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THE DIGITAL BANKING SERVICES: A SELECTION MODEL FROM ISLAMIC BANKS

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ABSTRACT

The digital banking services which consist of internet banking and mobile banking have occupied an important role in the financial sector. Despite the importance of digital banking, Islamic banks in Indonesia have encountered issues with the adoption of digital banking such as budget constraints as well as sizable investment. Therefore, it is important to examine how to prioritize the selection of digital banking services in Islamic banking. This study aims to propose a model for prioritizing the selection of digital banking services in Islamic banking by applying document research through analyze way the paper or journals and other published sources concerning with the digital banking and product development in Islamic banking. While most of the studies conducted in the conventional banking, in this study the proposed model is built to address the Islamic banking. The proposed model comprises six criteria and six alternatives of services that should be considered in the selection of digital banking services from Islamic banks perspective. The proposed model involves general criteria that presence in the general banking context (conventional banking or Islamic banking) and specification criteria which only presence in the Islamic banking namely Sharia (Al-Syari'ah). Therefore, the proposed model has characterized the model utilized for the Islamic Bank in prioritizing the services in digital banking.

Keywords: digital banking, internet banking, mobile banking, Islamic bank, model of digital banking services

INTRODUCTION

The advance in information technology has promoted the usage of the internet spreading among the people and it is predicted to continue to grow for years to come. There were 4.7 billion internet users globally and it is predicted to grow to 5.3 billion by 2023 (Statista, 2021a). Coupled with the ownership of smartphones and mobile phones, the use of mobile internet has facilitated the increase in e-commerce transactions (Asian Development Bank, 2020). The new technology has attracted the younger generation intensively to utilize the technology (Schindler, 2017). The latest situation on the Covid-19 outbreak has changed consumer behavior to minimize physical contact and promote cashless transactions (IFSB, 2020). In the financial sector, the advance in information technology has led to the emerging financial technology from the adoption of Automated Teller Machines (the 1970s), internet banking (1990s), and mobile banking (1990s-2000s) that have enabled banks to deliver financial services (Mullan et al, 2017; Thakor, 2020). Considering the benefits to the banks and customers, banks have been motivated to adopt digital banking particularly internet banking and mobile banking (Takieddine and Sun, 2015). Banks that have not adopted this technology are possible to be threatened with losing market shares (Stulz, 2019; Thakor, 2020). The diffusion of mobile banking among the countries is different in that developing countries are higher relative to developed countries (Mullan et al, 2017). Studies on digital banking adoption have been conducted taking various approaches. The popular and prominent innovation that has been investigated in the 1990s is internet banking and mobile banking has been popular to be researched in the 2000s and afterward (Nejad, 2016). In addition, the majority of the studies have focused on the consumer perspective for the analysis as well as the data used compared to the bank as a firm side (Nejad, 2016).

It is necessary to explore other system to have a comprehensive understanding in the financial innovation since different system or market have different characteristics (Nejad, 2016). In particular, Islamic banking which is based on the Islamic principles implies the process, the product and services of Islamic banking should follow the Islamic teachings including the values, and objectives (Laldin and Furqani, 2016) that differ from conventional banking. Innovation in Islamic banking and finance is expected to offer a new perspective, framework, product as an alternative in the financial sector that is generated from the Islamic tenet (Laldin and Furqani, 2016). For example, Ascarya and Sakti (2022) has proposed a micro fintech model for Islamic micro finance institutions considering the uniqueness of Islamic microfinance. Likewise, digital banking in Islamic banking is expected to offer a new perspective, a new model as an alternative to the conventional banking that has been existed.

In Indonesia, the users of the internet are growing continually. Internet users in Indonesia are estimated to account for 201.4 million users in 2021 and this number is predicted to grow for years to come estimated at 233 million users by 2025 (Statista, 2021b). In addition, the younger generation dominates the demographic, and the share of the younger generation (Gen Y & Z) is the largest group of people in Indonesia (Bank Indonesia, 2019).

Despite the attention and initiatives of the government of Indonesia, the Indonesian banks have suffered from the issues of technology such as a slower pace the adoption compared to the development of financial technology (Bank Indonesia, 2019). Indonesian Islamic banking is not much different. Lack of research and development (Indonesian Ministry of National Development Planning, 2016), lack of optimizing the information technology to support the product and services development as well as a business model are several issues that need to be addressed by the Islamic banks in Indonesia (OJK, 2021a). Adoption and development of digital banking by banks requires a sizable investment (OJK, 2021b). However, Indonesian Islamic banks have experienced a budget constraint (Adewale and Ismal, 2020) that lead to a high cost of innovation as an issue for Islamic banks in the financial innovation (Chaudhry et al, 2020). It is critical for banks to make an investment priority (OJK, 2021b).

