

The Perception of UTHM Pagoh Students on the Implementation of Mydigital ID in Malaysia

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Abstract

MyDigital ID is a Malaysia national identity management and transaction signing platform designed to address the vulnerabilities of its contemporary implementation such as insecure communication channels and storage of user credentials. MyDigital ID helps to enable fast and secure execution of identity authentication for users' interaction with entities both in person and online. However, the successful implementation of MyDigital ID faces challenges due to negative public perceptions despite its potential benefits, particularly concerning privacy, data security, and accessibility. This study investigates the perceptions of Universiti Tun Hussein Onn Malaysia (UTHM) Pagoh students toward the implementation of MyDigital ID. The objectives of this study include determining the relationship between MyDigital ID awareness levels and demographic characteristics using Chi-Square analysis, identifying the association between MyDigital ID and MyKad functionality via correspondence analysis, and distinguish the factor and potential barriers to the adoption of MyDigital ID using factor analysis. The results from Chi-Square analysis reveal significant relationships between MyDigital ID awareness levels and demographic characteristics. Correspondence analysis shows that respondents perceive MyKad as more functional and reliable compared to MyDigital ID, particularly for authentication purposes. Additionally, factor analysis identified four key barriers to adoption. These are data privacy and security, usability and interface experience, system efficiency and performance, and user support and ease of access. The findings underscore students' concerns about data privacy, system usability, and accessibility, despite the platform's compliance with regulatory acts and its potential to improve educational access and administrative efficiency. This study insights are crucial for addressing barriers to adoption, building trust, and enhancing the integration of MyDigital ID within Malaysia's digital landscape.

1. Introduction

Digital identity systems are transforming authentication and transactions globally, with countries like Estonia, India, and Singapore leading the way. Estonia's e-Residency enables global access to its e-services [1], India's Aadhaar addresses identity fraud [2], and Singapore's Singpass connects users to over 800 services, supporting international transactions [3]. Similarly, nations like Canada and South Korea are advancing their own digital ID systems [4].

The perception of digital ID among individuals and communities is a complex and multifaceted topic. Several studies have explored how people view and experience digital ID systems. A study on UK and German citizens found fears about data misuse, economic harm, and political risks. These worries arise from low trust in public authorities, shaped by past IT failures, data misuse, and political oppression. The findings suggest that reducing risks and improving trust is essential for public acceptance of digital ID systems [5].

A study on Delhi University students found high awareness of Digital India initiatives and belief in their benefits, such as better services and governance. However, barriers like lack of computer knowledge, fear of fraud, and resistance to change slow down acceptance. Educating people on benefits is key to wider adoption and promoting responsible governance [6].

A study on Filipino citizens' views of the Philippine Identification System (PhilSys) found that while usefulness and ease of use affect its adoption, trust, public awareness, transparency, and privacy concerns play a bigger role. Public awareness is the most important factor for its success, supported by secure IT systems and technical expertise. The study emphasizes a citizen-focused approach for national ID systems [7].

Malaysia's MyDigital ID system aims to provide secure, efficient identity authentication while fostering inclusivity and economic growth [8]. Despite its potential, concerns about data privacy, security, and accessibility have sparked scepticism among Malaysians [9]. Addressing these concerns is crucial for successful implementation.

Negative perceptions of MyDigital ID among Malaysians present significant barriers to its acceptance and effectiveness. Concerns about privacy invasion, data security, technological access, and potential exclusion of marginalized groups have undermined public trust. Understanding the root causes of these perceptions is essential to addressing them, ensuring widespread adoption, and achieving the system's objectives. Without public trust and acceptance, the implementation of MyDigital ID risks being underutilized, limiting its potential benefits.

This study examines UTHM Pagoh students' perceptions of MyDigital ID, exploring its awareness level, associations with MyKad, and barriers to adoption. By addressing barriers and raising awareness, the study seeks to inform strategies for improving MyDigital ID adoption. These findings contribute to understanding digital identity systems and guide future studies on similar topics across different demographic groups.

