

Integrating religiosity into a technology acceptance model for the adoption of mobile payment technology**Kameswara Natakusumah^{a*}, Erna Maulina^a, Anang Muftiadi^a and Margo Purnomo^a**^a*Department of Business Administration, Faculty of Social and Political Sciences, Universitas Padjadjaran, Indonesia***CHRONICLE****ABSTRACT***Article history:*

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This research studies the effects of the religiosity on financial technology (fintech) adoption. The study examines religiosity as part of the Technology Acceptance Model (TAM) dimensions for the adoption of mobile payment technology. We explore the role of religiosity in TAM and recommend several policies for related organizations. The study uses professional sample calculation from 113 traditional markets under Perumda Pasar Jaya as a business entity whose capital is wholly or mostly owned by the regional government through regional assets of DKI Jakarta Province, Indonesia, which use mobile payment technology. We obtained 363 respondents from June 2020 to June 2021, coinciding with the Covid-19 pandemic. Hypothesis testing was done employing SmartPLS 3.2.9 software and questionnaires. The study also adapts previous studies to ensure the questionnaires are relevant to the research objects. The research result show that religiosity explained the formation of TAM by small businesses in traditional markets under Perumda Pasar Jaya Management. Religiosity and the adoption of mobile payment technology determined whether a user used fintech or not. As the research period was limited to June 2020 - June 2021, including field research in the traditional markets, newer TAM mobile payment technology development and other TAM mobile payment-based research were not included. This research offers a new TAM development model using religiosity for mobile payment adoption in traditional markets.

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1. Introduction

Indonesia is encouraging the digitization of payment systems to accelerate digital economic and financial growth. As an initial step, Bank Indonesia (BI) developed the QR Code Indonesia Standard (QRIS). QRIS allows interconnected and interoperability QR-based payment using one standardized QR code. Modern technology increases the efficiency of the financial system and services. Therefore, BI encouraged QR Code transactions in traditional markets. As a response, Bank Rakyat Indonesia (BRI) and Bank Mandiri actively used fintech due to the high potential of the financial transaction system in traditional markets. Based on the description above, we studied the fintech adoption by small businesses in traditional markets managed by Perumda Pasar Jaya of DKI Jakarta Province, Indonesia. The utilization of fintech in traditional markets managed by Perumda Pasar Jaya is seen as an opportunity. Perumda Pasar Jaya manages more than 140 markets and 105,233 business places, in addition to an annual business turnover of up to 150 trillion IDR. Perumda Pasar Jaya traditional markets are visited by more than 2 (two) million visitors (~20% of total DKI Jakarta citizens) daily. Therefore, Perumda Pasar Jaya resources offer an opportunity for a mobile payment system. The utilization of mobile payment systems by small businesses in traditional markets is part of the revitalization program by Perumda Pasar Jaya. Traditional market businesses may use mobile payment to compete with modern stores and prevail in the Covid-19 pandemic. In addition, the traditional market revitalization

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program used a mobile payment system to maintain the existence of traditional markets and increase competitiveness in providing daily necessities for the community (Wijayaa et al., 2021).

Perumda Pasar Jaya's effort to encourage mobile payment technology in the traditional markets encountered both positive and negative responses. Consumers tend to use cash in traditional market transactions. However, cash transactions have several setbacks, such as the unavailability of small changes, fake or damaged money, and cash handling risk. In addition, Perumda Pasar Jaya cannot monitor cash transactions and therefore reduce market management income. Home shopping service connects 88 of 155 markets in DKI Jakarta and provides different shopping services from the marketplace. Consumers can directly contact the merchants listed on Perumda Pasar Jaya's website. The website shows the names of the merchants, phone numbers, merchandise types, and market locations. However, consumers cannot view the products and prices in detail. This system encourages the bargaining process between buyer and seller. In reality, the merchants claim that buyers demand them to buy goods they do not sell. However, marketplace merchants can list their products, descriptions, specifications, and prices. As a result, buyers can only buy products listed on the marketplace website. Technology Acceptance Model (TAM) is one of the theories in information technology utilization. Davis (1989) developed TAM and the thinking framework of behavioral intention on information technology. TAM focused on the user's behavioral intention based on the perceived usefulness and ease of utilizing information technology. TAM is one of many research models influencing the acceptance determinant in information technology study. In this research, information technology refers to financial sector technology such as mobile payment in small business management. The Scopus database showed that the study on mobile payment utilization in small and medium businesses had been conducted since 2004. However, the publication on the subject started in 2008. Therefore, mobile payment utilization in small and medium businesses is a new study that attracted interest from academics and practitioners.