Therefore, it is important to investigate the financial technology adoption in banking, particularly digital banking in Islamic banking, that focuses on the firm or bank's perspective in order to have a better understanding of how to prioritize the selection of digital banking services in Islamic banking. The present study aims to propose a model of selection of digital banking services in Islamic banking. Differ from the previous studies on digital banking, the present study concentrates on the Islamic banking system, particularly in the Indonesian context, to design the model using multi-criteria. This study contributes to extending the literature on the diffusion of technology and financial innovation concentrating on digital banking adoption as well as offers a greater understanding of the selection of digital banking services in Islamic banking.

The rest of the paper is structured as follows. The next section elaborates on the literature review concerned with digital banking as well as product development in Islamic banking followed by the theoretical framework considered in this present study. Afterward, a model of selection of digital banking services in Islamic banking is presented. A preliminary evaluation of the model is also deliberated in the following section.

LITERATURE REVIEW

The Digital Banking Landscape

The digital banking refers to the banking services delivered to the customer using digital channels that comprise internet banking and mobile banking (Garzaro et al, 2021; Levy, 2022; Chauhan et al, 2022). Internet banking is defined as the remote delivery channel using the internet for banking services (Furst et al, 2002) in which customers perform online transactions through a bank's websites (Berger, 2003; Hoehle et al, 2012; Sullivan and Wang, 2020; Chauhan et al, 2022; Levy, 2022) using a computer, Personal Computer or laptop anytime and anywhere (Laukkanen, 2007; Laukkanen, 2016; Shaikh and Karjaluoto, 2016; Garzaro et al, 2021; Levy, 2022). Mobile banking refers to the channel used by customers to interact with the bank in order to obtain the banking services using a mobile device (Barnes and Corbitt, 2003; Tiwari et al, 2006; Hoehle et al, 2012; Nicoletti, 2014; Chauhan et al, 2022) or mobile telecommunications such as a cell phone, smartphone or tablet, normally by downloading the mobile application (Shaikh and Karjaluoto, 2016; Garzaro et al, 2021; Levy, 2022). The main concern of mobile banking is the use of data telecommunication making phone banking, voice dial-up, and dial-up services excluded from mobile banking (Barnes and Corbitt, 2003). The medium to access the services has made a major difference between Internet banking and mobile banking (Laukkanen, 2007; Shaikh and Karjaluoto, 2016). In this study, digital banking refers to the offering and delivering banking services to customers using internet banking and mobile banking.

The advantages

The advantages of digital banking motivate customers and banks to adopt the technology. Reducing the cost that is addressed to the overhead cost associated with physical branches (Shah and Clarke, 2009) and transaction cost to the customer using the automation process (Tiwari et al, 2006; Shah and Clarke, 2009), and conveniently offering more services to the customer (Shah and Clarke, 2009; Hoehle et al, 2012; Sullivan and Wang, 2020) are the advantages of adopting digital banking to the banks. For the customers, digital banking that has enabled the customer to access the banking services anytime and anywhere (Tiwari et al, 2006; Shah and Clarke, 2009) would lead to the efficiency of using banking services by the customer (Laukkanen, 2007).

Technology Development and alternatives to digital banking services

Various classifications have been applied to categorize the type of digital banking services. Based on internet banking services offered, digital banking services can be grouped into two categories, namely, basic services that comprise balance inquiry, fund transfer, and bill payment, and premium services that are regarded as basic services equipped with at least three of the following services: credit application, new account set-up, brokerage, cash management, fiduciary, bill presentment and insurance (Furst et al, 2002). Considering the services offered by mobile banking, the services can be classified into three broad categories, namely, accounting, brokerage, and information (Tiwari et al, 2006). The type of services delivered through internet banking appears seemingly similar to mobile banking and diversification of services is necessary to create a competitive advantage (Laukkanen, 2016).

The rise of financial technology has the potential to develop digital banking services. The advance in financial technology such as big data analytics, machine learning, distributed ledger technology, artificial intelligence, and the internet of things have possibilities to improve the banking services covering credit, deposit, capital raising services, payments, clearing and settlements, investment management, and insurance (Thakor, 2020), real-time transaction and credit monitoring, credit scoring and approval, transformation in customer acquisition and retention, cashless society in payment services, blockchain, distributed ledger technology, deposit services, P2P lending and charitable giving (Gomber et al, 2017). Automated Robo-advisor services and digital wealth management tools are useful to maintain a competitive position and digitize the lending process to gain speed, convenience, and efficient decision making (BCBS, 2018).