2. Methodology

This chapter explains the methodology used to conduct the study.

2.1 Data collection

A questionnaire is a research instrument consisting of a set of questions or other prompts for the purpose of gathering information from respondents [10]. A Google Forms survey was used to gather data from undergraduate students in the Faculty of Applied Sciences and Technology (FAST), Faculty of Engineering and Technology (FTK), and Centres of Diploma Studies (PPD) programs at UTHM Pagoh. The idea to create the questionnaires was based on the information and Frequently Asked Questions (FAQ) from the official website of MyDigital ID.

2.2 Sample Size Determination

Sample size refers to the number of observations or individuals selected from a larger group or population to represent it in a study or research. Determining the appropriate sample size is important in ensuring the validity and reliability of research findings [11]. The formula to calculate the sample size, n based on Slovin's formula [12] in Eq. (1);

$$\text{Sample size, } n = \frac{N}{1 + Ne^2} \quad (1)$$

where N represents the population size and e represents the margin of error. This study requires a 373 number of respondents based on the population size of 5444 in UTHM Pagoh students with 95% confidence interval and 5% margin of error. The total sample size was collected are 805 number of respondents.

2.3 Sampling Techniques

Convenience sampling which is under the non-probability sampling was applied in the data collection for this study. Convenience sampling is a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access. This sampling technique involves selecting participants based on their easy availability or accessibility to the researcher [13].

2.4 Pilot Study

A pilot study was conducted before the actual survey was conducted. A pilot study is a small-scale preliminary study conducted before the main research to check the feasibility or improve the research design [14]. In summary, pilot studies are an essential stage in the research process that can help identify potential issues, improve study design, and provide valuable preliminary data before investing significant resources into a full-scale project [15].

2.5 Reliability and Validity

After collecting the data from pilot study, Cronbach's alpha was applied to test the reliability and validity of the questionnaire. Cronbach's alpha is a widely used statistical measure of the internal consistency or reliability of a psychometric test or scale [16]. The following formula in Eq. (2) was used to calculate Cronbach's alpha:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum V_i}{V_t} \right) \quad (2)$$

where k represents a number of items, V_i is the variance of the i th items and V_t is the variance of the total score. The internal consistency of Cronbach's alpha can be classified to the following categories if $\alpha < 0.5$ the questionnaire is unacceptable, $0.5 \leq \alpha < 0.6$ the questionnaire classifies as poor, $0.6 \leq \alpha < 0.7$ the questionnaire can be questionable, $0.7 \leq \alpha < 0.8$ the questionnaire is acceptable, $0.8 \leq \alpha < 0.9$ good questionnaire and $0.9 \leq \alpha$ the questionnaire is excellent [17].

2.6 Descriptive Analysis

Descriptive analysis is a fundamental type of data analysis that focuses on summarizing and describing data to reveal patterns and relationships within a dataset. It is a crucial step in statistical data analysis that provides insights into the distribution of data, helps in detecting errors and outliers, and identifies relationships between variables, preparing the groundwork for further statistical analysis [18]. Descriptive analysis was presented the demographic of the respondents and the awareness about the implementation of MyDigital ID.

2.7 Chi-Square Analysis

A Chi-Square analysis is a statistical test used to examine the differences between the demographic profile and the awareness level about MyDigital ID. It helps determine if observed results align with expected results and if the differences are due to chance or a relationship between variables [19]. The analysis involves creating a table of observed and expected frequencies, calculating the Chi-Square value, finding the critical Chi-Square value, and deciding whether to accept or reject the null hypothesis based on the comparison of these values [20]. The following formula is used to calculate the Chi-Square test as in Eq. (3);

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad (3)$$

where χ^2 indicates a Chi-Square statistic, O_i is observed value and E_i is expected value. If the test statistic is greater than the critical value, the null hypothesis is rejected, indicating a significant relationship between variables [21]. The hypothesis testing is as follows:

H_0 : There is no association between the awareness level about MyDigital ID and demographic characteristics

