Analysis of Integrated Railway QR Code Mobile Payment Systems Technology Acceptance

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ABSTRACT

This research investigates passengers' perceptions regarding the implementation of integrated railway Quick-response Code mobile payment systems. Their perception of the technology is crucial for determining the main factors that influence technology acceptance in transport tariff integration sector. The research locations are in Jakarta (Jaklingko application) and United Kingdom (Trainline application). The method used in this research was the technology acceptance model. The model was used to identify the construct and indicator variables hypothesized to influence acceptance. The model's dependability was then evaluated using the partial least squares – structural equation modelling method. After the model had been evaluated for dependability, it was tested on the determined hypothesis to determine factors that could increase passenger acceptance of the application. The analysis revealed that the technology acceptance model extension factors which influent the model were self-efficacy, informativeness, result demonstrability, subjective norms and perceived risk. This study's findings also suggest that policies implement travel behavior interventions, distribute information, instructing transportation operators to conduct targeted advertisement technology and comply with network security standards can increase technology acceptance. These results support previous research concerning the core concept of technology acceptance model but also found differences with several previous studies, namely that perceived risk does not influence perceived ease of use because the most significant concern of mobile telecommunication users is failure transactions. Moreover, the indicator difference between the two application models demonstrates that each technology implementation is unique and that there may be disparities in the indicators representing the model's construct variables.

Key word: tariff integration; technology acceptance model; QR code; mobile payment; structural equation modeling.

INTRODUCTION

Public transport integration aims to reduce unintegrated services among operators by integrating information, physical, and tariff services (Abrate et al., 2009). Moreover, according to Sharaby and Shiftan (2012), fare integration has three significant effects: shifting trips from private cars to public transportation, reducing congestion, and allowing passengers to choose the best route . However, existing transportation payment tools, for instance, traditional smart cards have flaws, such as not being interoperable among operators (Fraga-Lamas et al., 2017). According to Fraga-Lamas et al. (2017) innovative approaches, such as electronic ticketing systems using RFID, NFC, and QR codes, are being developed to address this issue.

Electronic tickets, such as IoT-based public transit payments using QR codes with banking integration, are one idea for implementing fare integration between railway operators in urban and intercity services (Shuran and Xiaoling, 2020). Researchers have examined the behavior of mobile phone customers and analyzed factors influencing consumer adoption (Zhou, 2013). However, implementing IoT applications involving multiple stakeholders may result in divergent expectations and objectives. Interviews with railway IoT users or potential users are necessary to understand their

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perceptions and use in developing and implementing IoT in the railway sector (Singh et al., 2022; Udoh and Kotonya, 2018).
QR Code-based technology enables the integration of fare across operators through the issuance of multiple QR Codes to users who purchase tickets from multiple operators (Shuran and Xiaoling, 2020). Several locations, including Greater Jakarta and the United Kingdom, have implemented this technology (Azzam Akmal et al., 2023; Trainline, 2023). As a result, it is critical to investigate the acceptability of this technology to identify the determinants that impact that acceptance and to develop approaches that will motivate users to utilize it.

Several studies examine the acceptability of technology, including in the financial sector, QR-code-based applications, transportation, internet-based applications, and social media and mass media-marketed applications. However, there is an absence of research exploring public perceptions of IoT-based transportation payment technology, especially using applications that utilize QR Code payment on transportation. Based on this rationale, the aim of this research is to observe factors that influence technology acceptance of QR Code-based integrated ticketing applications based on the perceptions of urban and intercity railway users.

RESEARCH METHODS

Research Steps

The stages of research to answer research questions commence with the observation problem and conclude with the formulation of conclusions. The research phase commences with the observation of the most recent railway issues. Then, a literature review was conducted to examine the problems and discover solutions to problems addressed in previous research. In addition, the literature review investigated variables and theories used in this study. After a literature review, the necessary data, construct, and indicator variables were identified to produce the PLS-SEM analysis results. After determining the variables, the hypothesis was formulated based on prior research. Based on previous research, parameters to determine the model's viability are also determined.

