END USER ACCEPTANCE MODEL FOR MYSEJAHTERA APPLICATION IN MALAYSIA

BY

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ABSTRACT

The Malaysian government has mobilized its strength to confront the current COVID-19 pandemic and sought to develop and implement a digital contact tracking application (known as MySejahtera) and made it an integral part of the lockdown exit strategy. The application records which users have been in closeness from one another. If a user is confirmed to have COVID-19, application users who have been recently close to this individual get informed. Although the adoption of some new technologies is confronted with high failure rates, this application is expected to contribute greatly to the said strategy. As the effectiveness of this application depends mostly on the acceptance of its users, the research will identify the factors that can stimulate, or which affect the adoption of this application and its effective incorporation into the lockdown exit strategies. The research proposes a model that is aimed to provide solutions to mitigate the factors that affect users' acceptance of this application. A quantitative approach was used for this research where an electronic survey was distributed among residents of Malaysia, and the collected data was analyzed using PLS-SEM. The proposed model is then validated based on the Unified Theory of Acceptance and Use of Technology model. The findings indicate that UTAUT factors (performance expectancy, effort expectancy, social influence, facilities condition) are significant predictors for the adoption of the application among residents of Malaysia. On the other hand, the factors of application-related privacy concern were found to be insignificant for the adoption of the application.

ملخص البحث

حشدت الحكومة الماليزية قوتها لمواجهة جائحة COVID-19 الحالي وسعت إلى تطوير وتنفيذ تطبيق لتتبع الاتصال الرقمي (المعروف باسم MySejahtera) وجعلته جزءًا لا يتجزأ من استراتيجية الخروج من الإغلاق. يسجل التطبيق المستخدمين الذين كانوا على مقربة من بعضهم البعض. إذا تم التأكد من إصابة أحد المستخدمين بفيروس COVID-19 ، فسيتم إبلاغ مستخدمي التطبيق الذين كانوا قريبين من هذا الشخص مؤخرًا. على الرغم من أن اعتماد بعض التقنيات الجديدة يواجه معدلات فشل عالية ، فمن المتوقع أن يساهم هذا التطبيق بشكل كبير في الاستراتيجية المذكورة. نظرًا لأن فعالية هذا التطبيق تعتمد في الغالب على قبول مستخدميه ، فإن البحث سيحدد العوامل التي يمكن أن تحفز ، أو التي تؤثر على اعتماد هذا التطبيق وإدماجه الفعال في استراتيجيات الخروج من الإغلاق. يقترح البحث نموذجًا يهدف إلى توفير حلول للتخفيف من العوامل التي تؤثر على قبول المستخدمين لهذا التطبيق. تم استخدام نهج كمي لهذا البحث حيث تم توزيع مسح إلكتروني بين سكان ماليزيا ، وتم تحليل البيانات التي تم جمعها باستخدام PLS-SEM. ثم يتم التحقق من صحة النموذج المقترح بناءً على النظرية الموحدة لقبول واستخدام نموذج التكنولوجيا. تشير النتائج إلى أن عوامل UTAUT (توقع الأداء ، وتوقع الجهد ، والتأثير الاجتماعي ، وحالة المرافق) هي عوامل تنبؤية مهمة لاعتماد التطبيق بين سكان ماليزيا من ناحية أخرى ، وجدنا بان عامل الخوف من الخصوصية المتعلقة بالتطبيق لايعتبر ذا أهمية بالغة في اعتماد تطبيق MySejahtera.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Protective Security Management.

…….

Rawad Abdulghafor
Supervisor

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Protective Security Management.

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This dissertation was submitted to the Department of Centre for Information Technology Advancement and is accepted as a fulfilment of the requirement for the degree of Master of Protective Security Management.

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This dissertation was submitted to the Kulliyyah of Information and Communication Technology and is accepted as a fulfillment of the requirement for the degree of Master of Protective Security Management.