H_1 : There is an association between the awareness level about MyDigital ID and demographic characteristics

2.8 Correspondence Analysis

Correspondence analysis is a multivariate statistical technique used to analyse the relationships between categorical variables and create visual representations of these relationships [22]. Correspondence analysis was applied to illustrate the results based on the association between respondents' perception of MyDigital ID and MyKad. The formula in Eq. (4) is used to calculate the coordinates of the categories of the variables in correspondence analysis [23]:

$$P_{ij} = \sqrt{\lambda_{ij}} S_{ij} \quad (4)$$

where P_{ij} represents principle coordinate, S_{ij} is a standard coordinate and λ_{ij} is eigenvalues. Figure 1 shows the correspondence analysis plot with four regions. The four regions show in Fig. 1 represent as Regions A and C indicate low priority with distinct positive associations, Region B reflects strong positive associations and good results, while Region D highlights negative associations and poor outcomes [24].

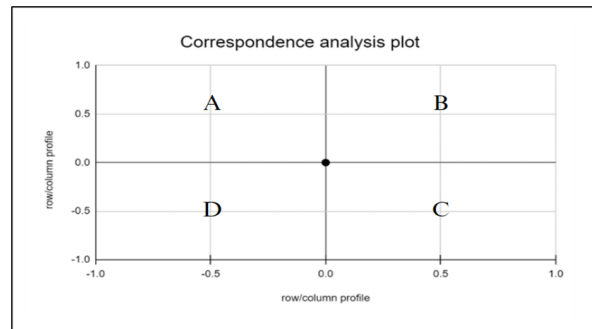


Fig. 1 Correspondence analysis plot

2.9 Factor Analysis

Factor analysis is a statistical method used to identify underlying relationships between factors among a set of variables. Exploratory Factor Analysis (EFA) was used to identify the number of factors that best explain the correlations between variables. This method helps in uncovering patterns in data and is particularly useful when the relationships between variables are not well understood [25]. The equation for factor analysis is shown in Eq. (5);

$$y_j = \lambda_{j1}f_1 + \lambda_{j2}f_2 + \dots + \lambda_{jm}f_m + \varepsilon_j \quad (5)$$

where y_j is observed variables, λ_{jm} is factor loading, f_m is latent factor, and ε_j is error term. This study applied Varimax as the factor rotation and Principal Component Analysis (PCA) for factor extraction. Deciding regarding the type of model and the quantity of factors to be extracted is part of the factor extraction process. After the elements are extracted, the factors are rotated to achieve a basic structure and increase interpretability.

3. Preliminary Analysis

A pilot study was conducted to evaluate the reliability of the questionnaire by using software SPSS. By spreading the questionnaire, 21 respondents from FAST, FTK and PPD were obtained. The data were collected through questionnaire and was distributed through social media such as Whatsapp and Telegram. The Cronbach's Alpha evaluating of 0.941 indicated that the scale had an excellent level of internal reliability.

3.1 Descriptive Analysis

Fig. 2 shows the pie chart of the respondents' gender. There are 461 (57%) male, and 344 female respondents (43%) involved in this study.

