Key Drivers Influencing Gen Z's Use of Chatbots in Malaysia's Digital Banking Sector: A Conceptual Model

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Abstract
The objective of this article is to determine the key factors influencing the adoption of chatbots in e-banking services among Gen Z customers in Malaysia. While digital banking services have grown rapidly, there is still a significant gap in understanding the factors that influence Gen Z's decision to use chatbots as well, within e-banking platforms in the region. This highlights a clear need for further research to better understand the unique behaviors and preferences of this important consumer segment regarding chatbot use in Malaysia's evolving digital banking landscape. This article was motivated by the increasing importance of chatbots as a digital innovation in the banking industry in Malaysia, particularly given that Gen Z customers are digital natives with specific preferences and expectations. From the synthesis review of literature, the study identified four important determinants elements including perceived usefulness, perceived ease of use, risk and trust, that may support or reject Gen Z's acceptance of chatbot technology. With this conceptual analysis, we aim to address this knowledge gap that can inform banks on how to enhance the design of their digital strategies, based on Gen Z customers' digital requirements, improve their user experience and successfully adopt Chatbot e-banking services in Malaysia. This study identifies important considerations for banks in Malaysia to create digital strategies and chatbot designs that are tailored to Gen Z customers, allowing banks to maximise user experience and adoption success. Most interestingly, this study is only a conceptual mode, with at best received an empirical result.
Keywords: Extended TAM Model, Intention, Chatbots, Gen Z, Malaysia

Introduction

The rapid evolution of digital technology continues to have a significant impact and change the business world, particularly banking, where chatbots have become a viable innovation of the World Bank's e-banking services. This change is particularly important for Generation Z (Gen Z) customers in Malaysia who are true digital natives, familiar with technology, and looking for seamless, easy, and personalized digital interactions from the service providers they use. Since Malaysian banks place a strong emphasis on enhancing customer service and operational efficiency, they have a great chance to include chatbot technology into their digital offerings. However, success depends on having a thorough grasp of the elements influencing Generation Z's acceptance of chatbots.

Generation Z represents the future change of the banking consumer base, which makes this research significant. Gen Z's acceptance of these new digital banking services will have an affect on the trajectory of the banking industry. Despite the significant amount of literature published on digital service platforms, there is still a lack of sufficient knowledge that specifically targets Gen Z determinants of chatbot technology acceptance in the context of e-banking in Malaysia. This information is essential for the banking sector to create, implement, and enhance chatbot services that suit Gen Z's technology requirements and preferences. By revealing these determinants, the results of this study can provide actionable output that increases customer satisfaction and engagement while establishing a competitive edge, ultimately expand the size of banking operations, and expand financial inclusion with greater accessibility. Overall, this study can help guide and empower Malaysian banks to innovate in the digital era, and e-banking services suited to the demands of generation Z as well as the transformation of the banking industry's digital IDEAL.

Members of Gen Z, generally born from 1995 to 2012, are growing and significant consumers in the financial market in Malaysia. There are behavioural differences of Gen Z, such as digital nativity skills, propensity for instant communication, and their high expectations for simple and engaging interfaces that make them prime adopters of innovative banking technology such as chatbots (Baptista & Oliveira, 2017; Smith, 2022). Empirical research has found that perceived usefulness and perceived ease of use are relevant acceptance determinants for Gen Z using digital banking tools, while trust and perceived security were mediators of their usage behaviour (Sivathanu, 2019; Wang et al., 2020). These acceptance factors align with widely accepted user acceptance theories of technology acceptance, such as Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2012).

The banking industry in Malaysia has experienced growth in digital transactions by a significant group of people that will increasingly be comprised of Gen Z customers, as they adopt banking digital solutions. Although this trend is positive, the integration and use of chatbots within these solutions and if sustainability issues have been examined. Past research has shown that chatbot service encounters quality (i.e. service quality, dependability, reliability, speedy service, and emotional appeal) influence customer satisfaction and long-term outcomes (Chocarro, Cortiñas & Marques, 2021). In addition, it has been be asserted that studies using technology acceptance models that account for the acceptance of technology and models with constructs such performance expectancy (similar to perceived usefulness) and effort expectancy (similar to perceived ease of use) shape behavioral

intentions to use chatbots as it relates to financial services (Kang & Namkung, 2019). Trust has also been identified to be an important mediator in which chatbot aspects are part of an overall acceptance expectation based measurement framework of chatbot acceptance mechanisms which supports chatbot acceptance in banks (Sjöström & Ågerfalk, 2022).