The previous researchers empirically used TAM to predict user acceptance and usage level based on *perceived usefulness* and *perceived ease of use* of information technology. TAM showed that perceived usefulness and ease of use are crucial factors that explain varying user behavioral intentions. According to Davis (1989), user behavioral intention relies on the intention to use information technology. In this research, user behavioral intention referred to the perceived usefulness and perceived ease of use of small businesses in the traditional markets that utilize information technology. However, perceived usefulness and perceived ease of use received criticism since TAM did not fully explain user behavioral intentions on information technology utilization. Therefore, previous researchers needed to find additional factors that could predict information system acceptance. Chuang et al. (2016) and Gefen et al. (2003) added the "trust" variable to TAM theory in the context of information technology usage. Therefore, this research modified TAM using the "trust" variable. The study by Chuang et al. (2016) on "the adoption of fintech service: TAM perspective" aims to determine the influence of fintech adoption using the TAM model. The research result showed that trust, perceived usefulness, and perceived ease of use positively influenced fintech user behavioral intention. Various research used trust, perceived usefulness, and perceived ease of use as independent variables to assess their influence on technology systems. However, previous research showed different findings and did not use the variables simultaneously to assess mobile payment fintech. There were various studies on user behavioral intention on the utilization of technology systems. However, little research assessed user behavioral intention on fintech (mobile payment) using small businesses in Jakarta's traditional market as a research object. The researchers chose small businesses in Jakarta's traditional markets for three reasons: (1) regulatory requirement from Perumda Pasar Jaya, (2) demand for technology development, (3) consumer demand and the Covid-19 pandemic. The small businesses in Jakarta complained about the difficulty of facilitating fintech. In addition, they questioned the fintech implementation from a religious perspective. Based on observation and interview results, merchants refused to use fintech for religious reasons. Therefore, religiosity is crucial in determining fintech implementation by small businesses in the traditional markets. Majelis Ulama Indonesia (MUI) has observed the phenomenon. MUI issued two *fatwa* (Legal ruling on a point of Islamic law given by a qualified jurist in response to a question posed by a private individual, judge, or government) on sharia (Islamic divine law derived from the religious precepts of Islam) electronic money (e-Money) and sharia fintech. *Fatwa* on Sharia e-Money is referred to as *Fatwa* Number 116/DSN-MUI/IX/2017. In addition, the *fatwa* on Sharia-Based Information Technology Financing Service is referred to as *Fatwa* Number 117/DSN-MUI/IX/2018. Both *fatwa* is related to sharia financial institutions and sharia business institution products and services. *Fatwa* on sharia e-money manages the legal relationship between parties involved in e-money transactions. The *fatwa* requires *akad* (*Akad* is derived from the word al-'Aqd which is a verbal noun form of the word 'Aqada which means recorded agreement or contract) between e-money issuers and holders. For example, *akad wadiah* (A pure deposit from one party to another, both individuals and legal entities must be guarded and returned whenever the depositor wants it) or *akad qardh* (Loan funds without compensation, where the borrower returns the loan with the amount and within the agreed period). On the other hand, *akad* between the issuer, e-money implementer, and digital financial service agent is called as *akad ijarah* (Contract of transfer of usufructuary rights to goods or services through payment of rental wages, without being followed by transfer of ownership), *ju'alah* (A promise or commitment to provide certain rewards for achieving specified results from a job), and *wakalah bi al ujah* (The contract of giving power by one person to another person to do something that is legally conditional, the granting of power may be with or without the provision of wages). MUI issued regulations on Information Technology based financial services that adhered to sharia principles. Implementing fintech mobile payment must not contradict sharia principles such as *riba* (additions that are required and received by the lender in return for the borrower's debt), *gharar* (doubts, deception, or actions aimed at harming others), and *haram* (something forbidden and may incur sin). Sharia fintech employs *akads* that adhere to the characteristic of financial services such as *akad mudharabah* (type of cooperation agreement regarding a

business between capital owner and manager) and *musyarakah* (cooperation between two or more parties to achieve a certain goal, in business the goal is to gain profit from a jointly managed business).

Based on the research above the gap, we suggested additional factors in mobile payment adoption, such as religiosity, perceived usefulness, perceived ease of use, and perceived security. Therefore, we assessed the factors mentioned above as part of the TAM dimension. Based on the Scopus database, there is research on mobile payment technology adoption using the religion factor. Usman et al. (2020) researched 'integrating trust, religiosity, and image into technology acceptance model: the case of the Islamic philanthropy in Indonesia'. Muflih (2022) studied 'Muzakki's adoption of mobile service: integrating the roles of technology acceptance model (TAM), perceived trust and religiosity'. The two quantitative studies assessed the religiosity factor in financial technology adoption. Furthermore, there was no research on mobile payment adoption using the TAM perspective by small businesses in traditional markets.