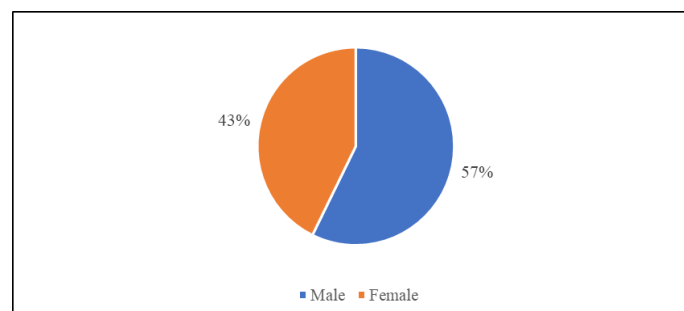


Fig. 2 Respondents' gender

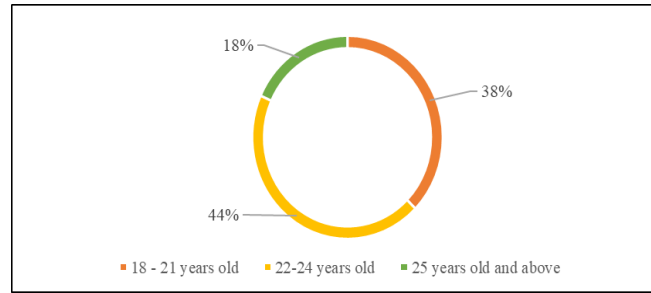


Fig. 3 Respondents' age

Fig. 3 presents a donut chart of respondents' ages. The largest group is aged 22-24 years, making up 44% (357) respondents. The smallest group is 25 years and older, at 18% (147) respondents. Meanwhile, 38% (301) respondents are aged 18-21 years. Next is Fig. 4 shows the respondents' race. Most are Malay (330), followed by Chinese (311) and Indian (149). Other races, including Bumiputera Sabah, Bumiputera Sarawak, and others (15).

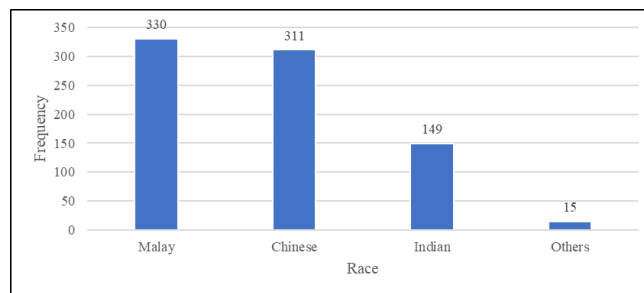


Fig. 4 Respondents' race

Fig. 5 shows respondents' year of study. Most are from Year 3 (244), followed by Year 2 (232) and Year 1 (195). Year 4 has the fewest respondents (134). Meanwhile, Fig. 6 shows respondents' faculties. Most are from FTK with 361, followed by FAST with 245 and PPD with the fewest respondents (199).

