Tallinn University

School of Digital Technologies

Human-Computer Interaction

CROWDSOURCING RISK OR THREAT ASSESSMENT FOR TOURISM

Master Thesis

Author: Abdullah Al Noman

Supervisors: Sonia Sousa, PhD

David Lamas, PhD

Author: …………………………………………..Date: ……………………

Supervisor: …………………………………………Date: ……………………

Supervisor: …………………………………………Date: ……………………

Head of the institute: ……………………….………… Date: ……………………

Tallinn 2017

DECLARATION

I hereby declare that I have written this thesis by myself and that I have used only the materials and sources indicated in the list of work cited. Neither me nor any other person has submitted this thesis to any other institution for a degree or for publication.

Abdullah Al Noman

.... Signature Date

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LIST OF ABBREVIATIONS

HCI = Human Computer Interaction

CPF = Crowdsourcing political forecasting

TtT = Tweak the Tweet

WTTC = World Travel and Tourism Council

WTO = World Tourism Organization

ID = Identification (in User Identification)

UNESCO = United Nations Educational, Scientific and Cultural Organization

TV = Television

AU = Australia

US = United States

GDP = Gross domestic product

Wi-Fi = Wireless Fidelity

SAARC = South Asian Association for Regional Cooperation

SMS = Short Message Service

UI = User Interface

UX= User Experience

UCD =User Centered Design

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ABSTRACT

Today travel is commonplace in the life of many people and tourism is often described as the world's largest and fast growing industry. What can explain this growth? This contributes the fact that many people have more leisure time available and often see travelling as an attractive activity for spending their free time. People start travelling for many reasons: their average workweek decrease, amounts of vacation and holiday time increase or just real income and disposable income levels became higher.

Some attention must be given to reasons why people do not travel. Of course, there are people who cannot afford to travel. Others do not travel for psychological reasons - uncomfortable feeling in strange surroundings. Moreover, there are many people who avoid trips somewhere during times of international tension, in the aftermath of terrorist attacks and during actual wars. Factors like these can reduce travelling because people facing with these kinds of problems may not realise that there are still options to meet their needs.

One of the most important factor in international tourism is globalisation. It refers both to the increasing ease with people who travel all over the world and to the trend of major corporations, for example some large hotel chains or franchise restaurants, to develop their operations into countries all over the world. Globalisation has particularly strong affect developing countries. There new tourism is important because it can influence on the local economy quickly and significantly.

In this research, the considered problem is that there is not enough developed tourism in Bangladesh. To solve this problem we try to increase social awareness for tourism growth using crowdsourcing information. The prototype of the application was made with the purpose to gather this kind of information to make risk or threat assessment for tourism.

This research study aims are to get updated information about risk or threat related to political situations through crowdsourcing, to make better social awareness and develop tourism interest in Bangladesh.

1. INTRODUCTION

Tourism completely depends on perception of people about a destination being safe and secure for holidays. Nowadays tourists want to be sure before their trip that they will be safe and have an enjoyable experience during their holidays. Statistics says that the negative images in the media affect tourists travel decision and the countries having political problems are unable to save them from visit. The reason for the thesis is to understand the problems in deep and find ways to help the countries having political instability by providing crowd sourced information.

This section describes the research problem and its significance, provides as well an overview of the thesis and is followed by an understanding the context section.

1.1. RESEARCH PROBLEM AND SIGNIFICANCE

Tourism has become a very important sector of economic development for many developing countries during recent decades. Bangladesh has huge possibilities and resources for tourism but the country could not contribute in the world tourism significantly. Bangladesh is a place of natural beauty. It has world's longest uninterrupted sea beach called Cox's Bazar[1] with a length of 120 kilometres. Cox's Bazar is one of the most known tourist destination and it attracts the most number of tourists of the country as well. It has to become a major international tourist destination yet. Another major tourist attraction in Bangladesh is Sundarban[2]. It is known as the world's largest mangrove forest (140,000 ha) and one of the biggest heritage declared by UNESCO. Sundarban is the homeland of famous Royal Bengal Tigers. Bangladesh has also many other natural and historical places to visit. Comparison to other neighbouring countries like Malaysia and India, Bangladesh is still losing its number of International tourists gradually.

The main reasons behind this are risk or threat related to political instability, lack of international hotel chains, bad transportation and weather. Among all those reasons, risk, or threat related to political instability is the most important one and it is responsible for the

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[1]Retrieved from the World Bank site on 1st June, 2015 -

http://parjatan.portal.gov.bd/sites/default/files/files/parjatan.portal.gov.bd/publications/a86aaa91_1174_4bf5_b3 fd_d19e4b82dddb/BPC%20Tourist%20Handbook.pdf

[2] Retrieved from the UNESCO website on 10th June,2015: http://whc.unesco.org/en/list/798

gradual decrease of international tourist in Bangladesh. Like Bangladesh, many famous tourist destinations including Egypt, Fiji, Thailand, France, and Belgium are affected by the threats or risks created due to political instability. Then, how do we solve this problem and create tourism growth in Bangladesh? It is impossible for us to stop the political instability by overnight but all we can do is to increase social awareness to make risk or threat assessment and give a real picture of the political situation to the world about Bangladesh and get more tourist. To assess risk or threat related to political situation we must get news from the crowd who are the real source of information. The main question for this research work - **"how to increase social awareness for tourism growth using crowdsourcing information?"**

Basing on the above, the main goals for this research are to:

● Understanding the problem.

● Understanding how crowdsourcing information can influence tourism.

● To introduce and develop a crowdsourcing platform for providing updated forecasting about risk or threat related to political situation and raising social awareness.

To achieve these goals we have to answer the following research questions:

● What is the impact of political instability in tourism for developing countries?

●   How crowdsourcing information can influence tourism?

● How to create tourism interest through crowdsourcing platform?

1.2. SCOPE AND MOTIVATION OF THE STUDY

Personally, I love travelling and I have been to so many countries to explore new places and experience different cultures. As a Hospitality and Tourism Management graduate, I know the importance of tourism industry for a developing country like Bangladesh. Although, Bangladesh has a numerous amount of tourist attractions and resources it could not make remarkable contribution in the global tourism for various reasons. During my master's study in Human Computer Interaction (HCI), I had an opportunity to gather knowledge regarding methods to design and develop technical systems and software's for the comfort of users. I also had a chance to learn how to perform user experience and make necessary changes in the design and development for a successful software and technical system. My travelling experience and

the knowledge from higher studies motivated me to choose project for the development of tourism in promising countries like my homeland Bangladesh.

Bangladesh has a huge population with a large number of unemployed people and that is why the labour cost is very cheap there. I am doing this project to increase the number of tourists in Bangladesh so that more work opportunities will be created for the local people and hence the country will be developed socially and economically. My purpose is to use my knowledge through this project to make my homeland one of the leading country contributing in global tourism.

The research project is very important to understand the effect of risk or threat related to political instability in tourism and the necessity of raising social awareness within a country. This project will also create a common platform for anyone from a particular region to share his or her free opinions about social or political issues. The main idea of the project is to make a risk or threat   assessment by providing real picture of political situation to the tourists about a destination before travelling. People will be able to choose their travelling place without any fear and threats and thus the tourism growth of a particular place will happen.

In order to achieve above goals we will collect both quantitative and qualitative data. The research methods include- literature review, big data mining, online survey, interviews, comparative evaluation and different User experience (UX) evaluation.

Research Question	Research Objective	Research Procedure
What is the impact of political instability in tourism for developing countries.	Understanding the problem.	Literature review
How crowdsourcing information can influence tourism.	Understanding how crowdsourcing information can influence tourism.	Contextual inquiry-Online survey Interviews Comparative evaluation
How to create tourism interest through crowdsourcing platform.	To introduce and develop a crowdsourcing platform for providing updated forecasting about risk or threat related to political situation and raising social awareness.	Personas Scenario Paper prototyping Card sorting Cognitive walkthrough Interviews

Figure 1- The research procedure.

1.3. THESIS OVERVIEW

The motive of this thesis is to understand how crowdsourcing information can raise social awareness, how to create a crowdsourcing platform for getting updated information and how this information can encourage tourism. Mainly the thesis has been dividing into 5 sections – 1) Introduction, 2) Understanding the context, 3) Research problem and strategy, 4) The prototype and 5) Conclusions.

The **first section** consists of information regarding the significance of the research problem and the thesis overview.

In the **second section** titled, "Understanding the context" provides and introductory overview of the study context and main topics addressed in this thesis.

The Research Problem and Strategy" section, the **third section**, explains the research methodology, the study procedure, the design approach and the concept. Also provides a comparative evaluation and user centered research approach

The **fourth section** of the thesis titled "The Prototype". Here we chose the methods to perform the prototype, trying to identify and follow a user centered research approach. It also includes a business approach and a description of the evaluation procedure.

The final section, **section five**, titled "Conclusions" discusses the results achieved in the course of this thesis along with an overall discussion, future works and reflections.

2.   UNDERSTANDING THE CONTEXT

This section intends to get a better understanding of the research contexts. It starts by addressing the Impact of Political Instability and Terrorism on Tourism, describes the political Environment and its Impact on Tourism opinion, conduct in developing countries and finally provides information regarding the current situation of Bangladesh Tourism.

2.2.   THE IMPACT OF POLITICAL INSTABILITY AND TERRORISM ON TOURISM

Political uncertainty and terrorism create many risk or threats and they have significant impacts on the number of tourists visiting a specific country. The term terrorism is not new but the attention focusing on the subject is traced back only a decade. To fight against terrorism nations around the world started joining forces in counter-terrorism activities, law enforcement and intelligence gathering.

In USA, President Clinton even signed the Antiterrorism and Effective Death Penalty Act into law in 1996 to reduce serious crimes from the country. Example of some current and most discussed political clashes include the 1991 breaking down of Yugoslavia[3] and the following war in Bosnia-Herzegovina, religious clashes in Burundi[4], Afghanistan, India, Pakistan, Iraq, Somalia, and South Africa, nonstop Arab-Israeli problems in the Middle East, 9/11 attack in US, Ukraine, Syria, France attacks.

Now, terrorism, and political instability are related to each other and became almost same topic. Despite of different characteristics, terrorism, and political imbalance both affect tourism in a great margin. Terrorism takes the attention of the public immediately through media; on the other hand, political instability is a slow and long lasting process. International terrorism and tourism have some similarities in their characteristics. They both cross-national borders involve citizens of different countries and use travel and communication technologies. If we go deeper into the topic about terrorism and tourism relationship then we can see targeting tourists or the

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[3]   Retrieved from the U.S. Department of State Office of the Historian site on 16st July, 2015 - https://history.state.gov/milestones/1989-1992/breakup-yugoslavia

[4]   Retrieved from the Global Security site on 16st July, 2015 - http://www.globalsecurity.org/military/world/war/burundi.htm

industry is quite deliberate and it helps terrorists to achieve their goals i.e. publicity, economic disruption, ideological opposition to tourism.