2. Literature review and hypotheses development

2.1 Perceived Usefulness and Mobile Payment Adoption

Davis (1989) defined perceived usefulness as the degree to which a person believes using a particular system would enhance their job performance. The proposition illustrates that individuals' intent to use mobile payment technology is separate from their attitude to technology, as they expect technology to increase their work performance. Previous research results showed that perceived usefulness directly influenced behavioral intention to adopt mobile payment (Kelana et al., 2017; Riskinanto et al., 2017; Sun & Havidz, 2019). In the context of cellular business service, previous research found that perceived usefulness was crucial in determining mobile payment service adoption (Kelana et al., 2017; Riskinanto et al., 2017; Sun & Havidz, 2019; Juwaini et al., 2022). Therefore, we formulated the following hypothesis:

H₁: *Perceived usefulness influences mobile payment adoption.*

2.2 Perceived Ease of Use and Mobile Payment Adoption

Davis (1989) defines perceived ease of use as the degree to which a person believes using a particular system would be free of effort. According to TAM, perceived ease of use influences an individual's attitude toward using a system. Previous research showed that perceived ease of use is the primary tool of e-business, such as online trading (Chen, (2003) and online banking (Guriting & Ndubisi, 2006). Users are concerned about the effort required to use an application and the complexity of the processes involved. Furthermore, users prefer useful and interesting experiences during browsing, information identification, and transaction processes (Chen, 2003). Customers adopt mobile payment when the application is easy to use and operate. Therefore, users easily adopt a technology due to its simplicity and usefulness (Rafdinal & Senalasaki, 2021; Yan & Yang, 2015; Zhou, 2011). We formulated the following hypothesis:

H₂: *Perceived ease of use influences mobile payment adoption.*

2.3 Perceived Security and Mobile Payment Adoption

Salisbury et al. (2001) define perceived security as the extent to which one can securely transmit sensitive information over the web. Threat refers to financial, resource, or network difficulties due to digital breaches such as denial of service, fraud, data destruction, etc. (Kalakota & Whinston, 1997). Consumers consider perceived security as the extent to which they believe their personal information will not be seen, stored, or misused by any party without their consent (Guinaliú, 2006). Perceived security is considered a significant consideration in conducting financial transactions through electronic devices and can be a major barrier to adopting e-commerce activities (Furnell & Karweni, 1999; Singh & Srivastava, 2018). Previous research stated that perceived security influenced mobile payment adoption (Gao et al., 2018; Widyanto et al., 2021; Zhang et al., 2019). Therefore, we formulated the following hypothesis :

H₃: *Perceived security influences mobile payment adoption.*

2.4 Religiosity and Mobile Payment Adoption

The relationship between religiosity and the adoption of mobile payment technology is built on two rationales. The first is the relationship between religion and technology. Technology and religion are seen as two competing things (Singh & Srivastava, 2018). Barlow (1996), Adamu (2002), and Bockover (2003) stated that the internet imposes a value system on its users and is therefore perceived as a potential threat to Muslim society. Adoption of new technology can be perceived as an unnatural and risky process by individuals who are deeply attached to their religion (Sjöberg, 2004; Sjöberg & Winroth, 1986). Fear of technology can be perceived as something that undermines the preservation of religious values and generates community resistance to technology adoption, which relies on religion-based justifications (Cabrera, 2010). However, another view suggests that there is no real conflict. Technology and religion are not contradicting each other (Brooke, 1991). Buddenbaum (2002) suggests that the relationship between religion and adopted technology needs to be considered together to develop and

deepen understanding of the relationship between the two. Armfield & Holbert (2003) and Lewis et al. (2005) studied the implications of religiosity on internet use and showed simultaneous consumption of technology and religious beliefs. Religion is a fundamental motivator at individual and collective levels that influences individual perceptions and attitudes towards new technologies (Armfield et al., 2006). Technology is embedded in social processes to negotiate the formation of personal and societal identities, which have the power to shape human desires and values (Campbell, 2006). Therefore, religion can act as an important motivator in adopting new technologies (Fernback, 2002) and creating forms of religious activity that are not available offline (Krogh & Pillifant, 2004). Dawson et al. (2000) argue that the technological services provided by the internet provide a sound basis for religious communities and encourage individuals to be free from the limitations of time, space, and mobility. The second is the relationship between knowledge and technology adoption. Al-Emran et al. (2020) have found that the knowledge of technology users determines technology acceptance. Roziq et al. (2020) studied TAM development and showed that knowledge determines the adoption of the *zakat* (a certain part of the property / asset that must be issued by every Muslim after achieving specified conditions) management information system. Sa et al. (2018) have found that personal factors determine mobile payment adoption. Based on the two optimistic opinions, we formulated the following hypothesis