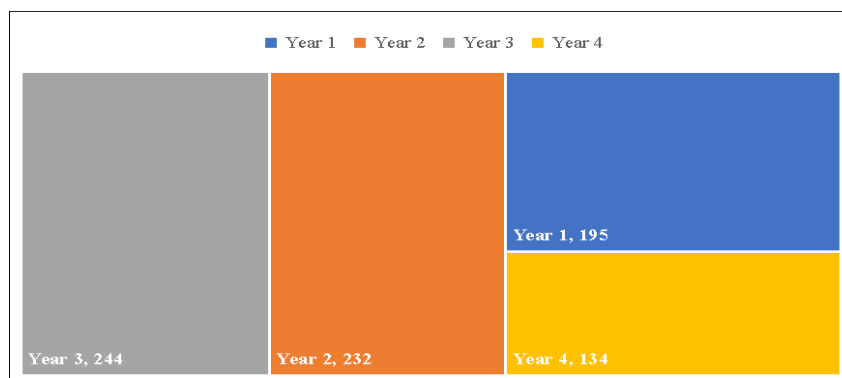


Fig. 5 Respondents' year of study

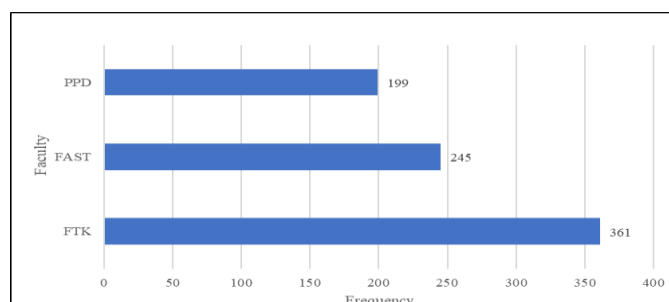


Fig. 6 Respondents' faculty

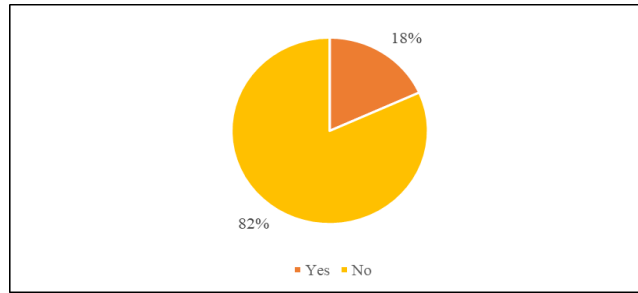


Fig. 7 Respondents' awareness about MyDigital ID

Fig. 7 shows a pie chart of respondents' awareness of MyDigital ID where the question asks if respondents have heard about MyDigital ID before. Most (82%) have never heard of it, while 18% are aware of its implementation in Malaysia. Fig. 8 shows a bar chart of respondents' awareness of MyDigital ID by gender. Awareness is low overall, with males slightly more aware than females. Both genders show a majority who are unaware, highlighting the need for better outreach efforts. Then, Fig. 9 shows the respondents' awareness levels across three faculties including FAST, FTK, and PPD. In all faculties, fewer respondents were aware compared to those who were not. FTK had the lowest awareness with 307 respondents, followed by FAST (188) and PPD (163). This highlights a significant lack of awareness across all faculties, emphasizing the need for efforts to improve it.

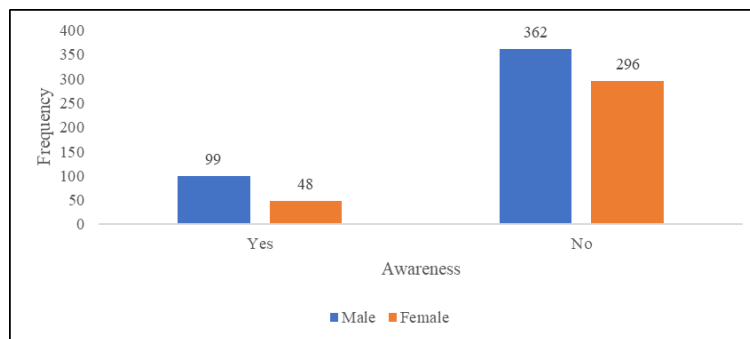


Fig. 8 Respondents' awareness based on gender

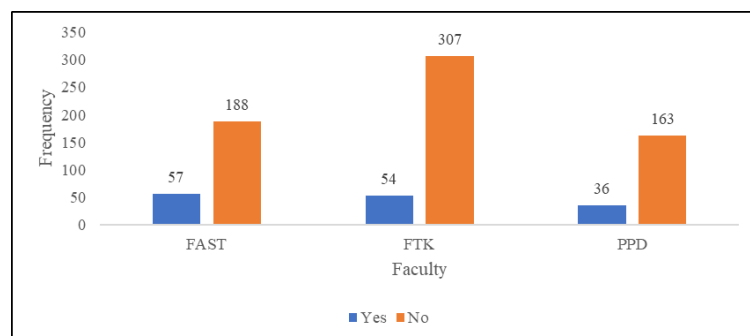


Fig. 9 Respondents' awareness based on faculty

3.2 Chi-Square Analysis

The association between two variables can be determined from the p -value that the Chi-square test resulted. The relationship between two variables was indicated by the hypothesis as follows:

H_0 : There is no association between the awareness level about MyDigital ID and demographic characteristics

H_1 : There is an association between the awareness level about MyDigital ID and demographic characteristics

Table 1 Chi-square tests between awareness and demographics and the strength of association.