2.2. POLITICAL ENVIRONMENT AND ITS IMPACT ON TOURISM MARKETING

Fiji island case study shows how explicitly the political situations affects tourism. By providing statistical numbers from 2007 where before coup the tourist numbers per year were around 400 000 and after it was dropped to 200 000 (Singh, 2007). At the same time statistics shows that traveling did not entirely filled out - even the traveling evolved risk and outcome after 2010 the numbers were increased to number around 600 000. The number of yearly tourists coming to a country depends on the safety and security condition of that country. And this safety and security is always disturbed by the political instability. After Fiji coup many countries warned tourists for not travelling to Fiji. Everyone expects much opportunities from a tourist destinations nowadays. The reason behind marketing a tourist destination is to meet the tourism needs and expectations by providing enough opportunities.

Marketing destination should follow the standards and quality that are unchanged with destination identity. At Fiji case Australia and New Zealand (Lexow & Edelheim, 2004) are two big contributors of Fiji tourism but due the political instability in the country, has forced these countries to issue strict travel advisories in past. Researcher finds that tourism marketers will confront difficulties then not recognise the changes in environmental forces or cope with threats created by changes in the political environment. Political instability in Fiji caused serious damage for the region.

Marketers of tourism face a huge challenge for political crisis management and they always have to make a close observation on the environment for innovative marketing strategies.

2.3. TOURISM IN DEVELOPING COUNTRIES

Tourism in developing countries not only increases foreign currency but also creates many job opportunities and eventually brings economic growth through tourism development. According to the statistic from WTO (World Tourism Organisation), the average growth rate

during 1990-2005 the average growth rate of international tourist in developing countries was 6.5%, which was just 4.1 % growth worldwide over the same years[5].

Tourism has a great importance for the development and growth of economy of a developing country. Financial development and tourism advancement has a positive relationship between them. It is important to fulfil tourism request by providing more tourism facilities. The economic expansion in developing countries also play an important role for tourism growth because for economic development the infrastructure and tourism resorts are developed.

2.4. CURRENT SITUATION OF TOURISM INDUSTRY IN BANGLADESH

Tourism develops the economic growth of a country by creating job opportunities, reducing poverty and inequality, preserving natural and cultural heritage, upgrading infrastructure and providing significant foreign currency. This century's' most remarkable economic and social phenomena is the surprising growth of tourism over last 50 years. The growth in Asia is much faster than in Europe. It is believed that Asia will continue its development in tourism industry in the upcoming decades also.

However, during 2006-2010 the picture of tourism development in Bangladesh was different. Bangladesh received 15, 29,000 visitors and managed to earn US$ 413.00 million. According to the data of World Travel and Tourism Council (WTTC) from the year 2011, travel, and tourism directly helps 1,329,000 jobs, which is 1.9 % of the total employment of the country. This is expected to rise by 3.6 % in the year 2012 and 2.9 % a year to create 1,840,000 jobs (2% of total employment) in 2022 (HOWLADER, Z.H. 2013).

Recently, government has taken some necessary steps and invested more money for development of tourism sector. Bangladesh Parjatan Corporation (The National Tourism Council)[6] was built in 2008 and has been working for the development of the tourism. It has taken several initiatives, for example, reforming new Tourism Policy, formation of Bangladesh Parjatan Board and the National Tourism Council. Although, in real the changes were very

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[5] International financial institution investments in tourism and hospitality, Retrieved on 13th November 2015. http://www.aabri.com/manuscripts/10444.pdf

[6] The National Tourism Council Bangladesh, Retrieved on 15th November 2015. http://www.parjatan.portal.gov.bd

slow. Due to insufficient promotion for the tourist destinations, services, and facilities, the tourism industry of Bangladesh could not grow up with the same flow as other deploying countries.

In-spite of having different excellent tourist resources the country was unsuccessful to catch the biggest tourist market. Lots of international hotel chains has agreed to build about 9000 international standard rooms in 3 big cities of the country which will need 15000 trained workers to operate (Ahmad, 2013). The earnings of Bangladesh from tourism can be expanded to huge level if the nation can embrace suitable limited time measures however, the country does not have the adequate assets for the reason generally. Even if we compare Bangladesh with other SAARC nations, we will see the contribution of tourism industry is still not so significant and mostly neglected[7].

The main reasons behind this slow development of tourism industry can be listed as follow - improper infrastructure, security problems, lack of modern recreation facilities, maintaining standards of hotels, weather forecasting system, lighting system along side roads to the tourist spot from city, proper, and timely communication system, lack of long term planning and political instability.

2.5. CROWDSOURCING

The word Crowdsourcing is consist of Crowd and Outsourcing. Crowdsourcing means outsourcing to the crowd. The term was populated by Jeff Howe and Mark Robinson in an article published in a magazine named 'Wired.' Crowdsourcing is one type of outsourcing that leads the crowd through an open call mostly via online. Normally, the crowd is a large group of unidentified people. By cause of anonymity, it is almost impossible to identify or recognise.

Crowdsourcing is a social media term what means several people`s opinions expressing and knowledge sharing to solve some problems. Crowdsourcing is opened feedback from people all over the world.

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[7] World Tourism Organization, Yearbook of Tourism Statistics, Retrieved on 21th November 2015. http://www.indexmundi.com/facts/pakistan/international-tourism,

Wikipedia[8] started to work as a collectively written and edited web based encyclopaedia from the first month of 2001. It allows anyone to be a member to provide their data and edit it online. It is hosting an unbelievable number of entries in English only.

The best example of crowdsourcing success is Michael Dell's Idea Storm. Dell asked his crowdsourcing market, "What product do you really want us to create?" The response from crowd was overwhelming and they suggested creating a laptop that had the option of having either no operating system or the Linux operating system. Dell listened to its market and got significant results: Reports state that Dell has sold more than 40,000 laptops installed with the Linux-based Ubuntu OS[9].

Another good example of crowdsourcing will be 'Galaxy Zoo' an astronomy project called solicited help in classifying more than a million galaxies. Just in one hour of the project launching, volunteers were submitting 70,000 classifications per hour[10].

Crowdsourcing is very useful for small works like translating basic writings or information collection. It can be used to accomplish difficult innovative tasks to solve problems. Between these easy and difficult tasks, there is an intermediate category of Crowdsourcing that works on fields like photography and software application.

2.6. SOCIAL AWARENESS

According to Dourish and Bly (1992) awareness can be defined as - "an understanding of the activities of others, which provides a context for your own activity" (Dourish & Bly, 1992). In the field of HCI, awareness is a commonly used idea name. In other words, awareness is almost a simile for consciousness – its meaning is derived from the object of the awareness.

Social awareness does not have a simple dictionary meaning. Social awareness is knowing what is socially acceptable, acting accordingly, and being aware of different problems in society, being especially sensitive to the needs of the less fortunate, etc. It is a model whereby

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[8] From WhatIs.com webpage, retrieved on 12th December 2015. http://whatis.techtarget.com/definition/Wikipedia

[9] Dell officially use this website to gather public opinion, retrieved on 15th December 2015. http://www.ideastorm.com/

[10] Astronomical website Galazy Zoo, retrieved on 21st December 2015. https://www.galaxyzoo.org/

one has fundamental knowledge about social issues including political, technological, medical, environmental, and scientific issues.

 If we will be more aware about social issues then we will be more responsible and will be able to take efficient actions in for the development of the society. For instance, if a large number of children are aware about the bad effects of global warming, they will be more responsible with greenhouse effect or cutting down of rainforest. Awareness is knowledge and knowledge is power. This means that when we are creating awareness for the people, we are also empowering them to go through some difficult situations and at the same moment, we are helping them to recover from these difficulties.

For tourism field 'social awareness' has a lot of importance. Social media has facilitated tourists with some hyper awareness during their travel. Nowadays tourists are always communicates with their friends, family members and news outlets via internet that can cause a sense of security. Social media and mobile devices allow individuals to watch events as they are happening and can help to raise the level of situational awareness, especially during crisis.

Example

This crowdsourcing study (Ruiz-Correa, Santani, & Gatica-Perez, 2014) investigates impressions of urban spaces by young inhabitants in a city in the developing world. The goal was to obtain collective perceptions from the actual inhabitants of the city under study, and more specifically youth (16-18 year-olds) about issues like danger, accessibility, and dirtiness. Over 9000 judgments for 102 photos of outdoor urban spaces in a city in Central Mexico were collected using standard scales in social sciences. In addition, later after the analysis a complete picture of the city safety were published as - dangerous, dirty, nice, conserved, passable, interesting, based on the image data. The study was very useful for social awareness and it created more tourist interest for the cities rated as- nice and interesting.

2.7. POLITICAL FORECASTING

Predicting or estimating the future based on past and present data is called 'forecasting'. Forecasting gives information about the potential upcoming events and their consequences for the organisation. Political forecasting, construed broadly as forecasting of events that affect the structure of political systems and the configurations of political power, is therefore quite an

important activity. Global politics is a high-stakes affair, and being able to predict it, prepare for it, and in some cases manipulate it, could be a game-changer.

However, it can be used to show a clear picture of the political stability of the whole country or can also show the situation of respective cities. For political forecasting, the tool mostly used is public opinion. In addition, opinion poll is used to create the forecasting.

Political forecasting is very important for a country's international image point of view. If a country is politically stable then it has a big chance of getting more tourists. Nowadays tourist only visit to the safest destinations. So, political forecasting can be a major tool for a country's' tourism growth.

Competing rating systems utilising methodology have been developed by Frost & Sullivan (the World Political Risk Forecast). Business International and Data Resources Inc. (Policon). A large portion of these are accessible to users on-line, and in the case of Policon at least, users may adjust the weight of different factors or incorporate their own particular judgmental data at whatever point considered better than the model's.

The latest entry to the "expert" assessment-rating field is by the Futures Group; their Political Stability Prospects reports combine observational data in format models with expert generated opinions to produce a stability index on a probabilistic distribution (de la Torre & Neckar, 1988).

We can go through an example to understand how political forecasting can create tourism growth by the example of 'Country Risk Forecast' [11].This online service provides continuously up to date ratings for the political, security, and terrorism but also travel risk. This service is much more suitable for the business traveler who also have to travel region in crisis. In this thesis, we will be using political forecasting for the purpose of risk and threat assessment.

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[11] Country risk forecast details from Control Risk web page ,Retrieved on 11th March 2016

https://www.controlrisks.com/en/services/political-risk/political-risk-monitoring/country-risk-forecast

2.8. CLOSING REMARK

We have discussed about the Impact of political instability and terrorism on tourism, tourism in developing country and the recent picture of Bangladesh tourism. We have mentioned how political instability can damage the tourism of a country. We also mentioned how slow is the government's action for tourism development in Bangladesh and again along with many other reasons political imbalance was one of the most responsible reason. We have addressed how crowdsourcing information can raise social awareness and how social media affect tourism.

3. RESEARCH PROBLEM AND STRATEGY

In this part of work, we do a deeper study to understand our problem, which is - to increase social awareness for tourism growth using crowdsourcing information. We research on some sample target market or user to identify their demand and scenarios. Use a comparative evaluation and that will help us to draft personas and respective scenarios. This section is followed by a paper prototyping proposal of our crowdsourcing application that were complemented with user experience evaluations procedures. Finally, we present the same result analysis and propose the final solution for our specific problem.

