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Understanding the Role of Digital Identity: A Conceptual Framework and Proposed Methodology for Measuring Malaysia's National Digital Identity Initiative

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ABSTRACT

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Malaysia is in the process of developing a National Digital Identity (NDI) system to provide citizens and residents with secure and efficient access to digital services. However, the success of the initiative depends on public awareness, perception and acceptance of the system. This paper proposes a preliminary framework for measuring public awareness, perception and acceptance of the NDI initiative in Malaysia. The framework was developed based on an extensive literature review and includes several important variables, including public awareness, perception and acceptance, as well as perceived usefulness, perceived ease of use, user experience, social influence and facilitating conditions. The proposed research design is based on a quantitative methodology using a questionnaire to collect data from a diverse sample of respondents. The proposed framework and methodology are a valuable contribution to the literature on the NDI initiative and can provide a foundation for future empirical research in this area. By using a rigorous research design, this study can provide valuable insights into the public's attitudes and perceptions towards this initiative, which can inform policy decisions and contribute to the successful implementation of the NDI initiative in Malaysia. The study contributes to the ongoing discussions on digital identity (DI) and provides valuable insights for policy makers, practitioners and researchers seeking to promote the adoption of DI systems in Malaysia and beyond.

1. Introduction

In today's digital age, governments around the world are introducing digital identity (DI) initiatives to enhance security, reduce fraud and simplify processes. Malaysia is also taking steps to develop its own National Digital Identity (NDI), which aims to create a secure and trusted DI for its

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citizens and residents. However, as the initiative is still in its infancy and has not yet been launched, understanding public awareness, perception and acceptance is critical to the success of this programme.

In addition, understanding how the public perceives DI and shares personal information online is critical to developing a secure and user-friendly system. To date, however, there has been insufficient research on public attitudes towards DI initiatives in Malaysia. However, research from other countries has shown that factors such as trust in government, perceived benefits and risks, and demographic characteristics can significantly influence the public's attitude towards DI [1,2].

The objective of this study is to propose a preliminary framework to assess the public awareness, perception and acceptance of the NDI initiative in Malaysia. By examining the factors that influence public attitudes towards DI, this study aims to provide valuable insights that can help in the design and implementation of the initiative. Specifically, this study aims to measure public awareness, perception and acceptance as well as perceived usefulness, perceived ease of use, user experience, social influence and enabling conditions.

The main aim of this study is to provide insights that can help policy makers and stakeholders shape the NDI initiative to meet the needs and expectations of the public. Therefore, the findings of this study have significant implications for policy makers and stakeholders. They will be able to use these findings to ensure that the NDI initiative is more effective and beneficial to all Malaysians. Ultimately, this study will contribute to the literature on the NDI initiative and provide a basis for future empirical research in this area.

2. Literature Review

DI initiatives to improve security, reduce fraud and increase the efficiency of government and private sector services have gained traction around the world. However, research has shown that public awareness, perception and acceptance of DI initiatives can vary widely, depending on contextual factors such as trust in government, perceived benefits and risks, and demographic characteristics [3-5].

Trust in government is a key factor in public acceptance of DI initiatives. A study in the Netherlands found that people who have higher levels of trust in government are more likely to accept the DI system [6]. Similarly, a study in South Korea found that trust in government and perceived benefits are important factors in public acceptance of a DI system [7-9]. However, low levels of trust in government can hinder the acceptance of DI initiatives [10]. A study in the United States found that people who had previous experience of identity theft or other forms of misuse of personal data were more sceptical of government identity solutions [11].

Perceived risks and benefits also play a role in the public's attitude towards DI initiatives. A study in Canada found that perceived risks such as data breaches and identity theft are major concerns for the public, while perceived benefits such as convenience and efficiency are important factors for acceptance [12]. Similarly, a study in Estonia found that perceived benefits of the DI system, such as reduced bureaucracy and improved security, were important for public acceptance [13].

Demographic characteristics can also influence public attitudes towards DI. For example, a study in Norway found that younger people are more accepting of DI initiatives, while older people are more sceptical [14]. Similarly, a study in the UK found that people with a higher level of education were more likely to accept DI initiatives [15]. Other demographic factors that may play a role in public attitudes towards DI initiatives include income, gender and ethnicity [16].

