USABILITY TESTING OF NEWSPAPER APPLICATION IN BANGLADESH

Supervised by

Dr. Imran Mahmud

Associate Professor and Head In-Charge

Department of Software Engineering

Daffodil International University

Submitted by

Hasin Israk Khan
191-35-2692
Department of Software Engineering
Daffodil International University

I am submitting this thesis report as part of my Bachelor of Science degree in Software Engineering as part of my final year of my studies.

APPROVAL

This thesis titled on **"Usability Testing Of Newspaper Applications In Bangladesh"**, submitted by **Hasin Israk Khan (ID: 191-35-2692)** 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 Bachelor of Science in Software Engineering and approval as to its style and contents.

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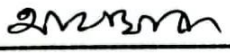

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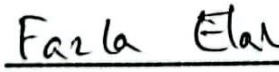

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DECLARATION

I am pleased to announce that this thesis was completed under the supervision of **Dr. Imran Mahmud, Associate Professor & Head In-Charge** , Department of Software Engineering, Daffodil International University, Dhaka . I also announce that I completed this work for the Bachelor of Science in Software Engineering degree. This work, whether in entirety or in part, has not been submitted for a bachelor's degree or any other type of graduation.

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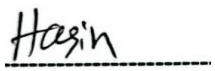

Hasin Israk Khan

ID: 191-35-2692

Department of Software Engineering

Daffodil International University

Certified by

Dr. Imran Mahmud

Associate Professor and Head In-Charge

Department of Software Engineering

Daffodil International University

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Finally, I must express my gratitude for my parents' steadfastness support and patience.

ABSTRACT

Nowadays, newspaper apps are very popular all over the world, including Bangladesh. One of the emerging trends in the field of newspaper using Smartphone devices is the newspaper application. Newspaper apps are becoming increasingly popular around the world, including in Bangladesh. Newspaper applications are one of the emerging trends in the field of smartphone newspapering. As the number of competitors in this field grows, so will their viewership and user experience, attracting more people to this type of application. So. I decided to evaluate two popular newspaper applications in Bangladesh, Prothom Alo and Daily Star, in order to better understand the current state of the field in Bangladesh. I used UMUX and SUPR-Q survey methods in my research. This survey included people of all ages, genders, and occupations. The data was then calculated and analyzed, and the results revealed that there are some user experience issues with newspaper applications. If this type of usability issue is resolved, the Bangladesh newspaper application will become more user-friendly in the future. In the future, I plan to work with more data and apply different methods to achieve more effective result.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chapter 1

INTRODUCTION

1.1 BACKGROUND

Newspaper applications have grown in popularity in the last decade. Nowadays, news applications have become more important than ever before, many companies spend significant amounts of money to develop and design an effective and attractive news websites . Their aim is for these websites to be as close to reality as possible, while using the latest technologies to reach the most significant number of readers (Benaida, 2022). Furthermore, websites strives to provide accurate and great information and accurate information as well as providing quality services that can be used by the readers (Benaida, 2022). It is essential, however, that achieve a minimum level of customer satisfaction before developing a usable web application (Benaida, 2022). Designers should employ appropriate methods for measuring website quality to prevent readers from neglecting the site, thus lowering the likelihood of users returning (Benaida, 2022).. The success of a website is largely determined by its usability.

In Bangladesh, Approximately 18.3 percent of Bangladeshis 15 years and older read newspapers regularly according to the National Media Survey 2021(Correspondent, n.d.). There are lot of newspaper applications in Bangladesh but some most popular newspaper applications such as Prothom Alo , The Daily Star etc. Meanwhile, according to Google Analytics, every month around 14 million (1 crore 40 lakh) readers visit the Prothom Alo online edition prothomalo.com. This online edition of Prothom Alo is the most popular Bangladeshi website. According to the US website tracking company Alexa, Prothom Alo is the No. 1 global Bangla website (Correspondent, n.d.).. The Daily Star established its place in the media scene of Bangladesh on January14,1991 as an independent newspaper. With The Daily Star Android app, you can read all the latest news on your smart phone 24 hours a day, 7 days a week, for free. This newspaper application is read by about 1000 users (The Daily Star - Bangladesh - Apps on Google Play, n.d.). The user experience of these newspaper applications isn't as good as it could be to attract readers.

News is increasingly being read online since the mid-1990s with the introduction of online newspapers. Newspapers have a long tradition of being designed in print, but today there is an increasing demand for knowledge about how to design usability news sites. Even withinside a closing couple of years, newspaper apps have taken precedence, with lots of us the use of our smartphones because of the handiest manner of getting access to trending and breaking information across the world, accounting for a big boom in energetic customers throughout all platforms.

The pervasive nature of the manner we get entry to information on smartphones has additionally supposed that the manner we get entry to it needs to be easy and elegant – with minimal disruption or obstacles to getting the facts we need while want it.

