

A FRAMEWORK OF TRUST IN CROWDSOURCING: A CASE OF
CATASTROPHIC EVENT

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A FRAMEWORK OF TRUST IN CROWDSOURCING: A CASE OF
CATASTROPHIC EVENT

SANGKIRTHANA A/P MAHALETCHNAN

This report submitted in partial fulfilment of the requirement for the
Bachelor of Computer Science (Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITY TEKNIKAL MALAYSIA MELAKA
2015

DECLARATION

I hereby declare that this project report entitled
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CATASTROPHIC EVENT

is written by me and is my own effort and that no part has been plagiarized
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SUPERVISOR: _____ Date: _____
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DEDICATION

Special dedication to my beloved family, who sincerity, love, care and encourage me to complete this Final year project.

To my supervisor, Pn Syarulnaziah Anawar at
Faculty of Information and Communication Technology,
Universiti Teknikal Malaysia Melaka (UTeM), Melaka, Malaysia.
Thank you for assist and help.

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ABSTRACT

Crowdsourcing is a process of a problem solving method by collecting public, or the crowd ideas. Crowdsourcing nowadays play an important role in natural disaster information propagate and can be utilised to solve many disaster problem. Even though, it is one of effective way to collect data during catastrophic event, but the reliability and trustworthiness is still absent. Due to the lack of trust on crowdsourcing, this study is carried out to investigate the elements of trust in crowdsourcing. Next, a framework of trust in crowdsourcing based on catastrophic event as case study is constructed based on results obtained. The research is conducted using quantitative methodology. The research instrument used for this study is structured questionnaire. A total 255 response from random crowdsourcing user are collected to analyse. The result shows, we found that Competence, Perceive of Quality, Benevolence, Integrity, Perceive Usefulness, and Social Information variables are all positively related to trust. This finding implied that people tend to believe the information from certain people or resource rather than, the credibility of the information.

ABSTRAK

Crowdsourcing adalah proses penyelesaian masalah dengan mengumpul maklumat atau idea-idea dari orang ramai. Crowdsourcing kini memainkan peranan besar dalam mengumpul maklumat bencana alam . walaupun crowdsourcing adalah salah satu kaedah efektif untuk mengumpul data semasa malapetaka tetapi kebolehpercayaan dan amanah masih kurang. Oleh kerana kekurangan kepercayaan terhadap crowdsourcing, kajian ini dijalankan untuk mengkaji unsur- unsur kepercayaan crowdsourcing. Seterusnya, *framework trust* dalam crowdsourcing berdasarkan peristiwa bencana direka berdasarkan keputusan yang diperolehi. kajian ini dijalankan menggunakan kaedah kuantitatif. Instrument kajian yang digunakan dalam kajian ini adalah soal selidik berstructure. Seramai 255 maklum balas dikumpul daripada pengguna rajak crowdsourcing untuk analyse. Hasil kajian mendapati *Competence, Perceive of Quality, Benevolence, Integrity, Perceive Usefulness, and Social Information* memberi kesan positive terhadap *TRUST*. Penemuan ini tersirat bahawa seseorang mempercayai maklumat dari orang – orang tertentu bukannya disebabkan maklumat itu sendiri. Hal ini disebabkan, seseorang berasa risiko itu kurang jika mempercayai maklumat yang disumbang oleh seseorang berdasarkan kajiannya, atau pngalaman.

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CHAPTER I

INTRODUCTION

1.1. Introduction

Crowdsourcing is a process of a problem solving method by collecting public, or the crowd ideas. The principle idea of crowdsourcing is basically a combination of large group of people for ideas, skill, experience and participation to generate new idea or solution. Crowdsourcing usually a platform to look for skilled and expertise such as photography, promotional staffing, office work, navigation, or design. Yu et al, (2012) state that crowdsourcing system offer new way for business and individual to leverage on the power of mass collaboration to accomplish complex tasks in a divide-and-conquer manner.

1.2. Research background

Crowdsourcing nowadays play an important role in natural disaster information propagate and can be utilised to solve many disaster problem. The participation of crowd in emergency response has been active through social media in recent years. The National journal reported that many people use social media like twitter or Facebook as tool for communication during an emergency (Hatch, 2011). During Haiti earthquake on 12 January 2010, a crowdsourcing application based on social media such as Ushahidi and twitter collect information of hazard scenes and images to help

decision making. Twitter is proven in speeding up communication medium in past emergency event like Mumbai terrorist attack in 2008 (Hughes & Palen, 2009).