Data compilation utilizes both primary and secondary data sources. Primary data were collected through an online survey, while secondary data were gathered from various sources. The testing analysis begins with validity and reliability to ensure the validity and dependability of the model assessments through a pilot survey. Acceptance factors were determined after obtaining a suitable model with the specified parameters. Once the influencing factors have been identified, best practice-based policy recommendations can be developed. The research concludes with conclusions and recommendations drawn from the findings. The steps in this research are illustrated in Figure 1.

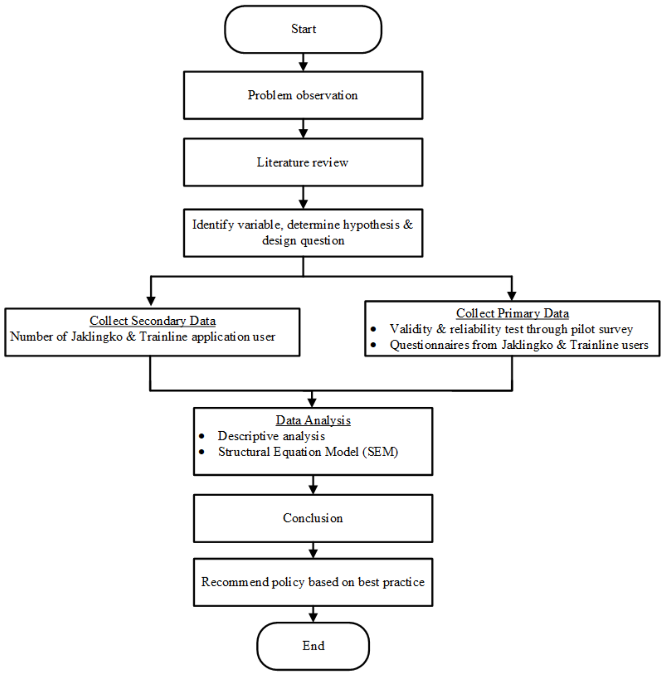

Figure 1. Research Step Flow Chart

Variable & Hypothesis Definition

This study's research design begins with identifying the construct based on the literature review results. In the concept operationalization stage, indicators that characterize the construct were determined after the construct had been defined. After determining the outer and inner models, the hypotheses to be tested were defined based on the literature review results. The hypothesis results were then used to determine the respondents' questions to collect data for PLS-SEM analysis. Figure 2 illustrates the phases of the variable & hypothesis definition.

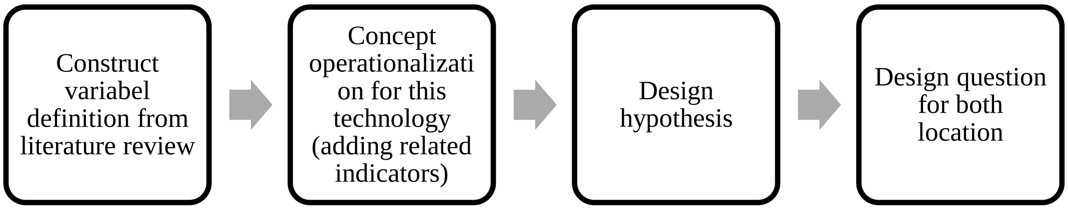

Figure 2. Variable & Hypothesis Definition Process

Construct Definition

The attitude towards, usefulness, ease of use and intention to use technology impact its acceptance. These four variables are categorized as internal factors, whereas all other variables are categorised as external factors. As a result of the Technology Acceptance Model's use and adaptation to the needs of numerous research disciplines, the external factor group experienced significant change and growth. The external factors used are subjective norms, perceived risk, self-efficacy, informativeness and result demonstrability. These factors follow the literature review on similar applications in the financial and transportation category and applications that utilize internet connections and mobile phones based on QR-Code.