In previously a lot of work has been done in this field. Because of its importance in many areas, website usability analysis is gaining popularity. One of the first website usability analyzes can be found in Capel and Huang 9(2007), where the selection of websites (500 company websites) is analyzed under various aspects for quantitative and objective evaluations. Although these works have been able to analyze the presentation of the websites and the navigational problems, the overall state of the quality of the websites has not yet been fully assessed (Aspandi et al. ,2022)

1.2 MOTIVATION OF THE RESEARCH

The usability of any application is very important to develop a attractive application for users. The term usability testing refers to testing a product with representative users for its usability. It consists of participants completing typical tasks under the observation of observers watching, listening, and taking notes. The purpose of the study is to identify any problems with the product's usability, collect qualitative and quantitative data, and assess its satisfaction with the participant (How to & Tools | Usability.gov, n.d.). In Usability Evaluations, the focus is on how well a product can be used by users to achieve their goals. A user's satisfaction with a process is also considered. A variety of methods are used by practitioners to gather feedback about a current site or plans for a new one.

Usability testing gives a result to improve feature of any application. The goal of usability testing is to identify problems before they are coded by the design and development teams. Identifying and fixing problems as soon as possible will reduce both staff time and schedule impact, resulting in a more cost-effective fix (How to & Tools | Usability.gov, n.d.).

1.3 PROBLEM STATEMENT

Newspaper application is now become very much popular in worldwide. So this types of application should have better user experiment to gather more users. There are many types of usability testing methods used by researchers. Some of these methods include lab tests, remote usability tests, survey questionnaires, and many others. A user's feedback about the usability of an application is collected using each method. In Bangladesh, there are lot of newspaper applications .But most of the applications don't have better user interface to give better user experience to the readers. The aim of this thesis paper is to improve the user interfaces of newspaper applications. The SUS, UMUX, UMUX-LITE SUPR-Q, Trustdiff as well as other types of survey questionnaires, are some of the methods for collecting survey data. The two methods that I have been used these are UMUX and SUPR-Q .These two methods will give some possible results that can help developers develop attractive newspaper applications with fewer errors and greater efficiency. Increasing reader usability will help make the newspaper applications more useful to readers, while at the same time helping owners achieve their goals. Many newspaper applications exist in Bangladesh, but most do not offer a good user experience. So, this paper will help to improve user experiences to gather more reader of that applications in Bangladesh.

1.4 RESEARCH QUESTIONS

The research question was

- How newspaper applications can get more users ?
- What is the current state of newspaper applications in Bangladesh?

1.5 RESEARCH OBJECTIVE

The main objective of my paper is to visualize the usability of newspaper applications in Bangladesh using two questionnaire methods. Additionally, this study has other objectives:

- Evaluate the user interface of most popular newspaper applications in Bangladesh.
- Using the most common survey questionnaire methods.
- Data is being gathered from people of all ages.

1.6 RESEARCH SCOPE

Research's main scope is as follows:

- This research paper gives the developers best result to increase the user usability to their applications to gather more users in future.
- To learn about the current state of newspaper applications in Bangladesh and the future efficient of newspaper applications.

1.7 THESIS ORGANIZATION

In the first chapter, Newspaper application, Newspapers in the context of Bangladesh, the background behind the work, motivation of the research, problem statement, research questions, research objectives, research scope are discussed.

In the next chapter, I will discuss literature review where we can see some previous studies in the field of usability testing of newspaper applications. In chapter three, the methodology of this research will be covered. In this chapter, I will discuss data collection, data pre-processing, and analysis of Methodology. In chapter four, the results of the methodology will be discussed. In chapter five, the last chapter, I will give the conclusion. There will be a total summary of my work. Here I have discussed what work I will do in the future for this work.

CHAPTER 2

LITERATURE REVIW

2.1 INTRODUCTION

In a literature review, A researcher goes over previous work, research, conference papers, etc. Books, articles, and so on can be used to learn about previous work on the subject. summarize the entire topic, determine what is lacking in the work They can then analyze the results. To achieve better results, work on limitations and overcome them.

2.2 PREVIOUS LITERATURE

The majority of newspapers' websites were available for free to all viewers in 2006; very few claimed to have made money from them. Declining profit margins and declining circulation in daily newspapers compelled executives to consider new methods of generating revenue from websites that did not require a subscription. Bringing breaking news in real time became possible due to the advent of the internet, which opened up new opportunities for newspapers. Many in the newspaper industry believe that well-established newspapers' credibility and strong brand recognition, as well as their close relationships with advertisers, increase their chances of survival. The movement away from the printing process can also help decrease costs (Wikipedia Contributors, 2019). Many researchers works in that field to increase newspaper application usability. In my work I gather some information to improve users usability.

To Evaluation of the User Experience, Langer & Zeiller (2017) shows, for interactive infographics to be appealing and usable, a clear and straightforward structure, and easy-to-use navigation tools are crucial. The presented results are based on an analysis of a relatively small sample of two interactive infographics, as well as a small number of participants. A continuous study will look at a much larger number of infographics and people.

Re-Assessing the Usability Metric for User Experience (UMUX) Scale, Berkman & Karahoca (2016) proves that usability testing is influenced by factors other than the number of users, the test environment, user characteristics, and usability actions.As a result, when conducting usability testing, it is critical to consider the psychological factors of users.

A Comprehensive Measure of the Quality of the Website User Experience SUPR-Q , Sauro (2015) proved that SUPR-Q helps to understand how well a website scores relative to others in the database.

Benaida (2021) provides a solution by developing a unique set of attributes that can assist designers and users in determining the level of usability in websites. The number of participants in this study is insufficient to generalize the findings to a larger population in order to obtain a more reliable.

