



Faculty of Information and Communication Technology



**TRUSTWORTHINESS VERIFICATION METHOD FOR SOCIAL
MEDIA INFORMATION**

Mohamad Nazri Bin Khairuddin Yap

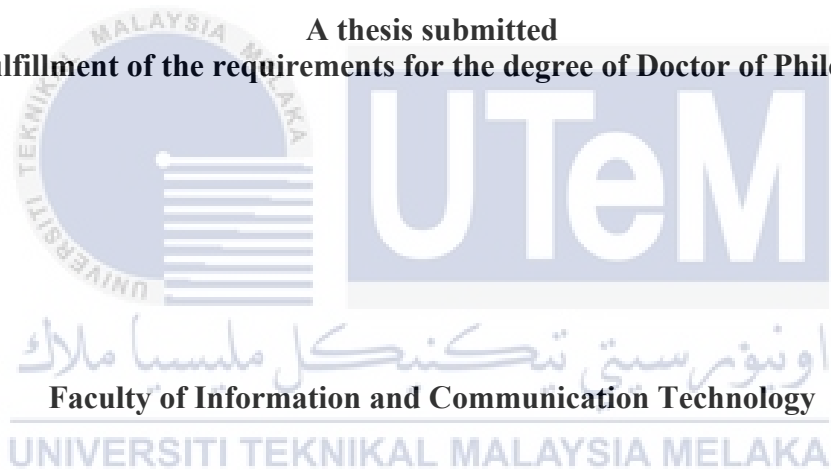
Doctor of Philosophy

2022

**TRUSTWORTHINESS VERIFICATION METHOD FOR SOCIAL MEDIA
INFORMATION**

MOHAMAD NAZRI BIN KHAIRUDDIN YAP

**A thesis submitted
in fulfillment of the requirements for the degree of Doctor of Philosophy**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2022

DECLARATION

I declare that this thesis entitled “Trustworthiness Verification Method for Social Media Information” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in term of scope and quality for the award of Doctor of Philosophy.

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DEDICATION

I dedicate this thesis to my wife Nor Hayati Binti Abu Mansor, my children Muhd.Aiman, Muhd Athif, Nur Ariana and Muhd Azfar, my beloved parents, sister, my parent-in-law and friends for their unconditional love and support.



ABSTRACT

The pervasive use of social media has generated massive information sharing among its users. Given the fluidity and excessive information available online, issues relating to the trustworthiness of information have become a concern among the users and authorities. Sensational and unreliable information shared in the social media may cause and harm the reputation of an individual, product, organization, or government. There exist several ways on how the society could overcome this issue of information trustworthiness by referring to the website of the related agencies pertaining the issues, manually search for information, or even depending on the information to be viral and shared through the social media. However, these methods did not come handy and time consuming allowing the society to get incomplete trustworthiness of information. Dealing with trustworthiness of information requires the society to consider and examine several aspects about the information itself such as the locality of the information, the reputation, the trusted source and the time or period of the information. Therefore, the objectives for this study are three folds. First is to define the factors of the trustworthiness of information for social media. At this stage, it is important to identify the determinants for information trustworthiness through scholarly review as well as from the surveys from the social media users. Second, is to propose a verification method that verifies the degree of perceived trustworthiness of information in social media. The determining factors are important to develop rules for verifying the information trustworthiness. These rules will provide the degree of the trustworthiness level for the determining factors which had been identified. The third objective is to evaluate the usability of the approach that verifies the degree of perceived trustworthiness of information in the social media. The usability of the rules is evaluated by conducting usability test from the random social media users. Furthermore, we have employed a process-based research method that starts with analyzing the most influencing factors of trustworthiness through literature and comprehensive survey to confirm the factors. Then, we have constructed the rules to calculate the trustworthiness percentage and realized the approach with a tool called TrustCrawler. Nevertheless, with the determining factors which form the rules for the verification will contribute for the level of the information trustworthiness. The verification percentage will determine the level of trustworthiness to indicate the significance of the information. It is believed that the adoption of verification approach will help to educate and make the public users aware of the level of trustworthiness of information, hence developing an informed, safe, and ethical users of media content. This study underlines how critical it is for social media users to comprehend and be properly informed about the information they acquire. In future, this research could extend the information trustworthiness verification method to other social media platforms.