Crowdsourcing is used to manage catastrophic event, namely for prevention, preparation, response and recovery. Crowdsourcing have many advantages because it has no limit in resources, scale. This is because crowdsourcing allow crowd to universally share resources in cheaper and effective manner. The crowdsource during catastrophic event helps to provide complete data collection. Report from victim in real time via mobile and social media can help to collect data immediately after disaster. This information is very important because these information specify where and what kind of help is needed. Some people use crowdsourcing during disaster as communication medium to communicate with people from outside world to send out help request or immediate rescue. Indirectly this can also help humanitarian effort, to provide help for humanitarian deeds.

During a crisis of missing MH370 Malaysia Airlines plane, three million people have joined an effort led by satellite operator to locate the plane. DigitalGlobe activated crowdsourcing platform called Tomnod on March 11, which invite public to look at imagery from its five high definition satellites. Malaysian government are looking forward to use crowdsourcing during catastrophic. After a crisis flood at Pantai Timur, Malaysia, Multimedia Development Cooperation (MDeC), the agency responsible for overseeing MSC Malaysia implementation, has launched the #TogetherWithU campaign. A core part of this campaign is the e-Bantuan Banjir (eBB) platform. The content on the eBB platform is live social media feeds, updates on areas affected by floods, volunteer and donor. A free mobile app will also be made available for user of devices running Android and iOS operating systems soon. The objective of the campaign to bring hope to victims of flood crisis and to also recover process and to assist in the situation is to showcase and deploy the best of technology so it can benefit the public during times of crisis like these when it matters most.

Even though, it is one of effective way to collect data during catastrophic event, but the reliability and trustworthiness of the information gathered from crowd raises a big question mark. Widespread use of smart phone allows crowd to post report and pictures with ease. The disaster management teams will benefit from the input observers but the trustworthiness of these reports may be uncertain, for example a terrorist group might use crowdsourcing to redirect the community's emergency response to the wrong place. (Weaver & Boyle, 2012). The information from

crowdsourcing applications, while useful, but do not always provide all the right information needed for disaster relief effort. The accuracy of the report's geo-tag and content is not guaranteed. (Gao & Barbier, 2011)

On the other hand, not everyone is aware and familiar with crowdsourcing. Although crowd have been given many platform to contribute data, the number of contribution especially during catastrophic event is low. A research (Hatch, 2011) done after Haiti earthquake reveals that crowd are disappointed because didn't receive sufficient response when they send request for help. This fact shows that the potential utilizing crowdsourcing in emergency response is very less.

1.3. Problem Statement

Crowdsourcing nowadays plays an important role in natural disaster information propagate and can be utilised for solve many disaster problem. On the other hand, information in crowdsourcing is deem and not reliable or trustworth due to low quality data. This happened because the data provided by the crowd on crowdsourcing platform not always the correct information. The accuracy and content is not guaranteed because the data provider is unknown. According to Gao & Barbier (2011), the information from crowdsourcing applications is useful but not always providing all the right information for disaster relief effort. This cause, the trustworthiness of these reports or update can be uncertain. Other than that, the low quality information in crowdsourcing is also happen because, user are not contributing to crowdsourcing. According to marrow, 2011 the user are not aware with existed of crowdsourcing. From past experience, when Haiti Disaster in 2010, the citizen are not aware of Ushahidi service even after initial media report. (Marrow, 2011). Low contribution to crowdsourcing can lead to less reliability to information in crowdsourcing.

Table 1.1: Summary of Problem Statement

PS	Problem Statement
PS ₁	The information in crowdsourcing cannot be trusted because of low quality data.

1.4. Project Question

There is some question arise from the problem statement, which is needed to be answered during this study. The question will lead this study.

Table 1.2: Summary of Project Question

PS	PQ	Project Question
PS ₁	PQ ₁	What are the elements of trust on information in crowdsourcing?
	PQ ₂	What is the element that influence trust on information in crowdsourcing
PS ₂	PQ ₃	How to integrate the element of trust in crowdsourcing into a model.

1.5. Project Objective

There are some objective that need to achieve in the study. Due to deficiency of trust on crowdsourcing, this study is carried out to investigate the element that can influence trustworthiness on crowdsourcing applications. The main objective of this analysis is:

Table 1.3: Summary of Project Objective

PS	PQ		Project objective
PS ₁	PQ ₁	PO ₁	To investigate the variable that affect trust on information in crowdsourcing platform
	PQ ₂	PO ₂	To analyse the variable that affect trust level on information in crowdsourcing platform.
PS ₂	PQ ₃	PO ₃	To construct framework of trust in crowdsourcing.
		PO ₄	To validate framework of trust in crowdsourcing.

