

-RESEARCH ARTICLE-

CYBERSECURITY AWARENESS AND DIGITAL BANKING ADOPTION: EXPLORING THE MODERATING IMPACT OF DIGITAL LITERACY

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—Abstract—

Fintech adoption in digital banking is important for enhancing efficiency, security, and customer experience. Therefore, the study empirically investigated the influence of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital banking. The role of digital literacy as a moderator was also tested. Quantitative data through a self-administered questionnaire was collected from 390 Fintech banking users. A cross-sectional research design is used in data collection employing a convenient sampling technique. Both SPSS and Smart PLS software were used to test the study hypothesis. The PLS-SEM findings indicate cyber security awareness, personal innovativeness, facilitating conditions, and access to finance have positive and significant impacts on digital payment trust. Further trust also positively and significantly influences digital banking adoption in fintech. Digital literacy also significantly moderated cyber security awareness, personal innovativeness, facilitating conditions, access to finance, and trust. The findings contribute to the literature by establishing a framework that links cyber security awareness, personal innovativeness, facilitating conditions, and access to finance as critical factors influencing digital banking trust in digital finance contexts. Practical implications indicate that practitioners and policymakers should focus on enhancing cyber security awareness and

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facilitating conditions to build trust in digital banking systems because these factors significantly influence to user adoption and could lead to increased financial inclusion and efficiency in fintech services. This study uniquely highlights the moderating effect of digital literacy on the relationship of cyber security awareness, personal innovativeness, facilitating conditions, access to finance, and trust which is providing new insights into the dynamics of fintech adoption.

Keywords: Digital literacy, Cyber security, Personal innovativeness, Fintech

INTRODUCTION

Fintech adoption is the digital banking that integrates innovative financial technologies, especially in digital payment which enables users to conduct their financial transactions more efficiently (Frost, 2020). Generally, fintech adoptions can increase financial inclusion which leads to enhanced economic growth (Hasan et al., 2024). Specifically, fintech companies provides a better way of delivering financial services through digital payment methods as compared to traditional methods (Chan et al., 2022). This is the reason, fintech adoption in digital banking is facilitating individuals to manage their finances in an efficient way which helps to increase economic growth (Jafri et al., 2024). In this regard, it could be explained that the adoption of fintech could lead to increased efficiency and reduced costs in financial transactions which is benefiting both consumers and service providers (Aloulou et al., 2024). Contrary, without the adoption of innovative financial technologies, traditional financial institutions may struggle to compete in an increasingly digital economy which could lead to inefficiency in the financial sector (Saadah & Setiawan, 2024). To remove these consequences, fintech adoption is important to enhance digital banking methods (Kumar & Rani, 2024). Therefore, the importance of digital banking methods in fintech adoption cannot be ignored.

Various factors could increase fintech adoption but customer trust is one of the integral factor in assuring the safety of users and digital banking methods (Jafri et al., 2024). Prior literature has shown that to raise the trust of customers, transaction security is an important part of increasing fintech adoption (Kumar & Rani, 2024). This is the reason, cyber security awareness is integral in enhancing the trust of any individual in digital banking through minimizing their risk (Olaiya et al., 2024). This could only be possible when the customers are educated about the risks like data breaches, and then they are more likely to engage with digital banking platforms confidently (Chaudhary et al., 2024). This awareness not only helps to protect sensitive financial information but also reinforces the credibility of fintech companies in prioritizing their security measures (Idayani et al., 2024). In this regard, through increasing implementation of cybersecurity protocols, fintech firms could increase their trust through securing the data of their customers which could encourage the attention of individuals toward

digital banking methods (Karangara & Manta, 2024). Exploring the significance of cyber security awareness for trust, the study explored the influence of cyber security on digital banking adoption through customer trust.