KAEDAH PENGESAHAN KEPERCAYAAN UNTUK MAKLUMAT MEDIA SOSIAL

ABSTRAK

Penggunaan media sosial yang meluas telah menghasilkan perkongsian maklumat secara besar-besaran di kalangan penggunanya. Memandangkan kecairan dan maklumat yang berlebihan yang tersedia dalam talian, isu yang berkaitan dengan kebolehpercayaan maklumat telah menjadi kebimbangan di kalangan pengguna dan pihak berkuasa. Maklumat sensasi dan tidak boleh dipercayai yang dikongsi dalam media sosial boleh menyebabkan dan menjejaskan reputasi individu, produk, organisasi atau kerajaan. Terdapat beberapa cara bagaimana masyarakat boleh mengatasi isu kebolehpercayaan maklumat ini dengan merujuk kepada laman web agensi berkaitan berkaitan isu tersebut, mencari maklumat secara manual, malah bergantung kepada maklumat yang akan tular dan dikongsi melalui media sosial. Walau bagaimanapun, kaedah ini tidak berkesan dan memakan masa yang menyebabkan masyarakat mendapat maklumat yang tidak boleh dipercayai. Berurusan dengan kebolehpercayaan maklumat memerlukan masyarakat mempertimbangkan dan meneliti beberapa aspek tentang maklumat itu sendiri seperti lokaliti maklumat, reputasi, sumber yang dipercayai dan masa atau tempoh maklumat. Oleh itu, objektif kajian ini adalah tiga lipatan. Pertama ialah menganalisis faktor-faktor yang mempengaruhi kebolehpercayaan maklumat dalam media sosial. Pada peringkat ini, adalah penting untuk mengenal pasti faktor penentu kebolehpercayaan maklumat melalui kajian ilmiah dan juga daripada tinjauan daripada pengguna media sosial. Kedua, mencadangkan kaedah pengesahan yang mengesahkan tahap kebolehpercayaan maklumat dalam media sosial. Faktor penentu adalah penting untuk membangunkan peraturan untuk mengesahkan kebolehpercayaan maklumat. Peraturan ini akan memberikan tahap kebolehpercayaan bagi faktor penentu yang telah dikenal pasti. Objektif ketiga adalah untuk menilai kebolehgunaan pendekatan yang mengesahkan tahap persepsi kebolehpercayaan maklumat dalam media sosial. Kebolehgunaan peraturan dinilai dengan menjalankan ujian kebolehgunaan daripada pengguna media sosial secara rawak. Tambahan pula, kami telah menggunakan kaedah penyelidikan berasaskan proses yang bermula dengan menganalisis faktor yang paling mempengaruhi kebolehpercayaan melalui literatur dan tinjauan komprehensif untuk mengesahkan faktor tersebut. Kemudian, kami telah membina peraturan untuk mengira peratusan kebolehpercayaan dan merealisasikan pendekatan dengan alat yang dipanggil TrustCrawler. Namun begitu, dengan faktor penentu yang membentuk peraturan untuk pengesahan akan menyumbang kepada tahap kebolehpercayaan maklumat. Peratusan pengesahan akan menentukan tahap kebolehpercayaan untuk menunjukkan kepentingan maklumat. Adalah dipercayai bahawa penggunaan pendekatan pengesahan akan membantu untuk mendidik dan menyedarkan pengguna awam tentang tahap kebolehpercayaan maklumat, seterusnya membangunkan pengguna kandungan media yang bermaklumat, selamat dan beretika. Kajian ini menggariskan betapa pentingnya pengguna media sosial untuk memahami dan dimaklumkan dengan betul tentang maklumat yang mereka perolehi. Pada masa hadapan, penyelidikan ini boleh memanjangkan kaedah pengesahan kebolehpercayaan maklumat kepada platform media sosial yang lain.

ACKNOWLEDGEMENT

In The Name of Allah The AlMighty, The Most Gracious and The Most Merciful and His Beloved Messenger Prophet Muhammad, Be Peace Upon Him, His close friends and His Followers.