Despite the growing importance of DI initiatives, there is limited research on public awareness, perception and acceptance of these initiatives in Malaysia. However, some studies have looked at

related issues such as online privacy and cyber security. A study in Malaysia found that while the majority of respondents were concerned about online privacy, many did not take appropriate measures to protect their personal data [17]. Another study found that awareness of cybersecurity threats among Malaysian university students was low [18].

Given the lack of research on public awareness, perception and acceptance of DI initiatives in Malaysia, this study aims to address this gap by proposing a preliminary framework for measuring public awareness, perception and acceptance of Malaysia's NDI initiative. By examining the factors that influence public attitudes towards DI, this study aims to provide insights that can inform the design and implementation of the initiative.

3. Research Objectives (ROs) and Research Questions (RQs)

The main objective of this conceptual paper is to provide a preliminary framework for assessing the level of awareness, perception and acceptance of the upcoming Malaysian NDI initiative. To achieve this objective, the study describes the following ROs and RQs:

- RO1: Develop an online questionnaire on awareness, perception and acceptance of NDI in Malaysia.
- RQ1: What are the key components of a questionnaire that can effectively measure awareness, perception and acceptance of the NDI initiative in Malaysia?

- RO2: Determine the level of awareness and understanding of Malaysians about the NDI.
- RQ2: What is the level of awareness, perception and acceptance of the NDI initiative among Malaysians and how do these factors differ across demographic groups?

- RO3: Identify the factors that promote and hinder the adoption of NDI among Malaysians.
- RQ3: What factors promote or hinder the adoption of the NDI initiative among Malaysians and how do these factors differ among different demographic groups?

- RO4: Identify the extent to which Malaysians are willing to adopt and use NDI.
- RQ4: What is the readiness of Malaysians to adopt and use the NDI initiative and how do these factors differ across demographic groups?

- RO5: Provide recommendations to promote awareness and adoption among the above user categories.
- RQ5: What recommendations can be made to promote awareness, perception and adoption of the NDI initiative among Malaysians, and how can these recommendations be tailored to different demographic groups to ensure maximum effectiveness?

4. Research Methodology

This study uses a quantitative research design to measure the level of public awareness, perception and acceptance of Malaysia's NDI initiative prior to its launch. The primary instrument used to collect data will be an online questionnaire. This section will describe the theoretical framework, conceptual framework and procedures for developing the research instrument, including the sampling method, data collection and data analysis. In addition, the research flowchart will provide information on the chosen data analysis method, which is expected to meet the study's

objective of gaining insights into public awareness, perception and acceptance of the NDI initiative. As the NDI initiative is yet to be rolled out in Malaysia, the findings of this study will be valuable in assessing the public's readiness and identifying factors that may influence their acceptance and adoption of this DI scheme.

4.1 Theoretical Framework

The theoretical framework of this study is anchored in three prominent theories, namely the technology acceptance model (TAM), the risk and negative consequences of individuals' perceptions, and the organisational trustworthiness theory, which have been widely used in previous research investigating technology adoption and acceptance.

The TAM was originally proposed by Davis in 1989 and has been used extensively to study users' attitudes and perceptions towards technology adoption and use. It suggests that users' behavioural intentions to adopt and use a technology are influenced by the perceived usefulness and ease of use of the technology [19]. In this study, TAM is used to determine Malaysians' attitudes and perceptions towards new NDI services and the likelihood of their adoption and use.

The risk and negative consequences theory of individuals' perceptions states that perceptions of risks and negative consequences associated with technology adoption have a significant influence on the intention to adopt and use a technology [20]. In the context of the NDI initiative, this theory is used to assess Malaysians' perceptions of potential risks and negative consequences associated with NDI services and how these perceptions affect their intention to adopt and use NDI services.

Finally, organisational trust theory suggests that users' trust in the organisation providing a technology significantly influences their intention to adopt and use the technology [21,22]. This study applies this theory to examine the extent to which Malaysians have trust in the organisation responsible for providing NDI services and how this affects their likelihood of adopting and using NDI services.

By integrating these three theories, this study aims to provide a comprehensive understanding of the factors that shape Malaysians' acceptance and adoption of NDI services and to assist in the development of strategies to enhance the success of the NDI initiative in Malaysia.