Aranyi & Schaik (2015) shows that quantitative UX data can be used to build impact-performance matrices, which can be used to identify design areas for improvement. But level of adoption and news site were not independently manipulated.

Raka et al.(2021) proves that Usability testing is influenced by factors other than the number of users, the test environment, user characteristics, and usability actions. As a result, when conducting usability testing, it is critical to consider the psychological factors of users.They used Stress Level Questionnaire and Measurement ,Usability Measurement and Result, Compare and Prove the Level of Stress on Usability methods in their work.

Freitas et al.(2022) analyzed that findings on inventions, current application fields, methods, and hardware and software used—as well as the advantages and disadvantages of combining virtual reality with traditional design reviews on flat screens or physical prototypes in usability testing. Participants had prior interactions with the systems being assessed, which influenced the evaluation of the system’s ease of use in the virtual environment.

Nugraha et al.(2022) analyzed MNA Line Today Indonesia's quality was determined using WebQual and IPA, indicating that the quality level of MNA Line Today Indonesia

does not correspond to the level of user interest. This study presents its limitations in the use of the WebQual attribute. For further research, it is hence imperative to identify more comprehensive MNA attributes.

Pavel (2021) analyzed that The widget's testing results, innovations, and fixes were presented, which should have a positive impact on the usability indicators.

Santiworarak & Choochaiwattana (2018) found that The important things that website designers and developers must consider are, first and foremost, having a clear entire navigation because it will help customers meet all of the store information that they require. This research paper study was limited only to B2C websites.

Hacek (2017) Shows Newswebsites have to be more interaction to student users .He used Online testing tools and platforms method in his work. He showed Newspaper sites should be more userfriendly to user .

Tidal (2016) provides that Based upon this usability test, responsive design may not necessarily equate with a singular experience across different devices. He used Guerrilla testing in his method.

2.3 CONCLUSION

There have many types of method used. They used SUS,SUPR-Q,UMUX, Heuristic evaluation, and many other techniques to achieve a good result. Forget about increased accuracy and real-time performance. In our work, we also attempted to improve the usability of the newspaper application.

CHAPTER 3

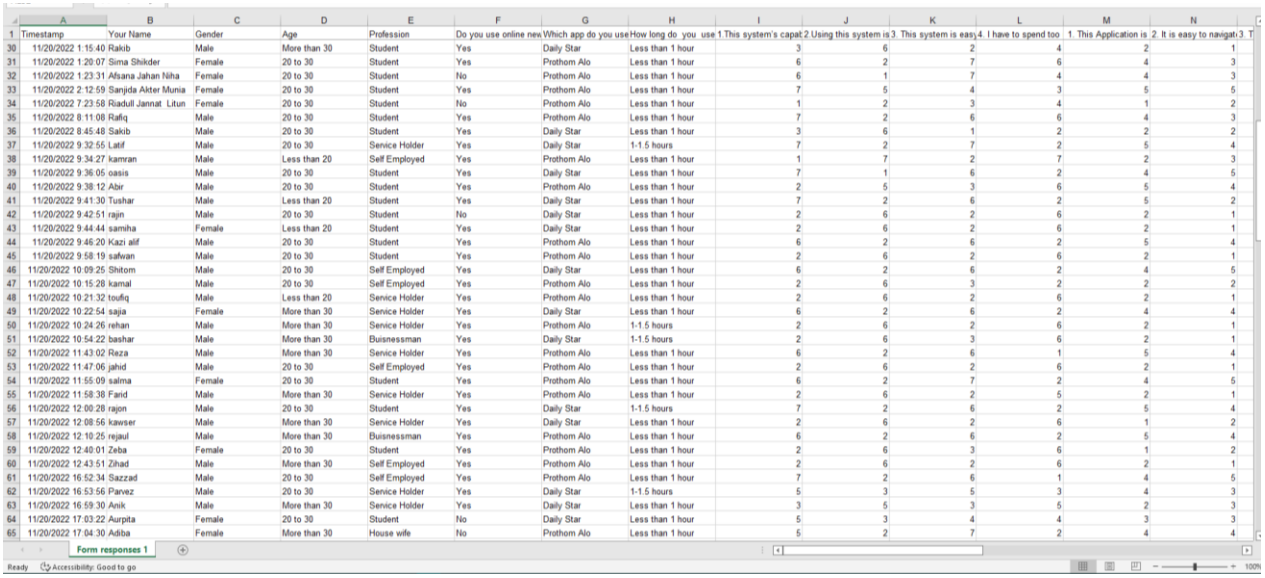
RESEARCH METHODOLGY

3.1 RESEARCH METHODOLOGY

I have applied Usability Metric for User Experience (UMUX) and Standardized User Experience Percentile Rank (SUPR-Q) questionnaire methods. I collect survey data from users using Google Forms.

3.2 DATA COLLECTION

This research is aimed to test the usability of newspaper applications in Bangladesh. For this research I selected Prothom Alo and Daily Star ,Which are most popular newspaper applications in Bangladesh. To begin, I created a Google form based on the UMUX and SUPR-Q questionnaires. Then I gave it to the user in order to collect data. A total of 150 people are participating in this survey. This survey is being completed by 150 people. After finishing the data collection, I entered it into an Excel spreadsheet (Figure 1).



