

Usability Testing of Tourism Apps In Bangladesh

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Abstract— Nowadays, in the era of modern technology vast number of users using Smartphone and use necessary applications while there is no doubt that tourism app are installed their phone as well. Tourism app has given guideline which is useful at stages of tourist's activity. For consumer's objective is to confirm relevant information about tourism which satisfied users also to ensure quality of app, lacking of particular part and give suggestion what should be taken in future that conducted by SUS method. Therefore in this study accomplished by SUS and illustrates the trouble of those tourism app that should be updated. Some tourism and travel applications get high rating of application scale in spite of huge lacking. Those identified tourism app's usability tested and reported those apps doesn't fulfill SUS standard score and that is why given suggestion where should be improved. This study aims to identify how these apps become top rated apps without good usability feedback. Researchers will get to know about the lacking of tourism app which identified by using SUS and possible way should be taken by new researchers in relevant field.

Index Terms— Information technology, Mobile apps, Tourism, usability testing, SUS.

1 INTRODUCTION

In the revolution of information communication and modern technology traveler makes a plan to travel where to get travel-related information via the tourism application during their trips [26] [27] [28]. Mobile tourism is one of the emerging trends in the field of tourism using Smartphone devices as electronic guides. From Bangladesh's perspective, tourists are growing rapidly also around 6 hundred thousand tourists come from abroad to visit where a huge number of travelers use tourism apps that related to rail, air and car service [6] [29]. Those application provides a lot of services like route planning, accommodation booking, ticket booking, travel guide with audio and video guideline. Usability is mostly outlined that a system or service can be used by particular users to gain appointed goals with effectiveness, efficiency and satisfaction. Usability testing mainly related to response that how much cheap, early, easy and fast when user's search's for test. Usability measured by task completion times which engage to user interface efficiency [15] [18] [30] [32]. These term is much broader to be said users are how much easily become familiar with application, spontaneously accessible and pleasant to use, able to move on through softly completion task during the first appeared with the system [16] [17]. Where users are grown up there should be concern about usability issue so in this research, we have investigated and compared of some tourism and travel mobile applications usability by using SUS calculation also aim of this research is to find out the best or worst features about app and to test the usability of those apps so that we can provide a guideline for future apps enhancement in the perspective of Bangladesh [12] [13] [14]. Rest of this paper discussed in first section literature review, questionnaire design in second section, thirdly data collection procedure & data preprocessing, data analysis are done in fourth section and lastly speculated result and discussion part.

2 LITERATURE REVIEW

Nowadays mobile apps play an important role in commercially as well as in personal life. There is no exception for the travel and tourism industry. By using Mobile applications tourists get travelling guide that can make use of information about the user's location, schedule and personal proneness to provide individualized entreaty [3] [5] [6] [7]. Tourists and travel application could be a proper solution to the problem of demonstrating actuality and navigating on smart phone devices [8] [9] [10]. Undoubtedly it allows travelers to get proper guidelines that are very helpful with their instant and immediate situation or needs [11]. In modern era, mobile devices have a lot of unique characteristics that make their use as tourism and travel apps especially fascinating such as omnipresence and scope [1] [2]. By employing mobile tourism apps users may receive and access exact information and proper service to their destination [31]. While number of users are increasing then easily realized that the internet has been one of the capable factors in tourism sector that really change traveler's behavior [19] [20] [24]. In tourism's sector the use of mobile devices are not a new idea at all. Materially audio & video guideline is using nowadays [27] [25]. In Bangladesh perspective there is few work done about usability where no one contributed in tourism and travel apps usability part. One research paper found which worked about usability of ERP software system [21].

3 METHODOLOGY

3.1 Variables of usability

In this paper included some variables according to usability those are effectiveness, learn ability, memorability, efficiency and satisfaction also have additional one that is errors. Sometimes usability is narrated as a characteristic appraisal quality which stands of various components. Mainly, Effectiveness is with satisfying and how much accuracy user can complete their objectives when they browse application [22] [23]. Efficiency measured in the time of task completing how many process spent and how perform. Satisfaction means the level of pleasure and friendliness behavior of the apps to the users. Easiness level of learning of the software product that called learn ability. In website visiting time how user easily remembers after a factual time that is memorability.