There is a limited but existing empirical literature base that considers the factors underlying user acceptance of chatbots in a digital banking environment by addressing the Bank service experience through the lens of Gen Z chatbots. Much of the existing literature either generalizes findings across a broader demographic or examines other forms of digital banking tools (e.g., application based, online banking). As a result, we have not developed understanding around the unique drivers and inhibitors that apply for Gen Z. Understanding what makes chatbots acceptable in a digital banking environment is crucial for banks that want to develop chatbot service that meets Gen Z's expectations and behavioral dispositions. The present study seeks to address this gap by proposing a conceptual model that incorporates the key antecedents of perceived usefulness, perceived ease of use, trust and perceived risk to account for the adoption of Gen Z's utilization of chatbots in Malaysia's e-banking industry. Identifying the drivers that shape this technology will contribute to knowledge and provide insights for Malaysian banks to adequately formulate their digital strategies and invest in chatbot designs that improve the user experience. Addressing the aspects of user experience, and generating trust and confidence around potential risks will potentially afford banks an opportunity to utilize chatbot-enabled services at a wider adoption level which will allow the banks to create and sustain connection with the next generation of consumers.

In conclusion, as the banking sector in Malaysia evolves digitally, and new banking models emerge, we are due to understand the factors that shape Gen Z's adoption of a chatbot service. This conceptual analysis becomes a stepping stone for future empirical exploration and practitioner relevance with respect to banks meeting the expectations of Gen Z and increasing the acceptance of chatbot services in digital banking in Malaysia.

Theoretical Foundation and Hypothesis Formulation
The Technology Acceptance Model (TAM)
A research framework is suggested based on The Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989) to establish the factors that influence consumers' Chatbox adoption behaviour. The theory is a well-known framework that helps to explain and predict users' acceptance of new technologies such as digital banking services. In recent years, TAM has been one of the most accepted models that describe the customers' intention to adopt various electronic banking services such as telebanking, or Internet banking (Alalwan et al., 2016; Curran and Meuter, 2007; Salimon et al., 2017). As with any model, TAM makes some key assumptions when discussing the primary constructs, they are: perceived usefulness (PU) and perceived ease of use (PEOU) – these constructs are key influencer of an individual's intention to use technology, which will also influence actual use. Perceived usefulness refers to the extent to which the user believes that the use of technology will improve performance. Perceived ease of use refers to the extent to which the user thinks the technology will be free of effort.

In the digital banking context, TAM has been well-utilised to understand what factors influence consumers' adoption of digital financial services in Malaysia. A more recent study, with 237 Malaysian respondents, reports that both PU and PEOU positively influence individuals' intentions to adopt digital banking services. In addition, perceived value was reported as a mediating factor between PU and PEOU and adoption intention, indicating the importance of being able to demonstrate value to users (Aliza, Abdul Rahim & Ramayah, 2025).

Malaysian TAM studies have also extended to incorporate constructs such as trust and perceived risk, as these are particularly relevant in financial contexts due to concerns around data security and data privacy. These constructs are further influences of users' acceptance and intention to use digital banking platforms such as mobile banking and chatbots (Tian et al., 2023; Hussain et al., 2021).

Therefore, the TAM can provide a simplistic but yet powerful theoretical framework in order to understand how Malaysian consumers, in particular tech-savvy Generation Z consumers, intentions to adopt digital banking technologies are shaped by their perceptions of perceived usefulness, perceived ease of use, trust and risk.

Perceived Usefulness
Perceived usefulness (PU) is one of the leading factors affecting user acceptance of technology, including in the case of digital banking services with chatbot. PU is defined as "the degree to which a person believes that using a particular system would enhance their job performance" (Davis, 1989), and it is widely used in literature examining technology adoption through the Technology Acceptance Model (TAM). For Gen Z, the digital natives who seek speed, convenience, and timely support, perceived usefulness (PU) of chatbots is an important factor for their digital banking behaviour.

Recent studies have shown that if a user believes that a chatbot will be useful for performing banking tasks such as checking balances, transferring funds, or receiving financial advice - they are more likely to adopt and continue using the chatbots (Klopfenstein et al., 2017; San & Othman, 2021). The same is true for users of digital banking services in Malaysia, who increasingly have banks integrating AI-enabled chatbots to enhance customer service and engagement since perceived usefulness has significant effects on engagement, especially for tech-savvy Gen Z users (Azmi et al., 2022).

Perceived usefulness is also more than just a task being finished. Performance and responsiveness go into perceived usefulness as chatbots evaluated by Gen Z users which provided accurate, timely, helpful, and relevant instructions, while importantly meeting their expectations for an intuitive user experience (Go & Sundar, 2019). The continued investment by banking institutions in chatbots only adds to their perceived usefulness - they can now provide customers 24/7 service, instantaneous response time, reduce the amount of time to complete the required task, ultimately making the entire process less frustrating. All of the above features are aspects of convenience, and convenience is critical in meeting the lifestyle choice of Gen Z consumers in a digital-first environment (Shankar et al., 2020).

