	Neutral	73	14.5	14.6	87.4
	Agree	33	6.5	6.6	94.0
	Strongly Agree	30	6.0	6.0	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: usability in website shows 37% respondents are answers disagree means usability of e-commerce websites are poor and 34% of the survey respondents are answer strongly disagree about the usability of e-commerce. Others are 14.5%, 6.5%,6.0% from the neutral, agree, strongly agree.

Navigation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	113	22.4	22.6	22.6
	Disagree	184	36.5	36.8	59.4
	Neutral	131	26.0	26.2	85.6
	Agree	51	10.1	10.2	95.8
	Strongly Agree	21	4.2	4.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1:navigation shows the majority of disagree percentage is 36.5%,that means the usability of e-commerce website navigation is not good for consumers and the others are 26.0%, 22.4%, 10.1%, 4.2% from the neutral, strongly disagree, agree and strongly agree.

Easy to Use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	160	31.7	32.0	32.0
	Disagree	180	35.7	36.0	68.0
	Neutral	90	17.9	18.0	86.0
	Agree	45	8.9	9.0	95.0
	Strongly Agree	25	5.0	5.0	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: easy to use shows the majority of disagree percentage is 35.7%, that means the usability of e-commerce website is not good for easy use of the consumers. The second major of strongly disagree percentage is 31.7 and the others are 17.9%, 8.9%, 5.0% from the neutral, agree and strongly agree.

Comfortable to Purchase in this Web site

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	111	22.0	22.2	22.2
	Disagree	180	35.7	36.0	58.2
	Neutral	105	20.8	21.0	79.2
	Agree	77	15.3	15.4	94.6
	Strongly Agree	27	5.4	5.4	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: comfortable to purchase on this web site shows the majority of disagree percentage is 35.7%, that means the usability of e-commerce website is not good for easy use of the consumers. The second major of strongly disagree percentage is 22.0 and the others are 20.8%, 15.3%, 5.4% from the neutral, agree and strongly agree.

Keep Promises

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	92	18.3	18.4	18.4
	Disagree	166	32.9	33.2	51.6
	Neutral	145	28.8	29.0	80.6
	Agree	51	10.1	10.2	90.8
	Strongly Agree	46	9.1	9.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: keep promises on this web site. Shows the majority of disagree percentage is 32.9%, that means the e-commerce websites do not keep their promises and the others are 28.8%, 18.3%, 10.1%, 9.1% from the neutral, strongly disagree, agree and strongly agree.

Confident of Conduct

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	100	19.8	20.0	20.0
	Disagree	164	32.5	32.8	52.8
	Neutral	124	24.6	24.8	77.6
	Agree	75	14.9	15.0	92.6
	Strongly Agree	37	7.3	7.4	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: confident of conduct on this web site. Shows the majority of disagree percentage is 32.5% and the others are 24.6%, 19.8%, 14.9%, 7.3% from the neutral, strongly disagree, agree and strongly agree.

Information on Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	98	19.4	19.6	19.6
	Disagree	204	40.5	40.8	60.4
	Neutral	129	25.6	25.8	86.2
	Agree	41	8.1	8.2	94.4
	Strongly Agree	28	5.6	5.6	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: information on website on this web site. Shows the majority of disagree percentage is 40.5% and the others are 25.6%, 19.4%, 8.1%, 5.6% from the neutral, strongly disagree, agree and strongly agree.

Loyal to Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	95	18.8	19.0	19.0
	Disagree	159	31.5	31.8	50.8
	Neutral	145	28.8	29.0	79.8
	Agree	66	13.1	13.2	93.0
	Strongly Agree	35	6.9	7.0	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: loyal to website to this web site. Shows the majority of disagree percentage is 31.5% and the others are 28.8%, 18.8%, 13.1%, 6.9% from the neutral, strongly disagree, agree and strongly agree.