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Timestamp	Your Name	Gender	Age	Profession	Do you use online new	Which app do you use	How long do you use	1.This system's capat	2.Using this system is	3. This system is easy	4. I have to spend too	1. This Application is	2. It is easy to navigat
30	11/20/2022 1:15:40	Rakib	Male	More than 30	Student	Yes	Daily Star	Less than 1 hour	3	6	2	4	2	1
31	11/20/2022 1:20:07	Sima Shikder	Female	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	6	2	7	6	4	3
32	11/20/2022 1:23:31	Afsana Jahan Niha	Female	20 to 30	Student	No	Prothom Alo	Less than 1 hour	6	1	7	4	4	3
33	11/20/2022 2:12:59	Sanjida Akter Munia	Female	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	7	5	4	3	5	5
34	11/20/2022 7:23:58	Riadull Jannat Litun	Female	20 to 30	Student	No	Prothom Alo	Less than 1 hour	1	2	3	4	1	2
35	11/20/2022 8:11:08	Rafiq	Male	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	7	2	6	6	4	3
36	11/20/2022 8:45:48	Sakib	Male	20 to 30	Student	Yes	Daily Star	Less than 1 hour	3	6	1	2	2	2
37	11/20/2022 9:32:55	Latif	Male	20 to 30	Service Holder	Yes	Daily Star	1-1.5 hours	7	2	7	2	5	4
38	11/20/2022 9:34:27	kamran	Male	Less than 20	Self Employed	Yes	Prothom Alo	Less than 1 hour	1	7	2	7	2	3
39	11/20/2022 9:36:05	oasis	Male	20 to 30	Student	Yes	Daily Star	Less than 1 hour	7	1	6	2	4	5
40	11/20/2022 9:38:12	Abir	Male	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	2	5	3	6	5	4
41	11/20/2022 9:41:30	Tushar	Male	Less than 20	Student	Yes	Daily Star	Less than 1 hour	7	2	6	2	5	2
42	11/20/2022 9:42:51	rajin	Male	20 to 30	Student	No	Daily Star	Less than 1 hour	2	6	2	6	2	1
43	11/20/2022 9:44:44	samiha	Female	Less than 20	Student	Yes	Daily Star	Less than 1 hour	2	6	2	6	2	1
44	11/20/2022 9:46:20	Kazi alif	Male	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	6	2	6	2	5	4
45	11/20/2022 9:58:19	safwan	Male	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	2	6	2	6	2	1
46	11/20/2022 10:09:25	Shitom	Male	20 to 30	Self Employed	Yes	Daily Star	Less than 1 hour	6	2	6	2	4	5
47	11/20/2022 10:15:28	kamal	Male	20 to 30	Self Employed	Yes	Prothom Alo	Less than 1 hour	2	6	3	2	2	2
48	11/20/2022 10:21:32	toufiq	Male	Less than 20	Service Holder	Yes	Prothom Alo	Less than 1 hour	2	6	2	6	2	1
49	11/20/2022 10:22:54	sajja	Female	More than 30	Service Holder	Yes	Daily Star	Less than 1 hour	6	2	6	2	4	4
50	11/20/2022 10:24:26	rehan	Male	More than 30	Service Holder	Yes	Prothom Alo	1-1.5 hours	2	6	2	6	2	1
51	11/20/2022 10:54:22	bashar	Male	More than 30	Buisnessman	Yes	Daily Star	1-1.5 hours	2	6	3	6	2	1
52	11/20/2022 11:43:02	Reza	Male	More than 30	Service Holder	Yes	Prothom Alo	Less than 1 hour	6	2	6	1	5	4
53	11/20/2022 11:47:06	jahid	Male	20 to 30	Self Employed	Yes	Prothom Alo	Less than 1 hour	2	6	2	6	2	1
54	11/20/2022 11:55:09	salma	Female	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	6	2	7	2	4	5
55	11/20/2022 11:58:38	Farid	Male	More than 30	Service Holder	Yes	Prothom Alo	Less than 1 hour	2	6	2	5	2	1
56	11/20/2022 12:00:28	rajon	Male	20 to 30	Student	Yes	Daily Star	1-1.5 hours	7	2	6	2	5	4
57	11/20/2022 12:08:56	kawser	Male	More than 30	Service Holder	Yes	Daily Star	Less than 1 hour	2	6	2	6	1	2
58	11/20/2022 12:10:25	rejaul	Male	More than 30	Buisnessman	Yes	Prothom Alo	Less than 1 hour	6	2	6	2	5	4
59	11/20/2022 12:40:01	Zeba	Female	20 to 30	Student	Yes	Prothom Alo	Less than 1 hour	2	6	3	6	1	2
60	11/20/2022 12:43:51	Zihad	Male	More than 30	Self Employed	Yes	Prothom Alo	Less than 1 hour	2	6	2	6	2	1
61	11/20/2022 16:52:34	Sazzad	Male	20 to 30	Self Employed	Yes	Prothom Alo	Less than 1 hour	7	2	6	1	4	5
62	11/20/2022 16:53:56	Parvez	Male	20 to 30	Service Holder	Yes	Daily Star	1-1.5 hours	5	3	5	3	4	3
63	11/20/2022 16:59:30	Anik	Male	More than 30	Service Holder	Yes	Daily Star	Less than 1 hour	3	5	3	5	2	3
64	11/20/2022 17:03:22	Aurpita	Female	20 to 30	Student	No	Daily Star	Less than 1 hour	5	3	4	4	3	3
65	11/20/2022 17:04:30	Adiba	Female	More than 30	House wife	No	Prothom Alo	Less than 1 hour	5	2	7	2	4	4