In summary, applied to developing a conceptual model to understand Gen Z's usage of chatbots in the digital banking environment and if they would continue to use a chatbot, perceived usefulness will be a key construct that influences user adoption and continued usage intentions.

H1: *Perceived usefulness of chatbots has a positive influence on Gen Z's intention to use chatbots in Malaysia's digital banking sector.*

Perceived Ease of Use
Perceived Ease of Use (PEOU), as first developed by Davis (1989), refers to "the degree to which a person believes that using a particular system would be free of effort." It is significant in chatbots for digital banking as PEOU may affect users' acceptance of the chatbot and ultimately their levels of engagement with chatbots in the digital banking environment, especially as Generation Z consumers have grown up with the expected frictionless digital interactions.

Generation Z consumers expect a straightforward and frictionless digital user experience. Chatbots with intuitive navigation, easy conversational pattern, and minimal learning curve made the users feel like they were using a low-effort technology to bank (Shankar et al., 2020). Research with Malaysian digital banking users indicated that chatbot usability was positively correlated with acceptance and use even among younger generations (San and Othman, 2021). However, chatbot usability does not ensure continued use. Chatbot features such as natural language processing and personalization responses increased users' perceived ease of use (PEOU), promoting continued use (Go & Sundar, 2019).

H2: Perceived ease of use of chatbots has a positive influence on Gen Z's intention to use chatbots in Malaysia's digital banking sector.

Additional Factor
Risk
Perceived risk is the risk of loss in seeking a desired outcome, which may be financial, privacy, or performance (Featherman & Pavlou, 2003). Perceived risk has been tied to fears about security breaches, bad information, and human error in financial transactions as well as chatbot delivery of insufficient information.

Perceived risk is still a barrier to chatbot for Gen Z users in Malaysia. Even a digital native group like Gen Z has the constraint of perceived risk in their context, where users are concerned about data privacy and systems' failures, including when chatbots have no human intermediaries (San & Othman, 2021). Perceived risk may lead to users delaying using chatbots for complex or sensitive banking interactions. However, there is evidence that the institutions can mitigate perceived risk by providing chatbot credibility in consumer communications and app user interface, trusted security features for chatbots, and hybrid forms of support (e.g., intelligent transition to human agents) (Liao et al., 2022; Shankar et al., 2020).

H3: Perceived risk associated with chatbot use negatively influences Gen Z's intention to use chatbots in Malaysia's digital banking sector.

Trust In Chatbox Responses and Accuracy
Trust in chatbot responses and their perceived accuracy is a significant factor in user acceptance and continued use of chatbots in the context of digital banking where Generation Z users expect immediate, accurate, and personalized service when using a digital banking chatbot. Trust means the level of reliance on a chatbot to perform accurately, honestly, and appropriately in context-specific responses (Gefen et al., 2003). Gen Z users in Malaysia are digital natives but are also hyper-aware of misinformation and threats to their security, thus the emphasis on trust.

Accuracy is a core value proposition which will build and reinforce trust. When chatbots provide accurate and appropriate answers to banking queries such as balance checks, money transfers, and eligibility for loans, they help to build confidence in a banking service that is a service application (Liao et al., 2022). Poor response accuracy is a strong possibility that will affect users' perspectives of the trustworthiness of chatbots in financial services, according to a study by Ashfaq et al. (2020). An error, or a vague response is often sufficient enough to cause the user to doubt the credibility of the chatbot and who may wish to speak with a human.

In addition to accuracy, a chatbot response substantially incorporates a user's trust in the chatbot to understand user intent prompts, offer clarity in how it has reasoned to respond in a process, and proactively correct mistakes (Go & Sundar, 2019). To establish a trustworthiness of a banking chatbot, a digital banking environment where many banks voice-enable their chatbots with multilingual services, requires spoken language processing accuracy, in particular the use of Bahasa Malaysia and English, as well as avoid a misaligned contextual communication and potentially unsatisfied users (Azmi et al., 2022). When the group of users, such as Generation Z, frequently rely on quickly made decisions, even something as small as in the language of a chatbot to infer a thought process, can disrupt their perception of reliability and use of chatbot systems altogether.

As a result, a conceptual model for Gen Z's adoption of chatbots in Malaysia's digital banking sector should consider trust in chatbot responses and the accuracy of those responses as interdependent variables that affect user trust and behavioral intention.
H4: Trust in chatbot responses and their accuracy has a positive influence on Gen Z's intention to use chatbots in Malaysia's digital banking sector.