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Table 1. Summary of Conceptual Framework

Variable	Concept Definition	Attribute	Developer
Perceived usefulness	Individual belief in the benefits of a technology	Enhanced user effectiveness	(Davis, Fred D, 1986)
Perceived ease of use	Individual confidence to be able to use technology	Flexibility User-friendliness	(Davis, Fred D, 1986)
Intention to use	User response to the technology applied	Continuity of use Excitement for utilising technology	(Davis, Fred D. et al., 1989)
Attitude towards	User evaluation of the technology	User convenience and interest Benefits for users	(Davis, Fred D. et al., 1989)
Subjective norms	The effect of social influence on a user's decision to use	Influence from colleague Perception from colleague	(Marangunić and Granić, 2014)
Perceived risk	User evaluations of specific risks	Leakage privacy risk Financial risk	(Li, J. et al., 2019)
Self-Efficacy	Beliefs regarding a user's to perform a specific task using a technology	Ability to use Experience in using similar technology	(Abdullah and Ward, 2016)
Informativeness	the information value provided by media like texts, images, or videos	Information about application updates Information on how to use	(Zhao and Wang, 2020)
Result demonstrability	The production of precise results.	Technology stability & reliability Technology feature & user interface	(Marangunić and Granić, 2014)

Concept Operationalization

Based on the conceptual framework, operational definitions were developed to define indicators for each variable further. By defining the operational definition, the indicators were determined by Table 2 for the TAM variables. Each indicator was assigned a code for identification purposes during analysis.

Indicators of perceived usefulness indicates the usefulness through buying tickets efficiently (Davis, Fred D, 1986). On the other hand, indicators of perceived ease of use indicates the ease through the features that are easy to use (Davis, Fred D, 1986). Indicators of the intention to use were how passengers intend to use it without instructions through the desire of passengers to use the application (Davis, Fred D. et al., 1989). On the other hand, indicators of attitude toward the application were how passengers comfort and interest to use the application (Davis, Fred D. et al., 1989).

Table 2. Conceptual Operationalization for TAM Variables

Variable	Operational Definition	Code	Indicator
Perceived usefulness	An integrated train ticket application based on a QR Code generates certain advantages.	PU 1	Help users give travel routes recommendation
		PU 2	Help users calculate integrated tariffs
		PU 3	Helps users speed up transactions
Perceived ease of use	The ease that users experience when operating an integrated train ticket application based on a QR Code	PEU 1	Ease of user registration
		PEU 2	Ease of finding route recommendations
		PEU 3	Ease of top-up balance or connection to other services
		PEU 4	Ease of buying integrated tickets
Intention to use		IT 1	The level of us of the application
		IT 2	The desire to keep using the app

Variable	Operational Definition	Code	Indicator
	The desire of users to use and continue to study the development	IT 3	The desire to find information on developments
Attitude towards	User evaluation in using the QR Code-based integrated train ticket application	AT 1 AT 2 AT 3	Convenience in using the application The benefits of using the application Interest in using the application

Indicators of subjective norms were how important people such as colleagues could influence the use of applications through their review and suggestion (Marangunić and Granić, 2014). On the other hand, indicators of perceived risk were how perceived risk affects application use through risks that may arise when using the application (Li, J. et al., 2019). Besides that, self-efficacy indicators were how the ability to operate affects the use of applications through user understanding of the application and experience in similar applications (Abdullah and Ward, 2016).

Indicators of informativeness were that the information received could affect the use of the application through the information obtained by the user regarding how to use it and the benefits received (Zhao and Wang, 2020). On the other hand, indicators of result demonstrability were how the results and reliability of the application could affect the use of the application through application quality and stability (Marangunić and Granić, 2014). Table 3 illustrates indicators for the TAM extension variables.

Table 3. Conceptual Operationalization for Extension TAM Variables

Variable	Operational Definition	Code	Indicator
Subjective norms	The influence of others on the use of the QR Code-based integrated train ticket application	SN 1 SN 2 SN 3	Others recommend using the application Others feel the benefits of using the application Others considered an integrated ticket was a good idea.
Perceived risk	The risks associated with using an integrated QR Code-based application could discourage use	PR 1 PR 2 PR 3	Financial risk when using the application Leakage risk when using the application Itinerary leakage risk when using the application
Self-Efficacy	User understanding of functions of the application and experience using similar applications	SE 1 SE 2 SE 3	User's understanding of the application's function User experience in using similar apps User interest in using without encouragement
Informativeness	Information about the QR Code-based integrated train ticket application	IF 1 IF 2 IF 3	Information related to the integrated ticket feature Information about how to use and benefit Information about the latest application updates
Result demonstrability	The QR Code-based integrated train ticket application facilities include	RD 1 RD 2 RD 3 RD 4	The quality of the application features User interface quality Application stability (not many bugs or errors appear) Application flexibility (can be used with weak signal)