The problem addressed herein relates with nowadays need to get the right news about the political situation of a country when traveling to specific political unstable countries. Either the information is scattered or the existing reports are not understood or up-to-date. In addition, some information available do not represent the real information, the one that local people have access. Therefore, the number of tourists is getting lower day by day in many developing countries like Bangladesh, Egypt, and Ukraine etc. However, this again shows how important are to get more local news about risk or threat related to political situation and in real time. Our solution to the problem comes by aiming to create a platform where anyone can access, get, and share the information. This process is known as crowdsourcing and the information collected is called crowdsourcing information.

The research question arisen from this wicked problem is - "how to increase social awareness for tourism growth using crowdsourcing information".

3.1. STUDY PROCEDURE

During our study procedure for this wicked problem, we divided the work into four main research phases, those include:

Phase 1, starts by defining the expectations and opinions of target group. For that, we develop a contextual inquiry procedure, and we conducted online survey and interviews. Phase 1 also includes a comparative evaluation for similar existing crowdsourcing applications.

Phase 2, is to design and plan our design procedure. We applied a user centered design approach that includes personas, scenarios, and the concept.

Phase 3, is called designing and development. Here, we design a paper prototype, evaluate it and proposed the final prototype application that also includes the development of a functional prototype.

Phase 4, is called as the evaluation of user experience. The evaluation held for paper prototyping and the functional prototype as well. Through this phase we will be able to know whether we are meeting our target group's expectations or not.
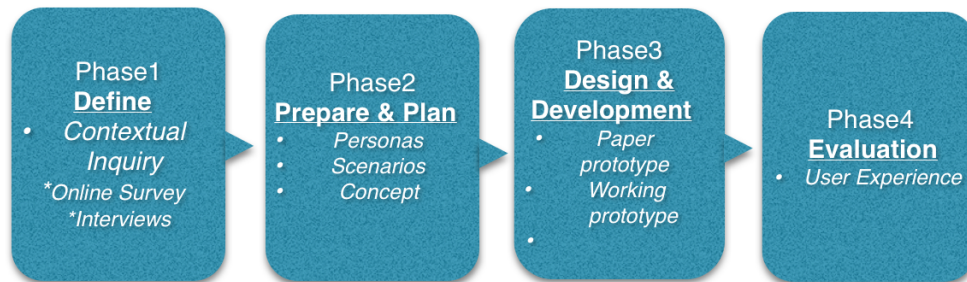
Figure 2 - The study procedure.

3.2. USER CENTERED RESEARCH APPROACH

Use-centered design (UCD) is a methodology used by developers and designers to ensure they are creating products that meet user's needs. UCD has many focuses and user experience is one of them but user experience is not UCD. UCD may be not subjective and frequently depends on data to help design decisions. UCD involves much more than making applications aesthetically pleasing. Design plays a paramount role; however, it may be not the main issue. UCD can actually save time by helping to avoid costly mistakes. UCD does not distract us from getting work done. It ensures that we focus on the right things: meeting user's needs with the proper technological solution (Lowdermilk, 2013).

During the design process and development in user-centered design (UCD), the focus is always to meet user's needs, expectations, and limitations. UCD technology products are enhanced for end user and importance is given to the fact - how the end user need or want to use a product rather than driving the user to change his behaviour to use the particular product.

User-centered design is a particular process for software development where typical UCD activities are classified into four major phases in the development lifecycle: analysis, design, implementation, and deployment. The investigation method of UCD normally consist of

ethnographic study, contextual inquiry, prototype testing, usability testing and other methods. Generative methods like card sorting, affinity diagramming and participatory design sessions can also be used. UCD approaches follow the ISO standard 52075.[12]

Because user centered design is a development process, we should keep it in mind and use it throughout development: from requirements capture to acceptance testing.

3.2.1. Our approach to user centred design

We follow three core principles in all our user centred design projects:

Early and continual focus on users and their tasks

We must understand our users and what we want to do with the system. This understanding we achieved by directly studying their behaviour and attitudes and by studying the nature of the objectives, we expect them to fulfil.

Empirical measurement of user behaviour

At the starting point of development, process, expected users should really use simulations and prototypes to perform real works and their performance and responses should be observed, recorded and analysed.

Iterative design

During the testing if there is, any kind of problem showed up it should be fixed. This basically means design has to be interactive: there has to be a cycle for designing, test and measure , redesign and keep doing same till the usability targets are achieved..

There are a number of specific activities we can choose to deliver user centered design. In this project, we will:

➢ Develop personas to characterise the users and their tasks.

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[12] More details about ISO standard 52075 available on the following link, Retrieved on 28 April 2015

http://www.iso.org/iso/catalogue_detail.htm?csnumber=52075

➢ Derive the information architecture.

➢ Paper prototype early design concepts.

➢ Usability test the system with representative customers.

3.3. CONTEXTUAL INQUIRY

Local people and tourists are our source of information. If the tourist get the idea of risk or threat related to political situation of all areas of a country, he will be willing to choose the safe places to visit instead of choosing another country or cancelling his tour. We believe that this is how a country can get more tourists and have a pure social awareness. We have to understand and figure out the ways in which crowdsourcing data can increase tourism interest by observing at existing examples. For instance, Australia Tourism is using Facebook page as a tool to announce, inform, and involve Facebook fans. Statistics of participation in terms of number of comments, number of fans liking a post and number of feedbacks suggest that Facebook is an effective tool for that type of engagement. The campaign of 'Nothing like Australia' [13] posted on Facebook, for instance, resulted in over 29,000 entries. The feature of social media allows consumers to share their travel experience by posting comments, opinions, even pictures and videos. These posts can serve as valuable information for other potential travellers.

3.3.1. Online survey

First, to understand public opinion about the crowdsourcing platform we did an online survey, se figure below. This survey included about seven short questions. Participants were mostly local people from Bangladesh and tourists. About, 27 people participated in the survey.

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[13] From the Australian tourism site, Retrieved on March 12th 2016.
http://www.tourism.australia.com/campaigns/TNLA.aspx

Figure 3 - Online Survey,

Figure below show some of the result analysis done.
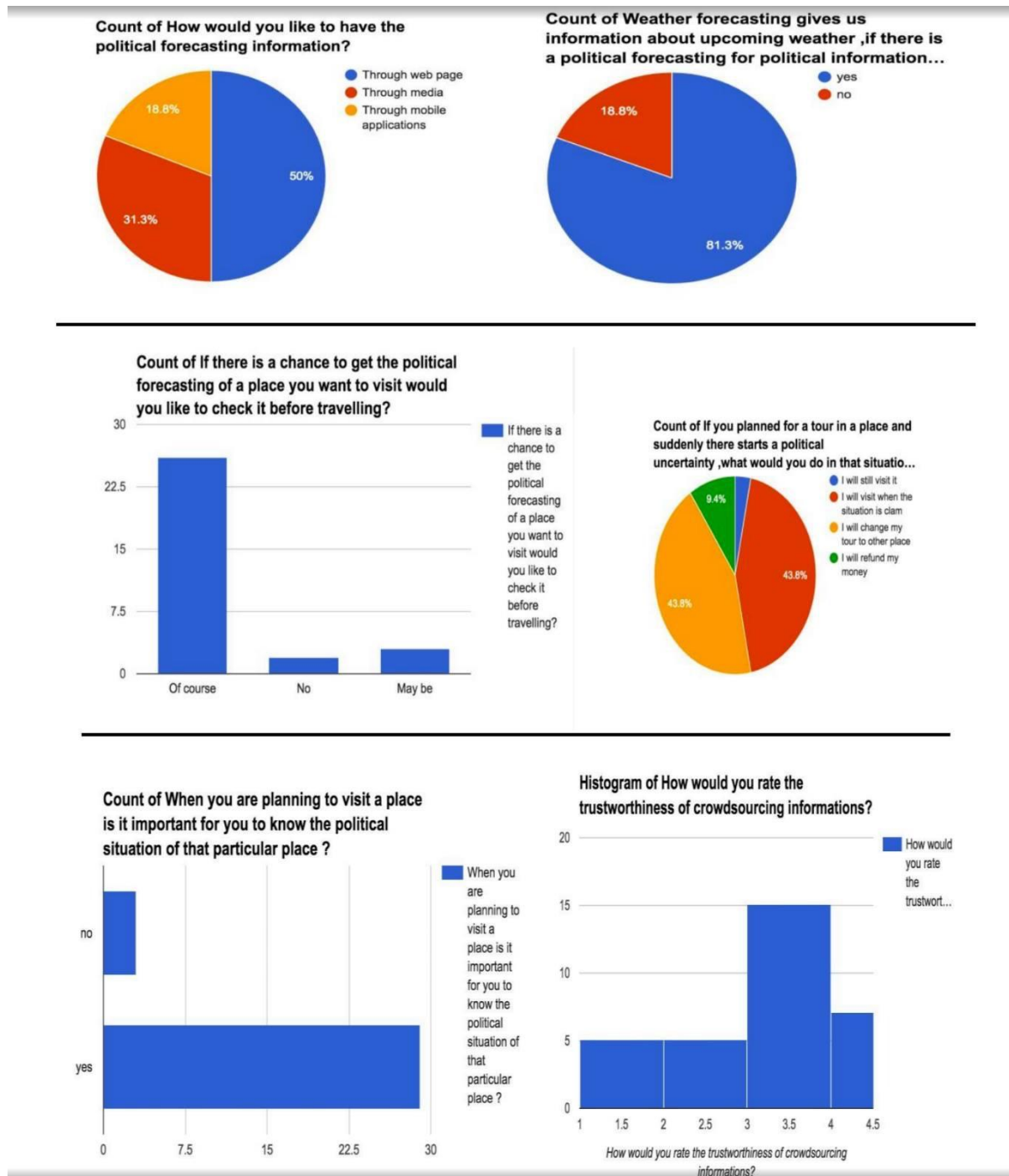
Figure 4 - Background information gathered from the Survey.

From the survey, we collected our data and put them into graph and charts to analyse. After the analysis we got the following ideas that most of the participants were willing to use our proposed crowdsourcing platform, they would like to trust crowdsourcing information and they showed interest to have this platform as both application and web page. During crisis, they would like to use the proposed platform and would still visit some particular cities of a country that are still safe.

We also did a statistical analysis to understand better users rate their trustworthiness to Crowdsourcing information, as the chart and graphs below shows.
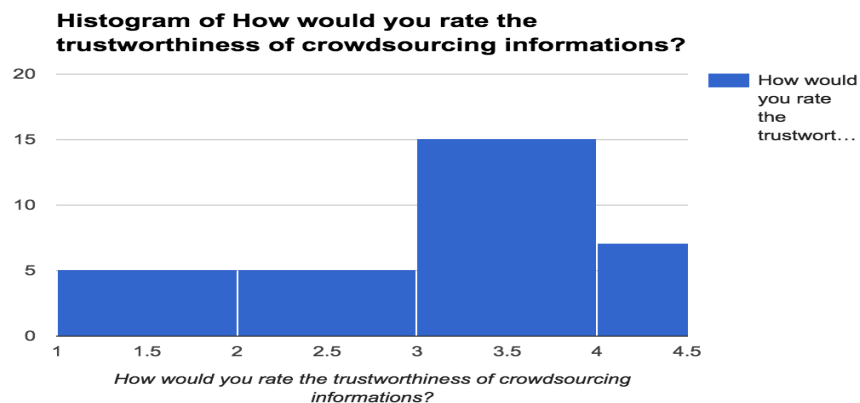
Figure 5 - Trust Level of Crowdsourcing Data in Histogram.