Recommend this Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	96	19.0	19.2	19.2
	Disagree	180	35.7	36.0	55.2
	Neutral	158	31.3	31.6	86.8
	Agree	39	7.7	7.8	94.6
	Strongly Agree	27	5.4	5.4	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: recommend this website to this web site. Shows the majority of disagree percentage is 35.7% and the others are 31.3%, 19.0%, 7.7%, 5.4% from the neutral, strongly disagree, agree and strongly agree.

Purchase Future from Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	106	21.0	21.2	21.2
	Disagree	183	36.3	36.6	57.8
	Neutral	121	24.0	24.2	82.0
	Agree	58	11.5	11.6	93.6
	Strongly Agree	32	6.3	6.4	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: purchase future from website to this web site. Shows the majority of disagree percentage is 36.3% and the others are 24.0%, 21.0%, 11.5%, 6.3% from the neutral, strongly disagree, agree and strongly agree.

Attractive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	112	22.2	22.4	22.4
	Disagree	174	34.5	34.8	57.2
	Neutral	134	26.6	26.8	84.0
	Agree	60	11.9	12.0	96.0
	Strongly Agree	20	4.0	4.0	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: attractive from website to this web site. Shows the majority of disagree percentage is 34.5% and the others are 26.6%, 22.2%, 11.9%, 4.0% from the neutral, strongly disagree, agree and strongly agree.

Clean and Simple

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	88	17.5	17.6	17.6
	Disagree	185	36.7	37.0	54.6
	Neutral	138	27.4	27.6	82.2
	Agree	74	14.7	14.8	97.0
	Strongly Agree	15	3.0	3.0	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: clean and simple website to this web site. Shows the majority of disagree percentage is 36.7% and the others are 27.4%, 17.5%, 14.7%, 3.0% from the neutral, strongly disagree, agree and strongly agree.

Enjoyable to Use this Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	153	30.4	30.6	30.6
	Disagree	163	32.3	32.6	63.2
	Neutral	97	19.2	19.4	82.6
	Agree	46	9.1	9.2	91.8
	Strongly Agree	41	8.1	8.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: enjoyable to use this website shows 32.3% respondents are answers disagree means usability of e-commerce websites are poor and 30% of the survey respondents are answer strongly disagree about the usability of e-commerce. Others are 19.2%, 9.1%, 8.1% from the neutral, agree, and strongly agree.

Use of Catalog

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	137	27.2	27.4	27.4
	Disagree	212	42.1	42.4	69.8
	Neutral	102	20.2	20.4	90.2
	Agree	30	6.0	6.0	96.2
	Strongly Agree	19	3.8	3.8	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: use of catalog in e-commerce website shows 42.1% respondents are answers disagree means usability of e-commerce websites are poor and 27.2% of the survey respondents are answer strongly disagree about the usability of e-commerce. Others are 20.2%, 6.0%, 3.8% from the neutral, agree, and strongly agree.

Registration

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	114	22.6	22.8	22.8
	Disagree	196	38.9	39.2	62.0
	Neutral	119	23.6	23.8	85.8
	Agree	43	8.5	8.6	94.4
	Strongly Agree	28	5.6	5.6	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: registration of the e-commerce website shows the majority of disagree percentage is 38.9% and the others are 23.6%, 22.6%, 8.5%, 5.6% from the neutral, strongly disagree, agree and strongly agree.

Accessibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	93	18.5	18.6	18.6
	Disagree	224	44.4	44.8	63.4
	Neutral	138	27.4	27.6	91.0
	Agree	31	6.2	6.2	97.2
	Strongly Agree	14	2.8	2.8	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: accessibility of the e-commerce website shows the majority of disagree percentage is 44.4% and the others are 27.4%, 18.5%,6.2%, 2.8% from the neutral, strongly disagree, agree and strongly agree.