The modes of adoption

The banks may opt for various strategies to adopt digital banking based on the available channels. Following Barnes' Strategic Model of Mobile Banking (Scornavacca and Hoehle, 2007), the bank may adopt first internet banking considering high PC penetration or adopt first the mobile banking considering high mobile devices penetration, prior to the channel extension. According to the number of channels, the bank may opt to utilize a channel, multi-channel approach, or omnichannel approach (Menrad, 2020). The rise of digital banking has shifted the bank to adopt the omnichannel (Hamouda, 2019) since it has been suggested as ideal for the banking industry (Komulainen and Makkonen, 2018).

There have been several ways to adopt digital banking suited to the form of the bank. The traditional bank may adopt digital banking to equip and along with the previous services delivered by physical branches and this is called "Click and Mortar" bank (Schaechter, 2002). Another way, a bank may opt for an "Internet-Only Bank" that adopts internet banking without relying more on the physical branches, without building the physical branches, and only offering the services online through the website (Schaechter, 2002; Berger, 2003). Other than the "click and mortar" bank, Verhoef (2021) demonstrated the emergence of the digital-only bank that has adopted digital channels without physical branches. However, the cost to implement digital banking is the crucial factor to be considered (Bradley and Stewart, 2002). Outsourcing the technology (Sinkey, 1998) or making partnership formation (Mullan et al, 2017) are other ways to implement digital banking considering the cost.

The risks

The digital banking is quite similar to electronic banking in that both of them use internet banking and mobile banking except, other than internet and mobile banking, electronic banking also comprises Automatic Teller Machine (ATM) and touch-dial phones (Hoehle et al, 2012). Therefore, the risk incurred from the adoption of electronic banking is quite similar to digital banking which is not novel to the basic type of risks that have been identified rather it tends to modify the existing risk (BCBS, 2003).

Operational risk is addressed to the potential loss due to significant deficiencies in system reliability or integrity (BCBS, 1998), misuse by a bank employee, and potential hacking from the external network (Pennathur, 2001). Significant negative public opinion of the bank regarding the services and privacy would lead to a reputational risk to the bank (BCBS, 1998; Pennathur, 2001). Violation of non-conformance with the law or regulation is a type of legal risk (BCBS, 1998). Digital banking involving the advance of technology to deliver convenience, personalized and seamless banking services to the customer has raised questions about how the bank addresses the risks such as consumer protection, cybersecurity, and data protection (Choi et al, 2020).

The Issues related to Islamic Banking

The Sharia compliance is a strategic issue regarding the product and services in Islamic banking. Islamic banking requires the bank activities performed following and complying with the Sharia principle (Cihak and Hesse, 2008; Abedifar et al, 2013). The overall goal of Islamic finance is to realize maqasid Sharia which is achieved by fulfilling legal requirements and complying with the principle of Islamic law in the documentation, process, and operation (Ahmed, 2011). Replication of conventional financial products and structure into an Islamic form (Laldin and Furqani, 2016) has been applied. However, this approach has been criticized for only changing the terminology from the conventional bank (Chaudhry et al, 2020).

In addition, fulfilling customer needs is another concern that needs to be addressed in Islamic banking. Following the Pyramid of Maslahah and Xiao's survival products, Ahmed (2011) categorized three categories of financial products. First, the necessities or survival are geared to satisfy the basic needs. Second, complementary or security is directed to satisfy additional needs beyond essential needs. Thirdly, embellishments or growth are aimed at satisfying ameliorable products. Taking the purpose of the products and services to fulfill, Yumna and Marta (2021) also categorized the financial needs into three groups, namely, financial products for transaction purposes; financial products for security or precautionary motives purpose; and financial products to satisfy the investment purpose. In addition, the authors added one specific purpose that is religious purpose such as hajj saving products.

Moreover, internal dynamics may occur in the product development process in Islamic banking (Ahmed, 2011). The compatibility between the Product Development department and the Sharia Department or the Sharia Supervisory Board in the process of product development is another issue in Islamic banking (Chaudhry et al, 2020). The trade-off between the economic and Sharia aspect may also arise in developing the product and services (Ahmed, 2011). When it occurs, the Sharia aspect should be prioritized over another one and the role of the Board of Directors is critical to aligning the trade-off (Ahmed, 2011).