Form responses 1

Ready Accessibility: Good to go

Figure 1: Raw Data

3.2.1 AGE OF PARTICIPANTS

In this survey, My data collection included people of all ages. The people in this data set are mostly between the ages of 20 and 30.These individuals total 113, which is a large number for their age. The people over the age of 30 were then occupied. This age group had 23 people, or 15.2% of the total, while the last age group, which was less than 30, had 15 people, or 9.9%.This indicates that people of all ages now use newspaper applications in Bangladesh. This suggests that people of all ages are now using newspaper apps in Bangladesh. For the above data, a pie diagram is shown (Figure 2).

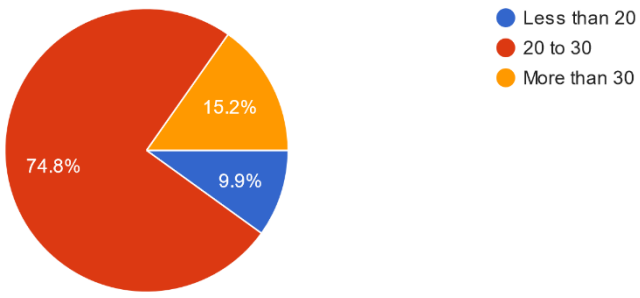


Figure 2: Age

3.2.2 GENDER OF PARTICIPANTS

In this survey, Males make up the vast majority of participants. Males make up 55.6% of the participants and Female make up 44.4% of the participants. For the above data, a pie diagram is shown in figure 3

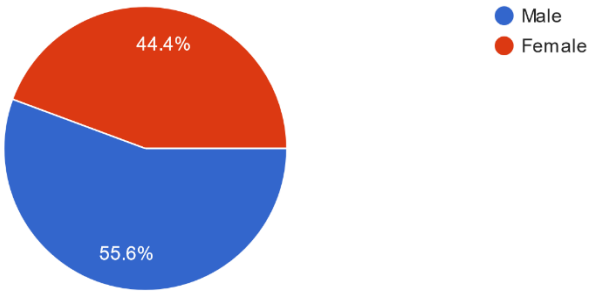


Figure 3: Gender

3.2.3 PARTICIPANTS PROFESSION

This survey covers five different professions. These people include students, self-employed people, service members, business owners, and housewives. The majority of survey respondents are students. There are 77 students, or 51% of the total. The survey then moves on to the self-employed group. This occupation employs 31 people, accounting for 20.5% of the labor force. Then there are those who work in the service sector. This occupation employs 29 people, accounting for 19.2% of the workforce. There are 13 businessmen (or 8.6% of the population), but only 1 housewife. For the above data, a pie diagram is shown in figure 4.

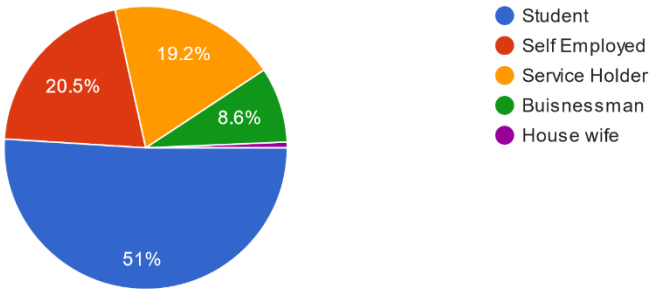


Figure 4: Occupation

3.2.4 APPLICATION USAGE

I chose the two most popular applications, Prothom Alo and Daily Star, for this survey. The majority of people in Bangladesh use these applications to read the daily news. In the survey, 81 people used the Prothom Alo newspaper app to read the news, while 70 used the Daily Star newspaper app. For the above data, a pie diagram is shown in figure 5.

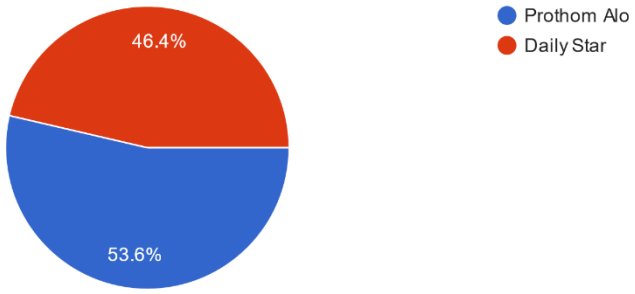


Figure 5: Application Usage

3.3 DATA PREPROECESSING

After collecting data from survey, I organized the data of 150 participants in Microsoft excel and completed the observation. This is a step where I prepare data to evaluate the usability of these two applications. I evaluate the usability of these two applications using two questionnaire method. Then I created two separate Microsoft Excel files for these two applications, each with two methods. For my work, I relied on specialized statistical software. SPSS was the name of the specialized statistical software. This software produces accurate dataset results for me. I imported the Excel file containing my datasets into this software. Then, using this SPSS software, I calculate the mean value, standard mean value, and score of method.