Use of Clean and Font

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	96	19.0	19.2	19.2
	Disagree	151	30.0	30.2	49.4
	Neutral	126	25.0	25.2	74.6
	Agree	100	19.8	20.0	94.6
	Strongly Agree	26	5.2	5.2	99.8
	Total	500	99.2	100.0	
	Missing System	4	8	100.0	
Total		504	100.0		

Interpretation: As the table 4.1.1: use of clean and font of the e-commerce website shows the majority of disagree percentage is 30.0% and the others are 25.0%, 19.8%, 19.0%, 5.2% from the neutral, agree, strongly disagree and strongly agree.

Online Payment System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	81	16.1	16.2	16.2
	Disagree	149	29.6	29.8	46.0
	Neutral	118	23.4	23.6	69.6
	Agree	90	17.9	18.0	87.6
	Strongly Agree	61	12.1	12.2	99.8
	Total	500	99.2	100.0	
	Missing System	4	.8		
	Total	504	100.0		

Interpretation: As the table 4.1.1: an online payment system of the e-commerce website shows the majority of disagree percentage is 29.6% and the others are 23.4%, 17.9%, 16.1%, 12.1% from the neutral, agree, strongly disagree and strongly agree.

Live Support System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	96	19.0	19.2	19.2
	Disagree	119	25.6	23.8	43.0
	Neutral	127	23.2	25.4	68.4
	Agree	101	20.0	20.2	88.6
	Strongly Agree	57	11.3	11.4	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: alive support system of the e-commerce website shows the majority of disagree percentage is 25.6% and the others are 23.2%, 20.0%, 19.0%,11.3% from the neutral, agree, strongly disagree and strongly agree.

Without Registration Purchase

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	104	20.6	20.8	20.8
	Disagree	143	28.4	28.6	49.4
	Neutral	115	22.8	23.0	72.4
	Agree	76	15.1	15.2	87.6
	Strongly Agree	61	12.1	12.2	99.8
	Total	500	99.2	100.0	
	Missing System	4	.8		
	Total	504	100.0		

Interpretation: As the table 4.1.1: without registration consumer wants to purchase of the e-commerce website. This table shows the majority of disagree percentage is 28.4% and the others are 22.8%, 20.6%, 15.1%, 12.1% from the neutral, strongly disagree, agree and strongly agree.

Menu Bar

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	74	14.7	14.8	14.8
	Disagree	157	31.2	31.4	46.2
	Neutral	145	28.8	29.0	75.2
	Agree	73	14.5	14.6	89.8
	Strongly Agree	51	10.1	10.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: menu bar of the e-commerce website. This table shows the majority of disagree percentage is 31.2% and the others are 28.8%, 14.7, 14.5%, and 10.1% from the neutral, strongly disagree, agree and strongly agree.

Downloading Speed of Website

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	90	17.9	18.0	18.0
	Disagree	176	34.9	35.2	53.2
	Neutral	127	25.2	25.4	78.6
	Agree	76	15.1	15.2	93.8
	Strongly Agree	31	6.2	6.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: downloading speed of the website of the e-commerce website. This table shows the majority of disagree percentage is 34.9% and the others are 25.2%, 17.9%, 15.1%, 6.2% from the neutral, strongly disagree, agree and strongly agree.

Provide Best Help

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	89	17.7	17.8	17.8
	Disagree	219	43.5	43.8	61.6
	Neutral	118	23.4	23.6	85.2
	Agree	49	9.7	9.8	95.0
	Strongly Agree	24	4.8	4.8	99.8
	Total	500	99.2	100.0	
	Missing System	4	.8		
	Total	504	100.0		

Interpretation: As the table 4.1.1: provide the best help of the e-commerce website. This table shows the majority of disagree percentage is 43.5% and the others are 23.4%, 17.7, 9.7%, and 4.8% from the neutral, strongly disagree, agree and strongly agree.

