



Examining Intentions to Use Mobile Check-in for Airlines Services: a View from East Malaysia Consumers

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Abstract. The purpose of this study was to determine the factors that influence both attitudes and behavioural intentions toward airline services via mobile check-in in East Malaysia. The intention of consumers to use mobile check-in for airline services was examined, as well as the role of attitude as a moderator between perceived usefulness, perceived ease of use, perceived trust, and perceived enjoyment. The study sampled 256 respondents using the snowball method and analysed them using PLS-SEM 3.0. Except for perceived ease of use, three of the four independent variables were found to have a positive effect on attitudes toward mobile check-in services. The perceived usefulness of mobile check-in had no effect on behavioural intention to use airline services via mobile check-in. Additionally, perceived ease of use was found to be insignificant when it came to attitudes and behavioural intentions toward using mobile check-in for airline services. Meanwhile, it has been demonstrated that attitude serves as an ideal mediator between perceived enjoyment, perceived trust, perceived usefulness, and behavioural intention. The current study has several managerial implications for the airline industry, particularly for self-service operations. Limitations include the inability to generalise the findings of this study to other industries or country settings.

Keywords: Mobile Check-in, Technology Acceptance Modal, Perceived Trust, Perceived Enjoyment

1 Introduction

Technological advancement caused a necessitates change in service delivery style and process, from traditional face-to-face service delivery to using self-service technologies such as mobile, kiosk machines, and online, to help service providers lower operating costs and reduce waiting lines from a consumer standpoint [1]. The same goes for the airline industry, also influenced by advanced technology's wave of self-service appeal, particularly in mobile check-in [2]. Nevertheless, the number of people using self-check is expected to rise as a result of the elimination of the traditional check-in method at low-cost carrier terminals (KLIA2). Lee [3] stated that Mobile Check-In (MCI) acceptances were not specifically addressed, and mobile check-in for airline services adoption is still in its infancy, particularly in East Malaysia. Airline services are considered the most convenient transportation mode in Sabah and Sarawak due to the uneven shape of the earth's surface in Sabah and Sarawak makes infrastructures such as highways and Mass Rapid Transit difficult to be implemented [3]. Despite the fact that Sabah and Sarawak are Malaysia's two largest states, there has been a lack of studies that specifically address the preferences of East Malaysians, specifically studies related to technology adoption for airline services.

Individuals can now check in their airline services online using various digital gadgets such as mobile phones, computers, and kiosk system machines. Self-check-in technologies are expected to improve check-in efficiency and reduce operational costs [4][5]. However, as reported by the media, mobile check-in services from AirAsia and Malaysia Airlines always encountered problems with their mobile applications [6]. Moreover, the mobile check-in option is rendered ineffective when more than one passenger travels at the same time [7]. Again, the preceding discussion did not focus exclusively on the East Malaysian market. To the extent of the researcher knowledge, prior studies only focused on examining mobile check-in services at the Kuala Lumpur International Airport 1 and 2 (KLIA1 & 2), there has been little research in East Malaysia's airports [4]. Clearly, there is a gap, and a study focused on these markets is required.

Nevertheless, airline check-in is critical for both airlines and airports to determine whether passengers intend to travel or not. Based on the evidence presented above, there are inconsistencies in the service delivery system and passengers' satisfaction, particularly for mobile check-in services for passengers in Malaysia, specifically East Malaysia. As a result, studying the factors influencing users' intentions to use mobile check-in services is critical for the use of modern technology in the airline industry.

This study will benefit stakeholders in Malaysia's service industry by providing pertinent user feedback on their expectations for the application of self-service technologies. This information is important for airline service providers and the government to develop an effective system for engaging with customers to maintain the quality and competitiveness of Malaysian airline services in the age of globalisation.

2 Literature Review

Prior to the actual behaviour, a person's intention is referred to behavioural intention (BI); the likelihood, pleasure, engagement, and consideration of accepting or rejecting a specific system [8]. Employment of Technology Acceptance Model (TAM) to underpin the present study, in concur with Theory of Planned Behaviour and Theory Reasoned Action, several important predictors have been identified and studied in predicting the intention to use mobile check in for airlines services in this study. These factors inclusive of perceived usefulness (PU), perceived ease of use (PEU), perceived trust (PT), perceived enjoyment (PE) and attitude (ATT) as the mediating variables.