Empirical Studies on Digital Banking

Taking a bank perspective, studies have been conducted to examine digital banking adoption using various methods or approaches, for instance, a grouping of issues followed by a non-parametric test (Nath et al, 2001), field study (Aladwani, 2001), Delphi method (Bradley and Stewart, 2002; Mullan et al, 2017), Analytic Hierarchy Process (Mishra and Singh, 2015), Interpretative Phenomenological Analysis (Larsson and Viitaoja, 2017), and thematic analysis (Mbama et al, 2018). The studies have suggested the main concerns to be addressed in digital banking adoption such as customer interests (Nath et al, 2001; Aladwani, 2001; Bradley and Stewart, 2002; Mullan et al, 2017; Larsson and Viitaoja, 2017; Mbama et al, 2018), the internal condition of the bank (Nath et al, 2001; Aladwani, 2001; Bradley and Stewart, 2002; Mullan et al, 2017), technology advantage and development (Nath et al, 2001; Aladwani, 2001; Bradley and Stewart, 2002; Mishra and Singh, 2015; Larsson and Viitaoja, 2017; Mullan et al, 2017; Mbama et al, 2018), the environment where the bank operates (Aladwani, 2001; Bradley and

Stewart, 2002; Mullan et al, 2017; Larsson and Viitaoja, 2017), and channels adoption such as internet banking and mobile banking (Mishra and Singh, 2015). Most of the studies taking bank perspective have investigated the issues related to drivers or inhibitors of digital banking adoption, however, the studies have rarely utilized multi-criteria to prioritize the elements or criteria involved in the studies by connecting or comparing among the elements or criteria.

Digital banking adoption in Islamic banking

The studies on digital banking are normally conducted in the conventional banking system, while studies on such issues have been scarce taking the Islamic banking context (Dinc, 2020; Iman, 2020), especially from the bank's perspective. Some studies in the Islamic banking context have taken general context by exploring financial innovation (Al-Salem, 2009; Iman, 2020) or product innovation (Tipu, 2014; Chaudhry et al, 2020; Dinc, 2020) in order to investigate technology adoption in Islamic banking and finance by taking Islamic financial institutions perspective. The findings suggest the main issues that need to be addressed by Islamic banks such as Sharia compliance (Al-Salem, 2009; Iman, 2020), high cost of innovation and lack of research (Chaudhry et al, 2020), and the importance of the Sharia Board (Tipu, 2014; Dinc, 2020). Taking a bank or firm perspective, most of the studies in Islamic banking have been approached using broad term perspectives such as financial innovation and product development without focusing, in particular, on digital banking adoption such as internet banking as well as mobile banking.

The literature has shown that most of previous studies in digital banking have been investigated in conventional banking. Previous studies in Islamic banking has investigated more on the general context such as product development or financial innovation and the studies have not been addressed particularly to the digital banking. To the best of our knowledge, none has been done in the context of Islamic banking.

Moreover, Ahmed (2014) has revealed that product development in Islamic banking is a challenging task due to differences with the conventional banking. The accounting systems of Islamic products differ from conventional banking in which Islamic banking is based on the sale and equity-based contracts as well as complying with Sharia. Most of the Information Technology in banking is based on the conventional banking. Adopting Islamic banking product in conventional banking information technology requires an adjustment to the information technology where it may cause hindering of Islamic products development. Therefore, it is important to investigate, in particular, digital banking in Islamic banking since conventional banking and Islamic banking are two different banking systems. This study attempts to build comprehensively the model for selection of digital banking services by Islamic banks.

THEORETICAL FRAMEWORK

Diffusion of Innovation Theory

Diffusion of Innovation theory has been regarded to be one of the most popular theories attempting to explain the adoption of innovation (Sahin, 2006; Puschel et al, 2010). Diffusion of Innovation Theory posited diffusion as the process in which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003). The process in which the adoption of and spread of innovation occurs widely in the population is also regarded as diffusion (Frame and White, 2004; Sullivan and Wang, 2020). Assessing the diffusion can be attributed to individuals, organization contexts as well as larger contexts such as cities or states (Dearing and Cox, 2018). Four main elements of diffusion, namely, innovation, communication channels, time, and social system (Rogers, 2003).

Innovation refers to an idea, practice, or object that is perceived as new by an individual or other unit of adoption (Brown, 1992; Rogers, 2003; Dearing and Cox, 2018). The term “innovation” is similar to “technology” in which both are designed to decrease the uncertainty toward achieving the intended outcome (Rogers, 2003). Based on Rogers’ Diffusion of Innovation, one would go through the knowledge or cognitive stage, persuasion or effective stage, decision stage, implementation stage, and confirmation stage to decide to adopt innovation (Sahin, 2006).