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Define Hypothesis

The conceptualization results generate testable hypotheses regarding the influence of research variables. Correlation or influence may characterize the relationship between variables. Hypotheses were derived from previous research. Based on above literature review, the hypothesis of the relationship between variables is illustrated in Figure 3 and summarized in Table 4.

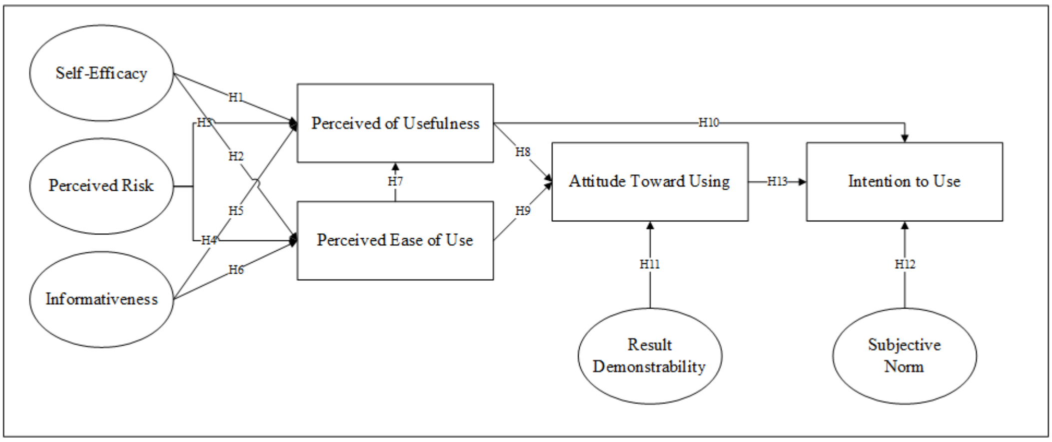

Figure 3. Hypothesis Relationship Between Variables

Table 4. Summary of Hypothesis Between Variables

Hypothesis Code	Hypothesis	Reference
H_1	Self-Efficacy positively affects users' perceived usefulness	(Chow et al., 2012)
H_2	Self-Efficacy positively affects users' perceived ease of use	
H_3	Perceived risk negatively affects users' perceived usefulness	(Paul, 2003)
H_4	Perceived risk negatively affects users' perceived ease of use	
H_5	Informativeness positively affects users' perceived usefulness	(Pintado et al., 2017)
H_6	Informativeness positively affects users' perceived ease of use	
H_7	Perceived ease of use positively affects users' perceived usefulness	(Venkatesh and Bala, 2008)
H_8	Perceived usefulness positively affects users' attitude toward using	(Marangunić and Granić, 2014)
H_9	Perceived ease of use positively affects users' attitude toward using	
H_{10}	Perceived usefulness positively affects users' intention to use	(Davis, Fred D., 1989)
H_{11}	Result demonstrability positively affects users' attitude toward using	(Plouffe et al., 2001)
H_{12}	Subjective norm positively affects users' intention to use	(Barki and Hartwick, 1994)
H_{13}	Attitude toward using positively affects users' intention to use	(Marangunić and Granić, 2014)

Data Collection

The secondary data required was the number of Jaklingko and Trainline mobile application users. The objective was to establish the required sample size for primary data gathering. The secondary data collection process involved referencing corporate reports and press releases.