2.1 Perceived Usefulness

PU refers to the degree to which a user believes that utilising a system will improve their job performance [8]. PU includes the user gaining the benefit or usefulness, such as being able to complete the task faster and more conveniently [9][10]. People believe that technology will enable and assist them to perform better on a task. Similarly, perceived usefulness is conceptualized as convenient, efficient, effective, and useable for the consumer to check-in for the airline service. Indeed, most of the past studies suggested that perceived usefulness positively impacts attitude and behavioural intention in mobile marketing [11][12]. However, there has been a limited focus on mobile

check-in for airline services particularly for the East Malaysia market regarding to the relationship between PU, ATT, and BI. Therefore, to close the gap aforementioned, the following hypotheses were developed:

- H1: PU has a positive impact on ATT to use MCI for airline services.
- H2: PU has a positive impact on BI to use MCI for airline services.

2.2 Perceived Ease of Use

PEU refers to a consumer's belief that using a system will save them time and effort [8][13]. PEU, according to Dahlberg, Mallat, and Öörni [14], includes ease to learn, control, understanding, use, clarity, and flexibility of use. According to the preceding discussion, the current study conceptualised PEU as being free of mental effort. The mobile check-in procedure is straightforward and simple to learn. In terms of relationship, PEU was found to be significantly related to attitude and actual use [15]. Previous research has confirmed the significant impact of PEU on ATT and BI (Alhasan et al., 2020; [16][15][5]. However, little empirical study has been conducted in mobile check-in for airline services except for Wong [1] to confirm the direct relationship between PEU, ATT, and BI. As a result, the current study was conducted to identify such a relationship as hypotheses below:

- H3: PEU has a positive impact toward ATT to use MCI for airline services.
- H4: PEU has a positive impact toward BI to use MCI for airline services.

2.3 Perceived Enjoyment

TAM's construct of PE was added by Van der Heijden [17] in a study on the use of websites to the original TAM. Perceived enjoyment is defined as the user experiencing something fun, pleasurable, or enjoyable while interacting with a particular system [18][19]. Pleasure or enjoyment was defined as the level of delight experienced by an individual in a preferred environment [20]. In addition to that, Holdack, Lurie-Stoyanov, and Fromme [21] accounted for a broad range of PE definitions including fun, felt good, exciting, enjoyable, and interesting. The current study adopts the conceptual definition of perceived enjoyment from Holdack et al. [21].

It was discovered that perceived enjoyment was significantly related to behavioural intention [20]. PE was also found to be significantly associated with attitude in a study of mobile social network game sustainable use intention [22]. However, in terms of the relationship between PE, ATT, and BI, there has been a limited focus on mobile check-in for airline services, particularly in the East Malaysia market. As a result, in order to bridge the aforementioned gap, the following hypotheses were developed:

- H5: PE has a positive impact toward BI to use MCI for airline services.
- H6: PE has a positive impact toward attitude to use MCI for airline services.

2.4 Perceived Trust

PT refers to a party's ability to earn the confidence or reliance of exchange partners, including the integrity and dependability of one party toward another [23]; trustworthy, reliable, and comfortable [24]. Singh and Sinha [25] define PT as an emotional state that compels one to trust another based on the other's acceptable behaviour. The concept of PT in this study is defined as the user trust the boarding pass showed in the system, comfortable with the system, and believe their information is protected [24]. PT was found to positively influence attitudes toward online shopping [26] and attitudes toward e-hailing services [27]. However, there is a dearth of empirical evidence establishing a relationship between PT, ATT, and BI in the field of mobile check-in for airline services. Hence, in order to bridge the aforementioned gap, the following hypotheses were developed:

H7: PT has a positive impact toward BI to use MCI for airline services.

H8: PT has a positive impact toward ATT to use MCI for airline services.

2.5 Attitude

Attitude is defined in the Theory of Reasoned Action (TRA) as "an individual's assessment of a system that has been used in the user's job. The positive or negative value that an individual associates with the fact of producing a behaviour is referred to as the individual's attitude toward the behaviour. [28]. Similarly, Tee et al. [5] stated that when a consumer has a strong favourable ATT toward technology, it will undoubtedly be adopted. The concept of attitude in this study was adapted from Nagaraj's [29] definition of attitude as the consumer's feeling of whether something is good or bad, favourable or unfavourable, wise or foolish, positive or negative, and beneficial or detrimental. Again, little attention was focus on mobile check in context empirically. As a result, to fill the gap, mobile check-in for airline services is assumed to have a similar relationship to the following hypothesis:

H9: ATT has a positive impact toward BI to use MCI for airline services.