	Have you heard about MyDigital ID?		
	ρ -value	Decision	Cramer's V
Gender	0.006	Reject H_0	0.096
Age	<0.001	Reject H_0	0.200
Race	<0.001	Reject H_0	0.471
Faculty	0.034	Reject H_0	0.092

The analysis reveals statistically significant associations between awareness of MyDigital ID and the factors of gender ($\rho = 0.006$), age ($\rho < 0.001$), race ($\rho < 0.001$), and faculty ($\rho = 0.034$), as all ρ -values are below the significance of $\alpha = 0.05$. The strength of these associations, indicated by Cramer's V values, varies across factors. Gender and faculty show weak associations with values of 0.096 and 0.092, respectively. Age has a slightly stronger, though still weak, association with a value of 0.200. Race exhibits a moderate association with a Cramer's V of 0.471, highlighting clearer differences in awareness levels among racial groups compared to the other factors. These findings underscore the role of demographic and institutional variables in influencing awareness of MyDigital ID, though the strength of these relationships varies.

3.3 Correspondence Analysis

Fig. 10 compares responses for MyDigital ID and MyKad on the statement "Identify the user personal information faster and easier." Responses for both systems are closely aligned. Most respondents agree that both systems are efficient, as indicated by the Agree response in the positive region. The Disagree response in region A suggests room for improvement in efficiency, while the Neutral response in the negative region highlights the need for further enhancements. This alignment indicates that both systems are perceived to perform similarly, justifying their function for efficient personal information identification.

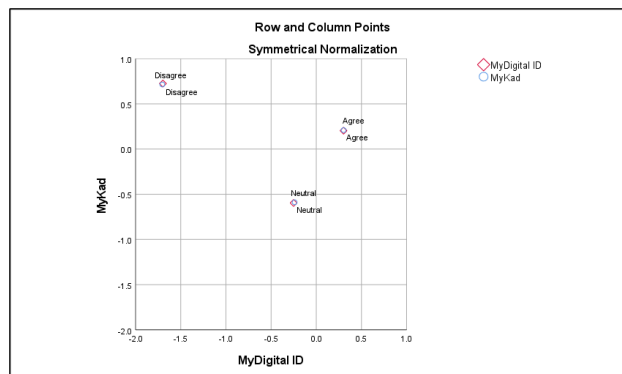


Fig. 10 Correspondence plot for system identification

Fig. 11 compares responses for MyDigital ID and MyKad on the statement "User personal information is kept safe without doubt." Neutral and Agree responses are similar for both systems, as they fall close together. However, Disagree responses differ, with MyKad in the negative region, suggesting the need for improvement. This difference in Disagree responses may arise from users perceiving MyDigital ID as a modern and secure solution, which could justify prioritizing its enhancement and adoption over traditional systems like MyKad.

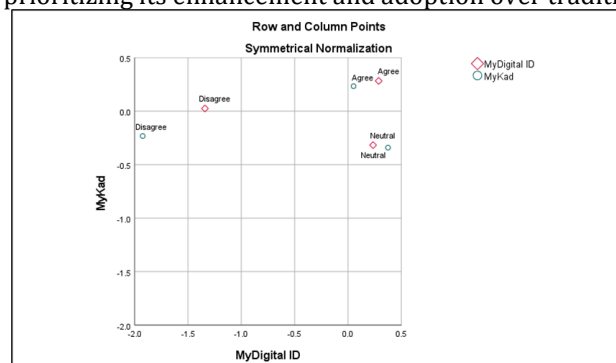


Fig. 11 Correspondence plot for system security

Fig. 12 shows a plot for the statement "More convenient when dealing with government premises." Agree responses for both MyDigital ID and MyKad fall in regions B and C, indicating most respondents find them convenient. Neutral responses for MyDigital ID and Disagree responses for MyKad in region A suggest no immediate action is needed. However, Disagree responses for MyDigital ID in region D indicate a need for improvement. This suggests that while both systems are generally perceived as convenient, addressing the concerns in the Disagree responses for MyDigital ID could overcome its overall user acceptance and satisfaction.