With the significance of cyber security awareness, personal innovativeness also played an integral part in increasing customers' trust to increase fintech adoption (Roh et al., 2024). Traditionally, when customers increase the culture of innovative digital technologies then they are more likely to be familiar with their functionalities and security features which increases their confidence toward fintech adoption (Karangara & Manta, 2024). On the other hand, facilitating conditions creates opportunities for individuals to engage in new behaviors and technologies (Lu et al., 2005). In fintech, these conditions include access to technology that leads to an increase the trust in increasing digital banking methods (Patnasingam et al., 2005). Equally, access to finance is also important in improving customer trust in digital payments (Okat et al., 2024). When individuals have greater access to financial services, they are more likely to explore and adopt fintech solutions that meet their needs to meet their financial well-being (Bollaert et al., 2021). Concurrently, it is also identified that companies facilitating access to finance increase the trust of any individual toward digital banking methods (Roh et al., 2024). Seeking the significance of these variables, the study explored the influence of personal innovation, facilitating conditions, and access to finance on fintech adoption through increasing customer trust among fintech users.

Different empirical studies have been explored on personal innovativeness, facilitating conditions, access to finance, and customer trust but these studies still have various gaps. Firstly, prior research was conducted on cyber security awareness, personal innovativeness, and fintech adoption while ignoring facilitating conditions and access to finance (Afzal et al., 2024). Another study explored access to finance Gafoor and Amilan (2024) while ignoring others. Therefore, this study contributed to testing the impact of cyber security awareness, personal innovativeness, facilitating conditions, and access to finance on fintech adoption. Secondly, most of the prior studies have been conducted on direct effects while ignoring indirect path analysis (Kumar & Rani, 2024; Mothobi & Kebotsamang, 2024; Setiawan et al., 2021). Therefore, this study was conducted to test the impact of fintech adoption through the indirect path of digital banking trust. Thirdly, extant studies have inconsistent findings (Kumar & Rani, 2024; Olaiya et al., 2024). These inconsistent findings enforced that there is a need for moderating variables (Chmura Kraemer et al., 2008). Therefore, this study contributed to digital literacy as a moderating variable. Digital literacy enhances fintech adoption by equipping users with the skills to access, understand, and utilize digital financial services effectively (Islam & Khan, 2024). As individuals become more proficient in navigating fintech platforms when their confidence and willingness to engage with these technologies could lead to greater adoption rates (Taufiq et al., 2022).

To address previous gaps, the study empirically investigated the influence of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital banking. The role of digital literacy as a moderator was also tested. The study objective practically contributed to the identification of key factors cybersecurity awareness, facilitating conditions, personal innovativeness, and access to finance which provides actionable insights for fintech companies and policymakers. Methodologically, the study advances the literature by incorporating digital literacy as a moderating variable which offers a strong understanding of how users' competencies influence the relationship between trust and fintech adoption. This comprehensive approach enables a stronger framework for analyzing user behavior in the rapidly evolving fintech business. The rest of the paper was divided into four chapter's literature review, research methods, data analysis, and results, discussion, and implications.

LITERATURE REVIEW

Theoretical Framework

Analyzing financial technology in digital banking requires applying theories related to technology adoption. Various theories have been developed in the extant literature namely the technology acceptance model (TAM), its extended version (TAM2), the unified theory of acceptance and use of technology (UTAUT), the diffusion of innovation (DOI) theory, financial inclusion theory (Afzal et al., 2024). The UTAUT is a model that is used in comprehending the individual intentions towards the adoption of fintech (Venkatesh et al., 2003). The extant study also used the UTAUT in the fintech adoption (Zakria et al., 2024). Therefore, UTAUT has been used in facilitating conditions which is emphasize individuals' perceptions of the availability of necessary technological infrastructure to support the technology (Tian et al., 2024).