H4: *Religiosity influenced mobile payment adoption.*

3. Research method

This research referred to relevant previous research. For example, Chuang et al. (2016) and Davis (1989) explained perceived usefulness, perceived ease of use, and perceived security variables. We developed the religiosity variable using Pace (2014) and mobile payment adoption using Mwanja (2018). Perceived usefulness consisted of *six indicators*: saving on transactions, limited time, limited space, convenience, flexibility in managing a business, and obtaining financial resources (Chuang et al., 2016; Davis, 1989). Perceived ease of use consisted of *five indicators*: easy to access, easy transaction with consumers, easy transaction with suppliers, easy to practice in business, and easy to learn (Chuang et al., 2016; Davis, 1989). Perceived security indicators refer to misused, exploited, researched, accessed, and traded personal financial information (Ryu, 2018). Religiosity consists of *two indicators*: intrinsic religiosity and extrinsic religiosity. We adopted the religiosity variable relevance to the real condition (Pace, 2014). Finally, mobile payment adoption comprises *six indicators*: facilitating supplier transactions, consumer transactions, opportunities to access financial resources, safe transactions, and usability at any time and place (Mwanja, 2018).

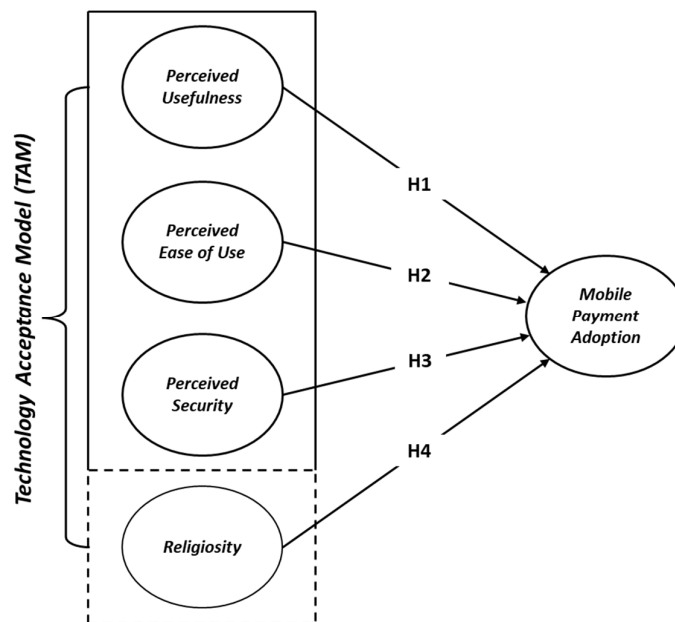


Fig. 1. Research Hypothesis Model

This research used professional sample calculation on 113 traditional markets under DKI Jakarta Province Perumda Pasar Jaya that used mobile payment technology. We obtained 363 respondents from June 2020 until June 2021, coinciding with the pandemic. Hypothesis testing employed SmartPLS 3.2.9 software and questionnaires. We adapted previous research to ensure the questionnaires are relevant to the research objects

4. Findings

Table 1 shows the measuring model, such as Cronbach's Alpha analysis, Composite Reliability (CR), and Average Variance Extracted (AVE). The construct or indicators have fulfilled the minimum value of the measuring model. In this research, the

indicators have AVE > 0.5 and a loading factor > 0.6 (Hair Jr et al., 2014). Therefore, the latent variables and indicators selected in this study are appropriate.

Table 1

Measurement Model

Construct/indicator	α	CR	AVE
<i>Mobile Payment Adoption</i>	0.904	0.926	0.678
<i>Perceived Security</i>	0.888	0.918	0.691
<i>Perceived Ease of Use</i>	0.840	0.893	0.676
<i>Perceived Usefulness</i>	0.890	0.916	0.644
<i>Religiosity</i>	0.906	0.925	0.640

Table 2 shows bootstrapping analysis that measures the relationship between variables and hypothesis analysis with $p < 0.05$ significance. The hypothesis testing result showed that Perceived Usefulness ($t = 2.616$), Perceived Ease of Use ($t = 5.505$), Perceived Security ($t = 2.414$), and Religiosity ($t = 2.401$) were able to predict the intention factor for mobile payment adoption. These findings indicate that all hypotheses are accepted.