The attributes of innovation predict the adoption rate of innovation (Mullan et al, 2017). It consists of relative advantages, compatibility, complexity, trialability, and observability (Kolodinsky et al, 2004; Sahin, 2006). Relative advantage is the degree to which innovation is perceived to be different from and better than its substitutes (Kolodinsky et al, 2004) or superior to all other options (Puschel et al, 2010). Compatibility is the extent to which the innovation is perceived as consistent and compatible with the needs, values, beliefs, experiences, and habits of potential adopters (Kolodinsky et al, 2004; Puschel et al, 2010) as well as fit with the way to achieving the same goals (Dearing and Cox, 2018). Complexity is the extent to which the innovation is perceived as difficult to understand and use (Puschel et al, 2010). Trialability is the extent to which the innovation can be used as a trial before its actual adoption (Puschel et al, 2010) or being reversible to manage (Dearing and Cox, 2018). Rogers (2003) argues that providing a partial trial would speed up the adoption process (Sahin, 2006). Observability is the extent to which the innovation particularly its benefits can be observed or described and can be seen by the potential adopters (Puschel et al, 2010; Dearing and Cox, 2018). Based on the degree of innovativeness, that is the relative time of earlier individuals adopting the innovation (Sahin, 2006), adopters can be divided into five categories, namely, innovators, early adopters, early majority, and late majority, and laggards (Dearing and Cox, 2018). These categories are classified based on the attractiveness of adopters to novelty, motivation by social pressure, and economic necessity (Sahin, 2006; Dearing and Cox, 2018).

Theory of Planned Behaviour

The theory of Planned Behaviour explains the influence of attitude, subjective norms, and perceived behavioral control on behavioral intention (Tucker et al, 2020). The theory stemmed from the Theory of Reasoned Action, which proposes attitude towards intended behavior and a person’s perception of social pressure (subjective norms) determine the intended behavior, with addition perceived behavioral control to cater condition in which the individual who has no complete control over the behavior (Nysveen et al, 2005). With regard to technology adoption, the intention to adopt the technology is influenced by the attitude toward the technology as well as perceived control over the adoption of the technology. In addition, competition among the banks may emerge as social pressure to adopt the technology.

Financial Innovation

Financial innovation is important to the financial system (Van Horne, 1985; Merton, 1992). Financial innovation refers to the idea that should move the market more efficiently or more complete (Van Horne, 1985) by meeting investor or issuer demands (Merton, 1992). Comprehensively, financial innovation is defined as something new aimed at reducing costs, reducing risks, or providing improved products/services/instruments that better satisfy financial system participants’ demands (Frame and White, 2010). It may take the form of a new product or a new process (Frame and White, 2010). The newness is regarded as a novel but not entirely new (Merton, 1992), typically a modification of existing ideas (Van Horne, 1985).

Financial innovation has attempted to explain processes and factors encouraging financial innovation to take place in the financial sector by introducing various theories to research the areas. Environmental conditions may induce the emergence of financial innovation to take place in the market. Several conditions for financial innovation to take place are underlying technologies, unstable macroeconomics,

regulation, taxes, market power, firm size, and appropriability (Frame and White, 2004). Schindler (2017) contended drivers provoke financial innovation as supply drivers, which are similar to Frame and White (2004) with additional innovation spiral and demand drivers that consist of regulation and demographics. Typically, it needs more than one factor for financial innovation to emerge (Van Horne, 1985; Schindler, 2017). Technology advances have stimulated dramatic change in the financial sector (Frame and White, 2010). Financial innovation has been researched extensively in the financial sector, particularly in banking (Frame and White, 2004; Frame and White, 2010; Nejad, 2016).

RESEARCH METHODOLOGY

The present study utilizes a document research methodology to analyze the published papers or journals as well as other published sources related to digital banking services, internet banking, mobile banking, and product development in Islamic banking (Azganin et al, 2021). Theoretical framework, as well as empirical studies, are also elaborated aiming at proposing a model for selecting digital banking services by Islamic banks which are contained factors or criteria that should be considered as well as the alternatives of digital banking services in Islamic banking.

THE MODEL FOR SELECTION OF DIGITAL BANKING SERVICES IN ISLAMIC BANKING

Digital banking needs to be holistically analyzed (Chauhan et al, 2022). Accordingly, as the literature has revealed, several factors (criteria) should be considered when a bank intends to adopt digital banking services which cover internet banking and mobile banking services. As such, the selection of digital banking services involving several criteria can be identified as a process of Multi-Criteria Decision Making. Following Nath et al (2001), Mullan et al (2017), and Akinci et al (2004), a set of criteria should be considered in the digital banking services adoption namely, customer, technology, the internal condition of the bank, environment, and channel. Since the Islamic bank should adhere to the Sharia principle in developing the product and services, Sharia has become the center of the product and services development (Ahmed, 2011) and should be added to the criteria being considered in digital banking services adoption. Each criterion that should be considered in the adoption of digital banking services consists of elements called sub-criteria constructing the involved criteria. As such, the criteria and the sub-criteria would be considered to select the digital banking services in Islamic banking.