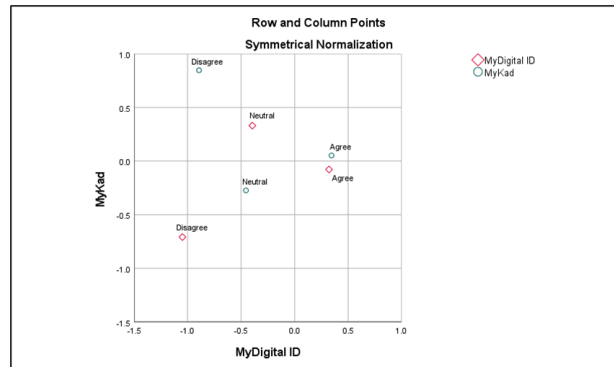


Fig. 12 Correspondence plot for system convenience

Fig. 13 shows the relationship between MyDigital ID (red) and MyKad (blue) regarding "reducing the risk of online identity fraud." Agree responses for both systems are in the negative region (D), indicating a need for improvement. Neutral and Disagree responses for both systems are positioned closely, reflecting similar perceptions among respondents. Overall, the plot highlights consistent views of both systems with minimal variation across response categories. This consistency suggests that while both systems are seen as potentially useful, further enhancements in MyDigital ID are necessary to increase users' confidence in their ability to effectively reduce the risk of online identity fraud.

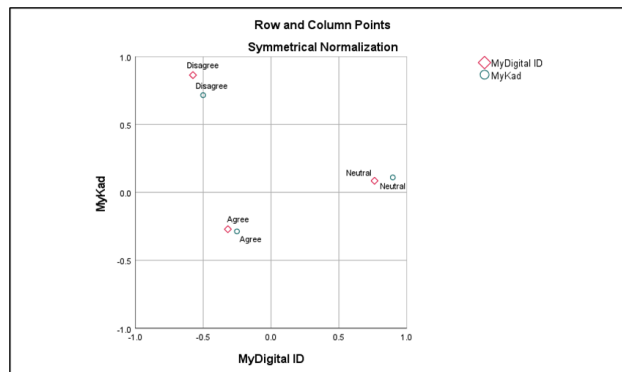


Fig. 13 Correspondence plot for system fraud prevention

Fig. 14 shows the relationship between MyDigital ID (red) and MyKad (blue) regarding "valid and secure self-authentication." Agree and Neutral responses for both systems are closely aligned, indicating similar positive and neutral perceptions. Disagree responses are slightly apart, suggesting minor differences in negative feedback. Overall, the plot highlights strong similarities in how respondents view both systems. This alignment supports that both systems are generally perceived as secure and reliable, though addressing the slight negative feedback could further enhance user trust and acceptance of both systems.

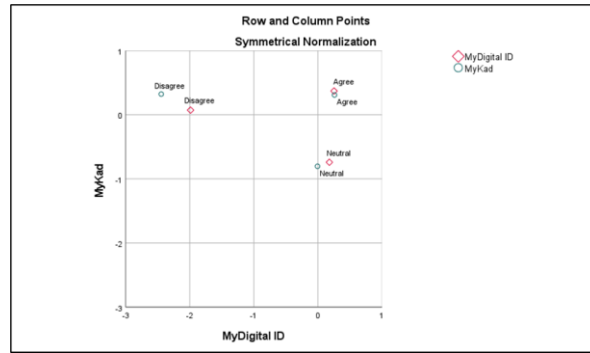


Fig. 14 Correspondence plot for system authentication

3.4 Factor Analysis

Table 2 shows the Kaiser-Meyer-Olkin (KMO) value of 0.927, indicating excellent suitability for factor analysis as it exceeds 0.05. The Bartlett’s test value of 0.000, below 0.05, confirms the factors are satisfactory. These results validate the dataset for conducting factor analysis.

Table 2 KMO and Bartlett’s test value

	ρ -value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.927
Bartlett's Test of Sphericity	0.000

Table 3 shows the value of the factor loading. In the Rotated Component Matrix, high loading values typically above 0.5 indicate a strong association between a variable and a specific component, which helps identify the thematic focus of each factor. The highest value (in bold) of factor loading was chosen when there are two values on the same variables. The rotated component matrix is central to understanding the results of this factor analysis, as it shows the relationship between each variable and the components extracted. This matrix presents the loadings, or correlations, of each variable with the four identified components after rotation. Varimax rotation was applied here to maximize the differences between components, making it easier to interpret each component as a distinct theme.