Table 2

Structural Estimates Result

Variable	Original Sample	t-Stat	Result
<i>Perceived Security</i> → <i>Mobile Payment Adoption</i>	0.161	2.414	Accepted
<i>Perceived Ease of Use</i> → <i>Mobile Payment Adoption</i>	0.351	5.505	Accepted
<i>Perceived Usefulness</i> → <i>Mobile Payment Adoption</i>	0.173	2.616	Accepted
<i>Religiosity</i> → <i>Mobile Payment Adoption</i>	0.191	2.401	Accepted

5. Discussion

Based on the analysis result, perceived usefulness influenced mobile payment adoption. Limited time, limited space, convenience, flexibility in managing a business, and obtaining financial resources determined the intention of small businesses to adopt mobile payment. Therefore, perceived usefulness influenced small businesses' intention to adopt mobile payment. Bailey et al. (2022) stated that the trust level in an organization and system influenced user intention to use cellular payment. Small businesses adopted fintech due to the technology usefulness factor. The utilization of technology is an opportunity during the Covid-19 pandemic. In addition, technology simplifies financial transactions at small businesses in traditional markets—for example, the need to prepare for small changes in the transaction, the availability of an automatic recording system, and access to financial resources such as a business capital loan. Previous research showed that perceived usefulness directly influenced behavioral intention to use certain online systems (Kelana et al., 2017; Riskianto et al., 2017; Sun & Havidz, 2019). Furthermore, perceived ease of use increased the intention to adopt mobile payment. Perceived ease of use and mobile payment adoption had a significant relationship. Therefore, easy access, easy consumer transactions, easy supplier transactions, easy practice in business, and easy-to-learn indicators affected mobile payment adoption. Rafdinal & Senalasar (2021), Yan & Yang (2015), and Zhou (2011) stated that small businesses considered perceived ease of use before using a mobile payment system. As a result, mobile payment was easy to use and operate, encouraging users to adopt the technology mentioned above and reap the benefit.

Perceived security in fintech adoption relates to safe financial transactions and user information confidentiality. The above factors influenced the intention to adopt mobile payment (Gao et al., 2018; Patel & Patel, 2018; Widyanto et al., 2021). Various research has observed the importance of security and user privacy in mobile payment (Bailey et al., 2022; Giovanis et al., 2012; Patel & Patel, 2018) defined perceived security as the extent of a person's trust in the safety of internet usage. Due to security violations such as personal data leaks and account breaches, however, small businesses need to consider security factors before adopting new technology. This research suggested that perceived credibility could better predict and explain the behavioral intention to adopt mobile payment. Based on the research results, religiosity influenced small businesses' intention to adopt mobile payment. Small businesses adopted mobile payment that adhered to religious teaching, value, and sharia economic principle. Previous research stated that religiosity and fear of sinful acts determine community intention to use mobile zakat services (Muflih, 2022; Suhartanto et al., 2019; Usman et al., 2020). For this reason, the religiosity factor can be an important motivator in adopting new technology (Fernback, 2002) and creating forms of religious activity that are not available offline (Krogh & Pillifant, 2004). Dawson et al. (2000) argue that technology services provide a sound basis for religious communities and encourage individuals to be free from time, space, and mobility limitations.

6. Conclusion and suggestion

The empirical finding of this research provided a new perspective on TAM. This research studied the influence of religiosity on fintech usage. We suggested religiosity as part of the concepts forming TAM. This research found that fintech has its

advantages for small businesses in traditional markets. For example, small businesses tend not to record financial transactions; now, the mobile payment system allows small businesses to record transactions automatically. Religiosity and mobile payment adoption are crucial factors determining a user's use of fintech. Therefore, the research hypothesis is accepted. Furthermore, small businesses in the traditional markets used the religiosity factor to consider using mobile payment. Therefore, sharia fintech products may develop in the future because small businesses are eager to adopt mobile payment.

7. Research limitation

The research encountered difficulty during sample collection. The research sample was 113 traditional markets managed by Perumda Pasar Jaya, DKI Jakarta Province, Indonesia. The sample used mobile payment technology and was willing to become a respondent to fill the questionnaire. However, the data collection was constrained due to the Covid-19 pandemic from June 2020 to June 2021.

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