Numerous studies on consumer behavior found that attitude (ATT) is a main predictor on consumer behavior [28][8][13]. TAM model deemed that the user' adoption behavior is determined by their attitudes, and attitudes are jointly affected by perceived usefulness and perceived ease to use [8][30]. Numerous studies applying TAM only tested the direct relationship between belief and attitude or behavioral intention, and as expected, belief variables were found significantly predict attitude. However, there was limited studies included attitude as a mediator. Indeed, Davis's [8] original work on TAM was not included attitude, and he did admit that people intention to use a technology can be influence by their attitude toward the technology. Questions remain about the mediating role of attitude toward the adoption of digital wallet in the TAM. Thus, the present study includes attitude as a mediator to further testify the direct and indirect relationships between the four independent variables (PU, PEOU, PE and TRU) and

the dependent variable (adoption of digital wallet) via the mediator (ATT). As a result, mobile check-in for airline services is assumed to have a similar relationship to the following hypothesis:

H10: ATT mediates between PEU, PU, PE, PI and BI to use MCI for airlines services.

Figure 1 presents the research framework of this study inclusive of perceived usefulness, perceived ease of use, perceived enjoyment and perceived trust as independent variables, attitude as mediators and intention to use mobile check in as the dependent variable.

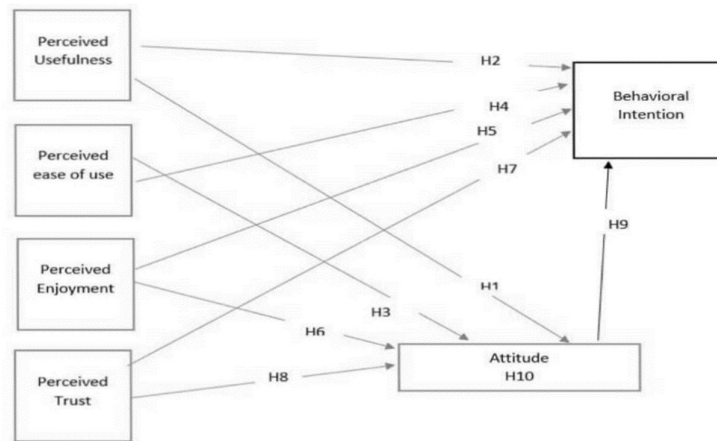


Fig. 1. Research Model

3 Research Method

The current study obtained 256 samples, all of which met the sample 129 minimum requirement. The sample are identified using snowball sampling method and self-administered questionnaires were adapted to gather the primary data. Snowball sampling is best method to reach unknown or rare populations and enables to identify respondent who meets the criteria for inclusion in this study [31]. In fact, there is a lack of statistical record about the respondents who have experienced the mobile check-in for airlines industry.

The questionnaire is divided into seven sections. The section A is about usage background that help the researcher to pre-screen the valid respondent and followed by section B (PU), section C (PEU), section D (PT), section E (PE), section F (BI), section G (ATT), and section G (demographic profile). For each variable, such as PEU, PU, ATT, and BI, five measurement items were adapted from [8]. In term PE and PT, there were measurement items adapted from Holdack et al. [21] and Ghazizadeh et al. [24].

The collected data were analyzed using Smart-PLS 3.2's Partial Least Squares-Structural Equation Modelling (PLS-SEM). This technique was chosen to promote analytical rigour and more consistent estimations [32][33]. Additionally, the model specification's characteristics, simplicity, and absence of strict distributional assumptions all contribute to the choice [32]. The analysis included evaluating the measurement model, the structural model, and the mediation model, as well as justifying the study's hypotheses.

4 Results

The final sample consists of 256 respondents. 121 out of 256 respondents (47.3%) are male, while 135 (52.7%) are female. 36% of total respondents are under the age of 20, followed by those age 21 to 30 years (176 respondents or 68.8%), those age 31 to 40 years (34 or 13.3%), and those age 41-50 years (8 or 3.1%). The remaining 2%, or 0.8% are over the age of 50. The respondents' educational attainment was deemed to be high; 178 (69.5%) respondents had a bachelor's degree, 52 (20.3%) respondents held a STPM or a college diploma, while 13 (5.1%) respondents held a master's degree. The remaining 12 (4.7%) respondents and 1 (0.4%) respondent were SPM and below, and PhD degree holders, respectively. Also, 71.7% of respondents had a monthly income of between RM3001 and RM4000, follows by respondents with incomes ranging from RM1001 to RM2000, RM2001 to RM3000, RM0 to RM1000, and RM5000 and above. For the ethnicity, majority of the respondents (113 respondents or 44.1%) are Chinese, followed by Bumiputera (66 respondents or 25.7%), Malay (56 respondents or 21.9%), and India (21 respondents or 8.2%).