In order to achieve the purpose of this study, a survey technique utilizing a questionnaire was employed to investigate the user's experience with the application. The survey was intended for users of the Jaklingko and Trainline applications at least 18 years old. The questionnaire uses closed-ended queries to obtain responses from respondents. Calculation of the number of target samples using the Slovin formula (Sevilla et al., 1984)

A pilot survey was administered to 15 respondents who utilized either the Jaklingko or Trainline applications to collect grammar feedback. Several questions were reworded based on the pilot survey to make it simpler for other respondents to read and complete the questionnaire.

The primary data survey utilized an online questionnaire with a target of 400 respondents utilizing the Jaklingko and Trainline applications. 414 Jaklingko respondents filled out the questionnaire, while 408 respondents filled out the questionnaire. However, 14 Jaklingko and 8 Trainline respondents did not meet the requirements because they did not use the two applications. Therefore, there are 400 Jaklingko and 400 Trainline data from respondents could be analyzed. The first 30 responses were used to measure the capacity of questions or statements to represent variables. The responses obtained were then analyzed using reliability and validity tests.

Research Parameter

PLS-SEM calculations using the application Smart PLS 4 (Ringle et al., 2022). According to Hair et al. (2014), the following are the outer & inner model evaluation parameters:

Table 5. Summary of Hypothesis Between Variables

No	Parameter	Value
1	Outer Model	
	Discriminant validity	√AVE of indicator > highest correlation to other constructs
	Convergent validity	AVE > 0.5
	Composite reliability	> 0.6
	Outer loading	> 0.7
2	Inner model	
	Coefficient of determination (R^2)	0 – 1
	Cross-validated redundancy (Q^2)	$Q^2 > 0$
	Path coefficients	-1 to 1
	Effect size (f^2)	$f^2 \geq 0$
	Collinearity	VIF ≤ 5

Validity & Reliability Test

The first 30 responses were used to measure the capacity of questions or statements to represent variables. If the test correlation value exceeds the table correlation value ($r_{count} > r_{table}$), the queries on the instrument are deemed valid, and vice versa. The reliability test was carried out at the pilot survey stage to the first 30 responses to measure the reliability and consistency of the instrument. According to (Taber, 2018), the acceptable alpha reliability value is 0.7; if the test result is more significant than 0.7, the instrument is deemed reliable. In this research, identical methodologies were used to evaluate the reliability of the data to check data consistency.

Data Analysis

Descriptive analysis was used to determine the profile of respondents from the Jaklingko application and respondents from the Trainline application. After descriptive analysis, Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis to examine the relationship between variables.

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PLS-SEM was chosen because this study aimed to investigate the relationship between variables, whereas CB-SEM was used to test the entire model (Dash and Paul, 2021).

RESULT AND DISCUSSION

Descriptive Analysis

Based on the results of the survey conducted, intention to use the application was illustrated in table 6, while demographic characteristics were illustrated in table 7.

Table 6. Intention to use of the application

Intention to use		Jaklingko		Trainline	
		Number	Percentage	Number	Percentage
Did not intent	(1)	10	2.50%	6	1.50%
Sometimes did not intent	(2)	18	4.50%	12	3.00%
Sometimes intentionally	(3)	136	34.00%	69	17.25%
Sometimes very Intent	(4)	144	36.00%	207	51.75%
Very Intent	(5)	92	23.00%	106	26.50%

Table 7. Demographic Characteristics

Demographic Characteristic		Jaklingko		Trainline	
		Number	Percentage	Number	Percentage
Gender	Male	184	46.00%	223	55.75%
	Female	216	54.00%	174	43.50%
	Prefer not to say	-	0.00%	3	0.75%
Age	18-25 Years old	148	37.00%	113	28.25%
	26-35 Years old	175	43.75%	177	44.25%
	36-45 Years old	59	14.75%	77	19.25%
	More than 45 Years old	18	4.50%	33	8.25%
Occupation	Civil Servant	18	4.50%	17	4.25%
	Private Employee	216	54.00%	227	56.75%
	Student	67	16.75%	102	25.50%
	Entrepreneurs	99	24.75%	38	9.50%
	Other	-	0.00%	16	4.00%
Operating system	Android	320	80.00%	182	45.50%
	Apple iOS	80	20.00%	218	54.50%

Validity & Reliability Testing

The validity test was carried out by examining the correlation value between the value of each question and the total number of question items. The correlation coefficient utilized was the Pearson Product Moment, where the r_{table} value derived with degrees of freedom for 30 samples is 28 (df=n - 2), and a confidence level of 95% is 0.374. Microsoft Excel's correlation coefficient formula was used to measure the test's validity. The item was declared valid if $r_{count} > r_{table}$. According to the test results all instruments were valid for use.

