

ADOPTION OF INTERNET BANKING IN MALAYSIA: AN EMPIRICAL ANALYSIS USING THE TECHNOLOGY ACCEPTANCE MODEL

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Abstract: *This study investigates the relationships between perceived usefulness, perceived ease of use, attitude, and intention to use internet banking within the framework of the Technology Acceptance Model (TAM). Data were collected from respondents in a public sector in Putrajaya, with 43 valid questionnaires returned. Correlation analysis revealed that all hypothesized relationships were supported. Perceived usefulness showed a stronger relationship with attitude ($r = 0.513, p < 0.01$) than with intention ($r = 0.339, p < 0.05$), while perceived ease of use also had a moderate relationship with attitude ($r = 0.499, p < 0.01$) and a weaker yet significant relationship with intention ($r = 0.328, p < 0.05$). These findings confirm the robustness of TAM in predicting internet banking adoption and highlight the importance of improving system usability and functional benefits to enhance user attitudes and encourage adoption.*

Keywords: *Technology Acceptance Model, Perceived Usefulness, Perceived Ease of Use, Attitude, Intention to Use Internet Banking*

Introduction

In today's rapidly digitizing financial landscape, internet banking is increasingly central to how consumers and financial institutions interact. The proliferation of broadband, mobile devices, and secure online infrastructures have enabled banks to offer services that transcend the limitations of physical branches. As customers today expect anytime, anywhere access to banking, institutions are investing in internet banking to reduce operational costs, improve customer experience, and expand market reach (Ghani, Ali & Omonov, 2022).

Understanding what drives users to adopt internet banking (or e-banking) has become essential. The Technology Acceptance Model (TAM), with its core constructs of perceived usefulness (PU) and perceived ease of use (PEOU), remains one of the most applied theoretical frameworks in this domain. Studies show that PU and reliability of banking systems significantly affect perceived digital banking effectiveness (Ghani, Ali & Omonov, 2022). Additional research indicates that trust, security/privacy perceptions, and perceived risk are important extensions to TAM in the context of e-banking. Factors influencing customers' intention to adopt e-banking, a TAM and cybercrime perspective finds that security and privacy moderate how PU and PEOU influence adoption intentions.

Even with these advances, certain conditions such as cyber-risk, digital literacy, demographic factors may inhibit adoption. In Malaysia, it shows that perceived risk negatively impacts both perceived usefulness and behavioural intention to adopt new banking technologies. Therefore, to fully understand the perspective of TAM in internet banking acceptance, this study integrates PU, PEOU, trust/security, perceived risk, and contextual factors in the Malaysian setting. This will help in identifying both enablers and impediments in technology adoption and offer implications for policy and banking practice.

Problem Statement

Although internet banking has been available in Malaysia for more than two decades, its acceptance among certain segments of the population remains lower than expected. Recent studies show that despite the convenience, cost-effectiveness, and innovations financial institutions deliver, many Malaysian consumers still hesitate to fully embrace internet banking due to concerns involving trust, security, perceived risk, complexity, and lack of awareness (Selvanathan, Tan, & Supramaniam, 2022; Yuen & Goh, 2023). This study identifies trust and self-efficacy as significant influences, while security and convenience were not always supported uniformly across respondent groups (Selvanathan, Tan, & Supramaniam, 2022). It was found that perceived usefulness and banking system reliability significantly shape digital banking effectiveness, but pandemic effects were less influential in that context.

Moreover, younger Malaysians, though more digitally literate, report concerns about perceived complexity, internet accessibility, and risk, which reduce their intention to adopt online banking services (Nasir, Rahim, & Aziz, 2023). There is a gap in understanding how these psychological, behavioural, and contextual factors interact in influencing technology acceptance specifically within internet banking, beyond the base constructs of TAM (perceived usefulness, perceived ease of use). Trust, perceived risk, external control, awareness, and system reliability may mediate or moderate these relationships.