The PLS-SEM technique was used to predict BI to use MCI for airline services and the role of ATT as a mediator. Several reliability and validity analyses were conducted to validate the measurement model. Convergent validity was determined in accordance with the recommendations of Hair et al., specifically by examining item loadings, average variance extracted (AVE), and composite reliability (CR). According to scholars, the loadings value must be greater than 0.708, the AVE must be greater than 0.50, and the CR must be greater than 0.70. As shown in Table 1, all loadings are range from 0.716 to 0.832, the AVE exceeded 0.50 and the CR exceeded 0.70, implying that convergent validity was achieved.

Table 1. Result of convergent validity

	Items	Loadings	AVE	CR
Attitude	6	0.716 – 0.785	0.529	0.871
Behavioural Intention	5	0.750 – 0.817	0.623	0.892
Perceived Enjoyment	5	0.750 – 0.813	0.624	0.892
Perceived Trust	5	0.766 – 0.832	0.581	0.873
Perceived Usefulness	5	0.749 – 0.816	0.612	0.887
Perceived Ease of Use	5	0.698 – 0.769	0.528	0.847

Notes: CR = Composite reliability; AVE = Average variance extracted

In addition, Discriminant validity analysis was used to quantify distinct concepts by examining the Heterotrait-Monotrait (HTMT) criterion measures of potentially overlapping concepts. Table 2 shows that all HTMT Criterion values were below 0.85 and 0.90 based on Henseler et al. [35]. Therefore, discriminant validity was established in this study.

Table 2. Result of discriminant validity

	ATT	BI	PE	PT	PU	PEU
Attitude						
Behavioural Intention	0.787					
Perceived Enjoyment	0.581	0.589				
Perceived Trust	0.603	0.657	0.662			
Perceived Usefulness	0.657	0.562	0.558	0.594		
Perceived Ease of Use	0.595	0.523	0.697	0.709	0.717	

Notes: ATT =Attitude, BI=Behavioural Intention, PE=Perceived Enjoyment, PU=Perceived Usefulness, PEU=Perceived ease of use

As for the structural model, Table 3 shows the results of the bootstrapping on the significance of the path estimates of the hypothesised relationships. The relative importance of the exogenous constructs in predicting ATT to use MCI for airline services revealed that PU ($\beta_1=0.315$, t -value=5.019, $p<0.01$) was the most important predictor, followed by PT ($\beta_8=0.204$, t -value=2.730, $p<0.01$), and PE ($\beta_6=0.187$, t -value=2.522, $p<0.01$), which supported H1, H6 and H8. However, PEU ($\beta_3=0.082$, t -value=1.223, $p>0.01$), which H3 is rejected. On the other hand, the relative importance of the exogenous constructs in predicting BI to use mobile check-in for airline services indicates that, PT ($\beta_7=0.233$, t -value=3.506, $p<0.01$) and PE ($\beta_5=0.141$, t -value=2.210, $p<0.05$) were found positive effect. Hence, H7 and H5 are supported. However, H2 ($\beta_7=0.073$, t -value=1.120, $p>0.01$) and H4 ($\beta_4=-0.042$, t -value=0.613, $p>0.01$) were found insignificant relationship toward BI to use MCI for airline services. The results also indicate a significant effect between ATT and BI to use MCI for airline services ($\beta_9=0.452$, t -value=6.846, $p<0.01$). Thus, H9 in this study is supported.

Table 3. Result of Hypotheses Testing

Relationship	Std Beta	Std Error	t-value	p-value	Decision
H1: PU -> Attitude	0.315	0.063	5.019	0.000**	Supported
H2: PU -> BI	0.073	0.065	1.120	0.131	Rejected
H3: PEU -> Attitude	0.082	0.067	1.223	0.111	Rejected
H4: PEU -> BI	-0.042	0.068	0.613	0.270	Rejected
H5: PE -> BI	0.141	0.064	2.210	0.014*	Supported
H6: PE -> Attitude	0.187	0.074	2.522	0.006*	Supported

H7: PT -> BI	0.233	0.066	3.506	0.000**	Supported
H8: PT -> Attitude	0.204	0.075	2.730	0.003*	Supported
H9: Attitude -> BI	0.452	0.066	6.846	0.000**	Supported

Notes: ***p*-value < 0.001, * *p*-value < 0.05, ns = not significant

Table 4 shows that the mediation analysis confirms attitude as the significant mediator in the relationship between PE, PT, and PU toward BI to use MCI for airline services. The bootstrapping analysis showed that the indirect effect of $\beta=0.084$, $\beta=0.092$, $\beta=0.142$ significant with a *t*-value of 2.737, 2.594, and 3.869. The indirect effect of 95 percent Boot CL: [LL=0.037, UL=0.152], [LL=0.038, UL=0.154], and [LL=0.091, UL=0.214], does not straddle a 0 in between, indicating the mediation effect. Hence, H10a, H10b, and H10c are supported. No mediation effect was found between PEU and BI to use MCI for airline services where the indirect effect of $\beta=0.037$, and insignificant *t* value of 1.183. The indirect effect of 95 percent Boot CL: [LL=-0.013, UL=0.089], straddle a 0 in between, indicating the mediation effect. Hence, H10d was rejected.