4.2 Conceptual Framework

The theoretical framework outlined earlier serves as the basis for the conceptual framework used in this study. The proposed conceptual framework includes the following variables:

- i. Perceived usefulness: refers to the degree to which the DI initiative is perceived as useful by the public. This variable is assessed using questions such as "How useful do you think DI's services will be to you?"
- ii. Perceived ease of use refers to the degree to which the DI initiative is perceived by the public as easy to use. This variable is measured by questions such as "How easy do you think it will be to use the services of DI?"
- iii. Social influence refers to the extent to which social factors, such as the influence of friends, family or government representatives, influence the public's attitude towards the DI initiative. This variable is measured with questions such as "To what extent do you feel pressured by others to use the services of DI?"
- iv. Facilitating conditions refer to the extent to which the public has access to the necessary resources, such as technology and knowledge, to use the DI initiative. This variable is

- measured by questions such as "Do you have the necessary technology to use the services of DI?"
- v. User experience refers to the extent to which the public's previous experience with similar initiatives from DI, as well as their perception of the security and privacy of the DI initiative, influence their attitude towards the initiative. This variable is measured by questions such as "Have you ever used a similar DI initiative?"
 - vi. Awareness refers to the degree to which the public is aware of the NDI initiative. This variable is measured using questions such as "Have you heard of the NDI initiative?"
 - vii. Public perception refers to the public's overall perception of the NDI initiative, including their beliefs about its benefits and risks. This variable is measured by questions such as "Do you think the NDI initiative will improve or harm your life?"
 - viii. Public acceptance refers to the public's willingness to adopt and use the NDI initiative. This variable is measured by questions such as "Would you be willing to use the NDI initiative?"

By measuring these variables, this study aims to provide information on the factors that influence public awareness, perception and acceptance of the NDI initiative in Malaysia. Figure 1 below illustrates the conceptual framework of the study based on the theories and variables explained earlier.