Digital banking services have considerable features or services offered to the customers. Following Ahmed (2011) and Yumna and Marta (2021), six alternatives to digital banking services are identified to categorize the digital banking services offered to the customers that are transfer and payments, account opening, security/insurance, social, investment, and beyond banking services. The relationship of criteria, sub-criteria, and the alternatives of digital banking services with regard to the prioritizing of selection of digital banking services by Islamic banks is illustrated in figure 1 while the elaboration of each criterion and the alternatives of digital banking services are presented in Table 1 – 7 below.

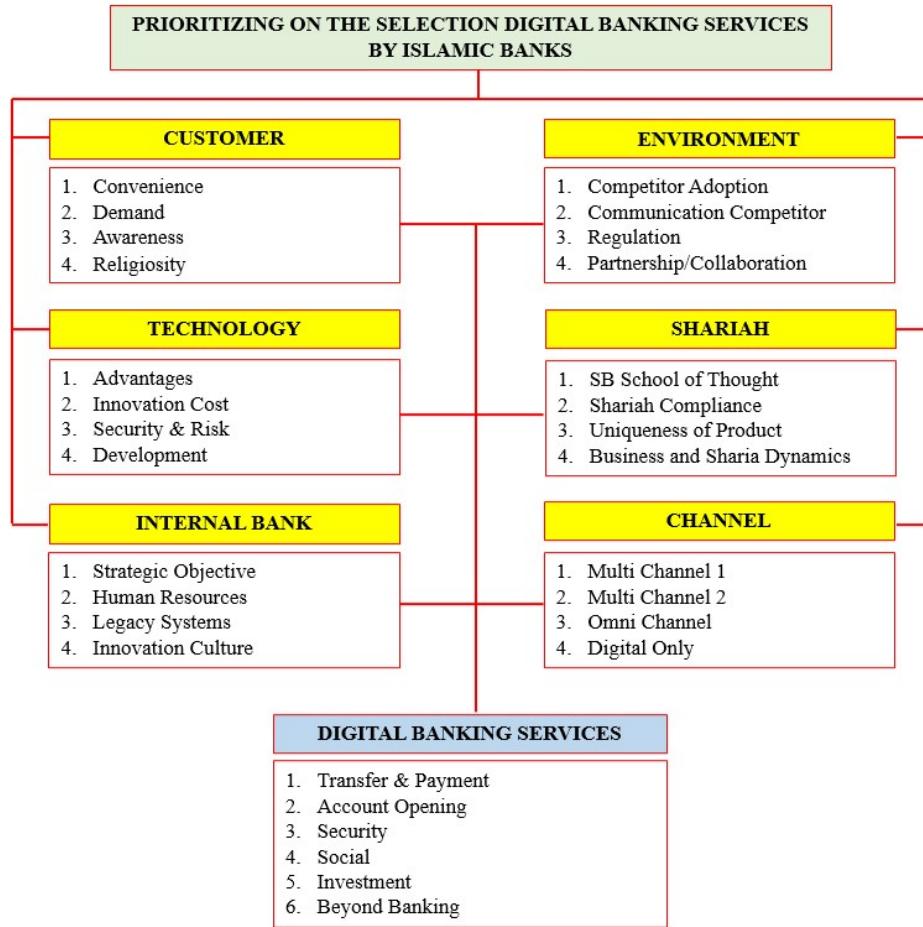


Figure 1. The Model for selection of digital banking services in Islamic banking

Table 1
Customer Cluster

No	Sub-Criteria	Description
1	Convenience	Better service to customers such as faster, easier, and reliable to enhance the ability to deal with customers (Aladwani, 2001; Bradley and Stewart, 2002; Mullan et al, 2017).
2	Demand	Meeting customer demand for the service, customer-driven demand, particularly Islamic bank customers (Aladwani, 2001; Bradley and Stewart, 2002; Mullan et al, 2017; Yumna, 2019).
3	Awareness	Customer awareness of the services provided by the Islamic banks (Jamshidi and Husin, 2018; Chaudhry et al, 2020).
4	Religiosity	Religiosity is an important factor for Islamic bank customers in the adoption of products and services (Jamshidi and Husin, 2018; Suhartanto et al, 2020).

Table 2
Technology Cluster

No	Sub-Criteria	Description
1	Advantage	Reducing costs and workforce, improving the bank's image and brand development (Aladwani, 2001; Bradley and Stewart, 2002; Mullan et al, 2017)
2	Innovation costs	Cost related to the technology such as the introduction of new technology (Bradley and Stewart, 2002; Chaudhry et al, 2020).
3	Security and Risk	Perceived security and risk concerns such as authentication, and security improvement (Bradley and Stewart, 2002; Mullan et al, 2017).
4	Technology development	Ease of development of the technology (Bradley and Stewart, 2002; Chaudhry et al, 2020).