Therefore, this study seeks to fill these gaps by investigating the key determinants including to perceived usefulness, ease of use, trust/security, perceived risk, awareness, and demographic

factors that influence Malaysians' behavioural intention and actual use of internet banking. The goal is to propose an extended TAM model that reflects the current technological, social, and regulatory environment in Malaysia, offering banks and policymakers actionable insights to increase internet banking acceptance.

Literature Review

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis (1989), remains one of the most widely applied theories in technology adoption research. It proposes that user acceptance is largely shaped by two cognitive beliefs: perceived usefulness (PU) and perceived ease of use (PEU). Over the years, TAM has been extended to examine the adoption of innovations across industries, including internet banking, digital wallets, and mobile payment services. Recent studies highlight that TAM continues to provide robust explanatory power for user behavior, though scholars argue for extensions that incorporate trust, security, and perceived risk (Rahi, Mansour, & Alnaser, 2022; Khan, Ejaz, & Fozia, 2023).

TAM has also been criticized for underemphasizing contextual and behavioral variables such as user satisfaction, performance outcomes, and cultural influences. As noted by Yuen & Goh (2023), while PU and PEU remain central, in the Malaysian banking context additional determinants like trust, reliability, and digital literacy significantly enhance predictive accuracy.

Perceived Usefulness (PU)

PU refers to the extent to which an individual believes using a system enhances performance or efficiency (Davis, 1989). In the internet banking context, PU often reflects time savings, convenience in transactions, and access to real-time financial services. Empirical research consistently finds PU as a strong determinant of behavioral intention. Ghani, Ali, & Omonov (2022) demonstrated that PU significantly improves perceptions of digital banking effectiveness in Malaysia, reinforcing its centrality in adoption.

More recently, Nasir, Rahim, & Aziz (2023) found that young Malaysians perceive online banking as useful primarily for its convenience and efficiency in payments, though this positive effect can be weakened by perceived risks. Similarly, Khan et al. (2023) argued that while PU predicts adoption intention, it is moderated by security concerns, suggesting that usefulness alone may not overcome trust deficits.

Perceived Ease of Use (PEU)

PEU refers to the degree to which a system is perceived as effortless to use. Studies indicate that if customers perceive internet banking as complex, their adoption likelihood diminishes. In a Malaysian study, Zulkiffli, Rosli, & Othman (2022) found PEU to be a significant predictor of adoption for cardless banking systems, highlighting that simplicity in design and intuitive navigation encourage greater uptake.

Furthermore, PEU has indirect effects through shaping PU and attitudes. Yuen & Goh (2023) observed that when systems are perceived as easy to use, customers are more likely to view them as useful, thus amplifying the overall adoption process. This suggests that banks should

prioritize user-friendly interfaces and digital literacy initiatives to strengthen customer adoption.

Attitude

Attitude toward using internet banking reflects an individual's positive or negative evaluation of the technology. TAM posits that PU and PEU influence attitudes, which in turn shape behavioral intention. Recent findings support this link: Selvanathan, Tan, & Supramaniam (2022) reported that in Malaysia, PU strongly shapes favorable attitudes, while PEU has an indirect effect through enhancing PU.

Attitudes are also shaped by contextual factors such as trust, security, and risk perceptions. For instance, Yuen & Goh (2023) emphasized that favorable attitudes are more likely when customers perceive robust security mechanisms, thereby reducing anxiety and fostering confidence in the banking system.

Intention

Behavioral intention, as defined in TAM, is the individual's plan or willingness to use a technology. Intention is the most direct predictor of actual system usage. Multiple studies confirm that PU and PEU both positively influence intention to use internet banking (Nasir et al., 2023; Khan et al., 2023).