3.4 STATISTICAL SOFTWARE

A statistical software program is a specialized program that is designed to perform complex statistical analysis. They are the tools that aid in the organization, interpretation, and presentation of specific data sets in order to provide scientific insights into patterns and trends. Statistical software implements statistical analysis theorems and methodologies such as regression analysis and time series analysis to perform data sciences (*Shrestha, 2022*). The best statistical software is the Statistical Package for the Social Sciences (SPSS).

SPSS is the most widely used and powerful software for analyzing complex statistical data. It quickly compiles descriptive statistics, parametric and non-parametric analysis, and generates graphs and presentation-ready reports to help you communicate the findings. Estimation and the discovery of missing values in data sets result in more accurate reports. SPSS is used to analyze quantitative data (*Shrestha, 2022*). It was first introduced in 1968. Since its acquisition by IBM in 2009, SPSS has been officially renamed IBM SPSS Statistics, but most users still refer to it as SPSS (*SPSS - Quick Overview & Beginners Introduction*, n.d.). SPSS is a program for editing and analyzing data. These data can come from almost any source, including scientific research, a customer database, Google Analytics, or even a website's server log files. A variable view sheet is always present in an SPSS data file. It displays the metadata that is associated with the data. Metadata is data that describes the meaning of variables and data values. This is commonly referred to as the "codebook," but in SPSS it is referred to as the dictionary.

Statistical software programs such as SPSS are currently among the best available. Frequently, survey-based research relies on SPSS because of its ease of use in managing complex data. Data analysis for my survey research was performed using SPSS.

3.5 USABILITY METRIC FOR USER EXPERIENCE (UMUX)

In this survey, I used Usability Metric for User Experience (UMUX) questionnaire. UMUX is the best questionnaire method for usability testing. UMUX is a concise qualitative assessment designed to assess a system's overall usability. The UMUX

questionnaire was constructed in 2010 at Intel by Kraig Finstad and his colleagues as a shorter alternative to the 10-item SUS questionnaire. It was also intended to address the International Organization for Standardization's (ISO) new definition of usability. Unlike SUS, which evaluates perceived usability and learnability, UMUX evaluates usability by evaluating effectiveness, efficiency, and satisfaction (UMUX (Usability Metric for User Experience), 2020).

3.5.1 PROCEDURE

150 Participants in this method are asked to answer four questions, each one with seven response options. That are shown in Figure 6.

The Usability Metric for User Experience

1	This system's capabilities meet my requirements.
2	Using this system is a frustrating experience.
3	This system is easy to use.
4	I have to spend too much time correcting things with this system.

Figure 6: UMUX Questions

The UMUX score is calculated using a formula in this method. The formula is given below:

$$\frac{((Q1-1)+(7-Q2)+(Q3-1)+(7-Q4))*100}{24}$$

In this formula, Q1-Q4 represent the responses of the participants to these four questions.

By completing an online survey, participants participated for the study. The survey items in the Google form were all UMUX questionnaire. After getting data I calculated the UMUX score for these two applications in that formula. Odd items are assigned a score of [user score - 1]. Even items are assigned a score of [7 - user score]. Then I added up

these differences and divide the sum by 24 (the highest possible score).After that I Divided quotient by 100. At last I calculated the average of results across all users.

App 1	App 2
Umux Score = 5737.5/150 = 38.25	Umux Score = 5845.83/150 = 38.97

Table 1: UMUX SCORE FOR ALL APPLICATIONS

Then, I calculated, the mean value and also standard deviation value for each four questions.

App 1		App 2	
Mean value	Standard Deviation value	Mean value	Standard Deviation value
3.44	2.32	3.45	2.32
4.69	2.11	4.86	2.12
3.45	2.29	3.56	2.28
4.85	2.13	4.80	2.19

Table 2: UMUX SCORE CHART FOR ALL QUESTIONS

The UMUX Questionnaire is the proper length. Participants can entire a short survey for its quality questions to give proper usability test result. I used this method in my survey because of that.

3.6 STANDARDIZED USER EXPERIENCE PERCENTILE RANK QUESTIONNAIRE (SUPR-Q)

SUPR-Q is a validated method for assessing the overall user experience of a website or application. It consists of eight questions divided into four categories: usability, trust/credibility, loyalty, and appearance. NPS is used to measure loyalty in part. Jeff Sauro of measuringU created the SUPR-Q in 2015 (SUPR-Q: Standardized User Experience Percentile Rank Questionnaire, 2021).

The SUPR-Q (Standardized User Experience Percentile Rank Questionnaire) is a set of eight standardized questions that assess users' perceptions of various aspects of a website, including usability, trust and credibility, appearance, and loyalty. The SUPR-Q is scored in two ways. The first is a raw score on a scale of 1-5, with 5 being the highest, averaged across all four categories. The second is a percentile rank score, which can tell you how site compares to hundreds of other websites in the SUPR-Q database. The SUPR-Q also includes a Net Promoter Score (NPS) calculation. The NPS is a separate score that many businesses use to determine whether a user is likely to recommend a website or service. Although the official NPS is calculated differently, you can use the SUPR-Q data to calculate NPS (Cunningham, 2020).