Table 3
Internal Condition of Bank

No	Sub-Criteria	Description
1	Strategic objective	Compatibility with the strategic objective/plan of the bank (Mullan et al, 2017).
2	Human resources	Availability of talented staff/specialists and training for the staff, employee engagement in the developing service innovation (Nath et al, 2001; Aladwani, 2001; Tipu, 2014; Chaudhry et al, 2020).
3	Legacy systems	Compatibility with existing bank systems, technology, and infrastructure (Bradley and Stewart, 2002; Mullan et al, 2017).
4	Innovation culture	Innovation culture as well as an attitude toward innovation and resistance to change (Bradley and Stewart, 2002).

Table 4
Environment Cluster

No	Sub-Criteria	Description
1	Competitor adoption	The number of banks adopting the technology (Bradley and Stewart, 2002; Mullan et al, 2017).
2	Communication by competitor	Communication and influence from others in the industry (Bradley and Stewart, 2002; Mullan et al, 2017).
3	Regulation	Government support includes regulations related to electronic banking (Aladwani, 2001; Bradley and Stewart, 2002; Iman, 2020).
4	Partnership/ Collaboration	Availability of Partnership/ Collaboration with other stakeholders (Mullan et al, 2017).

Table 5
Sharia Cluster

No	Sub-Criteria	Description
1	SB's school of thought	Sharia Board (SB) members may have different schools of thought that influence mutual consent (Chaudhry et al, 2020).
2	Sharia compliance	The product must comply with sharia as well as satisfy all Islamic legal requirements. Failure to fulfill Sharia requirements will lead to negative perceptions (Al-Salem, 2009; Ahmed, 2011; Ahmed, 2014; Laldin and Furqani, 2016; Yumna, 2019; Dinc, 2020; Usman et al, 2020).
3	The uniqueness of Islamic product	Critics on Islamic banking as a replication of conventional banking and only changing the terminology. Islamic banks need to differentiate from the conventional bank as well as innovative products (originality) (Al-Salem, 2009; Laldin and Furqani, 2016; Chaudhry et al, 2020; Dinc, 2020).
4	PD and SB Understanding (Internal dynamics)	Friction may occur caused involvement of various departments in product development. Product Department (PD) may not aware of Sharia aspects while Sharia Boards (SB) may not have a deep understanding of the market (Ahmed, 2011; Chaudhry et al, 2020).

Table 6
Channel Cluster

No	Sub-Criteria	Description
1	Multi-Channel 1	Banks with physical branches may prioritize adopting one of the digital channels (internet banking or mobile banking) which is separately managed (Laukkanen, 2007; Scornavacca and Hoehle, 2007; Hoehle et al, 2012; Laukkanen, 2016; Mishra and Singh, 2015).
2	Multi-Channel 2	Banks with physical branches may conduct channel extension by adopting both digital channels (internet banking and mobile banking) since each channel has its role for the customer and the channels are separately managed (Laukkanen, 2007; Scornavacca and Hoehle, 2007; Hoehle et al, 2012; Laukkanen, 2016; Mishra and Singh, 2015; Verhoef, 2021).
3	Omni Channel	Banks with physical branches adopt both digital channels (internet banking and mobile banking). The channels are integrated to deliver seamless, personalized, consistent, and unified banking services in all channels and enable the customer to switch seamlessly between channels during transaction/interaction (Verhoef et al, 2015; Komulainen and Makkonen, 2018; Hamouda, 2019; Verhoef, 2021).
4	Digital Channel	Banks may choose to be a fully digital company characterized by branchless, superior customer experience, adopting advanced technology (for example, Big Data, AI, and Cloud), and adopting digital channels (internet banking or mobile banking). Banks may adopt both digital channels since each channel has its role

(Schaechter, 2002; Berger, 2003; Choi et al, 2020; Verhoef, 2021).