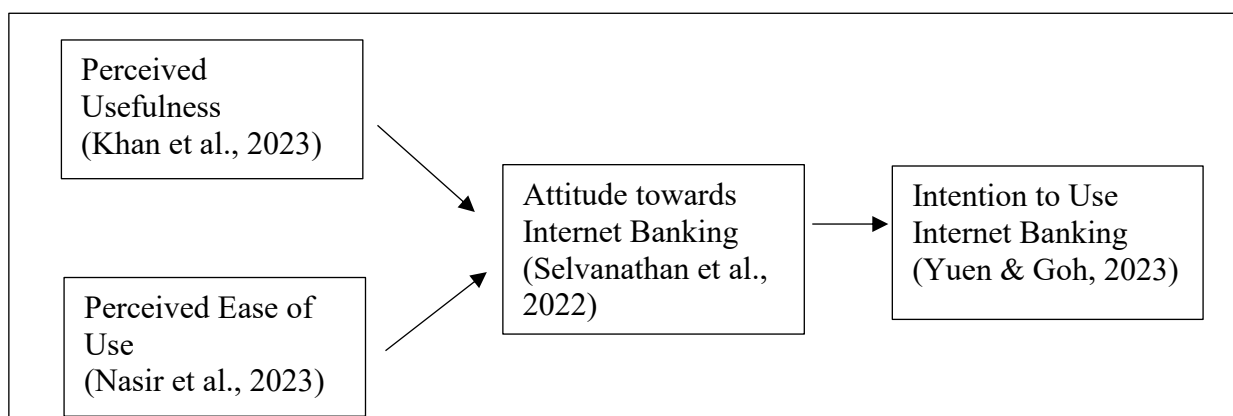
However, extensions of TAM suggest that intention is also moderated by external constructs such as trust, risk, and user innovativeness. Zulkiffli et al. (2022) found that perceived risk reduced intention despite positive usefulness perceptions. Likewise, Ghani et al. (2022) reported that intention can be reinforced by system reliability, indicating that operational excellence is just as important as perceptions of usefulness or ease of use.

Based on previous research the following hypothesis can be made:

- H₁: There is a relationship between perceived usefulness and intention to use internet banking.*
H₂: There is a relationship between perceived usefulness and attitude towards internet banking.
H₃: There is a relationship between perceived ease of use and intention to use internet banking.
H₄: There is a relationship between perceived ease of use and attitude towards internet banking.

Conceptual Framework

The present study is underpinned by a conceptual framework, which is visually depicted by the following framework:



Methodology

This paper intended to assess the correlation between the dependent and independent variables in this quantitative study. Data was gathered via a survey questionnaire to employees in the public sector in Putrajaya, Malaysia. The Statistical Package for Social Sciences 31.0 versions was implemented for data analysis, including Pearson Correlation was deployed to assess the hypotheses.

There are 43 sample size in a specific public sector used by researchers to generalize the results of the study. Sample sizes that are more than 30 and below 500 are acceptable for most of the researchers. Where the samples are divided into partition, a base example size of 30 for every classification is fundamental Uma Sekaran (2003). It includes employees from 4 departments by using stratified sampling, the process of selecting a sample that represents different groups or levels of a population (Salkind, 2018).

Findings

Respondents

The results show a higher participation among females (67.4%) compared to males (32.6%), which reflects the actual workforce composition where females outnumber males. In terms of age, the majority of respondents were 30 years old and above (74.4%), indicating that most staff are in the mature working group. The next largest group was 26–30 years old (16.3%), while the youngest group, 21–25 years old, contributed only 9.3%. For educational qualifications, most respondents held a Bachelor's degree (39.5%), followed by SPM (18.6%) and Diploma (18.6%). Smaller groups included STPM (14.0%), Master's degree (7.0%), and STAM (2.3%). With regard to marital status, a majority were married (69.8%), while only 30.2% were single. This suggests that most staff balance both family and work responsibilities. Looking at length of service, most respondents had substantial experience. The largest group had worked 11–15 years (34.9%), followed by 6–10 years (27.9%), and 1–5 years (23.3%). Only 2.3% had less than one year of service due to recent SPA intake, while 16–20 years (7.0%) and over 20 years (4.7%) represented smaller portions.