3.3.2. Interviews

During interviews, we introduced our ideas to the participants and performed a semi-structured interview. We also asked their opinion about our idea of crowdsourcing risk or threat assessment for tourism. We did paper note while asking some open-ended questions to the participants. The questions we asked were similar to the questions we had on the online survey.

Average interviews lasted 20-30 minutes. We had about 30 participants in total. Half of them were local, and another half was international citizens. Even though, the study is related to Bangladesh tourism, international tourists are also connected to the topic. Our predetermined questions helped us to focus on the type of information we wanted to achieve. Nevertheless, the inquiry structure was flexible so other questions could be generated through conversation. After finishing the interviews, we went through all notes and feedbacks from our participants.

Through the In-depth interview for contextual inquiry we can find out people are interested to use a crowdsourcing platform. They believe our idea is unique and effective for the tourism and as well as social awareness. They will be willing to contribute their best for the social awareness through a free and open medium.

In the stage of ideation, we can think of a total number of 80 idea and in the stage of conceptualisation, we filtered out to useful 10 main concepts. In these 10 concepts, 5 concepts are proceeded with prototyping and evaluation that we confirmed the usage of our research design process.

3.3.3. Comparative Evaluation

In this part of the research we tried to understand how similar crowdsourcing information based platform works and how they gather their data. As Bangladesh does not have any crowdsourcing platform, yet we tried to research on other similar platform internationally. One explored Crowd sourced information were as follow:

Ushahidi: Ushahidi platform[14] manage info coming from social accounts by creating crowd map. Swift River as open source platform to filter info from coming real time information. In crowd map, you can generate your own deployment of Ushahidi Platform without installing it on your own web server [15].Also you can build crowd map to handle information come out a place wherever crisis is.

Our design proposal aims rather to provide updated risk or threat assessment related to political situation for those who wish to travel to particular beautiful but political unstable destinations like Bangladesh, Ukraine, and Egypt. In that case, tourists want to be assured about the place political situation to ensure their safe travel. Also, serve cautious travellers who still like to go to certain country despite random political issues. The main idea of the proposed application is to invite people to discover those countries but same time ensure their safe travel by informing the different levels of political situation at grass root level – aiming to achieve this from a crowd source level. Thus, participation, interaction, and simplification are the main design keywords.

mPing: Another example explores is Oklahoma University weather forecast and application (Rothfusz, 2014) called mPing[16]. The weather forecast using here crowd sourced and displays instantly the outcome as image below shows.

Its interface shows in real time the weather conditions. We believe that proposing a similar graphical display for our application can be beneficial. We see good value on the button options to request more information by e-mail as well. It weakness is that it is containing lot of

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[14] From the Ushahidi web page, Retrieved on 20th February 2016. https://www.ushahidi.com/
[15] From the Ushahidi web page ,Retrieved on 20th February 2016.
https://www.ushahidi.com/blog/2009/04/09/explaining-swift-river/
[16] From the page of Crowdsourcing weather report-mPing, retrieved on January12t h2016.
http://mping.nssl.noaa.gov/

information for the user to search and understand can be tricky provide volunteer to answer the email requests.

Rahvakogu: Here is in Estonia Rahvakogu[17] crowdsourcing example was also examined. It is about political issues and how people can advise topics what needs government interests.

Rahvakogu foundation offers a crowdsourcing method for people to offer their opinion (like or dislike) on certain social or political raised issues. If the topic application gets enough votes it is raised to level where foundation presents it to government to revise. Those who want to make a proposal or comment are required to register with their national ID card. Over 1,000 people have registered so far. In our app, we will not rise such specific topics, but we will use the rating options to serve trustworthiness of the collected information. Volunteers run this website from NGOs such as the Estonian Cooperation Assembly, the Praxis Centre for Policy Studies, the Network of Estonian Non-profits Organizations (EMSL), the e-Governance Academy and the Open Estonia Foundation[18].

Airbnb : Another example of crowdsourcing platforms is Airbnb[19] motto is - your home away from home. With Airbnb, travelers can find one-of-a-kind space to stay in while in transit using their mobile devices. Huge number of listings are available in the platform, allowing travelers to compare the prices, and at the same time, the hosts are given the opportunity to earn money by renting out their space, whether it is a private room, an entire apartment, or a Tesla S car that has a sleeping bed inside for $85 per night! Through this application, travelers are being helped and the main objective of our application is similar to this too and the target group is same.

Firechat: Firechat [20] became one of the popular crowdsourcing applications during the pro-democracy movement in Hong Kong. Through this, the user can chat with people nearby even if there is no mobile network or web connection available. For that, all he/she needs to do is turning on Wi-Fi, Bluetooth or Airplane mode. It has public chat rooms, unlike WhatsApp or

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[17] From the official webpage of Ravakogu,retrieved on January 11th 2016. http://www.rahvakogu.ee
[18] From the news website of -News.err.ee, retrieved on January 14th 2016
http://news.err.ee/v/news/politics/6997132a-8d99-41df-ab4c-b315202f6527/citizens-parliament-update-one-week-on
[19] From the official page of airbnb, retrieved on January 15th 2016. https://www.airbnb.com
[20] From the web page of Firechat, retrieved on January 26th 2016. https://firechat.firebaseapp.com/

WeChat where the user will be able to see messages and public responds at the same moment. Since it does not require real names, user can create their own chat rooms to engage with a community of like-minded Game of Throne enthusiasts or local campaigns and activities.

Waze: Waze [21] is another similar crowdsourcing product, which is known as the world's largest community-based traffic and navigation app. anyone can join drivers in a specific area who share real-time traffic & road info to save time, gas money, and improve daily commuting for all. Just by driving with Waze open, user already contributing tons of real-time traffic information to your local community. User can also actively report accidents, police traps and other hazards you see on the road. User can get road alerts along his route and find the cheapest gas prices around him shared by the community. It is possible to add friends, send locations or keep others posted on certain arrival time (Mobile, Waze. 2012).

Kamino: It a new mobile application offering crowd-sourced city guides. Unlike Kamino users, who are comprised of locals, travel bloggers and experts, share the places and things that make their neighbourhood special all within walking distance. Unlike the recommendations found in professional guidebooks, Kamino provides a guide named "urban hikes" made by local people and placed on a map that help to show visitors to the best offer their neighbourhoods can give.

3.4. THE CONCEPT

Crowdsourcing is the participation of general people in different activities through online for mutual advantages. Crowdsourcing can be very important in emergencies. During the Haiti Earthquake in 2010, different crowdsourcing projects were introduced to help local people to get relief and any other help required. Many people were rescued from a trapped place during earthquake or providing them required food and shelter. Ushahidi used Tweak the Tweet (TtT) during the crisis time for affected people and it got the high attention of everyone. This is how the crowdsourcing information was increasing social awareness. Ushahidi was not the only one where were some others crowdsourcing projects who were working as a volunteer. For example, OpenStreetMap, WeHaveWeNeed, SwiftRiver etc.

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[21] From the homepage of Waze, retrieved on January 28th 2016. https://www.waze.com/
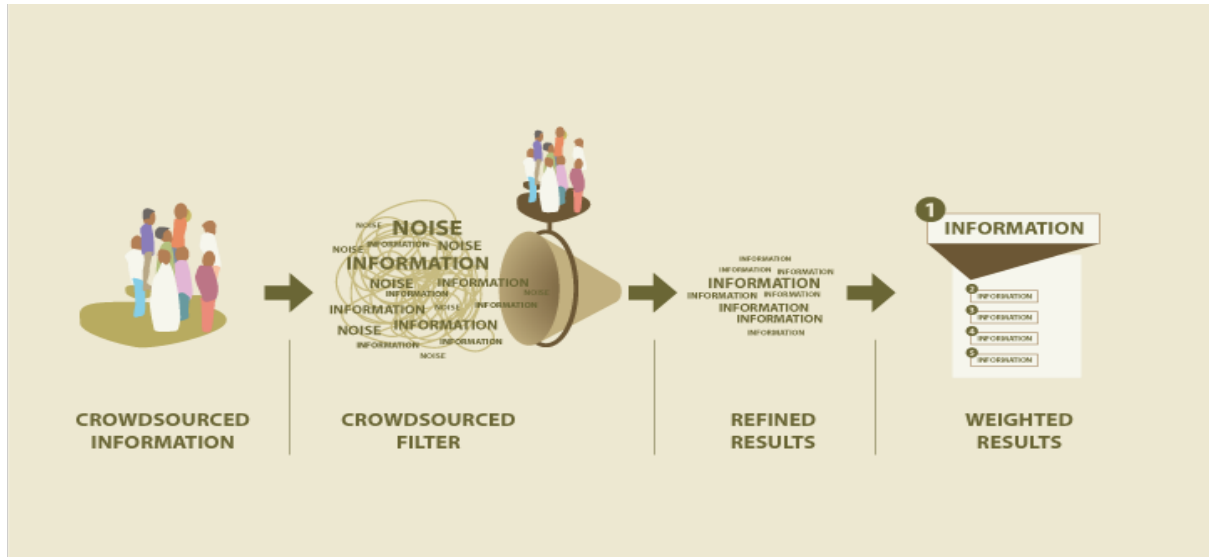
Figure 6 - Ushahidi Big Data Collecting and Filtering to Give Weighted Results.

Source: https://www.ushahidi.com/blog/2009/02/05/crisis-info-crowdsourcing-the-filter

In this proposed application, we are going to collect any sort of report coming from any sources or medium regarding risk or threat related to political situation of a locality. After collecting this big form of information, we filter them and provide an updated political picture by risk or threat assessment of the country for the tourist and local people. To get a clear conception of the user, and the source of data or the use of the application we have done a C-map of the application below:
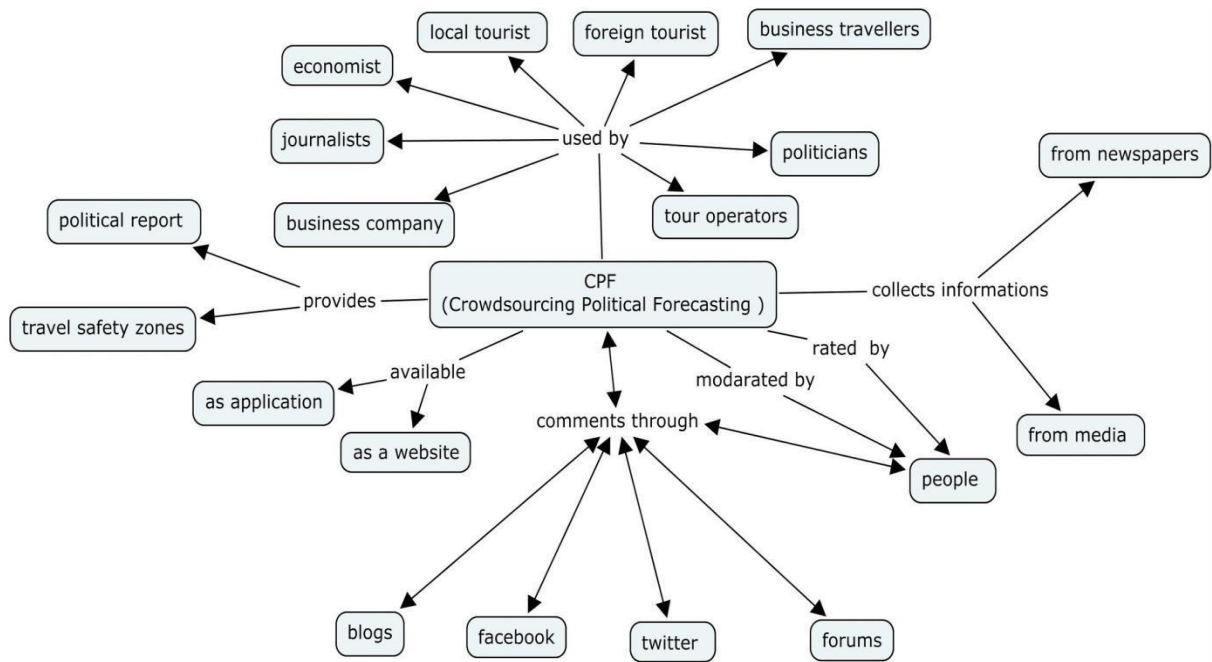
Figure 7 - Concept map for crowdsourcing political forecasting.