Price Comparison Mechanism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	137	27.2	27.4	27.4
	Disagree	156	31.0	31.2	58.6
	Neutral	110	21.8	22.0	80.6
	Agree	61	12.1	12.2	92.8
	Strongly Agree	36	7.1	7.2	100.0
	Total	500	99.2	100.0	
Missing	System	4	.8		
Total		504	100.0		

Interpretation: As the table 4.1.1: provide the best help of the e-commerce website. This table shows the majority of disagree percentage is 31.0% and the others are 27.2%, 21.8%, 12.1%, 7.1% from the strongly disagree, neutral, agree and strongly agree.

Table 4.2 Mean Statistics Analysis

Variables	Mean
Usability	2.2207
Trust	2.5020
Loyalty	2.4333
Appearance	2.4020
Nonfunctional Requirements	2.5509

Interpretation: The value of mean in Table 4.2 suggests that the mean scores show a more than average scores for usability factors.

Table 4.3 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, Nonfunctional Requirements

Interpretation: The value of R square in Table 4.3 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 4.4 Application of ANOVA

ANOVA[b]

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

a. Predictors: (Constant): Trust, Loyalty, Appearance, Nonfunctional 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 Nonfunctional Requirements) and dependent variable (Usability).

Table 4.5 Application of Coefficients

Coefficients[a]

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

a. Dependent Variable: Usability

Interpretation: The value of coefficients Table 4.4, following research framework suggests that trust has a positive effect on usability, loyalty has a positive effect on usability, Appearance has a positive effect on usability, nonfunctional requirements has a positive effect on usability.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the main findings and the major contributions of the presented research which was conducted on the improving business to consumer e-commerce usability. The chapter ends with the research limitations, recommendations for future works, and the conclusion section.

This section summarizes the research findings in response to the research questions listed on page 3.

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 4.2 and 4.3. 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, $R^{2=}$. 406 measures, 40.6% of the measurement of usability. Adjusted R^2=. 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 4.5because 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, when the four factors will improve, the usability of e-commerce can improve easily.

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.

Limitations

In this thesis there are some several delimitations on our work, Firstly, 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 thesis, our main object of the study is to improve Bangladesh b2c e-commerce. So this survey will complete only Bangladesh.

Secondly, 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.

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APPENDIX

Appendix A: Survey on E-commerce Usability
[In Context of Bangladesh]

Respondent's Details:

Name: _____ Age: _____

Gender: Male / Female Years of experience: 1 years |2 years |3years |4 years |5 years or more

Strongly Disagree **(1)**	Disagree **(2)**	Neutral **(3)**	Agree **(4)**	Strongly Agree **(5)**

Typical Evaluation Process Using SUPR-Q

A.	**Factors**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
1.	I am able to find what I need quickly on this website.					
2.	It is easy to navigate within the website.					
3.	This website is easy to use.					
4.	I feel comfortable purchasing from this website.					
5.	This website keeps the promises it makes to me.					
6.	I feel confident conducting business with this website.					
7.	I can count on the information I get on this website.					
8.	I consider myself a loyal customer of this website.					
9.	How likely are you to recommend this website to a colleague or friend?					
10.	I plan on continuing to purchase from this website in the future.					
11.	I found the website to be attractive.					
12.	The website has a clean and simple presentation.					
13.	I enjoy using the website.					

Additional Questions: The Following Indicators is Establish in Order to Measure Each Task

B.	Factors	(1)	(2)	(3)	(4)	(5)
14.	Do you think the catalog is good?					
15.	Do you feel registration form is going long and its consume time?					
16.	Do you think Accessibility is good?					
17.	Do you think the color of the website, it's not good for understanding product color?					
18.	Do you think online payment is not secure?					
19.	When you are shopping on online, do you feel the live support system is not good?					
20.	Do you feel without registration you want to buy product using carts?					
21.	Do you feel when you are in mobile phone, it's not properly work with menu and other option?					
22.	Is it faster to download?					
23.	Does it provide the best help?					
24.	Do you think the product price comparison mechanism is needed?					

25. Write down any problem of E-commerce in context of usability:

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26. If you have any suggestion to improve E-commerce in the context of usability :