Because it is so widely used in the industry, the SUPR-Q is a reliable indicator of a website's perceived quality. This also means that you can use SUPR-Q results to compare website to hundreds of other sites on the internet, not just own. It is also critical to understand that the SUPR-Q is not intended to diagnose problems, as the simple questionnaire is insufficient to tell you what to fix and why. To determine the why and how of a particular problem, should always rely on more in-depth discovery research, contextual inquiries, and ethnographic studies. This is why we recommend using the SUPR-Q as a benchmarking measure to determine the impact of a design (or redesign).

3.6.1 PROCEDURE

A survey questionnaire is used in this testing method. 150 Participants were asked to answer 8 questions, each with five response options, at the start of the survey. These 10 questions are shown in Figure 7:

CATEGORY	QUESTION	SCORE
Usability	Q1: The website is Easy to use	1-5
	Q2: It is easy to navigate within the website.	1-5
Credibility	Q3. I feel comfortable purchasing from the website.	1-5
	Q4. I feel confident conducting business on the website	1-5
Loyalty	Q5. How likely are you to recommend this website to a friend or colleague?	1-5
	Q6. I will likely return to the website in the future.	1-5
Appearance	Q7. I find the website to be attractive.	1-5
	Q8. The website has a clean and simple presentation.	1-10

Figure 7: SUPR-Q Questions

Participants respond based on their own experiences. After collecting data from users, the usability of an application is evaluated by analyzing that data. The SUPR-Q score is commonly used to evaluate applications. This score is calculated using a formula given below:

$$\text{Raw SUPR-Q Score} = \frac{Q1+Q2+Q3+Q4+Q5+Q6+Q7+(1/2*Q8)}{8}$$

The SUPR-first Q's seven questions are scored on a 5-point Likert scale ranging from Strongly Disagree to Strongly Agree. The standard NPS question "How likely are you to

recommend...?" is scored from 0 to 10. Average scores for each category to get the raw component scores. Before calculating the average for the loyalty category, divide NPS score by 2 to convert it to the same Likert scale. Simply take the average of the component scores to get raw SUPR-Q score.

App 1	App 2
SUPR-Q Raw Score = 382.68/150 = 2.55	SUPR-Q Raw Score = 393.43/150 = 2.62

Table 3: SUPR-Q SCORE FOR ALL APPLICATIONS

Then, I calculated, the mean value and also standard deviation value for each 8 questions in 4 category . By using the means and standard deviations, we can calculate the SUPR-Q score and the subscale scores.

App 1		App 2	
Mean value	Standard Deviation value	Mean value	Standard Deviation value
2.56	1.54	2.58	1.57
2.71	1.30	2.81	1.31
2.66	1.41	2.73	1.48
2.79	1.30	2.88	1.34
2.72	1.44	2.77	1.47
2.87	1.30	2.83	1.29
2.63	1.45	2.93	1.42
2.95	1.29	2.71	1.46

Table 4: SUPR-Q SCORE CHART FOR ALL QUESTIONS

SUPR-Q is the most basic and widely used questionnaire method for assessing a system's usability. That is why I chose SUPR-Q for this study.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

That section describes the outcomes of the usability testing. Following the data collection and preprocessing sections, I described the methods I used for usability testing. There, I'll discuss the outcomes of the usability testing that resulted from these methods.

4.2 RESULT DISCUSSION

In analyzing the dataset, I calculated UMUX and SUPR-Q scores to determine the usability of these two applications for users.

4.2.1 UMUX Result:

A total 150 participants was asked to provide their feedback of those two applications, Prothom Alo (App 1) and Daily Star (App 2) though a google survey form in online. In that survey, 150 participants were given their feedback based on UMUX questionnaire.

In order to calculate app ratings, we can use the UMUX score. Table 1 shows the rating variation for various UMUX scores. I explicitly state that the average UMUX score for all of applications is 38.25 and 35.97 which declared very poor range.

Score Range	Grade	Percentile
84.1-100	A+	96-100
80.8-84.0	A	90-95
78.9-80.7	A-	85-89
77.2-78.8	B+	80-84
74.1-77.1	B	70-79
72.6-74.0	B-	65-69
71.1-72.5	C+	60-64
65.0-71.0	C	41-59
62.7-64.9	C-	35-40
51.7-62.6	D	15-34
0.0-51.6	F	0-14

Table 5: The Sauro/Lewis Curved Grading Scale

According to Table 5, App 1 and App 2 both received a very low grade of an F. So these two applications have to improve their usability. In Table 2 , I have shown Standard deviation value for these two applications. For App 1, the lowest score is 2.11 and highest score is 2.32 which are represented by two UMUX questions, 2 and 1, respectively. These low and high value represent some negative sign for App 1. Due to App 1's low effectiveness, it is necessary to develop methods to make App 1 more effective. For App 2, the lowest score is 2.12 and highest score is 2.32 that values also represent negative sign for this app. So that I see both application have low users satisfiction. Both these application have improve their user satisfaction and also usability to get more users in these applications.