3.4.1. How It May Work

A user can simply send us SMS when he is offline too. The SMS system will help a user to stay connected with us even offline. User can also provide us data through email, twitter, or using our application.

After getting this big data, we filter them through Ushahidi deployment system and then we publish this filtered data to our application. For groups running social impact projects unable to afford the current pricing model, Ushahidi has a free responder plan[22] To filter SMS reports we use another Ushahidi tool called -SMSsync[23]. From the proposed application, our user will be able to log in and see the safety marks from the map, read top stories, post their report, comment, or rate others report and share it into different social network.

These top stories will be placed according to user's ratings and views. User will have their own ranking and trust level according to their previous post ratings and contribution. We have 5 ranking levels for user from the higher level to lower are- completely trustworthy, trustworthy, mildly trustworthy, neutral, beginner. We are going to start with few volunteers but any user

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[22] Ushahidi free responder plan details available here: https://www.ushahidi.com/plans/apply-for-free

[23] SMSsync details are available at:http://smssync.ushahidi.com/.

can be our volunteer as soon as they get their trustworthy ranking. Volunteer will monitor the complaints or feedback and always work to upgrade our Crowdsourcing Political Forecasting (CPF) system.
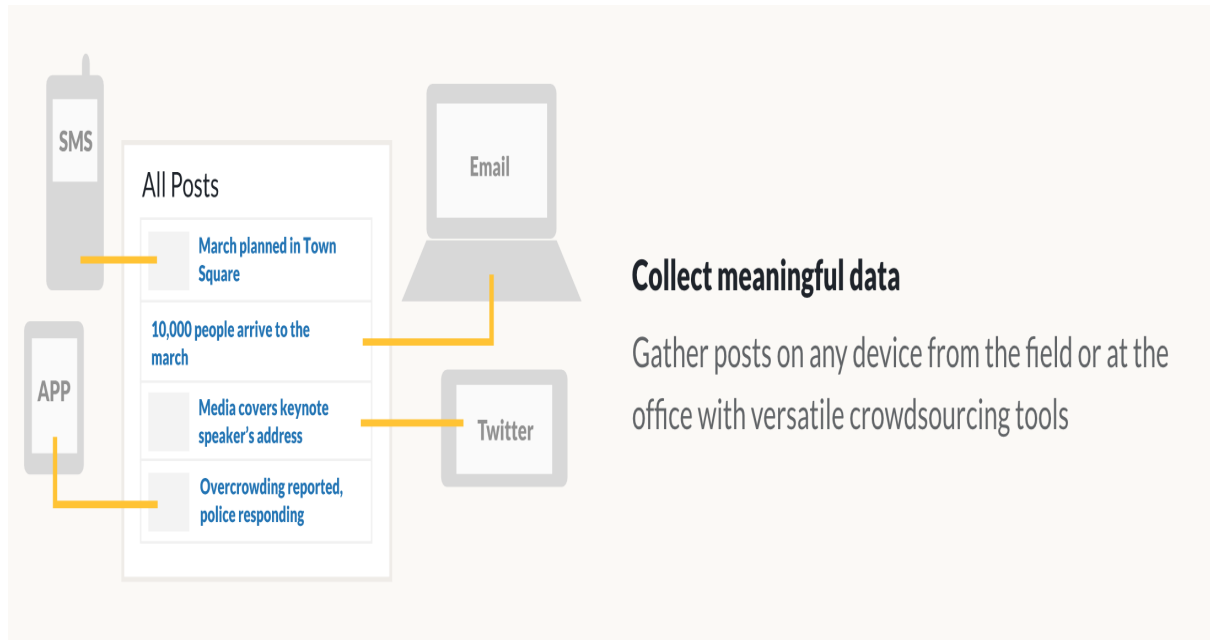

Figure 8- Ushahidi Collecting Data from Different Sources.

Source: https://www.ushahidi.com/

4. THE PROTOTYPE

The design work of our application started by creating personas and user scenarios above concept map. In the following line, we will describe those in more detailed.

4.1. PERSONAS

In this part of study, we have chosen three Personas from crowd based on our target group to focus on our user goals and current behaviour. They give us a story and describe the reasons people do what they do in an endeavour to help everyone connected in designing and building a product or service. For each persona, we figured out the good sides and what we could do better about the way they were formed.

4.1.1. Persona 1

Profile: Tanbin Sharif (28), male is a travel agent in Bangladesh. He has finished his study from University of Nicosia, Cyprus on Hospitality & Tourism Management. His main duty is to offer and suggest customers to travel different places around the country and other attractions all around the world. Therefore, he has to be aware of current situation of those specific areas instantly and provide information to his customers. He also wants to know which places are safe to travel and which are not, so that he can suggest others about that. It is a big challenge to work as a travel agent in a country like Bangladesh where political instability is a usual thing.

Information Seeking: He uses online newspapers, news, and blogs to get instant news about tourist areas.

Goal: To get information about the situations of different travel places and helps his customer to choose a safe and comfortable place travel. He wants to be updated about the danger of travelling some places and inform his customers to take precautions.

4.1.2. Persona 2

Profile: Jahangir (40), male works for 24-hour net news provider company bdnews24. His work is very stressful; his articles are rated by automatic web page visitation counter. He writes mostly of sports news. Now, he seeks possibility to make more articles about local politics - he

seeks information from political blogs, Internet magazines and articles. He has average salary. He does not go to travel since he cannot afford travelling due to his salary; Thought Company just gave him mobile telephone with camera. Then, he writes articles. He also can make video and photo shoot for newspaper so they could more efficiently operate News Company.

Information Consumption: He uses bdnews24 webpage, internet magazines, played web articles, Facebook is mostly to chat with friends, Twitter is not used but due to his work, he has to post their tweets about his latest articles or published works.

Goal: He would like to write more articles about current political situation in Bangladesh. He seeks authentic information source without high cost.

4.1.3. Persona 3

Profile: Taher (45), male is working in a finance company as a stock market seller in Dhaka (Capital of Bangladesh). He has a stressful job during the day he needs to watch and calculate all the data about market and try to guess next movement. However, political situations and unsuspected situations in countries make him to guess market position and find new strategy.

Taher's job also affects his characteristics and lifestyle. He should look like fancy every time to show his clients he earns so much money and improves charisma because he always wears formal suits, fancy accessories and luxury cars.

It needs to a person.

Interests: Experiencing different food, playing golf, luxury cars, travelling (but he does not have time for it), fashion.

Internet usage: Taher uses Internet to access information about daily economic data from different countries. Taher also follows the news to understand market movements.

Social media usage: Taher uses social media to follow other economists to understand their opinion and try to catch instant news. He also wrote own ideas about economy on his Twitter account.

Goals: Taher needs reliable and fast information about countries to understand is it safe for investment or not.

4.2. USER SCENARIOS

In this part of study, we have chosen three scenarios based on interviews and survey we conducted in research methods. These scenarios give us a story and describe the reasons people do what they do in an endeavour to help everyone connected in designing and building a product or service. For each scenario, we figured out the good sides and things we could improve about the way they were constructed.

4.2.1. Scenario 1

Travel Agent's Experience with CPF

Tanbin has his own travel agency and has been working last few years on its success. During his works, he found it difficult to provide the updated news about the risk or threat related to political situation of a travelling place instantly. Sometimes he cannot believe the news from media because they do not show the real picture of the situation too and mostly media and newspapers give news after the incidence happens or even more lately. He had not enough time to read all those newspapers and watch the TV news to know about a specific areas situation before making a tour package or handling a client's business trip.

One day he came to know about CPF (crowdsourcing political forecasting) application, which gives an updated news about risk or threat related to political instability of a specific place through the local people's comments and reports. He install the application into his smartphone and when he enters to the application the first thing appears is a map of Bangladesh which shows the danger zones of travelling and the safe places of travelling too including his current location. Tanbin was so happy to have such a result on different cities of Bangladesh what would take him hours and hours to get.

He decided to go details on the regions where the application says dangerous to travel. As soon as he clicked on the city, all the reports and comments under the city showed up. Tanvir could read all those comments and posts and was able to rate them as well. He got inspired by seeing huge number of people are participating on this new application, commenting, and posting about the risk or that related to political situation of their locality. Comments from different twitter pages and blogs and Facebook pages were available there with source information. Therefore, he decided to write on the application too, for that he required a user account, which

was so simple to, made, and then he got his location automatically by the application itself. He posted his first report about his city political situation and instantly he could see how many people are reading it and he could see his ratings and comments under the post as well.

Tanbin noticed that if an incidence occurs, within few moments or during the incidence, people are writing it and in some cases, people were writing there is a possibility of violence soon. It gave him a clear idea how active the application is and he was glad to have such application what will increase his workflow and provide him all the current news about politics within short time in a specific way. It will save his time and he can rely on it more because the local people are providing the news and they are monitoring it and they are setting the result too automatically.

4.2.2. Scenario 2

Online Newspaper Journalist Gets Involved with CPF Application

Jahangir notices in one morning his Facebook friends shared interesting site CPF, he starts to browse it and he notices a Bangladeshi geographic map with lots of animated social media comments. However, it has difference with others, it has connection to political status of commented cities - he gets involved.

He starts to discover whole site, about cities he is into Chittagong (Port city of Bangladesh). He browses all throughout application where is offered automatic info about travel options. He gets very interested, since he cannot travel frequently, he still thinks to start collect money and go to travel – the cheap offer links, provided at site as well the politically interesting situation calls Jahangir. While he discovers site he also can write little overview of what is at people's minds (analyse of comments) at Chittagong. He sends it off to editor and he gets good feedback since he had lively source. He got work done as well he entertained himself; as well, he got interested about to discover other countries.

He also noted there were some comments about his city, he peeks in and totally disagrees and wants straight to comment, the commenting box appears under comment, is then whenever you spend reading the comment.