A Conceptual Model
This study aims to identify the factor influencing Gen Z's Use of Chatbots in Malaysia's Digital Banking Sector. Figure 1 shows the proposed conceptual framework built based on the extensive literature review
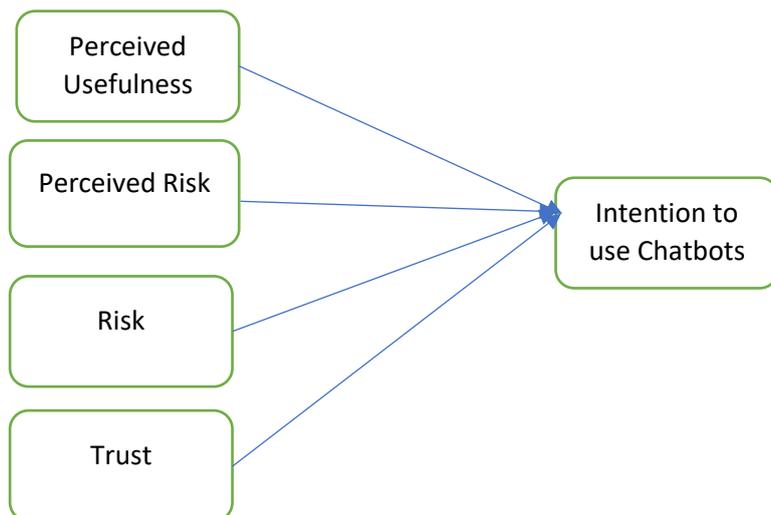
Implications and Limitations of The Study

Theoretical Implications

The implications from this study present important contributions for both practitioners and researchers. From a research-based context, the study looks specifically at Malaysian Gen Z users which provides a culturally and demographically informed lens, a gap in the existing body of literature, since most of the research is directed at other populations or age groups that can be more generalisable to time and culture. This contextual focus deepens the theoretical perspectives on how digital natives and users in Malaysia from a cultural point of view perceive and engage in the uptake of AI services in banking, and serve as a basis for follow up research finding to test the proposed conceptual links (Toh & Tay, 2022).

Additionally, the study also extends technology acceptance models beyond the commonly discussed determinants of risk and trust in the context of chatbot-based digital banking relating to a specifically Malaysian Gen Z perspective. This culturally and demographically oriented perspective also serves as a contribution to the literature, along with a basis for future empirical study to further validate and expand the proposed conceptual links (Toh & Tay, 2022).

Practitioner's Implications

For practitioners in Malaysian banks, understanding the drivers of Generation Z to use chatbot-based e-banking services specifically their perceived usefulness, ease of use, risk, and trust, can better inform digital strategies specifically tailored to the nuanced preferences and behavior of this demographic. Additionally, banks can improve chatbot interfaces as well as integrate security features to further enhance the user experience in ways that can reduce perceived risk, a barrier to adoption among Gen Zs (San & Othman, 2021; Featherman & Pavlou, 2003).

Limitation

The contributions of this research must be understood within the limitations of this study. First, as the study is conceptual, it has not been tested empirically and the indicated relationships between factors and chatbot adoption have not been statistically tested. This limits the study's findings to only the theoretical model presented (San and Othman, 2021). Second, the focus of the study is on Generation Z users only, which means the results cannot

be generalised beyond this age group, or to other cultures where behaviors of technology acceptance may differ (Featherman & Pavlou, 2003). Third, while this study focused on several important determinates of sustainability that also highlighted very important variables such as perceived usefulness, ease of use, risk and trust, we also acknowledge there are more valuable determinants we did not consider, such as social influence, chatbot personality or cost, that can significantly impact intended adoption decisions (Shankar et al., 2020).

Conclusion

As this study is conceptual, we have theorized that the proposed variables need future empirical testing to test their relationships and effects. While we based our proposal on a robust synthesis of previous literature, future researchers should consider testing and proposing additional variables in the framework to include more dimensions of the phenomenon. The framework included in this study is grounded from a comprehensive review of the literature that has yet to be tested in an empirical context, specifically the Malaysian context of digital banking.

Despite these limitations, this study was made significant in contributing to our understanding of the factors that influence Gen Z users' adoption of chatbots in Malaysia's digital banking sector. Gen Z is an important consumer market characterized by unique digital behaviors and expectations, and studying them specifically provided important insight to industry practitioners who can use these insights to help digital banking institutions develop and refine digital strategies that better meet Gen Z customer preferences and requirements. Any improvement in these strategies is expected to improve overall user experience and encourage Gen Z consumers' acceptance of chatbot-enabled e-banking services in Malaysia.

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