4.2.2 SUPR-Q Result

A total of 151 people responded to the survey here, as well as in UMUX provide their feedback of those two applications, Prothom Alo (App 1) and Daily Star (App 2) though a google survey form in online. In that survey, 150 participants were given their feedback

based on SUPR-Q questionnaire. A total of 151 people responded to the survey here, as well as in SUPR-Q. represent some negative sign for app2.

After getting data , I calculated the SUPR-Q score that shows in Table 3. I explicitly state that the average UMUX score for all of applications is 2.55 and 2.62 which declared very poor range at the scale of 5. These SUPR-Q score is so poor so that these two applications have to improve more user experience because this SUPR-Q measures user experience of any application.

CHAPTER 5

CONCLUSION AND LIMITATIONS

The usability of newspaper applications was conducted in this study. Newspaper applications have to be more effectiveness to the readers . To increase effectiveness ,these applications have to developed a better user experience for readers. In Bangladesh newspaper applications don't have better user experience that result have shown in this research. Nowadays, many people use online newspaper applications, so more people are interested in those types of applications. If developers improve the user experience of those applications, they can connect more people in Bangladesh to the digital world.In my research, I evaluate the present two newspaper applications in Bangladesh and get a usability results of these applications using two methods. These two methods are UMUX and SUPR-Q. In my research, there were 150 participants share their thoughts using these applications. The result of this research will be more effective to the developers to improve newspaper applications in Bangladesh. The usability of mobile applications can also be benchmarked using this research , which is a crucial first step in determining what functions well and what needs to be improved in the rapidly expanding market for newspaper mobile applications.

Limitaions: This study was completed by UMUX and SUPR-Q, but it could have also been completed by SUS or another usability testing method. For this study, I worked with only 150 people's data, but I intend to collect more data in future.

References:

1. Benaida, M. (2022). Significance of culture toward the usability of web design and its relationship with satisfaction. *Universal Access in the Information Society*, *21*(3), 625–638.
2. Correspondent, S. (n.d.). *Prothom Alo at the top with 5 million readers*. Prothomalo. Retrieved November 16,2022, from https://en.prothomalo.com/bangladesh/prothom-alo-at-the-top-with-5-million-readers
3. Google. (n.d.). *The daily star - bangladesh - apps on Google Play*. Google. Retrieved November16,2022,from https://play.google.com/store/apps/details?id=com.mcc.thedailystar&hl=en&gl=US&pli=1
4. Affairs,A.S. for P. (2013,November 13). Usability testing. Usability.gov.Retrieved November16,2022,from https://www.usability.gov/how-to andtools/methods/usability-testing.html
5. Aspandi, d., Doosdal, S., Ulger, V., Gillich, L., & Staab, S. (2022). User Interaction Analysis through Contrasting Websites Experience. *arXiv:2201.03638* [cs.HC].
6. Online newspaper - Wikipedia. (2017, November 12). Online Newspaper - Wikipedia. Retrieved November 18, 2022, from https://en.wikipedia.org/wiki/Online_newspaper
7. Langer, J., & Zeiller, M. (2017). Evaluation of the user experience of interactive infographics in online newspapers. In *CEUR Workshop Proceedings (Vol. 2009, pp. 97–106). CEUR-WS.*
8. Ilker, M., Msc, B., & Karahoca, D. (2016). Re-Assessing the Usability Metric for User Experience (UMUX) Scale. *Journal of Usability Studies, 11(3), 89–109.* Retrieved from http://www.upassoc.org.
9. Sauro, J. (2015). SUPR-Q: A Comprehensive Measure of the Quality of the Website User Experience. *Journal of Usability Studies, 10(2), 68–86*. Retrieved from http://www.upassoc.org.

10. Aranyi, G., & Van Schaik, P. (2016). Testing a model of user-experience with news websites. *Journal of the Association for Information Science and Technology*, *67*(7), 1555-1575.
11. Raka, S. J., & Setyohadi, D. B. (2021). Measuring user satisfaction in website usability by considering stress level. *International Journal on Informatics Visualization*, *5*(3), 333–339. https://doi.org/10.30630/joiv.5.3.512
12. de Freitas, F. V., Gomes, M. V. M., & Winkler, I. (2022, February 1). Benefits and Challenges of Virtual-Reality-Based Industrial Usability Testing and Design Reviews: A Patents Landscape and Literature Review. *Applied Sciences (Switzerland)*. MDPI.
13. Nugraha, A., Kuswantoro, I. G., & Utama, D. M. (2022). Mobile news applications quality analysis using web quality and importance performance analysis. In *AIP Conference Proceedings* (Vol. 2453). American Institute of Physics Inc.
14. Tkachenko, P. (2021). Analysis of user interfaces usability assessment methods in software development.
15. Santiworarak, L., & Choochaiwattana, W. (2018). A Case Study of Usability Design Principle in Responsive e-Commerce Web Application. International Journal of E-Education, e-Business, e-Management and e-Learning, 8(3), 139–144.
16. Hacek, J. (2017). The correlation of usability, familiarity, satisfaction and reputation with the loyalty of student users of news websites. Medijske Studije, 8(15), 56–71.
17. Tidal, J. (2017). One site to rule them all, redux: The second round of usability testing of a responsively designed web site. Journal of Web Librarianship, 11(1), 16-34