Using Cronbach's Alpha method, 30 responses from the pilot survey were evaluated for reliability. 0.7 is an acceptable alpha reliability value. It indicates that an instrument is considered reliable if the construct variable's coefficient value has a Cronbach's Alpha value greater than 0.70. The SPSS application was used for the reliability test, which yielded Cronbach's Alpha values of 0.961 for the Jaklingko questionnaire and 0.909 for the Trainline questionnaire.

Jaklingko Application Technology Acceptance Model

Convergent validity, discriminant validity & composite reliability were valid. On the other side, all outer loading indicators were more than 0.7 and declared valid, except PR3 indicator (itinerary leakage risk when using the application) had an outer loading of 0.646; because the outer loading value was less than 0.7, it was declared invalid. Therefore, the outer model needs to be modified by removing the PR3 indicator to make the model feasible. Table 8 illustrates evaluation of Jaklingko TAM measurement model while Table 9 illustrates re-evaluation after PR3 removed.

Table 8. Evaluation of Jaklingko Outer TAM Measurement Models

Parameter	Threshold Value	Min Value	Max Value	Validity
Outer Model				
Discriminant validity	$\sqrt{AVE}$ > highest correlation	0.802	0.930	Valid
Convergent validity	AVE > 0.5	0.643	0.865	Valid
Composite reliability	> 0.6	0.839	0.950	Valid
Outer loading	> 0.7	0.646	0.994	Invalid

Table 9. Re-evaluation of Jaklingko Outer TAM Measurement Models

Parameter	Threshold Value	Min Value	Max Value	Validity
Outer Model				
Discriminant validity	$\sqrt{AVE}$ > highest correlation	0.802	0.930	Valid
Convergent validity	AVE > 0.5	0.643	0.865	Valid
Composite reliability	> 0.6	0.839	0.950	Valid
Outer loading	> 0.7	0.714	0.996	Valid

Inner model parameters show that all parameters were valid. Table 10 illustrates inner evaluation of Jaklingko TAM.

Table 10. Evaluation of Jaklingko Inner TAM Measurement Models

Parameter	Threshold Value	Min Value	Max Value	Validity
Coefficient of determination (R^2)	0 – 1	0.675	0.720	Valid
Cross-validated redundancy (Q^2)	$Q^2 > 0$	0.615	0.666	Valid
Path coefficients	-1 to 1	-0.053	0.611	Valid
Effect size (f^2)	$f^2 \geq 0$	0.0	0.618	Valid
Collinearity	VIF ≤ 5	1.058	3.637	Valid

The initial model was prepared by reviewing the literature and establishing several hypotheses about the relationship and influence between the variables used. Analysis with the bootstrapping procedure produces a relationship and influence between variables based on the path coefficient value and the significance level with a 95% confidence level. Figure 4 shows the path coefficient and significance values based on statistical parameters.