Starting to type immediately appears new box upon it. It asks to create account or you connect through twitter or Facebook or provide your email and new password. Moreover, immediately

he can comment. He enjoys the commenting part; he drags CPF application to his laptop desktop. Jahangir is bored, looking constantly something new, cheaper, and mad about travelling, even though, he does it only few times.

4.2.3. Scenario 3

Step 1. Activists at protest: Taher went to the protest in the middle of town hall. He saw that there was not any channel or press media in the protest. Then, he opened smart phone and took some pictures and videos.

Step 2. Activist shares information on social media: When he is sharing news, we put our tags to his posts. Admins see the posts and if it is reliable share them in the accounts and websites at the same time.

Step 3. Other people comment the situation: After posts became mainstream on the web page or social media accounts people can see the situations, comment them and evaluate the reliability of the posts.

Step 4. Open the comment to the world: After evaluation process finished if situation marked as important it be release on the web page. Other tourists, businesspersons, politicians can see the situation and understand what is going there.

4.3. PAPER PROTOTYPE

For better understand and evaluate users experience we started by designing a paper prototype followed by an interactive prototype, see paper prototype figure below.
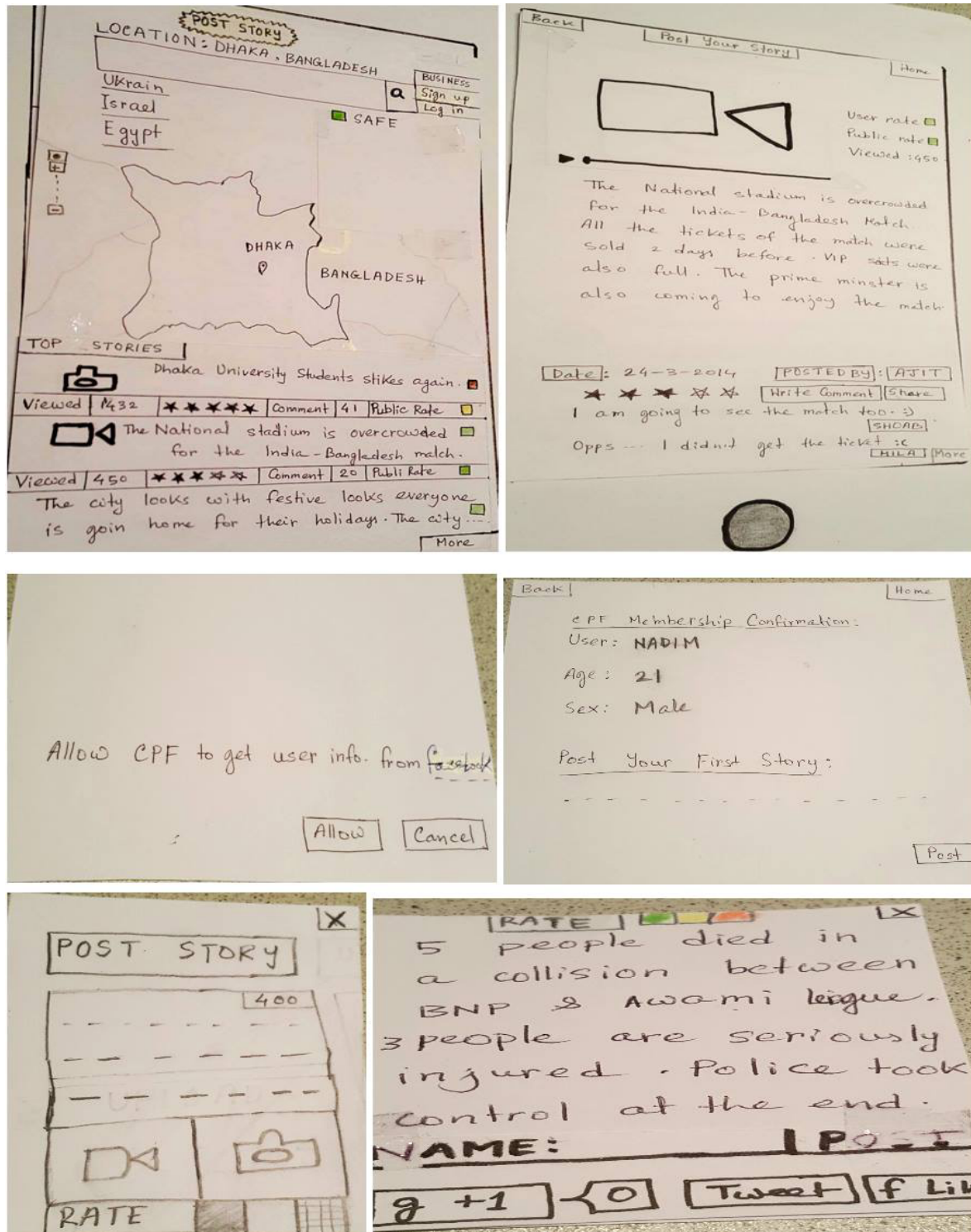

Figure 9 - Paper Prototyping of CPF Application.

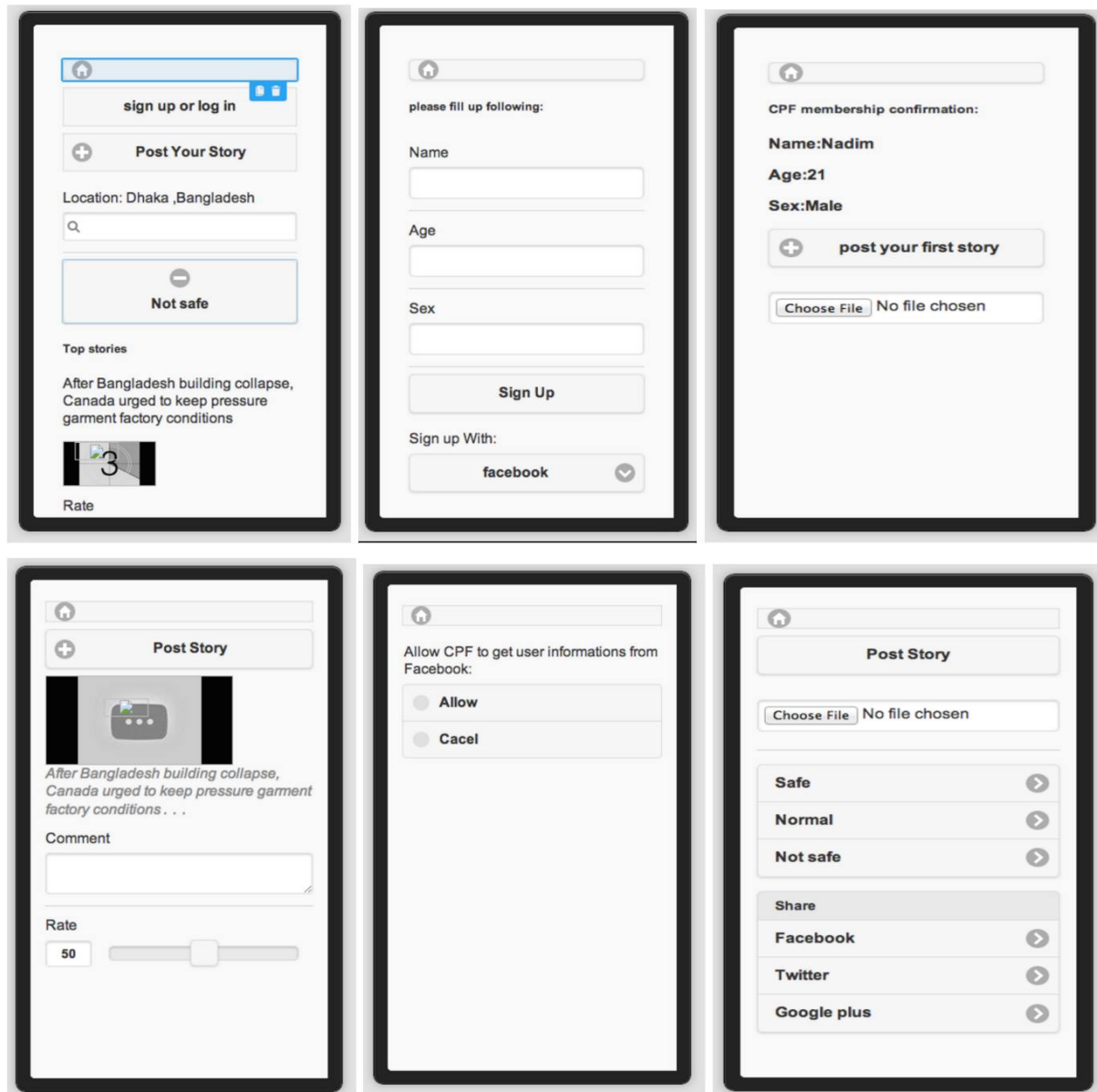The first version of the functional application prototype was created using a tool called Codida under marvelapp[24].

Figure 10 - First prototype of application.

This prototype can be used also in computer desktop but it is designed for mobile purpose. As well, however this application is designed to work in android it can also work in IOS.

In the following line, we will describe our User experience evaluation procedure

4.4. USER EXPERIENCE EVALUATION PROCEDURE

Our paper prototype evaluation procedure included three main methods, card sorting, Cognitive Walkthrough and interviews.

In both cases, we described to our participants about the concept and the functionality of analysis tool. Thereafter, the participants were handed a paper with instructions. We provided the questions among the participants as soon as they finished reading the instructions. The test is formed with 3 different tasks which we provided one by one without any order. They were encouraged to think aloud when performing the tasks and at some points, prompting was used. In combination with the last paper prototype tests, interviews were held to determine how the concept could be improved.

4.4.1. Card sorting

We used card sorting method to target user's expectations, understanding categories, and navigation levels for the risk or threat related to political forecasting grouping both in open and for closed card sorting we used this method.
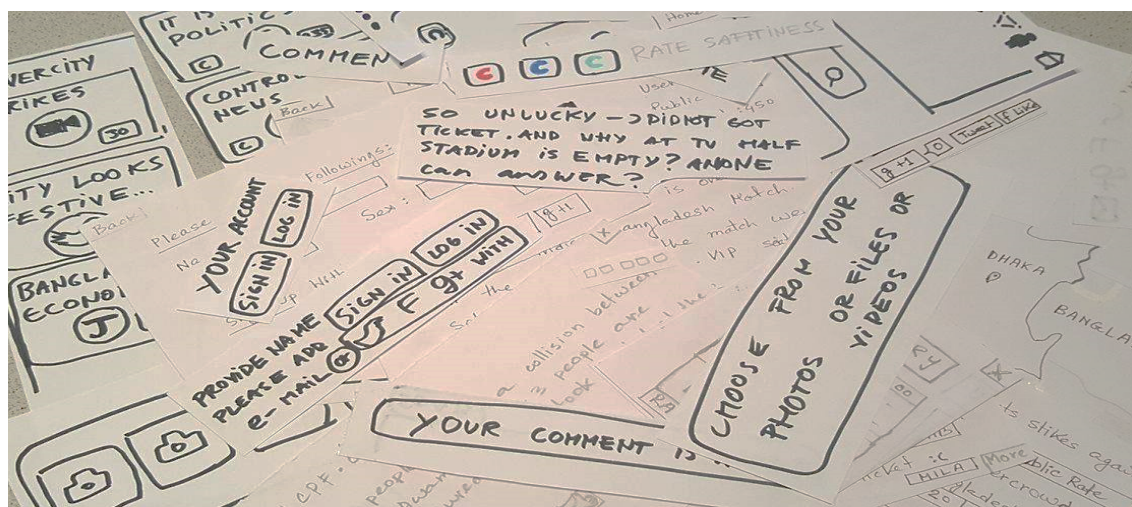

Figure 11 - Card sorting of paper prototype.

