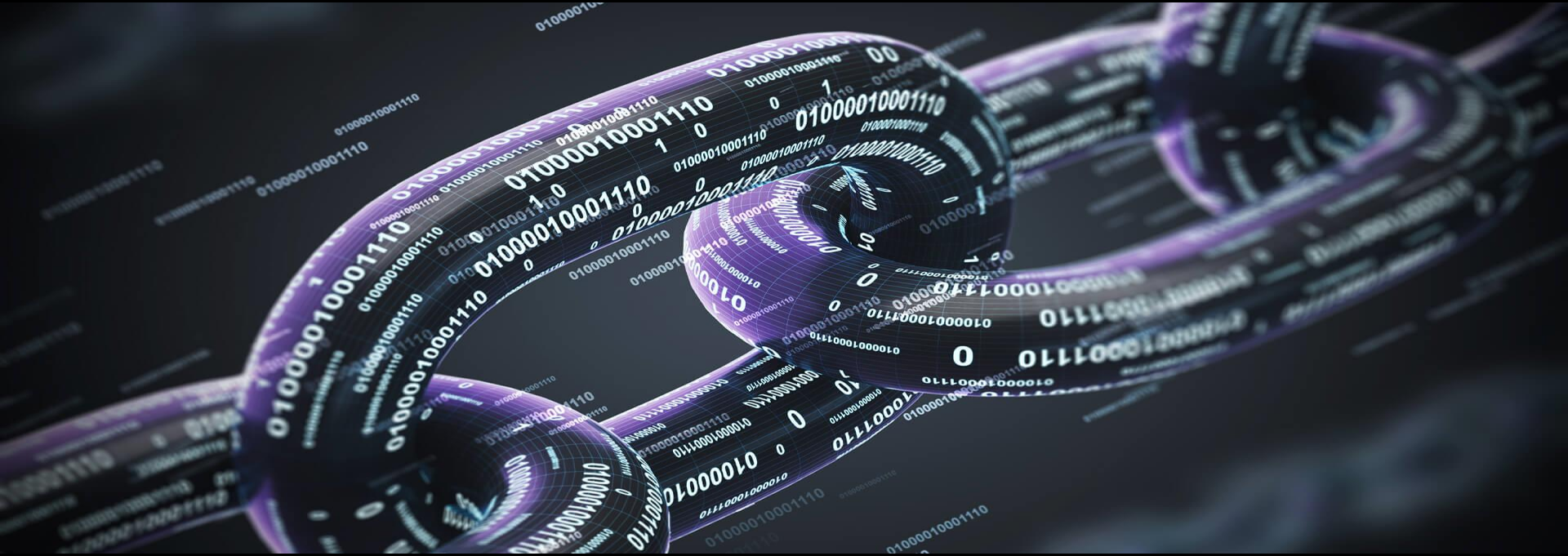


KOLOKIU PENYELIDIKAN 2021 INSTITUT TADBIRAN AWAM NEGARA



FACTORS DETERMINE THE BEHAVIOURAL INTENTION IN ADOPTING THE BLOCKCHAIN TECHNOLOGY BY MALAYSIAN PUBLIC SECTOR OFFICERS

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Table of Content

Outline



01

Introduction

Background of Study |
Problem Statement | Research
Objectives and Questions

02

Literature Review

Theoretical Framework

03

Methodology

Research Design | Sampling
Design | Instrumentation

04

Results

Analysis & Findings

05

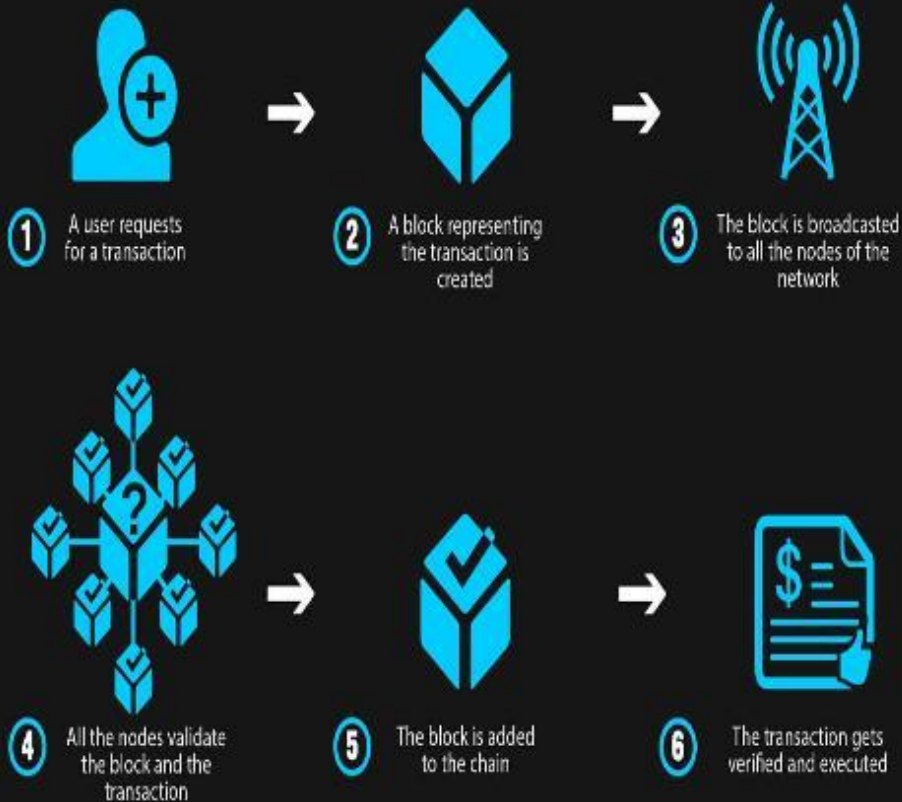
Conclusion

Discussion | Contribution to
Knowledge | Limitations |
Conclusion

06

Thank You

How Does a Blockchain Work: A Step-by-Step View



Introduction

Background of Study

Blockchain Technology

- Storage mechanism that eliminate third party/intermediaries (central agency such as Bank).
- Avoid unnecessary charges.
- Provide a decentralized database containing sequential, cryptographically linked blocks of digitally signed asset transactions, and governed by a consensus model (Sultan et al., 2018).

Introduction

Background of Study

Technological and digital advances are bringing transformative change to our world, thus government, academia and industry, are striving to anticipate how the pace and scale of these advances will change the way our world works, and to identify and leverage the opportunities and tackle the challenges they will bring (Al-Ruithe, Benkhelifa, & Hameed, 2018).

Blockchain technology brings positive prospective value including **data integrity and quality, transparency, fraud risks, corruption mitigation** and enriched **trust, security and privacy issues** (Batubara, Ubacht, & Janssen (2018)).

According to MIMOS Berhad (2017) as Malaysian's National Applied R&D Centre, the Malaysian Ministry (MOSTI) is strongly **looking at the Blockchain technology to ensure that Malaysia is not left behind** in this technology advancement.

In addition, the Malaysian Industry-Government Group for High Technology (MIGHT) highlighted that **Malaysia would be adopting the Blockchain technology by the year 2025**. As of now, the Blockchain technology in Malaysia is still in its infancy due to lack of understanding and awareness of such technology.

Introduction

Problem Statement

Batubara et al. (2018) indicated that **countries** such as China, Estonia, the Netherlands, the United Arab Emirates, the United Kingdom and Sweden are advocating the **adoption of Blockchain technology in their public sectors**.

such adoption **relates to** facilities to deal with **trust and transparency** as government activities are susceptible to fraud, corruption and lack of trust between and within its agencies.

Blockchain technology is often regarded as **innovative** in many ways, but there is still considerable **lack of understanding** about **what, where and how** this technology can be effectively adopted (Risius & Spohrer, 2017).