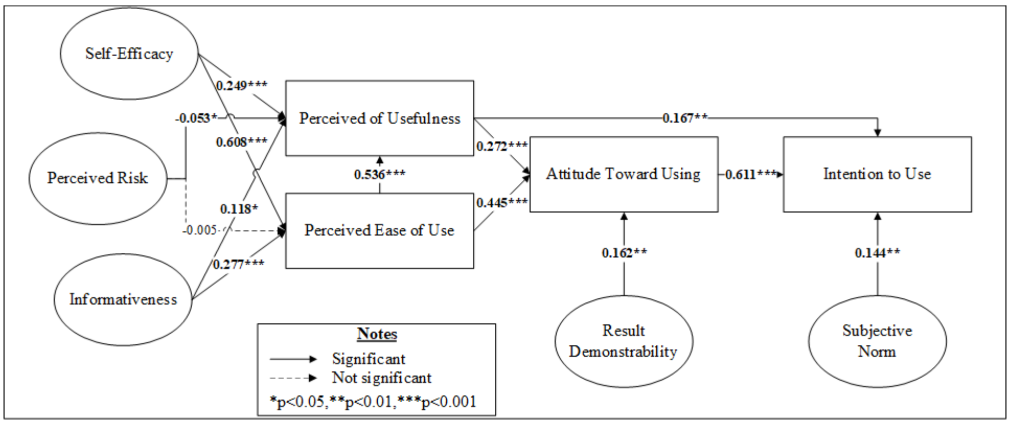

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Figure 4. Relationship Between Variables in Jaklingko TAM Model

The evaluation results show that the model meets the eligibility as a model, both a measurement model and a structural model based on the test parameters. The P values of all path coefficients meet the significance level of 95% (0.05) except for the perceived of risk, which affect the perceived ease of use. Furthermore, the path perceived risk to perceived ease of use is not significant. The list of weights from the SEM analysis results is shown in Table 11.

Table 11. Jaklingko Coefficients and Indicator Weights From SEM

Exogenous variable	Endogenous variable			
	Attitude towards	Intention to use	Perceived of usefulness	Perceived ease of use
Attitude towards		0.611		
Perceived of usefulness	0.272	0.167		
Perceived ease of use	0.445		0.536	
Self-efficacy			0.249	0.608
Perceived risk			-0.053	
Informativeness			0.118	0.277
Subjective norms		0.144		
Result demonstrability	0.162			

Trainline Application Technology Acceptance Model

Outer loading, convergent validity, discriminant validity & composite reliability were valid. Table 12 illustrates evaluation of Jaklingko TAM measurement model. Furthermore, inner model parameters show that all parameters were also valid. Table 13 illustrates inner evaluation of Trainline TAM.

Table 12. Evaluation of Trainline Outer TAM Measurement Models

Parameter	Threshold Value	Min Value	Max Value	Validity
Outer Model				
Discriminant validity	√AVE > highest correlation	0.786	0.930	Valid
Convergent validity	AVE > 0.5	0.618	0.864	Valid
Composite reliability	> 0.6	0.835	0.950	Valid
Outer loading	> 0.7	0.771	0.935	Valid

Table 13. Evaluation of Trainline Inner TAM Measurement Models

Parameter	Threshold Value	Min Value	Max Value	Validity
Coefficient of determination (R^2)	0 – 1	0.514	0.638	Valid
Cross-validated redundancy (Q^2)	$Q^2 > 0$	0.421	0.503	Valid
Path coefficients	-1 to 1	-0.072	0.566	Valid
Effect size (f^2)	$f^2 \geq 0$	0.005	0.417	Valid
Collinearity	VIF ≤ 5	1.113	2.599	Valid

The initial model was prepared by reviewing the literature and establishing several hypotheses about the relationship and influence between the variables used. Analysis with the bootstrapping procedure produces a relationship and influence between variables based on the path coefficient value and the significance level with a 95% confidence level. Figure 5 shows the path coefficient and significance values based on statistical parameters.