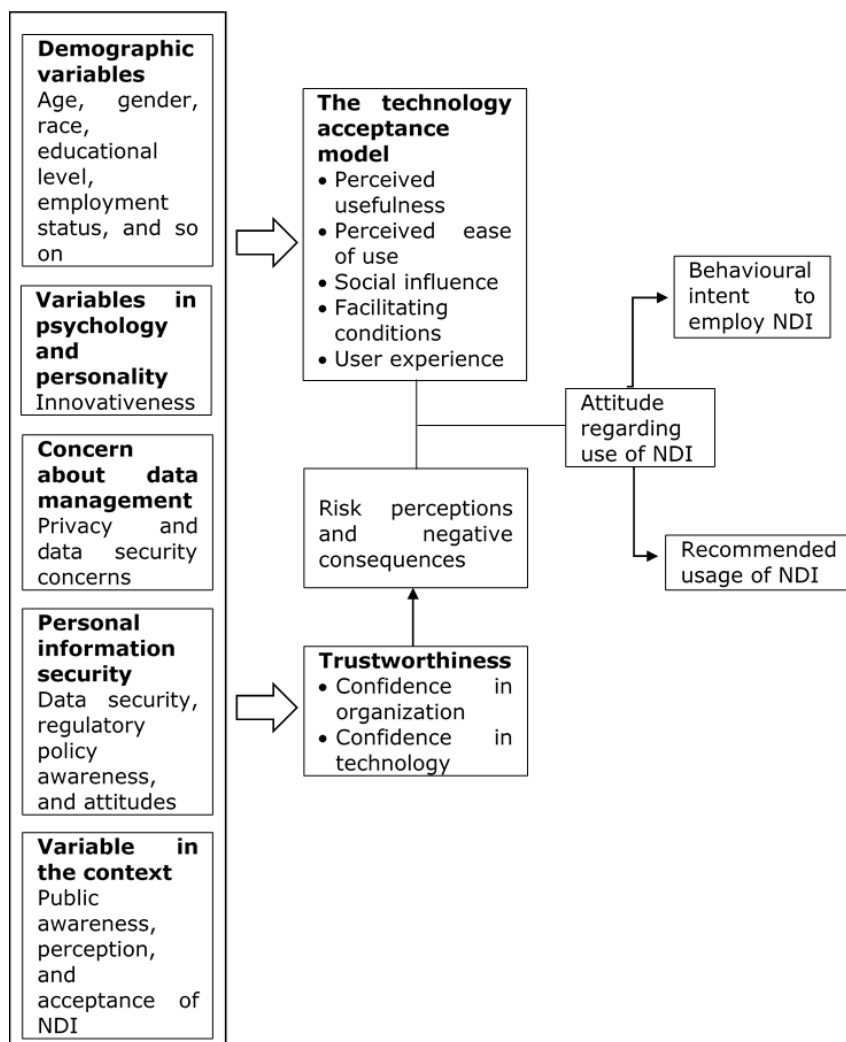


Fig. 1. The conceptual framework of the study

4.3 Research Instrument Design

The research instrument is developed based on the theoretical and conceptual framework proposed in this paper. The proposed research tool consists of four main sections, namely: innovativeness, data management, personal safety information and awareness, perception and acceptance of NDI services. The Innovativeness section aims to measure people's receptiveness to new technologies, while the data management section assesses their views on managing their identity online. The Personal Security Information section includes three themes, the first of which explores how individuals can increase the security of their personal data or identity. The second topic looks at citizens' views on the laws in place to protect their personal data or identity. The third theme explores the public's views on the most qualified party responsible for protecting their personal data or identity.

The last section of the questionnaire is of utmost importance as it directly relates to the NDI initiative. It aims to collect information on the level of awareness of the identity system and the NDI among the public. It also aims to determine the acceptance of the services offered under the NDI initiative and the expected date of their introduction. The section also looks at the public's perception of the identity system and its potential benefits in the future. It examines the factors that motivate individuals to adopt the identity system and attempts to determine the most effective method of promoting the initiative to encourage individuals to use NDI-related services.

Although the first three sections of the questionnaire are not directly related to NDI, they can provide valuable insights into the level of security of personal data or identity of the general public, which is the main reason why Malaysia needs a national identity system. It is expected that the data provided in this study will also help convince the public of the need for a trusted identity system to protect their personal data. Because of the public's unwavering trust, both the service provider and the regulator will feel more confident to use this system.

4.4 Sampling and Participants

The target population for this study is adults aged 18 years and above living in Malaysia. Probability sampling will be used to select a representative sample of the target population. The sample size will be determined using statistical power analysis based on the conceptual framework and research questions.

4.5 Data Collection and Analysis

Data will be collected through an online survey addressed to the selected sample. The questionnaire will include questions on demographic characteristics, awareness, perception and acceptance of Malaysia's NDI initiative. The questionnaire will be pre-tested with a small sample of participants to ensure its validity and reliability.

Both descriptive and inferential statistics will be used to analyse the data. Descriptive statistics such as means, modes and frequencies are used to summarise the data. In addition, inferential statistics such as hypothesis testing are used to examine the relationships between demographic variables and awareness, perception and acceptance of Malaysia's NDI initiative. In addition, the psychometric properties of the research instrument, particularly the section on awareness, perception and acceptance of NDI services, can be assessed using Rasch measurement analysis. This approach can provide insight into the validity and reliability of the survey questions as well as information on their performance across different groups of respondents [23,24]. The results of this

analysis can be used to improve the questionnaire and increase its ability to measure the proposed constructs. Figure 2 shows the research flowchart for this study.