“Ideal for the government use: **trust, traceability, transparency, and security**. These features make technology to deal with issues such as – corruption, bureaucracy, and lack of accountability. However, there has been **lack of awareness and understanding** on the potential of blockchain technology applied in the public sector, so it is essential to **identify and analyze the factors that influence the behavioral intention** to adopt blockchain technology in the public sector”.

Introduction

Research Objectives

RO1

To analyse the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, and trust on behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

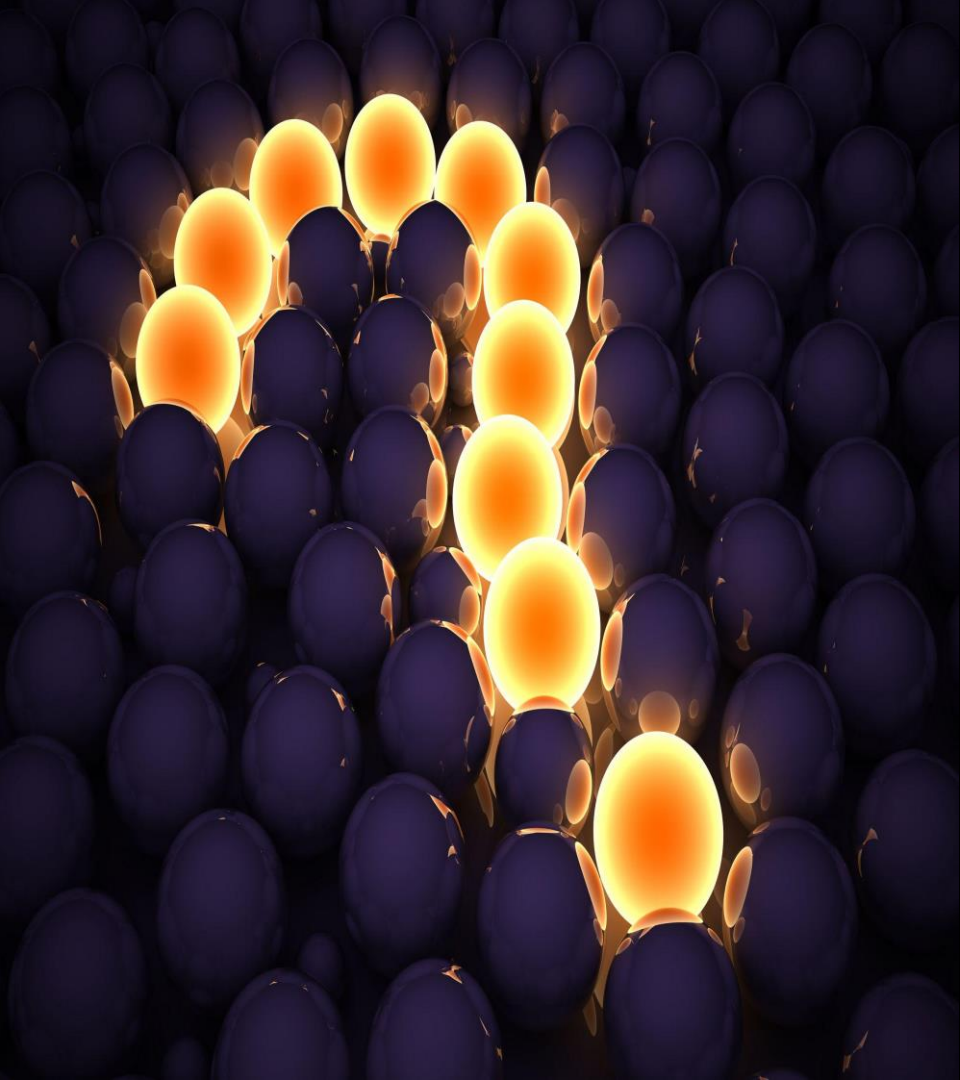
RO2

To identify the most important factor(s) that influences behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

RO3

To investigate differences (if any) on behaviour intention to adopt the Blockchain Technology among the demographic profile groups such gender, age, education level, position level, and years in service.