For open card sorting we gave participants some key words what we are looking, for like- sign in, sign up, posting news, view risk or threat related to political news, upload file, rate others news, share news and see map for travel safety.

During closed card sorting, we asked to the participants to sort cards in the defined group - political forecasting for risk and threat assessment.

Results

We were taking pictures and counted the number of cards used by participants for analysis purpose. We got qualitative information depending on: which cards appeared together most often, how often cards appeared in specific categories. After analysing the data from card sorting, we gather useful information and structured the information architecture of the actual prototype.

4.4.2. Cognitive Walkthrough

To determine the level of usability, we performed cognitive walkthrough on our paper prototype. **The three tasks are as**

1) Searching for local political news through CPF, 2) Posting political stories of local city and share it with social network, 3) Creating a user ID in CPF application.

A sample video[25] of this procedure is available online. The participant tried to finish with a "success" for each step in the process.

If the participant ends up with a "failure" instead and calculates why the user might not finish the task based on the interface design. We can develop the usability of the website or the application by using these insights.

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[25] YouTube video of paper prototype is available at https://www.youtube.com/watch?v=dFHVF-mS6U8.

Results

We tested first the paper prototyping within some Human Computer Interaction (HCI) master students and teachers at Tallinn University. The problems users faced during testing are as follow:

Problem 1: the users were not able to perform all 3 tasks completely. The user washable to find proper navigation to post his/her story.

Problem 2: they found is lots of information in same page.

Problem 3: information should be like a list not side by side it does not follow the mobile application formats; it seems like more web application.

4.4.3. Interviews

The feedback collection method was in a form of interviews. These in-depth interviews with semi-structured questions are used for the gathering opinions on their experience after using. The interview questions were designed in such a way that it provides the answer for the research questions. This is an optimal choice because it allows the respondents to describe their experiences and feelings in as much depth as possible. Then, we went through the feedbacks one by one and managed to identify our faults for the prototype design. Participant's feedbacks are available in my study blog[26].

We posted our all information regularly on a blog for public. Much information technology related personnel were commenting and reviewing the posts. We tried to utilize their valuable feedback and put it into our future work efficiently.

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[26] Our study blog is , accessible at: https://nomansjc.wordpress.com/2014/02/02/project-idea/comment-page-1/#comment-17;https://nomansjc.wordpress.com/ga-5-1-testing-paper-prototype/

4.5. THE BUSINESS APPROACH

We have divided our business approach into several major parts:

Target customers: We tried to identify who will be our customers are ready to pay for the application and who will use the application free. Our expected customers will be local and international tourists, politicians, journalists, tour operators, Business Company, business travellers, economists, and so on.

Early Adopter: We tried to find out from our target customers who will be more excited to use the application and could not do without it, they are the early adopter. This kind of people will tell other people about the use of the application. For our app early adopter are tour operators, international tourists and journalists.

Path to Customers: It is always hard to reach to your target group or early adopter, so it is important to find a way to reach them .For our case it can be social networking like Facebook and Twitter.

Problems: As we have the defined group of people and we know where to find them, we can put our attention to main points. What sort of problem our users are facing?

Solution: After having the problems we come out with required solution.

Revenue Model: Both paid and free version of the application will be available. Of course, the paid version will have special features like alert or feedback notification. It can be free to view and sign up for alert for safety of certain area can charge an amount for monthly and yearly basis. Making money off free applications made possible through advertising networks like Chartboost and PlayHaven that may allow us to host advertisements through our applications. If we start out with both a free and a paid version, we can watch each closely and see which one brings in more money. In-application purchases are another source of income through both free and paid apps. Nevertheless, mostly there will be free downloads of the application.

Marketing Message: It is important to have a good name and CPF is short and catchy tag line too. In addition, we have a good marketing message to "keep calm and travel safe".

4.6. THE USER INTERFACE

During designing the prototype we considered few key issues as - easy to access, simple to understand and visually attractive. User can access with social networking or directly to crowdsourcing political forecasting for risk or threat assessment. There is a Geomap of Bangladesh showing different cities safety mark and in top story user can see the most important and trusted recent risk or threat assessment related to political news. If the user wants, it is possible to read the news in details by simply clicking on it and it is possible to share it to any other social networking. It is easy to know how true a report is if we look the reporters ranking and the ratings he got for the report.
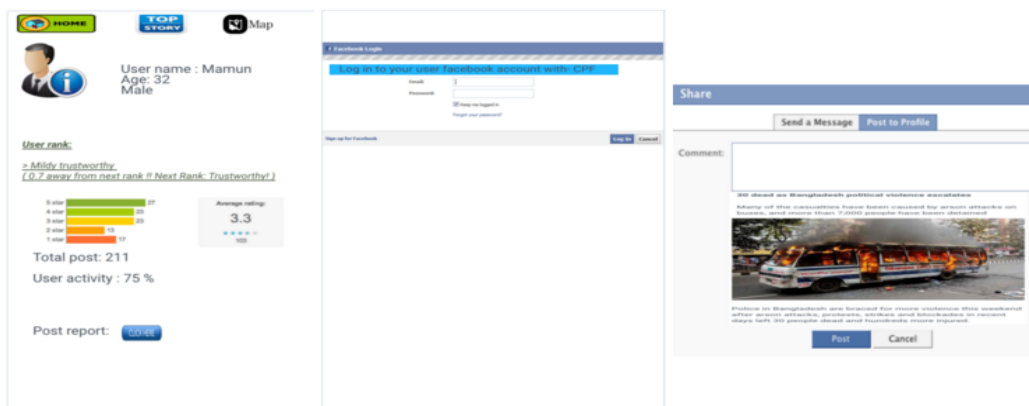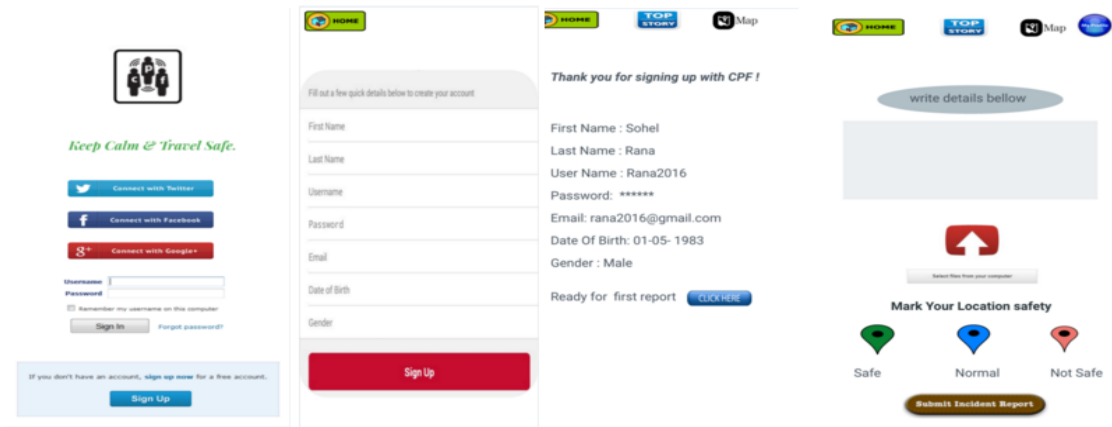
Figure 12 - CPF, Prototype (UI) User Interface.

4.6.1. Tools Used

To create this prototype we have used a website called marvelapp.com and the application prototype[27] is available in the website. To analyze UX reports we used spreadsheet. We also used C-map (Concept Map) to get a details idea of crowdsourcing political forecasting (CPF).

4.7. FINAL EVALUATION

The final User evaluation procedure included the following main methods: think aloud and observation.

4.7.1. The procedure

The evaluation started with a short interview before the user went through the testing of the application prototype, we did also observation and counted number for clicks for a total and 3 different tasks, did a System Usability Test and recorded the procedure. After the testing, we asked their opinion again regarding the experience after finishing all 3 tasks and ask for additional suggestions regarding the application. Then, add the data into a spreadsheet to analyze.

This method especially helps us for determining users' expectations and identifying what aspects of a system are confusing. To evaluate the results we used a voice recorder for this task.

4.7.2. The script

We asked user to perform 3 tasks in the application prototype. The tasks are as follow:

1. Sign up manually, find in the map which cities are safe to travel.
2. Sign in with Facebook, go to the user profile page, post the first story, and share it with Facebook.
3. Sign in manually read the top stories and read the first report in details.

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[27]Application prototype available : https://marvelapp.com/cb0cc5

4.7.3. Participants

Participants belong to different groups and contexts. A total of 16 participants participated in this study. Those included 6 local tourists, 1 travel agent, 2 politicians, 1 UX designer, 3 HCI students, 1 journalist and 2 businessperson.

4.7.4. Results

This test allows us to observe which strategies user use to finish specific tasks. We analyzed the reflected steps of solving every task by user. Some users were not comfortable in think aloud. It gives us a picture of invisible navigation of a user during their experience with the prototype.

First Click Testing

First Click Testing is used to identify what a test participant is going to click first on the interface to finish his specific task. It is very important to know the first click of user for user's' tasks upfront so we have used this test for our application prototype's final evaluation. We can evaluate the navigation and the effectiveness of our application is linking structure through the first click testing, to observe how users get around the application to finish their task. If a participant click down the right path on his first click then he has more chances to finish the task than a participant who clicks down the wrong-path on the first click. We will track every single click, measure the time of making first click and count the number of total wrong clicks.

Results: For the three tasks, respectively user should use sign up, Facebook log in and sign in button. In this case, not a single user clicked on a wrong button and the average duration for first click is 1.02 second.

System Usability Test

During this test, we asked 10 item questionnaire' with five response options. We haves used SUS (System Usability Test) because it is non-proprietary and very free. We provided the SUS sheet printed to every user and requested them to fill it up after their experience with our application prototype. Every user took about 2-3 minutes to fill up the form.

Figure 13 - System Usability scale Sheet.

<u>Results:</u> After finishing with the SUS forms, we did the analysis and calculation of the data and the average score from 16 users were 82%. Which is well above average usability.

Screen Recording

For monitoring user movement and to count click number and duration of tasks we used an application called AZ Screen Recorder[28]. It recorded every movement of a user during his/her experience of the application.