On the other hand, DOI shows how the social community becomes aware of various innovations by employing specific channels. The personal innovativeness channel is comprised of DOI which shows that individuals are willing to increase their attentions towards innovations except for traditional systems (Tian et al., 2024). Previous studies have effectively utilized these constructs to identify the antecedents of technology adoption across various fields (Tian et al., 2024). Furthermore, access to finance is also important to increase customer trust through enhancing digital payments (Okat et al., 2024). It has been found that when customers have more access to their financial resources then it increases the financial services that could lead to improved fintech adoption (Bollaert et al., 2021) which is supported by financial inclusion theory (Okat et al., 2024). Digital literacy enhances fintech adoption by equipping users with the skills to access, understand, and utilize digital financial services effectively (Islam & Khan, 2024). As individuals become more proficient in navigating fintech platforms, their confidence and willingness to engage with these technologies increase, leading to

greater adoption rates (Taufiq et al., 2022). Therefore, this study contributed to digital literacy as a moderating variable under the theory of the TAM model. The study aimed to test the impact of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital payments. The study also tested the moderating effect of digital literacy. The above variables are predicted in Figure 1 below.

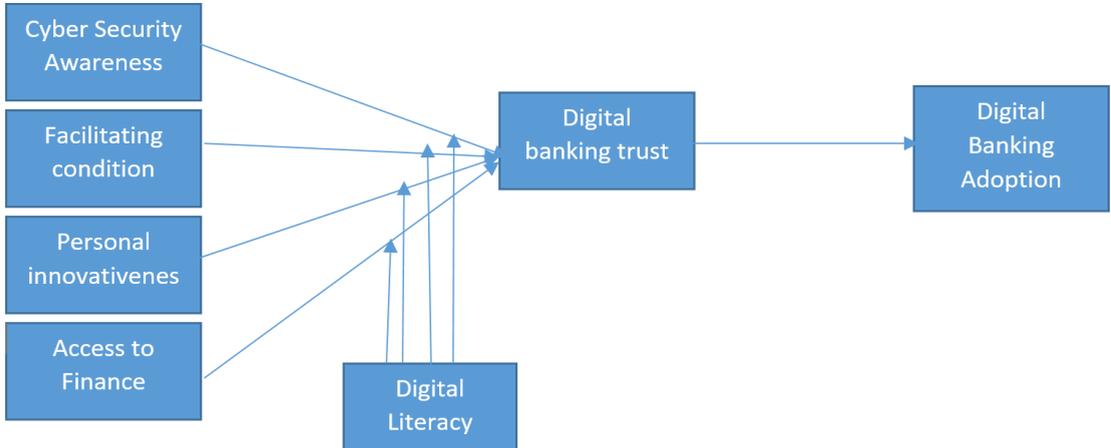


Figure 1: Conceptual Framework

Empirical Studies and Hypothesis Development

Cybersecurity awareness and Digital Banking Trust

Cybersecurity consists of various technologies that are designed to protect networks and devices from the access of unauthorized attacks (Xie et al., 2010). Within the context of financial technologies, it consists of measuring the technologies that help to safe sensitive information which increases the attention of individuals toward more financial technologies (Roy et al., 2010). This is the reason, the significance of Cybersecurity in the fintech adoption could not be ignored because consumers concerned are more likely to save their personal and financial data (Familoni & Shoetan, 2024). A lack of strong cybersecurity measures could lead to diminished trust in adopting fintech solutions (Popoola et al., 2024). Furthermore, effective cybersecurity practices not only protect users but also enhance the overall reputation and reliability of fintech services which helps to increase a more secure digital financial ecosystem (Afzal et al., 2024). Cybersecurity awareness is also important in increasing the trust and confidence among users in the fintech sector (Afzal et al., 2024; Akor et al., 2024). Moreover, the integration of strong cybersecurity measures is also essential for fintech companies to comply with regulatory requirements and industry standards. As fintech firms often operate in a less regulated environment compared to traditional banks, they may underestimate the importance of comprehensive security protocols (Akor et al., 2024). However, establishing a cybersecurity awareness mitigates risks which helps

enhance customer trust (Mittal, 2024). Another study also found that when the cybersecurity of the transaction is increased then the trust of the customer also increased (Misas et al., 2022). In this regard, the proposed hypothesis is below,