In particular, I would like to express my sincere and deepest appreciation to my main supervisor Professor Ts. Dr. Massila binti Kamalrudin for her contribution, her infinite patience, priceless guidance and endless support to make this thesis come true. I also wish to express my sincere appreciation and prayers to my co-supervisor, Associate Professor Dr. Safiah Sidek for her encouragement and advice. Special thanks to Professor Dr. Ahmad Zaki A. Bakar for his friendship and support. I come to meet and being able to present this project to Cyber Security Malaysia, Multimedia and Communication Malaysia Commission (MCMC), computer science experts, friends, colleagues and top management in Universiti Malaysia Sarawak (UNIMAS) as well as Universiti Teknikal Malaysia Melaka (UTeM) particularly the Faculty of Computer Science and Information Technology and Faculty of Information and Communication Technology, thus providing me valuable insight and positive feedbacks on this research.

My heartfelt thanks to my beloved wife Nor Hayati Abu Mansor for her belief in my capability to accomplish this endeavour and trying to do the best, to my children Aiman, Athif, Ariana and Azfar. I am indebted for their patience, moral support and understanding. Last, my dedication to my parents: Hj Khairuddin Yap Abdullah and Hjh Saptuyah Junaidi for their wisdom, and upbringing that taught me about love, patience, confidence and perseverance. Above all, I am grateful and thankful to The AlMighty Allah for His Blessings. Praise be upon Him.

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LIST OF ABBREVIATIONS

AI	-	Automated Intelligent
APA	-	American Psychological Association
API	-	Application Programming Interface
BERT	-	Bidirectional Encoder Representation from Transformers
CD	-	Cognitive Dimension
CNN	-	Convolutional Neural Network
CSS	-	Cascading Style Sheets
GIS	-	Geographic Information System
GST	-	Government Service Tax
HCI	-	Human Computer Interaction
HTML	-	HyperText Markup Language
ICT	-	Information and Communication Technology
ID	-	Identity Document
IR	-	Internal Rate
IS	-	Information Systems
JSON	-	Java Script Object Notation
KKM	-	Kementerian Kesihatan Malaysia
LSTM	-	Long Short-Term Memory
MCMC	-	Multimedia and Communication Malaysia Commission
MCO	-	Movement Control Order
MLM	-	Mask Language Model

MVC	-	Model-View-Controller
NLP	-	Natural Language Processing
NOAA	-	National Oceanic and Atmospheric Administration
PaaS	-	Platform as a Service
RBAC	-	Role-Based Access Control
RNN	-	Recurrent Neural Network
SDLC	-	System Development Life Cycle
SEO	-	Search Engine Optimization
SLR	-	Systematic Literature Review
SPSS	-	Statistical Package for the Social Sciences
TSM	-	Trust Score in Social Media
UNIMAS	-	Universiti Malaysia Sarawak
URL	-	Uniform Resource Locator
USE	-	Usefulness, Satisfaction and Ease of Use
UTeM	-	Universiti Teknikal Malaysia Melaka
WWW	-	World Wide Web
XML	-	eXtensible Markup Language