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Dean, Kulliyyah of Information Communication & Technology

DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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This thesis is dedicated to my parents for laying the foundation of what I turned out to be in life.

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LIST OF SYMBOLS

MCMC	Malaysian Communications and Multimedia Commission
UTAUT	The Unified Theory of Acceptance and Use of Technology
MCO	Movement Control Order
WHO	World Health Organization
RMCO	Recovery Movement Control Order
EMCO	Enhanced Movement Control Order
GPS	Global Positioning System
PLS-SEM	partial least squares structural equation modeling
SPSS	Statistical Package for the Social Sciences
AVE	Average Variance Extracted
ADOP	Adoption of MySejahtera
PE	Performance Expectancy
EE	Effort Expectancy
SI	Social Influence
FC	Facilities Condition
APP	App-related privacy concern
EFA	EXPLORATORY FACTOR ANALYSIS
KMO	Kaiser-Meyer-Olkin
df	Degree of freedom,
Sig	Significant (p-value)
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
AVE	Average Variance Extracted
Q 2	Predictive Relevance
VIF	Variance Inflation Factor

SRMR	The Standardized Root Mean Square Residual
GoF	Goodness of Fit
IPMA	Importance-Performance Map Analysis

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

On January 25, 2020 Malaysia recorded its first 3 cases of coronavirus disease (COVID-19) (Rahman, 2020). Cases have increased unexpectedly since the first detection of this epidemic. Government and health authorities have tried to mobilize all health and safety measures to alleviate the spread of the epidemic, including hand washing, wearing masks, social distancing and lockdown (Mohd Radzi et al., 2020). Traditional measures in the field of public health may not be enough to avoid the spread of the virus in a population in the long term, which requires more effective preventive measures (Ferretti, Wymant, Kendall, Zhao, Nurtay, Bonsall, et al., 2020).

As preparedness strategies were no longer adequate to control the disease it has spread to several Malaysian states, the government deliberate put in place a range of preventive initiatives to minimize the severity of the infection in the states (Azad et al., 2020). While researchers have found no an effective treatment, agile response is needed to tackle the Virus. The lack of a rapid response disaster management to a tragedy such as an outbreak can become a prime reason of failure to mitigate the impact of a disaster to society. And it has been attempted by governments and health authorities to mobilize emerging technology to counter this new challenge (Ramakrishnan et al., 2020), the use of tracker wristbands, mobile apps, thermal cameras, facial recognition, and drones are included (Gupta et al., 2020).

In particular, digital contact tracing apps were introduced as tools to help minimize the spread of the infection. Contact tracing is a time-tested technique that has been implemented extensively to tackle outbreaks of infectious diseases such as measles, HIV, syphilis, and Ebola (Patel et al., 2020). It includes finding infected people and warning them that they are at risk through a careful method of retracing where and with whom an infected person is in the vicinity (Abbas & Michael, 2020). In the case of the global COVID-19 pandemic, digital contact tracing provides many advantages over conventional contact tracing. It aims to automate a labor-intensive practice in a circumstance where human communication tracers are scarce (Jalabneh et al., 2020). In addition, it can give more precision, where human memories are forgettable and fallible (Iyengar et al., n.d.), particularly in the case of COVID-19, where disease may be symptomless for up to two weeks (S. Sharma, Singh, Sharma, et al., 2020). Finally, the speed of infection of the COVID-19 virus requires quick contact tracing in order to be functional (Brough & Martin, 2020). Digital contact tracing, by offering speed, scale and precision, seeks to overcome these weaknesses.