H1: *Cybersecurity awareness significantly influences to digital banking trust.*

Facilitating conditions and Digital Banking Trust

Facilitating conditions creates opportunities for individuals to engage in new behaviors and technologies (Lu et al., 2005). In fintech, these conditions include access to technology, availability of finances, intuitive interfaces, and infrastructure (Okat et al., 2024). Potential users' adoption of fintech greatly depends on feeling enabled and skilled by factors outside their immediate control (Miraz et al., 2022). On the other side, it has been observed that providing ease of use towards financial technology leads to fintech adoption. Therefore, facilitating conditions remain a major area of concern in research in the extant literature (Ratnasingam, 2004). A significant influence of facilitating conditions has been found on customer trust to increase fintech adoption (Miraz et al., 2022). They also concluded that as the facilitations related to any technology are increased, it leads to improving the intentions of any individual towards the digital technology (Miraz et al., 2022). In a similar vein, Al Shamsi et al. (2022) also found that the presence of educational materials and customer support positively impacted the way customers perceived fintech offerings by improving trust. They also argued that further research could be explored on other developing countries to increase the generalizability of study. In this regard, the proposed hypothesis is below,

H2: *Facilitating conditions significantly influence digital banking trust.*

Personal Innovativeness and Digital Banking Trust

Personal innovativeness is posited by adopting different innovations which is being categorized through experimentation of various innovations (Senali et al., 2023). In the context of fintech, personal innovativeness enhances the culture of trust of any individual who is more likely to be open in adopting new technologies in engaging more readily with financial innovations (Wirani & Ibrahim, 2022). This is significant in the fintech companies because it leads to an increase in the adoption of new methods in the management of their finances that is only possible when their trust level is increased (Hapsari et al., 2023). Individuals with high personal innovativeness tend to perceive fintech as beneficial, which not only encourages their adoption of these technologies but also increases greater sense of trust in their functionality and reliability (Hapsari et al., 2023). Wirani and Ibrahim (2022) conducted a study and found that individuals with higher levels of personal innovativeness were more likely to increase their trust level which could lead to an increase the fintech adoption. In the same vein, Senali et al. (2023) further demonstrated that personal innovativeness positively influenced users'

trust toward adopting online banking services. They also further concluded that when the user's trust is increased then their intentions towards fintech services also increase. [Hapsari et al. \(2023\)](#) further study also found that personal innovativeness significantly enhanced trust. They also found that innovations increase the confidence towards any technology and increase the acceptability of innovation-adopting companies. These previous studies emphasized that personal innovativeness is an important component of increasing the customer's trust in adopting digital payments. In this regard, the proposed hypothesis is below,

H3: *Personal innovativeness significantly influences digital banking trust.*

Access to Finance and Digital Banking Trust

Access to finance consisted of providing a financial resources to the business or any individual that is important in economic growth ([Van der Cruijssen et al., 2021](#)). When the access to finance for any individual or any companies is increased from any financial institutions to enhance their business operations then their trust towards financial institutions also increased ([Bollaert et al., 2021](#)). When access to finance is increase then their intention towards fintech adoption also increased through building a reliability, transparency, and security of these institutions ([Charfeddine et al., 2024](#)). When individuals trust financial institutions then they are more likely to seek out and utilize financial products which lead to improved trust ([Charfeddine et al., 2024](#)). Conversely, a lack of accessing financial resources could minimize their trust in the financial production ([Chen et al., 2024](#)). To overcome this consequence, [Waller et al. \(2024\)](#) further found that improved access to finance significantly enhanced trust in financial institutions. They also argued that further research could be explored in countries where fintech adoption is in the early stages. To address this limited, [Amnas et al. \(2024\)](#) further conducted on low fintech adoption institutions and they argued that to better access to financial services increases the higher levels of trust in banks which could increase digital payments. These previous studies emphasized that access to finance is an important factor in increasing the customer's trust in digital payment methods. In this regard, the proposed hypothesis is below,