1.6. Project Scope

1.6.1. Catastrophic Event

Crowdsourcing is one of method of obtaining or collect information which is introduce recently in year 2006. The existent of this term is not realised by many. From the previous study, the utilisation of crowdsourcing during hazard event is one of effective method to manage hazarded events. Unfortunately usage of crowdsourcing in Malaysia especially during catastrophic event is limited. Furthermore, recently hazarded event in Malaysia increase in number such as missing of MH370, flood at Pantai Timur, sink hole at Jln.pudu and other. Due to this, this present study scoped to utilisation of crowdsourcing during catastrophic event to increase awareness to implement usage of crowdsourcing during catastrophic event.

1.6.2. Random sample size.

This present study is scoped to only Malaysian. The respondent in this study is does not specify to any gender or age group. Anyone can become responded as long as they have knowledge in using social network to share information to crowd. According to Makiko, 2014 Facebook, twitter and other social network been recognised as crowdsource platform during catastrophic event. So, user of social network is targeted, because can easily reach.

1.7. Project Contribution

- Theoretical contribution: Framework for trust on crowdsourcing during catastrophic event.
- Practical contribution: Validated questionnaire for trust on crowdsourcing during catastrophic event.
- Community contribution: Guideline of trust on crowdsourcing among Malaysian for National Security Council, who responsible for disaster management
- Community contribution: Increase awareness on utilising crowdsourcing during catastrophic event

1.8. Thesis Organization

Chapter 1: Introduction

In this chapter, the background of crowdsourcing is discussed briefly. Then this discussion narrowed to the utilisation of crowdsourcing during catastrophic. In this chapter some problem is highlighted which motivate to do this thesis. During the discussion many questions arises from problem that are highlighted, which need to be solved at the end of this thesis. After discussing, the objective of this thesis is identified from the problems and included in this chapter. This chapter also contains the scope and contribution of this thesis.

Chapter 2: Literature Review

This chapter discusses the about the research has been done on crowdsourcing before. First, research done on crowdsourcing and the type of crowdsourcing is discussed. Then the discussion is narrowed to research that carry out only for a catastrophic event is discussed. Then, from previous study some variable that may implemented in crowdsourcing is identified. Basically

element of trust in general and in E commerce, is revised to identify the variable that will be suitable for crowdsourcing.

Chapter 3: Methodology

This chapter is to describe the method used to conduct this research. The method used have five phases which are develop research question, research design, collect data, analyse and evaluation. In Develop research question phase, the question that will be answered at the end of the research is identified. Based on the questions the objective of the research is specified.

The Second phase is research design, in this phase discusses how the research will be conducted. The variable that influences trust in crowdsourcing is selected from academic paper. In third phase is research design. In this phase the most compatible research instrument for this type of research is identified. Forth phase is analysis, in this phase, the data from actual data is analysed using several test. Last but not least, the evaluation phase is conducted, in this phase the test result is evaluated to make conclusion of this research. This phase all the objective is should be achieved. Then in chapter, variable selected is described with the definition.

Chapter 4: Data collection

In this chapter, the research instrument design is discussed. The questionnaire is selected as research instrument of this research. Easy English is used to ensure the respondent understands the question. The questionnaire is constructed carefully to make sure there are no bias questions. Then the sample size and sample method are discussed. The questionnaire created with proper step to ensure the instrument is valid. Two methods are selected to validate this questionnaire which is content validation and construct validation. Content validation, conducted by referring three expert that chosen based on their specialist. The expert lectures give some comments. Their comment is taken into consideration and modification are made to improve the questionnaire. This step repeated until there is no comment on questionnaire. To validate the questionnaire pilot study is also conducted. Pilot is not the actual respondent.

Construct validation divided into two which are Factor Analysis and Items Analysis which need pilot to conduct this test. Using the validated questionnaire the data collected from 255 respondents to be used in the next chapter for analysis. Data are then collected through various mediums.

Chapter 5: Analysis and result

This chapter discusses how statistical analysis is done from the data collected. Two types of analysis need to be done, which is correlation and regression. Pearson's correlation selected to find out the relationships among the variables in the model. Then further examination is conducted using regression to predict factor and dependent variable trust. Both analyses are done using SPSS software. The software used to produce the statistical values. The software also used to create tables and plot graph.

Chapter 6: Validation and discussion

In this chapter the result of the data analysis is validated. The validation is conducted using Structural Equation Modelling (SEM). This statistical model will explain the relationship among multiple variables. (Hair Jr.et al.2010). SEM is used to determine whether a certain model is valid. Then the result from the analysis is compared. Furthermore the discussion on the result is compared with hypothesis to see whether the hypothesis is achieved.

Chapter 7: Conclusion

This chapter discusses the summary of the whole analysis. The limitation are highlighted and discussed here. The future work, to improve this study in future is also included in this chapter.