Introduction

Research Questions

RQ1

How does performance expectancy, effort expectancy, social influence, facilitating conditions, and trust will attract behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector?

RQ2

What is the most important factor(s) that influence behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector?

RQ3

Are there any differences on behaviour intention in adopting the Blockchain Technology among the demographic profile group such gender, age, education level, position level and years in service?

Literature Review

The Unified Theory of Acceptance and Use of Technology

The unified theory of acceptance and use of technology (UTAUT) provides a unified view to explain user acceptance of new technology so that researchers no longer need to “pick and choose” one model while ignoring the contributions of other models (Venkatesh et al., 2003).

Performance Expectancy

- The degree to which a person believes that using a particular system would enhance his or her job performance.

Effort Expectancy

- The degree to which a person believes that using a system would be free of effort.

Social Influence

- The person’s perception that most people who are important to him/her think he/she should or should not perform the behavior.

Facilitating Conditions

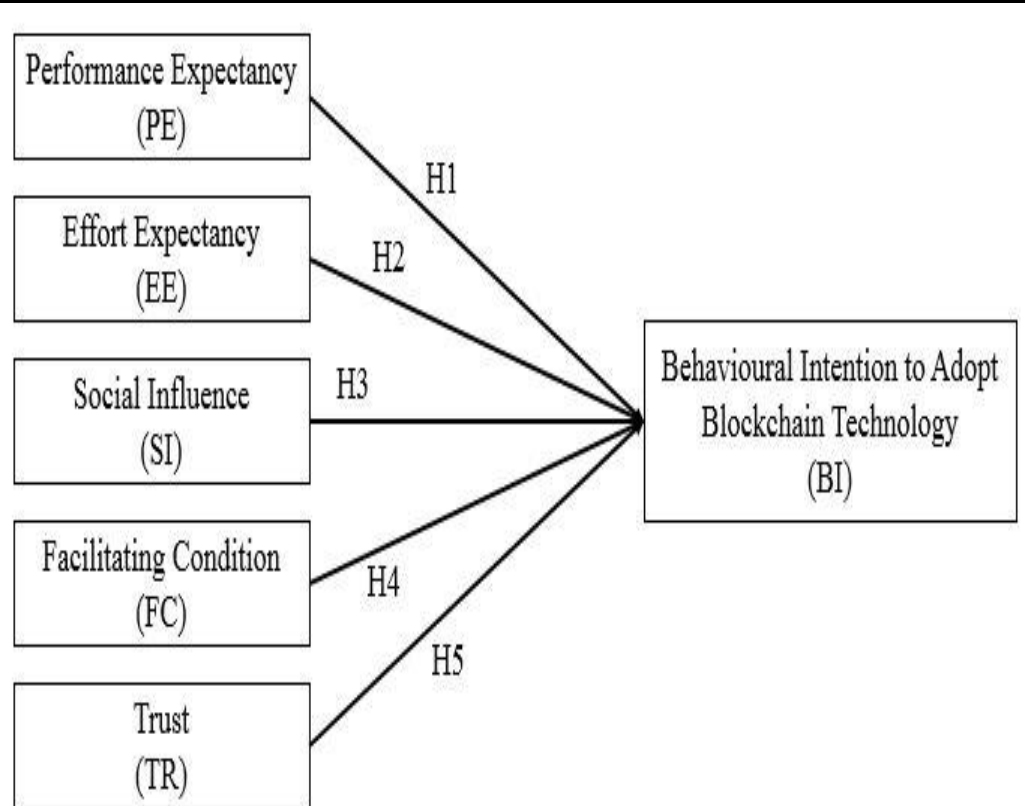
- Reflects perceptions of internal and external constraints on behaviour and encompasses self efficacy, resource facilitating conditions, and technology facilitating conditions.

Trust

- Defined by the extent to which the users feel confident that a system such as Blockchain Technology, will operate on par to its claimed key attributes on a consistent basis.