H4: *Access to finance significantly influences digital banking trust.*

The Moderating effect of Digital Literacy

Previous studies have shown the relationship among facilitating conditions, personal innovativeness, cybersecurity awareness, and fintech adoption. This shows that there is a need for moderating variables because extant studies relationships are not clear. Digital literacy consists of effectively providing information related to digital technologies ([Kumar & Rani, 2024](#)). In the fintech adoption context, the digital platform comprises the skills of any individual through developing skills related to financial

applications and evaluating the credibility of digital financial services (Amnas et al., 2024). This ability not only increases the intentions toward fintech but also increases the empowerment intention which enables to any individual to take control of their well-being in their digital platform (Raisah & Rahagi, 2024). Extant studies have found that the relationship between digital literacy and cyber security is important because they collectively increase the intention of any individual toward fintech adoption (Raisah & Rahagi, 2024). Individuals with higher digital literacy are more likely to have more importance in measuring cybersecurity like two-factor authentication and secure password practices, which are essential for protecting sensitive financial information (Amnas et al., 2024). Accordingly, digital literacy increases the culture of cybersecurity which leads to an increase the customer trust to increase fintech adoption (Raisah & Rahagi, 2024).

In other words, digital literacy also increases the effect of personal innovativeness on the trust to increase fintech adoption (Alkhwaldi, 2024). Customers who have more literacy related to any technology then they are more able to create confidence in the adoption of financial technology. Digital literacy increases the culture of innovations that leads to the trust of individuals towards any technology. Equally, digital literacy leads to an increase in the easiness of technology like access to technology and user-friendly interfaces which increase trust in the products. When users are digitally literate, they are more likely to leverage available resources and support systems leading to a greater likelihood of adopting fintech solutions (Amnas et al., 2024). Thus, digital literacy not only enhances personal innovativeness but also ensures that it effectively contributes to a more strong and inclusive digital financial ecosystem (Kumar & Rani, 2024). In the same vein, digital literacy also helps to increase access to finance by providing individuals with the skills and knowledge which is needed to effectively use the financial services that could increase their confidence in these technologies (Amnas et al., 2024). When the access to finance in any financial institution is increased to adopt the technology then their product effectiveness also increases because customer trust is built about that product (Patnasingam et al., 2005). Through digital literacy, individuals could manage their funds which leads towards greater engagement and adoption of financial products (Raisah & Rahagi, 2024). Based on importance of digital literacy, current study has used the digital literacy as a moderating variable, and proposed the following hypothesis below,

H5: *Cybersecurity awareness significantly influences digital banking trust with a moderating effect on digital literacy.*

H6: *Facilitating conditions significantly influence digital banking trust with a moderating effect on digital literacy.*

H7: *Personal innovativeness significantly influences digital banking trust with a moderating effect on digital literacy.*

H8: *Access to finance significantly influences digital banking trust with a moderating*

effect on digital literacy.

Digital Banking Trust and Fintech Adoption

Trust consists of an entity's beliefs, integrity, and competencies, which could be an individual, organization, or technology firm (Jafri et al., 2024). In the context of fintech adoption, trust is an important factor that is important to affects the user's willingness to engage in digital financial services (Roh et al., 2024). Han et al. (2024) findings showed, trust in online platforms is increasing in digital banking. Appiah and Agblewornu (2025) further also found that the perceived trustworthiness of fintech providers impacts the users' attitudes toward adopting mobile banking applications. Furthermore, Balaskas et al. (2024) also revealed that trust affects the initial adoption of fintech services and they also suggest that if companies successfully can build trust they can get a competitive advantage in fintech services. In other empirical, trust has a significant impact on fintech adoption has been found by (ur Rahman et al., 2024). They also concluded that further research could be explored on other countries that could increase digital payment adoption in their countries. These previous studies emphasized that trust is integral to increasing fintech adoption in digital payments. In this regard, the proposed hypothesis is below,