Variables like "Data should not be shared with third parties without consent" (0.758) have a strong high loading showing a strong correlation with Component 1. Meanwhile, variables such as "A more user-friendly interface is necessary" (0.794) load strongly on Component 2. For Component 3, variables such as "The login and authentication process are too complicated" (0.822) load strongly. Lastly, Component 4 captures variables like "The system suffers from slow response times" (0.722) load strongly on Component 4.

Table 3 Rotated component matrix

	Statements	Component			
		1	2	3	4
1	Data should not be shared with third parties without consent	0.758			
2	Unauthorized data access is a serious issue	0.751			
3	Personal data must not be mis used	0.713			
4	Third party data sharing policies need to be clear	0.709	0.437		
5	Users need control over their personal data	0.681	0.363		
6	There should be resistance to fraud	0.677	0.479		
7	Identity theft is a significant risk	0.661			0.399
8	There is a lack of transparency in data collection and usage	0.644			
9	Data breaches are a major concern	0.628	0.47		
10	Personal data needs to be protected	0.628	0.601		
11	Recovering an account if compromised is difficult	0.613			0.42
12	A more user-friendly interface is necessary		0.794		
13	The mobile app functionality needs to be improved		0.751		

14	The system needs faster login and authentication		0.708		
15	The system should have more reliable performance	0.447	0.703		
16	The authentication process must be secure	0.548	0.66		
17	Users experience difficulty in accessing the system		0.461	0.366	0.4
18	The login and authentication process are too complicated			0.822	
19	User support is lacking			0.746	
20	Navigation within the system is difficult			0.696	
21	The account setup process should be simplified	0.551	0.59		
22	The system suffers from slow response times				0.722
23	The system requires frequent updates				0.674
24	There is poor integration with other services			0.534	0.608
25	Security measures are often insufficient	0.551			0.57

Table 4 shows four key factors that have been categorized from the 25 variables included in factor analysis. The category of factors was decided based on the value of factor loading and the common themes related to the variables.

Table 4 Category of factors in components

Component	Factor	Explanation
1	Data privacy and security	Concerns about protecting personal information
2	Usability and interface experience	Emphasizing the need for a user-friendly system
3	System efficiency and performance	Focusing on speed, reliability, and integration of the system
4	User support and ease of access	Addressing login challenges and support resources

4. Conclusions

This study successfully conducting the Chi-Square analysis, correspondence analysis and factor analysis to view the perception of UTHM Pagoh students on the implementation of MyDigital ID in Malaysia. The analysis revealed that the awareness level about MyDigital ID has an association with gender, race, faculty, and course of the respondents. However, the strength of the association is varied for every demographic characteristic. Furthermore, the result from the correspondence analysis shows that the first attributes have a similar plot for both MyDigital ID and MyKad. The second, third, fourth, and fifth attributes show that MyKad is more convenient. In short, the function of MyKad is more convenient about the functionality compared to MyDigital ID. Additionally, the key factors that have been potential barriers to the adoption of MyDigital ID were data privacy and security, usability and interface experience, system efficiency and performance, and user support and ease of access. Overall, the findings shows that there is need of action the increases the level of awareness about MyDigital ID and overcome the factor and barrier to the adoption of MyDigital ID. This underscores the importance of addressing these barriers through targeted improvements while increasing public awareness to boost confidence in MyDigital ID as digital ID system.

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Conflict of Interest

Authors declare that there is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Aziz Ridzwan Ruzaini Aziz Jaafar, Norhaidah Mohd Asrah; **data collection:** Aziz Ridzwan Ruzaini Aziz Jaafar; **analysis and interpretation of results:** Aziz Ridzwan Ruzaini Aziz Jaafar; **draft manuscript preparation:** Aziz Ridzwan Ruzaini Aziz Jaafar, Norhaidah Mohd Asrah. All authors reviewed the results and approved the final version of the manuscript.

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