Literature Review

Theoretical Framework



Source: Theoretical Framework based from the UTAUT (Venkatesh et al., 2003)

H1: There is a significant relationship between performance expectancy and behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

H2: There is a significant relationship between effort expectancy and behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

H3: There is a significant relationship between social influence and behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

H4: There is a significant relationship between facilitating conditions and behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

H5: There is a significant relationship between trust and behaviour intention for the adoption of the Blockchain Technology by the Malaysian Public Sector.

Methodology

Research Design

Approach

Quantitative - to examine users' behavioral intention to adopt Blockchain technology in public sector using the UTAUT elements.



Method

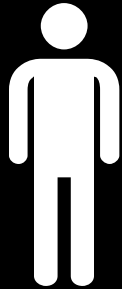
Survey - to quantitatively describe the relationship among variables of a population and findings of a sample can be used to generalize the population.

Technique

Structured Questionnaires - to gather information from individuals with closed-ended type of questions.

Methodology

Sampling Design



Population

Chief Secretary to the Government of Malaysia (Public Sector CIO CONVEX, 2018) indicated that Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) should explore how the public sector agencies can utilize the Blockchain technology to improve transparency, integrity and accountability.

- Total of 386 government officers in various departments and ministries in Malaysia (Grade 41 and above).

Sampling Technique

A non-probability purposive sampling methods is adopted in this study. Sample of the group is limited to a specific characteristics deemed suitable for the study.

- Aim of this study is to assess the behavioural intention towards adopting Blockchain among government officers that dealing with the technology planning in their organisation.
- They are responsible in deciding the applicability and usage of modern technologies such as Blockchain in the public sector.

Sampling Size

Out of 386 officers (N) that were invited to participate in the survey, 100 (S) of them have answered the questionnaire through the Google Forms.

Methodology

Instrumentation

Section A
Demographic Profile
<ul style="list-style-type: none">• Gender• Age• Education Level• Position Level• Years in Service• Blockchain Awareness• Blockchain Exposure• Blockchain Experience
Nominal & Ordinal scale

Section B
Performance Expectancy (PE)
<ul style="list-style-type: none">• 5 scale-items
Section C
Effort Expectancy (EE)
<ul style="list-style-type: none">• 5 scale-items
Section D
Social Influence (SI)
<ul style="list-style-type: none">• 5 scale-items
Section E
Facilitating Conditions (FC)
<ul style="list-style-type: none">• 5 scale-items
Section F
Trust (TR)
<ul style="list-style-type: none">• 5 scale-items

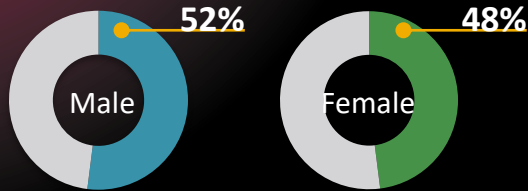
Section G
Behavioural Intention (BI)
<ul style="list-style-type: none">• 5 scale-items
5-point Likert-scale