Table 1: Demographic Profile of Respondents (n = 43)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	14	32.6
	Female	29	67.4
Age Group	21–25 years	4	9.3
	26–30 years	7	16.3
	31 years and above	32	74.4
Education Level	SPM	8	18.6
	STAM	1	2.3
	STPM	6	14.0
	Diploma	8	18.6
	Bachelor's Degree	17	39.5
	Master's Degree	3	7.0

Demographic Variable	Category	Frequency (n)	Percentage (%)
Marital Status	Single	13	30.2
	Married	30	69.8
Length of Service	< 1 year	1	2.3
	1–5 years	10	23.3
	6–10 years	12	27.9
	11–15 years	15	34.9
	16–20 years	3	7.0
	> 20 years	2	4.7

Correlation Analysis

The findings indicate that perceived usefulness has a positive and moderate relationship with attitude towards internet banking, with an r value of 0.513. The correlation is statistically significant at $p < 0.01$, suggesting that when users perceive internet banking as useful, their attitude towards adopting the service improves in a meaningful way.

The results show that perceived usefulness has a positive but weak relationship with intention to use internet banking, with an r value of 0.339. This relationship is statistically significant at $p < 0.05$, indicating that although perceived usefulness influences the intention to adopt internet banking, the strength of this relationship is relatively low compared to its influence on attitude.

Perceived ease of use demonstrates a positive and moderate relationship with attitude towards internet banking, with an r value of 0.499. The relationship is significant at $p < 0.01$. This finding highlights that when internet banking systems are perceived as easy to use, users are more likely to develop favorable attitudes towards the technology.

The findings reveal that perceived ease of use has a positive but weak relationship with intention to use internet banking, with an r value of 0.328. This relationship is statistically significant at $p < 0.05$, implying that although ease of use affects users' intention to adopt internet banking, the impact is weaker compared to its effect on attitude.

Table 2: Correlation Analysis

Relationship	r value	Results
Perceived Usefulness *Attitude towards Internet Banking	0.513**	Moderate and significant relationship
Perceived Usefulness *Intention to use Internet Banking	0.339*	Weak and significant relationship
Perceived Ease of Use *Attitude towards Internet Banking	0.499**	Moderate and significant relationship
Perceived Ease of Use *Intention to use Internet Banking	0.328*	Weak and significant relationship

Hypotheses Supported

The results of the hypothesis testing reveal that all proposed relationships are supported. Perceived usefulness demonstrates a significant influence on both intention to use and attitude towards internet banking, with a stronger effect on attitude ($r = 0.513$, $p < 0.01$) compared to intention ($r = 0.339$, $p < 0.05$). Similarly, perceived ease of use shows significant relationships with both intention and attitude, where the correlation with attitude is moderate ($r = 0.499$, $p < 0.01$) while the relationship with intention is weaker ($r = 0.328$, $p < 0.05$). These findings suggest that while both usefulness and ease of use play important roles in shaping users' adoption of internet banking, their influence is stronger on shaping positive attitudes than directly driving intention to use the service.

Discussions

The findings of this study confirm the applicability of the Technology Acceptance Model (TAM) in explaining users' adoption of internet banking. All hypotheses were supported, indicating that both perceived usefulness and perceived ease of use significantly influence attitude and intention towards internet banking. However, the strength of these relationships differs, with perceived usefulness and perceived ease of use exerting stronger effects on attitude compared to intention.