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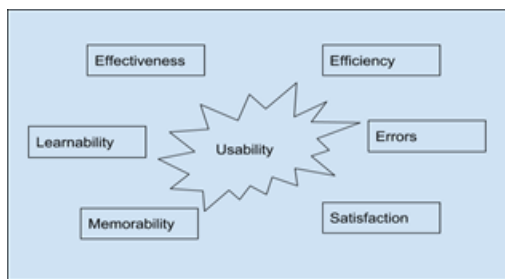


Fig. 1 Usability variables for tourism applications [22]

3.2 EXPERIMENTAL DESIGN

Quantitative research is elucidated as a methodical examination of incident in gathering numerical data and performing computational [2][3]. This research collects data from subsist and potential customers and it's performed by survey, create polls and questionnaires etc. These research results illustrated by numerical form. At the same time after realizing numerical value future of services can be predicted and changed consequently. So In this research mathematical frameworks are used by researchers and statisticians. Quantitative researches are classified by survey research and co relational research, experimental research and causal comparative research. By using survey form with SUS questionnaire taken from users feedback which submitted in survey app.

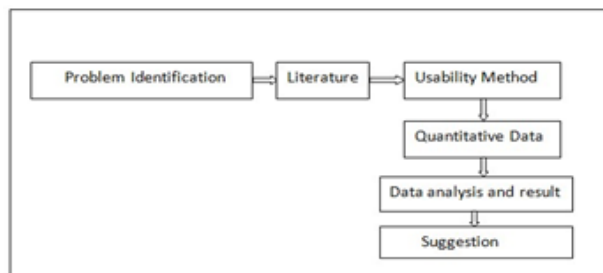


Fig. 2 Experimental Process Model [21]

3.3 SURVEY METHOD

With the cleansed candidate responses on the 5 point likert scale (1=strongly disagree to 5=strongly agree) the survey was directed which was included SUS questionnaire [5][6][7][23]. In this research, survey method has been used with a convenience sample of four ages ranges participant (ages <20, 20- 25, 25-30, 30<). Each participant worked through the survey according to instruction that made by us where each session has been taken up approximately 20 minutes for every user. They have downloaded those apps (Tour day bd1, My tour bd2 , Bangladesh Tourism Corporation3, Tour Bangladesh4, Bangladesh Travel Guide5) from google play store (<https://play.google.com/store>). In spite

¹<https://play.google.com/store/apps/details?id=com.tourtoday.bd>

²<https://play.google.com/store/apps/details?id=com.mytourbd.app>

³<https://play.google.com/store/apps/details?id=com.mcc.tourisminformation>

⁴<https://play.google.com/store/apps/details?id=com.tos.tourism>

⁵<https://play.google.com/store/apps/details?id=travel.Sohan>

of explaining about those apps by experimenter, users were unable to compare their experience among those. By using survey app users recruited for completing survey in different times with different groups. The sample size of the survey is 100. Figure 5 shows the four age groups of the sample. They submitted their answers independently. Age group are respectively with percent 25-30(6.0%), 20-25(85.0%), 20> (8.0%), 30> (1%).