H9: *Digital banking trust significantly influences fintech adoption.*

Research Approach and Design

The study empirically investigated the influence of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital payments. The role of digital literacy as a moderating variable was also tested. We have used the quantitative deductive approach for data collection to test the hypothesis of the research. Quantitative research offers objective measurements and statistical analysis, allowing for identifying patterns and relationships. This approach allows researchers to increase the scope of their findings from a sample to a larger population (Borgstede & Scholz, 2021). In another sense, a cross-sectional research approach was employed. This design in social science research is considered efficient and cost-effective, catching a snapshot of data at a single time. Furthermore, it expedites the simultaneous investigation of multiple variables making it valuable for investigating prevalence and association (Davis, 1989). Consequently, this research employed a cross-sectional research design to examine the hypothesis of the study.

Survey questionnaire design

To assess the conceptual model, an organized survey instrument was designed and administered to digital banking users. The questionnaire comprised two segments: the

first section gathered demographic data which consisted of gender, age, working experience, salary in dollars, and qualification. The second section focused on the study's constructs. The survey instrument was adapted from prior literature where it was already used. Cybersecurity awareness comprises 4 items (Afzal et al., 2024). Facilitating conditions were also measured through 4 items (Afzal et al., 2024). Personal innovativeness is also comprised of 4 items. Trust is also comprised of 4 items (Afzal et al., 2024). The digital payment method which is conceptualized under the fintech adoption comprises 4 items (Musyaffi et al., 2024). Digital literacy is also comprised of 4 items (Mei, 2024). Lastly, access to finance also comprises four items (Doumi et al., 2024). Each questionnaire item was rated using a five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree".

Sampling and Pilot Testing

The study population was users of digital banking which were selected employing the convenient sampling technique. The study sample size was 500 users of digital banking. A total of 410 questionnaires were returned back and among those 390 were valid for the study's further analysis (Table 1).

Table 1: Research Material and Methods

Steps	Details
Instrument Development	- Extensive literature review and pre-testing
	- Development of a structured questionnaire
	- Scale: 5-point Likert scale
Sample & Data Collection	- Sample Size: 500
	- Frame: digital payment users
	- Response Rate: 78.17%
Data Analysis	- Descriptive Statistics and Correlation (SPSS)
	- Measurement Model and Structural Model: PLS-SEM (SmartPLS)

Source: Author's Illustration

As the study instrument was adapted from the prior literature which shows that content analysis is ensured. The next step is to test the questionnaire through pre-testing. In the pre-testing process, several modifications were implemented, including the removal of certain double-barreled questions, leading to a more streamlined and user-friendly questionnaire. The pilot survey's reliability assessments confirmed that instrument met the required threshold limits which is validating the effectiveness of the pre-testing process. However, to maintain the integrity of the final analysis, pilot test results were excluded in the main analysis on full sample size. After pre-testing process, a questionnaire was then used for the pilot testing. For the pilot testing, a questionnaire was distributed to 45 respondents and the whole questionnaire's alpha value was greater than 0.70 which shows that the construct is valid for further analysis (Wadood et al., 2021).

ANALYSIS AND RESULTS

This section represents respondent's demographic characteristics and hypothesis results. The demographic profile was found through the SPSS software. Tested hypothesis through "Partial Least Square (PLS)-Structural Equation Modeling (SEM)" in the Smart PLS 4.

Demographic Analysis

Table 2 predicted results show the demographic analysis 390 where the questionnaire was returned from 410. Among the respondents, gender distribution indicates a slight male majority which is 53.8% and 46.2% female. Age-wise, the majority of respondents come in the 25-34 (38.5%) years category, followed by the 18-24 years group (30.8%), suggesting that younger adults are more engaged with payment banking services. In the working experience, 38.5% of respondents have 3 years of experience, while 20.5% have less than a year, indicating a relatively new user base in the payment banking sector. Regarding educational qualifications, (56.4%) have a bachelor's degree, (23.1%) have a Master's degree which is reflecting a well-educated demographic that is likely to be more receptive to adopting fintech solutions. Above discussed results are depicted in Table 1.