Table 4. Result of Mediation Analysis

Hypothesis	Std Beta	Std Error	<i>t</i> -value	P Value	5%	95%	Decision
H10a: PE>ATT>BI	0.084	0.035	2.437	0.007	0.037	0.152	Supported
H10b: PT>ATT>BI	0.092	0.035	2.594	0.005	0.038	0.154	Supported
H10c: PU>ATT>BI	0.142	0.037	3.869	0.000	0.091	0.214	Supported
H10d: PEU>ATT>BI	0.037	0.031	1.183	0.118	0.013	0.089	Rejected

Notes: *ATT* =Attitude, *BI*=Behavioural Intention, *PE*=Perceived Enjoyment, *PU*=Perceived Usefulness, *PEU*=Perceived ease of use

5 Discussion and Conclusion

The purpose of this study was to ascertain consumers' BI when employing MCI for airline services. The findings indicated that only three (i.e., PT, PE and ATT) out of the five predictors are significantly related to behavioural intention. Consumer attitude toward the mobile check-in system appears to be the most significant ($\beta=0.452$) predictor amongst the five constructs. This indicates that if a person has a strong favourable attitude toward a new system or technology, it will undoubtedly be adopted. The important role of attitude in the adoption of new technology has been widely discussed and recognised in most of the past theories such as TAM [8], TRA [28] and the Unified Theory of Acceptance and Use of Technology (UTAUT) [13]. Following this, perceived trust and perceived enjoyment were found significantly influenced attitude and behavioural intention. This means that the MCI users are very particular on reliability, safe (protection of their information), and comfortable and enjoyment to be used for MCI service. This result is analogous to substantiate studies on e-ticketing [5], mobile wallet [12], and e-hailing services [27].

It appears that PU and PEU are not significant predictors toward the BI to use the MCI for airline services. The results are contradicted with the previous studies claimed

the positive relationship between PU and PEU on the BI toward new system [16][15][5]. Perhaps, most of the users in Malaysia still think that traditional counter-in is more useful and easier for them to complete the check-in process compared to using mobile check-in. Particularly, human interaction is still an important element in service organisation like airline industry [36]. Although PU has no significant direct impact on BI, it does affects user's BI indirectly via ATT. The result indicated that PU was fully mediated by attitude in which ATT absorb most of the PU impact on BI. Moreover, this finding suggests that most of users in Malaysia, especially the users in East Malaysia found that the new mobile check-in for airline services is still complication and troublesome. As reported, mobile check-in services from AirAsia and Malaysia Airlines always encountered problems with their mobile applications [6][7]. These should be the main reasons that explained why people perception on the application of MCI was complicated and not easy to use, lead to the insignificant effect of toward BI to use the MCI services.

The study's findings have significant implications for theoretical and managerial practice in MCI for airlines service area. Theoretically, the current study adds PE and PT to the (TAM) in the context of mobile check-in for airline services, providing empirical support for the model. Inconsistency between PEU and BI was confirmed in this study, as was the absence of a relationship between PEU and ATT. This finding closes a gap in the preview study. Additionally, the research contributes significantly to the body of knowledge by addressing a gap in MCI services. As previously stated, there has been little research on MCI for airline services in East Malaysia.

Practically, this study provides compelling evidence that may assist marketing managers and airlines service providers in better understanding the BI to use MCI for airlines service. Due to the changing technological environment in which services operate, the transformation of face-to-face service toward self-service technology, particularly in the mobile industry, has occurred [25]. Thus, airlines service providers should develop a MCI system that benefits the passenger, is convenient for the passenger, is preferred by the passenger, and is pleasant and desirable for the airline passenger. While developing an ATT toward using MCI for airlines does not guarantee BI to use MCI for airlines, it does play a critical role in developing BI to use mobile check-in for airlines. As a result, service providers constantly strive to ensure that their customers have a favourable ATT toward them [27].

Future research could look into the user experience of other smartphones from different manufacturers for comparison purposes. The differences in expected experience between students and non-students, as well as between users of different ages, are worth investigating in order to tailor specific designs for specific groups. Despite its limitations, this study has provided some insights to smartphone industry leaders on designing and marketing their products to maximise user satisfaction.

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