In Malaysia and many other affected countries, we believe that there are many challenges that will face Policymakers regarding the extent to which the population agrees to adopt and share personal information on tracking apps that exacerbate the situation (Yusof et al., 2020). Citizens have a set of apprehensions about adopting such applications, especially in the shadow of the Corona pandemic (Al-Worafi et al., n.d.), as the sharing of personal information of patients and their families by the authorities or third parties increases the risks of stigmatization, discrimination and blame form the public (Walrave et al., 2020a). There is an augmented risk that the public can begin to openly blame patients with COVID-19 for initiating infection clusters. In fact, in some cases, these infected people had to react publicly to these accusations in order to defend themselves (T. Sharma & Bashir, 2020). Accordingly, these challenges were not limited to the concerns of disseminating personal information only, but also to develop these applications locally in record time and make them suitable for users is part of these obstacles.

The chief industry regulator at the Malaysian Communications and Multimedia Commission (MCMC) confirmed that the apps improvement in Malaysia was still lagging behind due to a lack of understanding of the Public sector requirements (Fadzil, 2017). This is likely to result in a lower acceptance rate for locally improved applications in Malaysia (Thaneshan et al., 2017). Investigate Digital contact tracing apps usage intention currently remains limited (Sundarasen et al., 2020). Therefore, it is important to analyze the variables that would stimulate or slow down the adoption of a contact-tracing app and reduce the concerns of users of these applications to incorporate it effectively into for lockdown exit strategies. Considering the current problems, this research intends to extend the UTAUT model to understand user's acceptance of COVID-19 Digital Contact Tracing Apps in Malaysia.

1.2 PROBLEM STATEMENT

The COVID-19 pandemic has caused governments around the world Including the Malaysian government to lock down their countries to control the spread of the virus. However, this lockdown has had serious economic and social repercussions (Sharon, 2020). The introduction of contact tracing apps is one of the controversial approaches and solutions to this dilemma (Gupta et al., 2020). These applications use mobile technologies to detect and warn users who may have come into contact with a Carrier of the virus person, thus curbing the spread of COVID-19 (Ferretti, Wymant, Kendall, Zhao, Nurtay, Bonsall, et al., 2020).Malaysian government was therefore struggling to incorporate contact tracing apps as a core element of their strategies for lockdown exit (Yusof et al., 2020).

It has been estimated that more than half of the population of a country must set up and effectively use the app that the government implements to make such monitoring and informing effective for counteract the transmission of infection (Hinch et al., 2020). However, most governments do not intend to implement those apps

forcibly or even impose sanctions (Austin et al., 2020). Therefore, one of the most important challenges that faced the government and it was its main concern when designing, establishing and promoting this application in understanding how to achieve acceptance by citizens and reach the desired goal of this application (Altmann et al., 2020). The matter becomes more complicated because just the announcement of these tracking applications has raised a lot of Discussions in the community about what are the real benefits of these applications, many questions and concerns about a set of issues (e.g. Performance expectancy), privacy concerns (e.g. gathering sensitive data) (Wen et al., 2020).

In general, the effectiveness of digital contact tracing app largely depends on acceptance by residents. Although, the adoption of new technologies is confronted with high failure rates (Zastrow, 2020). Therefore, it is important to analyze these variables that would stimulate or slow down the adoption of a contact-tracing app to incorporate it effectively into for lockdown exit strategies. Then To identify the factors that that could influence the adoption of MySejahtera application by people in Malaysia. To validate a proposed model based on the Unified Theory of Acceptance and Use of Technology model.

1.3 RESEARCH QUESTIONS

This research addresses the following questions:

1. Which factors influence the adoption of MySejahtera?
2. Does age moderate the relationships between Performance Expectancy, Effort Expectancy, Social Influence, Facilities Condition, App-related Privacy Concern, and Adoption of MySejahtera?
3. How to conduct an empirical evaluation of the proposed model based on the Unified Theory of Acceptance and Use of Technology model?

1.4 RESEARCH OBJECTIVES

This research aims to fulfil the following objectives:

1. To identify the factors that that could influence the adoption of MySejahtera in Malaysia.
2. To investigate the moderating role of age on the relationships between Performance Expectancy, Effort Expectancy, Social Influence, Facilities Condition, App-related Privacy Concern, and Adoption of MySejahtera.
3. To validate a proposed model based on the Unified Theory of Acceptance and Use of Technology model.