Results

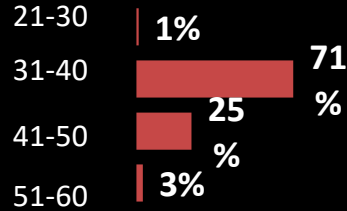
Analysis & Findings

Demographic Profile of 100 Respondents

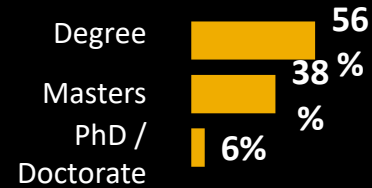
Gender



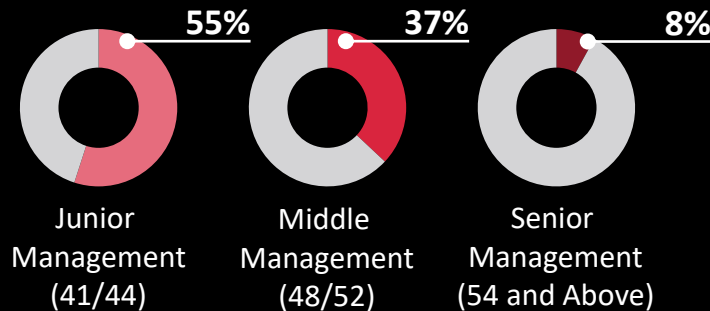
Age



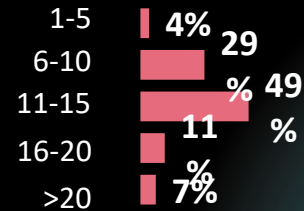
Education Level



Position Level



Years in Service

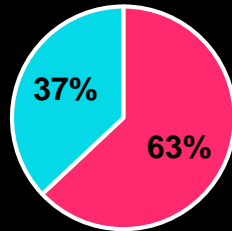


Results

Analysis & Findings

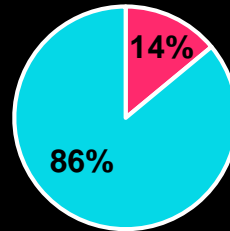
Demographic Profile of 100 Respondents

Awareness



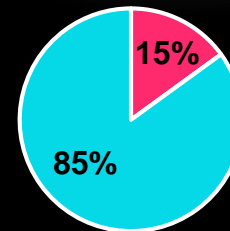
■ Yes ■ No

Exposure



■ Yes ■ No

Experience



■ Yes ■ No

- ❑ Blockchain Technology is still in infancy especially in Public Sector.
- ❑ Good chance and opportunity to improve the rate of exposure so as to increase the potential of the public sector in adopting the game changing technology in order to provide better service to the public.

Results

Analysis & Findings

Spearman's Correlation Analysis

Variable	Result (R)
Behavioural Intention (BI)	1
Performance Expectancy (PE)	.662**
Effort Expectancy (EE)	.440**
Social Influence (SI)	.534**
Facilitating Conditions (FC)	.513**
Trust (TR)	.651**

** Correlation is significant at the 0.01 level (2 tailed)

- The findings show PE, SI, FC and TR have strong relationship with BI while EE have moderate relationship.

Results

Analysis & Findings

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788 ^a	.621	.600	.50342

a. Predictors: (Constant), TR, SI, PE, EE, FC

- Adjusted R-square value is 0.600 indicates that 60% of the variability in dependent variable (BI) can be explained by Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Trust. Besides that, the remaining 40% of variation can be explained by other factors which were not taken into account in this study.

Results

Analysis & Findings

Coefficients^a

Model	Unstandardized		Standardized	t	Sig.
	Coefficient		Coefficients		
	B	Std. Error	Beta		
(Constant)	.532	.263		2.022	.046
PE	.354	.091	.359	3.894	.000
EE	-.068	.123	-.064	-.554	.581
SI	.246	.100	.254	2.456	.016
FC	.014	.123	.014	.115	.908
TR	.377	.081	.377	4.666	.000

- The findings show the p-value of EE & FC is more than $p=0.05$ (i.e., $p=0.581$ & $p=0.908$), which indicates that it made less of a unique contribution and is statistically not significant. PE, SI & TR is statistically significant to prediction the BI as p-value is less than $p=0.05$ (i.e., $p=0.000$).

a. Dependent Variable: BI

Conclusion & Recommendations

Discussion

RQ1) Relationship between Independent Variables on Behavioural Intention for the Adoption of the Blockchain Technology

RQ2) The Most Important Factor that Influence Behaviour Intention for Adoption of Blockchain Technology by Malaysian Public Sector.

Trust (TR) produced a highly significant result, 0.000 ($p < .001$) in the regression test with the highest β score which is 0.377. This indicates a very strong linear relationship between trust and behaviour intention for the adoption of the Technology.

Performance Expectancy (PE) reported a p-value of $p < .001$, with a β score of 0.359, which is the second highest value from the other factors. This means, the PE factor has a strong linear relationship with the behaviour intention for the adoption of the blockchain Technology.