Table 2: Demographic Analysis

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	210	53.8
	Female	180	46.2
Age	18-24 years	120	30.8
	25-34 years	150	38.5
	35-44 years	70	17.9
	45 years and above	50	12.8
Working Experience	Less than 1 year	80	20.5
	1-3 years	150	38.5
	4-6 years	90	23.1
	More than 6 years	70	17.9
Qualification	High School	60	15.4
	Bachelor's Degree	220	56.4
	Master's Degree	90	23.1
	Doctorate	20	5.1

Assessment of Measurement Model

For the construct validity, two criteria are important convergent and discriminant. Regarding discriminant validity, the constructs' correlation remained under 0.85 that is confirming the discriminant validity of the construct. Meanwhile, convergent validity

is present, indicating that the two constructs maintain a positive correlation (Wadood et al., 2021). This aspect is important for construct validity which is ensuring that a group of items accurately reflects the underlying construct (Wadood et al., 2021). To determine convergent validity, multiple criteria are commonly examined, including “Cronbach’s Alpha, factor loadings, average variance extracted (AVE), and composite reliability (CR)”. Alpha evaluates the internal consistency of a group of items with a minimum threshold of 0.70 or higher considered adequate, signifying that the items consistently measure the same construct (Amirrudin et al., 2021). Additionally, factor loading values measure the strength of the association between each item and the underlying construct, with a cutoff of 0.50 or more (Haji-Othman & Yusuff, 2022). Furthermore, AVE evaluates the variance captured by a construct against measurement error, with a minimum threshold of 0.50 indicating that the construct explains at least 50% variance in the construct (dos Santos & Cirillo, 2023). Composite reliability (CR) assesses the overall reliability of a set of construct items and is similar to Alpha but often considered stronger, as it accounts for the varying loadings of items. A minimum threshold of 0.70 or more is generally recommended, confirming that the items together form a reliable measure of the construct (Schuberth, 2021). The findings are illustrated in Table 3 and Figure 2 below.