<u>Results:</u> We put the counted duration and click numbers for specific tasks on a spreadsheet. The data of screen recordings and the results shown in following graph:

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[28] Screen recorder details available: http://az-screen-recorder.en.uptodown.com/android

51
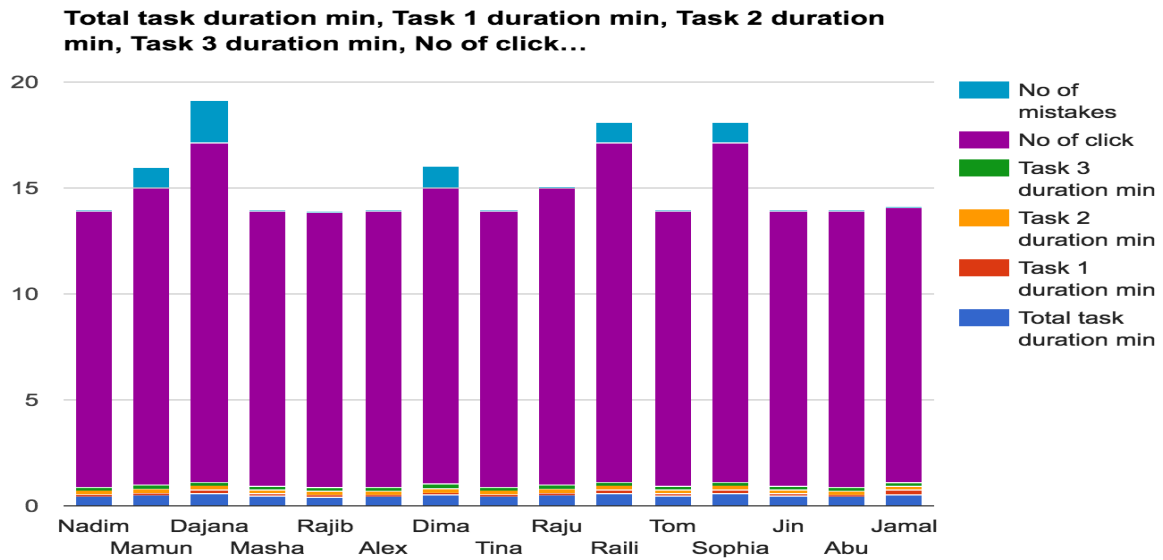
Figure 14 - UX Data Analysis Results for the Prototype Showing in Bar Graph.

	A	B	C	D	E	F	G
1	User Name	Total task duration min	Task 1 duration min	Task 2 duration min	Task 3 duration min	No of click	No of mistakes
2	Nadim	0.44	0.09	0.19	0.16	13	0
3	Mamun	0.5	0.1	0.2	0.2	14	1
4	Dajana	0.56	0.19	0.2	0.17	16	2
5	Masha	0.46	0.09	0.2	0.17	13	0
6	Rajib	0.43	0.09	0.18	0.16	13	0
7	Alex	0.44	0.08	0.19	0.17	13	0
8	Dima	0.51	0.1	0.21	0.2	14	1
9	Tina	0.44	0.09	0.19	0.16	13	0
10	Raju	0.5	0.1	0.2	0.2	14	0
11	Raili	0.56	0.19	0.2	0.17	16	1
12	Tom	0.46	0.09	0.2	0.17	13	0
13	Sophia	0.56	0.19	0.2	0.17	16	1
14	Jin	0.46	0.09	0.2	0.17	13	0
15	Abu	0.44	0.08	0.19	0.17	13	0
16	Jamal	0.54	0.18	0.19	0.17	13	0

Figure 15 - UX Testing Data Analysis in Spreadsheet.

Overall Results

During a number of tests of the final evaluation, 16 participants from different groups and contexts were asked to perform three specific tasks. The final evaluation process includes short interviews, observations, number of clicks, first click, SUS (System Usability Test) and screen recording. The most prevalent issue participants experienced during the final evaluation process was - difficulties with navigation, the button size, and looks. Overall, they found the interface very comfortable to use. From the above results of the tests, we were able to conclude,

that the interface is still not mature enough and it needs more work to be done. Many minor changes in the interface are required including some major changes in some parts of it. Many of these changes (especially the major ones) have been already applied after the first round of tests and had been verified during the second round.

 However, still, a significant amount of work and improvements are required to make this application a sellable final product. A deeper in field research session is required to get a complete picture of the usability of the application.

4.8. CLOSING REMARKS

In this chapter, we did the main study to understand the problem of our thesis and tried to study similar crowdsourcing product. We did observation and testing of our ideas. Reviewed the feedback from participants.

Evaluation is a continuous process so until the program is completely done we can never say final evaluation as final. Therefore, the user interface need to be redesigned partially to solve the navigation and appearance problems found by the users during evaluation tests. Due to lack of time, we did a number of user experience test but more user experience tests are required before launching of the product for use.

In the following section, we will be discussing the conclusions on the concept, results, and a draft possible future work.

5. CONCLUSION

This chapter contains information on the main results achieved, overall discussion, future work in this area, reflections on the subject matter and the learning outcomes of this study.

5.1. MAIN RESULTS ACHIEVED

Through this study, we had a clear understanding of the impact of political instability and terrorism on tourism, tourism in developing country and the recent picture of Bangladesh tourism. We also had a deep research work on the topic-how crowdsourcing political forecasting can make risk or threat assessment and create tourism growth by increasing social awareness.

The main results achieved in this study are - a successful testing of the prototype of our crowdsourcing political forecasting (CPF) application, finding ways to connect all people in a locality in a same platform to broadcast problems, and an open call for contributions to solving the problem share their ideas and raise social awareness.

This study also gives us an opportunity to create a trusted source of information for the tourists from different nationalities to get more interested about travelling Bangladesh fearlessly.

5.2. OVERALL DISCUSSION

Crowdsourcing is an excellent idea to solve big problems by bringing all people in same platform to share information's for mutual benefits. Any number of new media tools could be designed to meet the needs of an organization in search of a solution to a problem. Nevertheless, the solution comes depending on the kind of the problem, the kind of input necessary from crowd. Besides, it is important to understand things that will motivate these crowds to engage in such social task. Moreover, why do not we design these tools to serve the public good, rather than focusing on only profitable applications? This is how, the crowdsourcing application idea came to create tourism growth and increase social awareness in Bangladesh.

However, it needed a lot of research work to understand how crowdsourcing information will manage to do it accurately for the tourism growth and for social awareness of a particular area. For that reason, we started our research from the root to know people's expectations and

opinion about such a platform. One month of field study in different cities of Bangladesh gave us a clear idea about the demand of local people.

Later we did research how people will access to our platform and provide their information. For that, we conducted some theoretical research on the similar crowdsourcing platforms and finally came out with an idea of CPF application. We did personal; scenario, paper prototyping and finally we did an application prototype as well. In every step of this research work we did user experience testing, we took feedback and did required change in our design part. We are very hopeful our idea will be successful to fulfil our goals.

5.2. REFLECTION

During this research work we have understood, tourism has been treated as a powerful engine of growth for many developing countries including Bangladesh. However, having a huge amount of possibilities, the tourism industry in Bangladesh did not improve for many years and the contribution of Bangladesh in world tourism is not remarkable. The tourism industry of Bangladesh can contribute to achieving the country's tourism growth in many ways. Moreover, different short, mid, and long-term projects with enough budgetary allocation is required. The sector also needs to be prioritised in the national development plans and policy programs including political stability.

Many developing countries like Bangladesh are losing their tourist market only because of political disturbance. We also came to know that nowadays people do not trust TV channel or newspapers completely, so our attempt for risk or threat assessment by crowdsourcing political forecasting was truly a demand of time. We had to face many difficulties to select a platform to monitor this huge crowdsourcing information. Being a HCI student now, I realised how hard it is to implement your ideas and bring a completely new product in market.

However, I had a great experience to achieve deeper knowledge of Human Computer Interaction and to know the risk or threat for tourism due to recent political situation of Bangladesh. We have learned from this research how to do user testing, how to do certain change in design of our plan and idea according to user's feedback.

5.4. FUTURE WORK

Future work of this project includes implementing an idea for different developing countries that has a huge possibility of tourism development, making a complete application along with a website. Connecting with different countries and making an international risk or that assessment related to political forecasting for all of us will be in our future work list as well. As this a non-profit social impact project for this moment we will be using Ushahidi platform for big data mining but in future we would like to have our own data mining system.

Risk or threats assessment based on political situation was a case study for the thesis but our main idea was to use crowdsourcing information to raise social awareness for tourism growth. In the beginning of our study, we wanted to give a political forecasting using crowdsourcing information so we named the application as 'CPF' but in future, we will change it into a name related to risk and threat assessments. We would not only focus on political situations but also to other factors that are responsible for the tourism development of a particular region.

We can create a personalised recommendation system for tourism using the application. Success of this recommender system will help people travelling to Bangladesh as well as locals to have an idea about the safe places of the country to visit. It will help to the country for its tourism growth. We proposed a crowd sourced personalised attraction recommender system. As our application is a social awareness system, the recommender system[29] will help its user to be aware of their surroundings before they visit a place.

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[29] Here is a proposed recommendation system of CPF: https://docs.google.com/document/d/1sG-99YrDhVXK8arG7-YfTnFcUAsbXPY0-l3EDgBgjHU/edit?usp=sharing

KOKKUVÕTE

Pealkiri: Ühisloome riskide või ohtude hindamine turismile

Tänapäeval on reisimine üldlevinud elustiili osa ja turismi nähakse sageli kui kõige suuremat ja kiiremini kasvavat majandusharu. Millega seletada niisugust kasvu? Üheks seletuseks on, et inimestel on tekkinud rohkem vaba aega ja reisimist nähakse kui atraktiivset vabaaja veetmise viisi. Inimesed on hakanud rohkem reisima erinevatel põhjustel nagu keskmise töönädala vähenemine, puhkuse ja pühade pikenemine ning sissetuleku suurenemine ja rohkema vaba raha olemasolu.

Tähelepanu tasub pöörata ka põhjustele, miks inimesed ei reisi. Kindlasti on inimesi, kes ei saa endale reisimist lubada. Teised ei reisi psühholoogilistel põhjustel nagu hirm tundmatuse ees. Paljud inimesed väldivad reisimist rahvusavahelistesse kriisikolletesse nagu aktiivsed sõjakolded ja hiljutised terrorirünnaku paigad. Need faktorid vähendavad reisimist, sest inimesed, seistes silmitsi taoliste hirmudega, ei adu võimalusi, mis saaksid siiski rahuldada nende vajadusi.

Üks olulisem tegur rahvusvahelises turismis on globaliseerumine. See on seotud nii rahvusvaliste reiside mugavamaks muutumise kui suurkorporatsioonide tegevuse laienemisega maailmas nagu suurte hotellikettide ja fransiisirestoranide üleilmastumine. Eriti mõjutab globaliseerumine arenevaid riike. Kasvaval turismil on kiire ja oluline mõju kohalikule majandusele.

Selles uurimistöös keskendutakse probleemile, et Bangladeshis ei ole turism piisavalt arenenud. Probleemi lahenduseks kasutame ühisloomet ehk (ingl. crowdsourcing), et tõsta turismi arendamiseks vajalikku sotsiaalset teadlikkust. Rakenduse prototüüp oli tehtud ühisloome informatsiooni kogumise eesmärgiga, et hinnata riske või ohte turismile.

Selle uurimistöö eesmärkideks on ühisloome abil saada hiljutist informatsiooni riskide või ohtude kohta, mis on seotud poliitiliste olukordadega, et tõsta sotsiaalset teadlikkust ja arendada huvi turismi vastu Bangladeshis.

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