1.5 RESEARCH SCOPE

The effectiveness of digital contact tracking app depends on the acceptance of the users in installing and using the app. Therefore, this research focuses on studying the factors influencing the intention to use this application from the Population and proposing solutions to mitigate the impact of these factors. The study will focus on what is proposed in the model describing the many factors that influence users' decision about how and when to use COVID-19 digital contact tracing apps when presented.

1.6 RESEARCH SIGNIFICANCE

To reduce the risk of spreading Corona virus as community exits the lockdowns, various applications have been developed for contact tracing. Digital contact tracking applications have significantly contributed to controlling the spread of the Covid-19

epidemic in a more effective and efficient way. However, these apps have brought some challenges which have affected the users' acceptance. While the effectiveness of a tracing app depends largely society acceptance to this app, but we lack a realization of what makes users willing to set up and use such apps. This research will contribute to a study, identify the factors that would stimulate or slow down the adoption of a MySejahtera Application to it effectively. To be specific, model that describes the adoption of Digital Contact Tracing Apps in Malaysia. Furthermore, this research proposes solutions to mitigate the impact of the factors affecting the of users' acceptance of COVID-19 digital contact tracing Apps. These solutions will reflect the public benefit behind using this application to confront COVID-19 and recover from this crisis faster. Studying MySejahtera Application adoption for COVID-19 in developing countries like Malaysia does not only serve the development of technology in Malaysia but can contribute to the body of knowledge in the area of MySejahtera Application acceptance of COVID-19 digital contact tracing Apps. This research will be of significance in several areas and provide new knowledge to theoretical and practical. Therefore, the findings of the study have several valuable implications for academic, practices and policy-Making.

1.7 RESEARCH ORGANIZATION

This research consists of 6 chapters where the first chapter briefly introduces the Utilization of digital contact tracing applications in the tackle to Covid-19 virus and outlines the questions and objectives of this research, along with the research scope and limitations. Chapter 2 describes previous studies on digital contact tracing technology, its issues, the extent of its effectiveness in dealing with the virus and what are the challenges that will face decision-makers to include it in exit strategies from the lock down and what are the factors affecting society's acceptance of such applications in light of the Covid-19 pandemic. This is followed by Chapter 3, which includes the methodology used to achieve the goals of this paper, the design of the study and the procedure used to collect data. As for the chapter 4 of this research, it covers the results

of the study and analyzes the collected data. In chapter 5, the outcomes of the research are discussed and an explanation whether the outcomes have met the aims of this study is provided. Finally, chapter 6 shows the conclusion of this research and future work.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In the absence of a vaccine or an effective treatment, the Covid-19 epidemic is the most dangerous threat facing humanity in the past 100 years (Sun et al., 2020). This threat was not limited to public health only, but it also led to other challenges facing decision makers (Iyengar et al., n.d.). Governmental and health authorities have taken a set of measures that will reduce or prevent the spread of the virus across the country (Mohamad Nasri et al., 2020). To date, the measures have focused on non-pharmaceutical interventions to restrict the epidemic's spread, such as physical distance, case isolation, and manual tracing of contacts (Alabed et al., 2020). These measures have not been enough to stop the outbreak Virus (Brough & Martin, 2020). Therefore, several countries have resorted to partial or complete 'lockdown' policies to contain the disease (Lawrence et al., n.d.), significantly restricting their populations' social and economic interactions (Cho et al., 2020). Although lockdowns can enable countries to control the number of infections, they come at a high social and economic cost (Kim & Kim, 2020).

Governments have resorted to implementing effective strategies and measures for lockdown exit (Azad et al., 2020). But it was difficult to track COVID-19 with traditional methods (Fadzil, 2017), as cases infected with the virus may not show