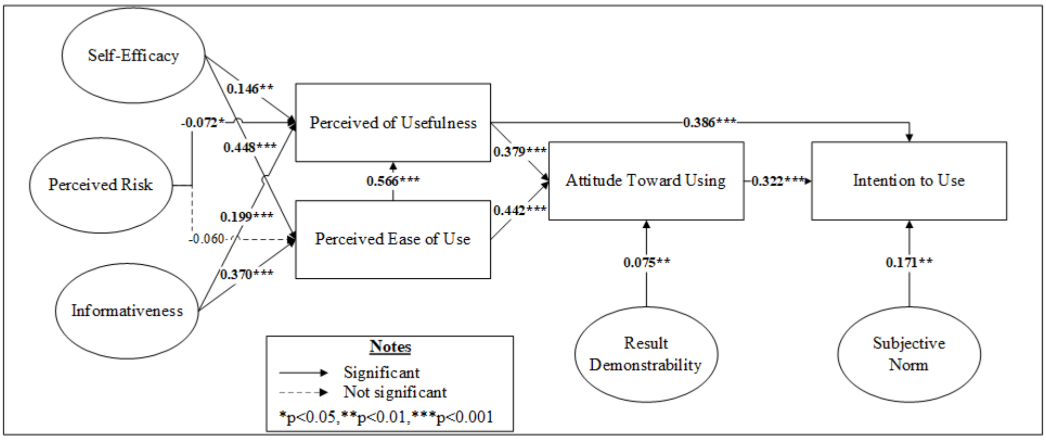

Figure 5. Relationship Between Variables in Trainline TAM Model

Structural equation modelling (SEM) generates weights for each indicator on latent variables and estimates path coefficient values between latent variables. Table 14 displays the weights obtained from the analysis using Structural Equation Modelling (SEM).

Table 14. Trainline Coefficients and Indicator Weights From SEM

Exogenous variable	**Endogenous variable**			
	Attitude towards	**Intention to use**	**Perceived of usefulness**	**Perceived ease of use**
Attitude towards		0.322		
Perceived of usefulness	0.379	0.386		
Perceived ease of use	0.442		0.566	
Self-efficacy			0.146	0.448
Perceived risk			-0.072	
Informativeness			0.119	0.370
Subjective norms		0.171		
Result demonstrability	0.075			

Discussion

As indicated by the majority of Jaklingko users (36%) stated sometimes very intent to use. While the majority of respondents (52%) stated sometimes very intent to use. On the other hand, 2% Jaklingko & 1% Trainline respondent users did not intend to use the application. The results of the Jaklingko and Trainline acceptance model show an identical model. Exogenous constructs can substantially impact endogenous constructs because both models' value of determination (R^2) is more significant than 0.5, indicating that the exogenous construct is more influential on the endogenous construct. It can be concluded that increasing the exogenous construct could increase the endogenous construct.

The inner models of the two models strengthen previous research conducted by Marangunić and Granić (2014), which stated that the core composition of the technology acceptance model is composed of constructs perceived ease of use, perceived usefulness, intention to use, and attitude towards variable. On the other hand, the inner models of the two models also show different results from the research conducted regarding the effect of perceived risk on perceived ease of use. According to (Li, Y.-H. and Huang, 2009), perceived risk can directly affect perceived ease of use. However, this relationship was found to be insignificant in this study. The reason that can explain why perceived risk does not significantly affect perceived ease of use is that the biggest concern of mobile telecommunication users is data loss and failure in delivery or transactions. Hence, mobile technology users are more concerned about the risks to the usefulness function rather than the functional function's ease of use (Aloudat et al., 2014; Bahli and Benslimane, 2004).

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To increase intention to use an application, focus on boosting self-efficacy through travel behaviour interventions and incentives (Skarin et al., 2019). A comprehensive information campaign about the application's features can increase awareness among (Išoraitė et al., 2023). Promoting the application through targeted social media advertisements with influencers can also boost demonstrability and subjective standards (Summers et al., 2016). Mitigating perceived risk can be achieved by requiring developers to display user evaluations and receive feedback on their websites (Chopdar et al., 2018). Ensuring security standards, such as PCI-DSS, can also help protect digital transactions and user privacy. These strategies aim to increase self-efficacy, informativeness, and perceived risk in the application's use (Barney, 2023).

CONCLUSION

Key determinants that impact technology acceptance on QR Code-based mobile ticketing applications utilised in urban and intercity train systems are identical. The determinants are self-efficacy, informativeness, subjective norms, result demonstrability & perceived risk respectively. Jaklingko and Trainline technology acceptability factors are identical, however indicator of itinerary leakage risk when utilising the application did not influence on Jaklingko application acceptance while it influence on Trainline application acceptance. Policy to increase the technology acceptance on integrated QR code-based ticketing are implement travel behaviour interventions, information campaign regarding the application's functionalities and advantages, promote the benefit of using the application, instructing operators to conduct promotions via targeted advertisement and instructing application developers to comply with network security standards.

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