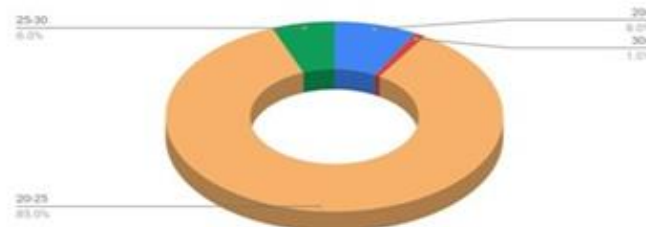


Fig. 3 Age ratio

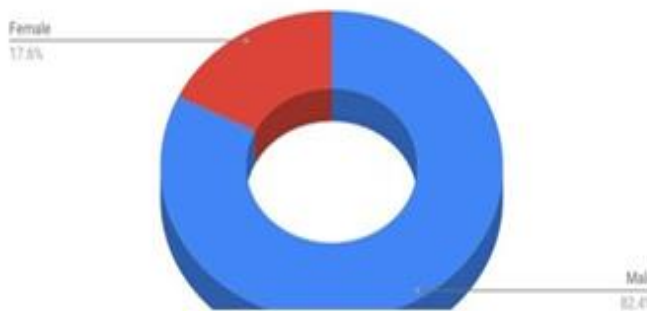


Fig. 4 Gender ratio

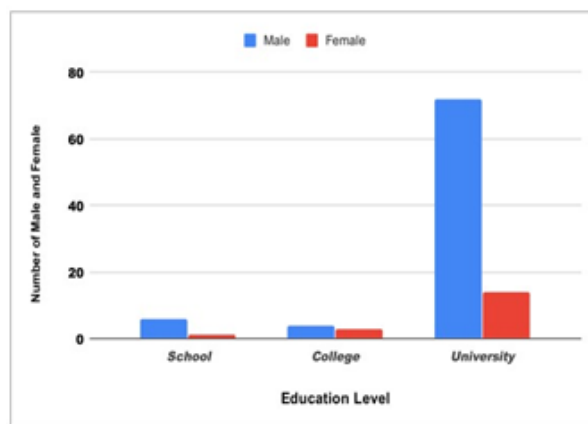


Fig. 5 Education Level Ratio vs. Gender

Figure 5 represents the gender wise sample of different education level where university students are 72.0% and 14.0%, school students are 6.0% and 1.0%, and college students are 4.0% and 3.0% male and female respectively.

3.4 QUESTIONNAIRE DESIGN

With the structured questionnaire data was collected where the questionnaire consisted of two parts: The first part focused on demographic questions like age, gender, and experience of using tourism application. The second part focused on measurement items based on satisfaction and revisit intention.

The SUS survey included requests for demographic information from users: their age, their education level, their gender by using the survey application. The survey then provided the following 10 standard statements with 5 response options (5-point Likert scales with anchors for strongly agree and strongly disagree) [5][6]. Table 2 shows the 10 different questions used in our research.

TABLE 1
OVERALL SYSTEM USABILITY SCALE (SUS) SCORE CHART FOR ALL QUESTIONS

App 1		App 2		App 3		App 4		App 5	
Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation
.81	0.98	2.26	1.14	1.86	.80	3.75	0.69	1.87	1.18
.23	0.97	3.89	0.97	4.15	.93	2.17	0.93	4.11	.87
.76	0.84	2.16	1.04	1.89	.67	2.12	1.84	1.87	.87
.01	0.89	3.55	1.62	2.57	1.38	2.15	0.80	2.82	1.33
.15	1.28	1.91	0.89	1.39	.68	3.43	1.05	1.54	.77
.89	1.10	3.9	0.83	3.98	.91	2.73	0.91	4.16	.93
.68	1.009	2.6	0.84	2.36	.95	3.72	0.98	2.33	.95
.66	1.21	3.72	1.05	4.02	1.20	2.41	0.94	3.9	.97
.42	1.01	2.09	0.90	1.90	1.28	3.20	1.61	1.91	.78
.23	0.90	2.45	0.83	2.28	.97	2.22	0.74	2.5	.83

TABLE 2
SUS CALCULATIONS FOR ALL APPS

App 1	App 2	App 3	App 4	App 5
$SUS\ Score = \frac{6452.5}{100} = 64.52$	$SUS\ Score = \frac{3600}{100} = 36.00$	$SUS\ Score = \frac{3160}{100} = 31.60$	$SUS\ Score = \frac{6530}{100} = 65.30$	$SUS\ Score = \frac{3170}{100} = 31.70$

3.5 DATA COLLECTION PROCEDURE

A total of 100 participants completed the survey. Participants were located throughout Bangladesh. Initial data were collected in September 2018. Participants were asked to identify their favorite tourism mobile app and answered 10 questions in one app for 5 different apps by used survey apps. Participants accomplish their survey for each item using a 5-point likert scale (strongly disagree = 1 to strongly agree = 5)[4][5].

3.6 DATA ANALYSIS

After collecting the data from the survey participants, we preprocessed the data using the System Usability Scale [5]. This scale was originally developed by John Brooke in 1986, over the last 31 years it has become an indispensable method to quickly and accurately determine how a website’s user experience can be compared to industry standards. For analyzing data, the “SUS” is used. It is a 10 questions likert Scale where - each question rated from 1 to 5 to gauge a user’s feelings on different things [4] [5]. We can assess each answer on its own, like a traditional survey. After calculating a user’s answers, the scale set up a score. Actually that delivers us a good understanding of how applications examines to an

average across the industries. At first need to be calculated system usability scale (SUS) for each of the respondents. The following steps need to be considered for calculating SUS score. In the first step for each of the 10 questions have to convert the scale into number. According to SUS questionnaire defined the scale values as: 1=strongly disagree,2=disagree,3=neutral,4=agree,5=strongly agree. Secondly Calculation is done.