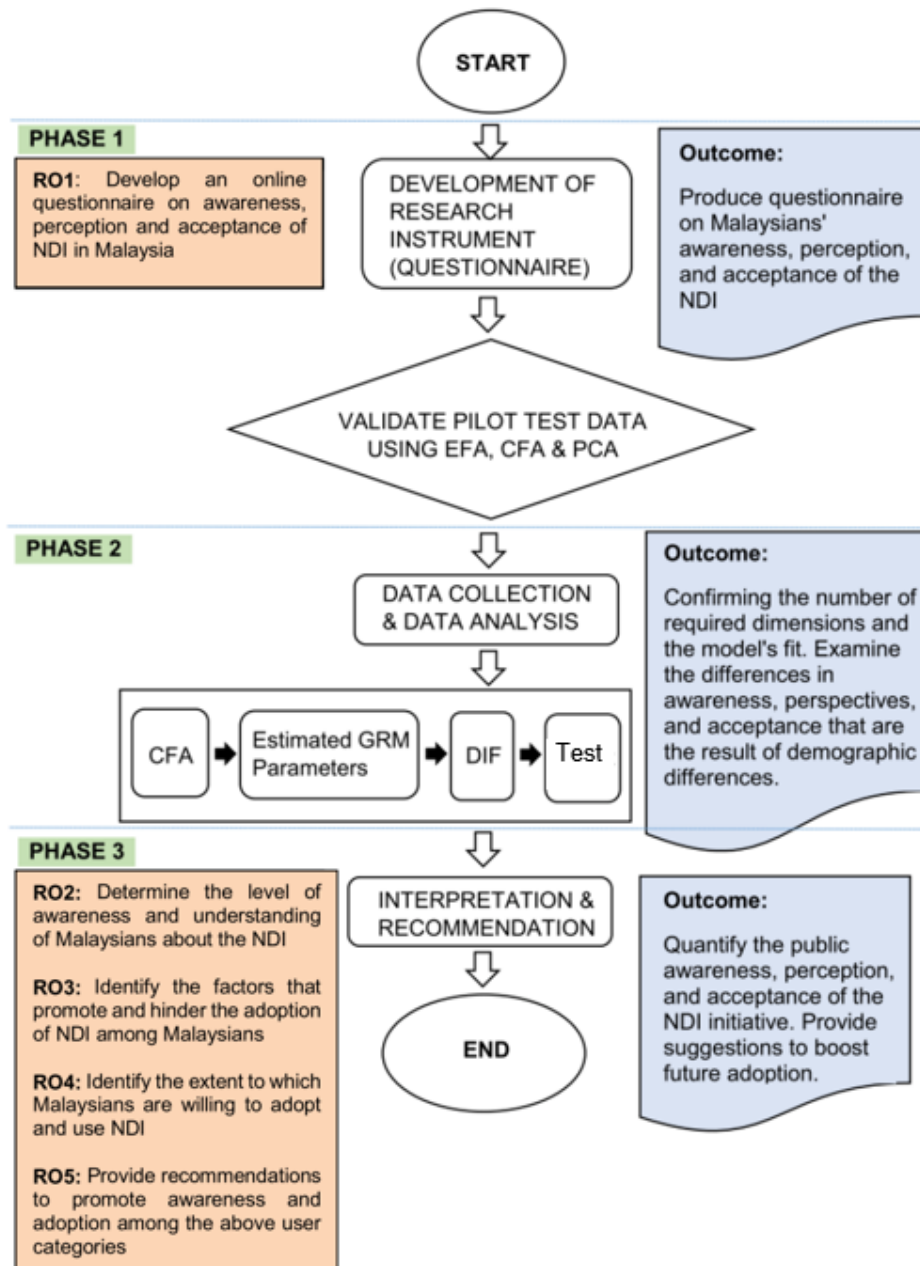


Fig. 2. The research flowchart of the study

4.6 Ethical Considerations

Informed consent will be obtained from all participants before they take part in the survey. Participants will be informed of the purpose of the study, the nature of the questions and their right to stop participating in the study at any time. Data collected through the survey will be kept confidential and used for research purposes only.

As the NDI initiative has not yet been launched in Malaysia, this study uses hypothetical scenarios and descriptions of the initiative to assess public awareness, perception and acceptance. This approach has been used in previous studies on DI initiatives in other countries [25,26].

5. Conclusion

This paper presents a framework to measure public awareness, perception and acceptance of the upcoming NDI programme in Malaysia. The framework includes key factors such as awareness, perception, acceptance, perceived usefulness, ease of use, user experience, social influence and facilitating conditions. A quantitative approach using a questionnaire is proposed to collect data from a large number of respondents. Statistical analysis, including hypothesis testing and Rasch measures, will reveal relationships between variables, assess the validity of the survey and identify influences on NDI adoption. The importance of the study lies in measuring the level of awareness, perception and acceptance of NDI, which will provide information on catalysts and barriers to adoption. This information will help policy makers, governments and stakeholders to implement NDI effectively. Survey quality assessment ensures robust and reliable data that highlights differences between respondent groups and improves understanding of perceptions of NDI. In essence, this framework and methodology enriches the NDI literature and provides a foundation for future research. The rigorous design promises invaluable insights into public opinion, policy governance and support for the triumphant integration of NDI in Malaysia.

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