The positive and moderate relationship between perceived usefulness and attitude ($r = 0.513$, $p < 0.01$) suggests that users who recognize the benefits of internet banking, such as convenience, efficiency, and time savings, are more likely to develop favorable attitudes towards the service. This aligns with prior studies that highlight the importance of perceived usefulness in shaping consumer attitudes and adoption behaviors (Alalwan, 2022; Lin & Nguyen, 2023). On the other hand, the weaker relationship between perceived usefulness and intention ($r = 0.339$, $p < 0.05$) indicates that while usefulness is a critical driver, it may not be sufficient on its own to directly influence intention. Factors such as trust, risk perception, and security concerns may play a mediating role (Albashrawi & Motiwalla, 2022).

Similarly, the results show that perceived ease of use has a significant impact on both attitude ($r = 0.499$, $p < 0.01$) and intention ($r = 0.328$, $p < 0.05$). This finding supports earlier TAM-based research that emphasizes ease of use as a determinant of technology acceptance (Venkatesh et al., 2016). More recent studies further indicate that when internet banking platforms are user-friendly and require minimal effort, individuals are more likely to adopt and sustain usage (Osei & Boateng, 2022; Zhang & Wang, 2024). The stronger relationship with attitude suggests that ease of use enhances positive perceptions, which in turn shape behavioral intention, consistent with the mediating role of attitude in TAM (Lee et al., 2022).

Overall, the findings highlight that improving both the perceived usefulness and ease of use of internet banking platforms is crucial for strengthening user attitudes, which subsequently lead to higher adoption intentions. This underscores the importance for banks to invest not only in functional benefits such as efficiency but also in usability enhancements, customer education, and trust-building mechanisms to encourage broader adoption.

Practical Implications

The findings of this study provide several practical implications for the banking industry, policymakers, and system developers. Since perceived usefulness strongly influences users' attitudes towards internet banking, banks should emphasize the functional benefits of their platforms, such as convenience, speed, and efficiency. Clear communication of these

advantages through targeted marketing campaigns and customer education programs can enhance positive perceptions and drive adoption.

The results show that perceived ease of use plays an equally important role in shaping attitudes. This suggests that system designers must prioritize user-friendly interfaces, simplified navigation, and mobile compatibility. Reducing complexity in banking applications can minimize resistance among less technologically skilled users, particularly older customers or first-time adopters. Training workshops or digital literacy initiatives could further support these efforts.

The weaker direct influence of both usefulness and ease of use on intention to use highlights the need to address other influencing factors, such as trust, security, and perceived risk. Policymakers and financial institutions should collaborate to establish stronger cybersecurity measures, transparent privacy policies, and consumer protection frameworks. Demonstrating commitment to safeguarding customer data can foster greater trust in internet banking services.

Finally, the findings indicate that attitudes serve as a critical mediator in influencing intention. Therefore, banks must cultivate positive user experiences through responsive customer support, personalized services, and reliable system performance. By combining technological innovation with relationship-building strategies, financial institutions can ensure sustained adoption and long-term customer loyalty.

Conclusion

This study examined the relationship between perceived usefulness, perceived ease of use, attitude, and intention to use internet banking, grounded in the Technology Acceptance Model (TAM). The findings confirmed that all four hypotheses were supported, highlighting that both perceived usefulness and perceived ease of use have significant impacts on user attitudes and intentions. In particular, perceived usefulness demonstrated a stronger influence on attitudes, while perceived ease of use also played a key role in shaping positive perceptions of internet banking.

The results further revealed that while usefulness and ease of use have only weak direct effects on intention, their impact is amplified through attitude, reinforcing the central mediating role of attitudes in the adoption process. These findings align with recent studies (Alalwan et al., 2022; Al-Marouf et al., 2021) that emphasize the importance of user perceptions and positive experiences in driving digital banking adoption.

Overall, this research contributes to the growing body of literature on TAM by reaffirming its applicability in the context of internet banking. It also provides valuable insights for practitioners, suggesting that improving user-friendly system design, enhancing functional benefits, and addressing security concerns are essential strategies for increasing adoption. By focusing on these factors, banks and policymakers can foster greater trust, encourage wider usage, and support the ongoing digital transformation in the financial sector.

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