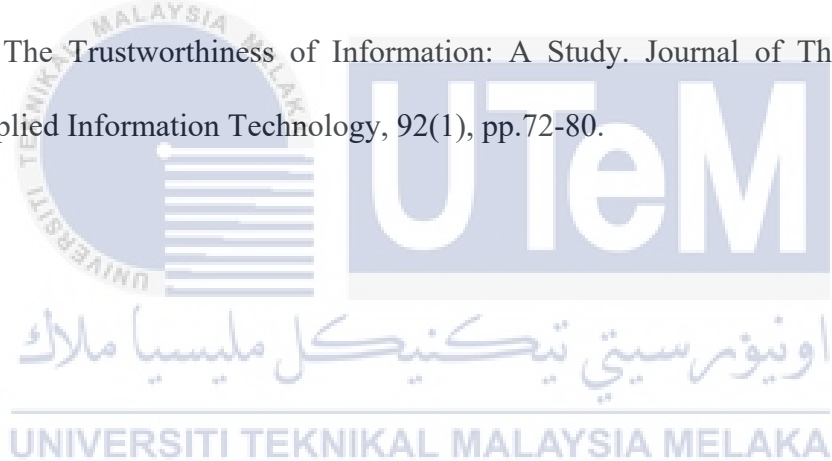


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CHAPTER 1

INTRODUCTION

1.1 Introduction

The openness of the Web and proliferation of modern communication systems have resulted in the difficulty to determine who and what to trust online. The easily accessible and variety of information have also facilitated the manipulation and dissemination of unreliable information by irresponsible users which may eventually disrupt the safety and harmony of a society. There have been many instances, whereby the dissemination of unreliable information tarnishes individuals and organizations or causes public panic. According to Ahmad et al., (2021), who mentioned the misinformation and disinformation on Covid19 fake news where technology countermeasures are not sufficient to address the ongoing problem of the malicious use of data. This article added that there are three important elements that enables disinformation which are the types of content being created and shared, the creator's motivation and how content is being disseminated. Advantage to that, this research will emphasis on the ability to verify information trustworthiness with outlining the most important information trustworthiness determinants or factors in order to assist the verification process. Therefore, to safeguard the safety and harmony of a nation, public users need to be able to differentiate between the good information from the bad ones. In this case, verifying the perceived trustworthiness of information is one of the ways for users to differentiate between the good information from the bad ones. This research aims to develop an automated approach to verify the degree of perceived trustworthiness of information in media social. To do this, the factors influencing the degree of perceived

trustworthiness will be analysed and a rule to verify the trustworthiness will be constructed. Then, an automated tool embedded with a crawler capability will be developed to realize the approach. The tool will then be evaluated using both qualitative and quantitative approaches for its usability with the users of social media. It is anticipated that the adoption of this approach will help to educate and make the public users aware of the level of trustworthiness of the information, hence developing an informed, safe and ethical users of media content.

1.2 Problem Statement

This research focuses on the issues related to the verification on trustworthiness of information. Mass information obtained from the internet could be difficult to be clarified. Information from the internet could be obtained from personal blogs, Facebook, Twitter, Instagram and any of the social media websites. According to Webopedia, Social media is increasingly used in various contexts and seem to have an impact on society. At the same time, the technological development of ICT (Information and Communication Technology) is influenced by society itself as individuals and groups use social media in specific and often not prescribed manners. A main reason for social media implementation in organizations is knowledge sharing as in modern economies knowledge is considered to be a factor of outstanding strategic importance for organizational development. Our lifestyle is more and more digital dependent every day. In recent years, the term digital lifestyle evolved and became connected with a daily life in which we can create, share and enjoy multimedia information in a personal and mobile environment. It has become a major issue where society is much depending on the information obtained from social media. Therefore, along with the emerging usage of technology and the social media application, information is available despite the time and location. However, it also brings harm with the unvetted information through social media.

Information trustworthiness is very important as the amount of information freely available in modern day society is phenomenal. Critical factors such as who to trust, when does the event occur, how many has disseminated the information and what is the actual situation of the information need a serious attention. On the serious note, information posted on the internet was being shared without knowing the level of the trustworthiness of the source. Thousands and millions of such information was shared through social media. Due to the controversial nature of vast information in social media, many social media users faced the uncertainty and the unreliable information they obtained. At the same time, social media users are concern on the information trustworthiness as such information will provide judgement and decision making.

Social media provide large benefits for many people as bringing harm. For business sector, product and services information are available in social media. Interaction between the business and the consumer is important in order to provide better product and services. However, there are situation where the business did not provide a satisfactory product and services to the customer. As for the customer, unresolved matters will be shared in the social media with the intention that the society will be aware. Still, the fault is unclear giving the business a bad reputation and losing customers. In this such viral information, many social media users will share the information and give their comments. Apart from that, there are also cases on the sensitive issues on product. For example, the Halal issues on Cadbury chocolate in Malaysia had create attention by many organisations including the ministry. The information was claimed to be fake by the business. Social media users on the other hand, had started to share the information without knowing the truth of the information. Harms were done and bad reputation was given to the business. Trending information could be also full of misleading and slandering where the users should be aware of. The users did not understand the originality of the source of the information. Consequently, there is the