Table 7
Alternatives of Digital Banking Services Cluster

No	Sub-Criteria	Description
1	Fund Transfers & Payments	Transaction purpose. Money transfers inter-account within the banks, to other banks within the country, and to other banks across the globe (different countries) (Furst et al, 2002; Malhotra and Singh, 2007; Nicoletti, 2014).
2	Accounts Opening	Transaction purpose. Set up new accounts for deposit accounts such as checking and saving accounts, receiving as well as processing financing (loans) applications (Furst et al, 2002; Ahmed, 2011; Yumna and Marta, 2021).
3	Security	Ancillary product for managing the risk. In the context of Islamic finance, it is related to the <i>Takaful</i> (Furst et al, 2002; Tiwari et al, 2006; Nicoletti, 2014).
4	Investment	Transaction (selling and purchasing) related to securities or financial instruments. In the context of Islamic finance, it is related to Islamic securities or Islamic financial instruments (Furst et al, 2002; Tiwari et al, 2006; Ahmed, 2011; Yumna and Marta, 2021).
5	Social/donation	The endowment is an ancillary product for a charity donation. In the context of Islamic finance, it is related to Islamic Social Finance such as <i>zakat</i> or <i>waqf</i> (Ahmed, 2011; Nicoletti, 2014).
6	Beyond banking (Leisure/luxury)	Meeting the customer needs beyond banking transaction/financial transactions such as leisure or managing customer finances. For example, ticket booking, hotel room booking, financial management application, cash flow analysis, and tax calculation for the business customer (Ahmed, 2011; Mariani et al, 2021).

RESULT FINDINGS

The proposed model is built comprehensively following the multi criteria decision model as the decision on prioritizing the services in digital banking involves multiple alternative services and multiple criteria considered in the selection of the services. Several methods that has been used extensively to be utilized in the proposed model for analysis are analytic hierarchy process (ahp) and analytic network process (anp). For example, mishra and singh (2015) used ahp to prioritize the electronic banking services, ali et al (2020) and ascarya and sakti (2022) utilized anp to explore factors influencing financial inclusion and to investigate micro fintech model for microfinance, respectively.

The criteria considered in the selection of digital banking services can be grouped into two categories. First, the general criteria which may be applied to conventional banking and islamic banking, are customer, technology, internal bank, environment and channels. Despite the nature of similarity in general criteria, islamic banking posseses particular issues that need to be addressed in the general criteria. For example, the customer religiousity has been proven to influence the customer decision (jamshidi and husin, 2018; suhartanto et al, 2020), high cost of innovation is an issue of financial innovation in islamic banking (chaudhry et al, 2020), objective of islamic bank that is not only profit maximization (laldin and furqani, 2016), regulation on islamic banking products and services, for example, otoritas jasa keuangan (ojk) regulation no. 24/pojk.03/2015 in indonesia. Secondly, the specific criteria that only be applied to

the islamic bank is sharia aspect due to the nature of islamic bank based on the islamic teachings. Conventional banks that operates based on interest rates certainly have not been involved in these criteria. The presence of sharia in the proposed model characterizes the proposed model utilized for islamic banks.

The alternative services in the proposed model has included the basic and the advance services. According to furst et al (2002), transfer and payment services are basic services offered to the customers while the other services in the proposed model are categorized as advance services that may equip the basic services. Moreover, for islamic banks, all these services should comply with the sharia principles. For example, account opening for saving account based on sharia contracts, takaful for security interest (insurance), zakat and waqf for social interest, and sukuk and islamic securities for investment. Beyond banking services is regarded as non-traditional banking services, for islamic bank such as islamic content and islamic personal finance management. Beyond banking services is considered to be an important services to the market for banks in the next decade that should be added to the forward-looking strategy (marianni et al, 2021).

CONCLUSION

The objective of this study is to propose a model for prioritizing the selection of the digital banking services in islamic banking based on the diffusion of innovation theory, financial innovation, and theory of planned behaviour as well as the literature on digital banking and product development in islamic banking. Document research is applied by analyzing the papers or journals and other published sources related to digital banking (internet banking and mobile banking) and product development in islamic banking to construct the model which consists of criteria, sub-criteria, and the alternatives of banking services. Six criteria are considered in the model and six alternatives to digital banking services are identified to categorize the digital banking services. Most of the studies have taken place in the context of conventional banking, in this study, the proposed model is addressed to the context of islamic banking. One of the distinguishing factor in this study compared to previous studies in digital banking is to identify comprehensively the proposed model by combining the general criteria along with specific islamic banking criteria namely sharia aspect since islamic bank operates the process, products and services based on the sharia principles. Since the proposed model has distinguished for the islamic bank, islamic bank managers or scholars may utilized the model for prioritizing the services in digital banking by islamic bank.

LIMITATION OF THE STUDY

The respondents that evaluated the model in the context of indonesian islamic banking were islamic banking practitioners and experts in indonesian islamic banking. As such, the model is suited to the islamic bank in indonesia. The model may be applied to other islamic banking (outside the indonesian islamic banking) as long as it has similar industry characteristics or by modifying the model suited to the characteristics of the islamic banking industry. It is also necessary to further elaborate the model using other methods to suit other islamic banking industries or to test the model in the application such as using multi-criteria decision making method.

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