The Social Influence (SI) factor is significant at .0016 ($p < 0.05$), with a β score at 0.254 as found from the regression test. There is linear relationship between social influence and behaviour intention in adopting the technology. This means the social influence affects the behaviour intention.

This study rejected two hypotheses, respectively for, **Effort Expectancy (EE)** and **Facilitating Conditions (FC)**. It is expected that these factors have not received enough impact on its technological context due to cultural difference, knowledge and readiness. This implication supports previous technology acceptance research that suggests different cultural and technological contexts affect different levels of acceptance.

Conclusion & Recommendations

Discussion

RQ3) The Differences on Behaviour Intention to Adopt the Blockchain Technology among Demographic Profile Group such Gender, Age, Education level, Position level and Years in Service.

Demographic Profile	p-value	Significance Level
Gender	0.062	P < 0.05
Age	0.580	
Education Level	0.579	
Position Level	0.357	
Years in Service	0.266	

- In this research, analysis of variance (ANOVA) is used to compare the scores between the items for more than two or more different groups. However, the differences between the means of the behavior intention for the adoption of Blockchain Technology among different gender, age, education level, position level and years in service are not significant as the p-value is greater than the significance level ($p < 0.05$).

Conclusion & Recommendations

Contribution to Knowledge

Detail out the Factor Dimensions for Better Understanding: This study contributes to a theoretical understanding on factors that drives the intention to adopt the Blockchain Technology among the Malaysian Public Sector officers. The model of this study can be applied for further studies on the adoption of the Blockchain Technology in other organizations. The research shows that 60% of the total variability in the behaviour intention to adoption is explained by the independent factors tested in the research model.

Blockchain Technology Awareness & Readiness: This study has met its objective in identifying factors that influence the adoption of Blockchain Technology in the identified sector. However, it is worth noting that given its present infancy in the Public Service sector, more attention needs to be given in such areas. This study has identified that exposure and knowledge on disruptive technologies such as Blockchain are somewhat meagre among government officers. The Unified Theory of Acceptance and Use of Technology (UTAUT) model proposed by Venkatesh (2003) is suitable for identifying the behaviour intention in the adoption of a new technology.

Focus on Model Improvement: The framework model should be continuously improved to keep abreast with reliable factor that could influence the intention of the tested target group to adopt a specific technology. In terms of scope, the present study only focused on data collected from a group of government officer at several ministries. Future studies could consider to adopt larger population and sample size by including various government agencies within and beyond Malaysia.

Conclusion & Recommendations

Limitations

Limited Resources: The first limitation is on limited resources encountered while conducting this research. This refers to the limited number of publications and references on the topic specific to its application on government sectors partly due to its infancy in Malaysia. Therefore, many of the relevant past studies and references were adopted from foreign countries.

Small Respondents Sample Size: Secondly, the respondent's sample size adopted in the study is considered relatively small. A total of 100 respondents involved in this study are not enough to provide a comprehensive and representative finding from the public sector point of views. The limited number of respondents of this research may represent the opinion of the whole population. It is recommended the future studies employs and maximises the benefits of both quantitative methodology and qualitative methodology.

Conclusion & Recommendations

Conclusion

Government officers as a policy makers should carefully **plan, decide and implement on which area** of the **Blockchain Technology can be applied** in the public sector. Advanced technology can improve the quality and efficiency of the service that can be offered to public.

Findings from this study also informs the relevant authorities to **develop strategies to implement suitable Blockchain application** for the public sector. It is imperative for the government agency to be **equipped with knowledge, skills and resources related to the technology**. Special attention needs to be given on Trust, Performance Expectancy and Social Influence factors to increase the acceptance and adoption of Blockchain technology.

It is important for relevant government authorities such as MOSTI, MAMPU to **provide sufficient programs related to awareness** to eventually **ease the use of the technology**. Appropriate and suitable application of the Blockchain Technology in public services must be investigated in-depth keeping in mind that services provided by the government must demonstrate full trust and transparency.



DOES ANYONE HAVE ANY QUESTIONS?

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