Here, X =All odd numbered question summations – 5. Y = 25 – All even numbered question summations. After calculating X and Y then by following equation of SUS Score= (X + Y) x 2.5.Where odd numbered questions are represented positive response at the same time even numbered questions are represented negative response from the user. According to user’s response survey form will be filled up. By subtracting 5 from summation of all odd numbered questions after that 25 has been subtracted from summation of all even numbered questions. Finally those variables will be multiplied by 2.5.In the third step system usability scale score illustrates usability performance in the aspect of predefined usability variables. The general guidelines of SUS score is shown in Table 2. Greater than 80.3 means Excellent and respectively range of 68-80.3 means good, 68 means okay,51-68 represents poor where less than 51 means awful.

4 RESULTS AND DISCUSSION:

Each participant was asked to submit their opinion of those five apps through survey mobile application which was developed by us. Some Participants had to leave early, and therefore could attempt to submit all questions. Only 100 users among 180 users submitted their opinion (ten questions for each travel and tourism app of the five applications) successfully and independently. Using the SUS score we can define the app rating. Table 8 represents the rating variation for different SUS scores. We clearly state that our all application’s mean SUS score respectively 64.31, 35.75, 32.36, 65.04, and 30.94. Here application 1 and application 4 achieved 51-68 range which declared poor range and other 3 application achieved <51 range which declared awful. For App 1, we found 2 lowest standard deviation score (0.84, 0.89) which are represented 2 SUS questions respectively 3 and 4. These both SUS questions recommend the poor efficiency of app 1 there for it should be developed to increase the efficiency for app 1. For App 2, we found two values as one is too high and another is too low, both 2 values represent some negative sign for app2. First value is for question no. 4 where it represents that this app is not so efficient and another one is question no 6 which represents that app is not user satisfactory, so these two points should be developed for increasing the efficiency and satisfaction level to the user. By analyzing the standard deviation values of app 3, we can see that a totally less quality app, as this app could not fulfill 5 usability standard scale where all positive values are so poor and all negative values are high. Therefore it should be developed considering a standard structure. In the case of app 4, we can see the standard deviation value for 1st SUS question is too poor, thus it breaks the effectiveness of users. The satisfaction level of this app is so good, so developers should be increase the effectiveness part to make a strong support from user satisfaction using this app. And finally for app 5, we can see that negatives questionnaires have low values where positive values are high. If this distinction can be

removed then it will be the best app in the marketplace. By analyzing all standard deviation values of these five apps we can noticed that those all apps are so poor in the rating score. For developing a good and well standard app, developers should be concerned about 5 components of usability and those are effectiveness, efficiency, satisfaction, learn ability, memorability.

TABLE 3
STANDARD TABLE FOR SUS SCORE [5]

SUS Score	Grade	Adjective Rating
>80.3	A	Excellent
68-80.3	B	Good
68	C	Okay
51-68	D	Poor
<51	F	Awful

Table 3 illustrates the overall SUS calculation results of 5 different apps with height SUS Score and Lowest SUS Score. Here mean SUS score is calculated using this equation $(X+Y)*2[5]$.

TABLE 4
SUS SCORE FOR ALL APPLICATIONS

Applications	Highest SUS Score	Lowest SUS Score	Mean SUS Score	Grade
Application 1	95	30	64.52	D
Application 2	72.5	10	36.00	F
Application 3	75	7.5	31.60	F
Application 4	90	30	65.30	D
Application 5	82.5	2.5	31.70	F

5 CONCLUSION AND LIMITATION

This study investigated the usability of tourism and travel mobile applications. The study was performed by running a usability test with users on tourism and travel mobile applications which was directed by using SUS. In this paper identified items that described the quality of the mobile applications' usability in terms of SUS score. From mean SUS score of those five apps it can easily detect which app is better and what the lacking of apps. This score can also be used to benchmark the usability of mobile applications which is an essential step in understanding what works and what needs to be improved in the rapidly growing mobile app market. Although this study accomplished by SUS but it also could be using by SUMI or other usability testing technique. Following this study future study could be done UX testing [8].

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