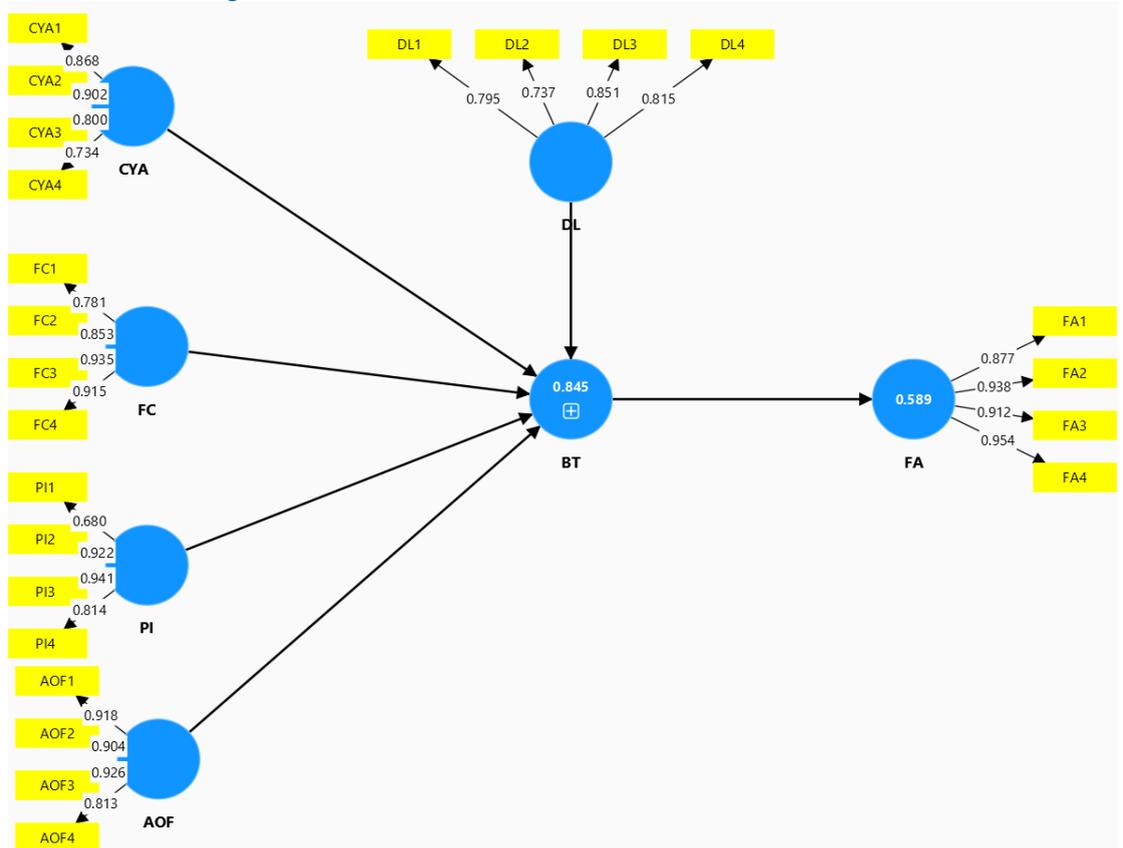


Figure 2: Factor Loadings

Table 3: Convergent Validity

Construct	Codings	Alpha	CR	AVE
Cybersecurity Awareness	CYA	0.871	0.931	0.752
Facilitating Conditions	FC	0.853	0.883	0.734
Personal Innovativeness	PI	0.822	0.854	0.684
Access to Finance	AOF	0.832	0.832	0.652
Banking Trust	BT	0.883	0.914	0.783
Digital Literacy	DL	0.842	0.873	0.724
Fintech Adoption	FA	0.863	0.892	0.742

Hypothesis Results

The next step is hypothesis testing by employing a structural model (Figure 3). 5000 resampling techniques were employed to test the study hypothesis. Structural Model results show the “positive significant” effect of various factors on banking trust and fintech adoption among users. For instance, H1 demonstrates a positive significant impact of cybersecurity awareness on banking trust ($\beta = 0.612$, $t = 5.22$). Similarly, H2 shows that facilitating conditions positively impact banking trust ($\beta = 0.552$, $t = 4.82$). Furthermore, H3 reveals a positive significant impact of personal innovativeness on banking trust ($\beta = 0.521$, $t = 4.22$). Additionally, H4 indicates that access to finance has a positive significant impact on banking trust ($\beta = 0.412$, $t = 3.53$). The results also specified the positive significant impacts of cybersecurity awareness and facilitating conditions on banking trust with the moderating effect of digital literacy. H5 shows that cybersecurity awareness positively influences banking trust ($\beta = 0.452$, $t = 3.83$), while H6 reinforces the positive significant impact of facilitating conditions ($\beta = 0.552$, $t = 4.83$). Moreover, H7 indicates that personal innovativeness continues to have a significant influence on banking trust ($\beta = 0.521$, $t = 4.23$). H8 further supports the notion that access to finance positively influences banking trust ($\beta = 0.432$, $t = 3.54$). Finally, H9 reveals a strong positive significant impact of banking trust on fintech adoption ($\beta = 0.723$, $t = 6.01$). The above results are presented in Table 4 below.

Table 4: Hypothesis Testing

Hypothesis	Path Coefficient	t-Value	p-Value	Result
CYA→BT	0.612	5.22	0.000	Supported
FA→BT	0.552	4.82	0.000	Supported
PI→BT	0.521	4.22	0.000	Supported
AOF→BTA	0.412	3.53	0.001	Supported
CYA*DL→BT	0.452	3.83	0.000	Supported
FA*DL→BT	0.552	4.83	0.000	Supported
PI*DL→BT	0.521	4.23	0.000	Supported
AOF*DL→BT	0.432	3.54	0.001	Supported
BT→BT	0.723	6.01	0.000	Supported

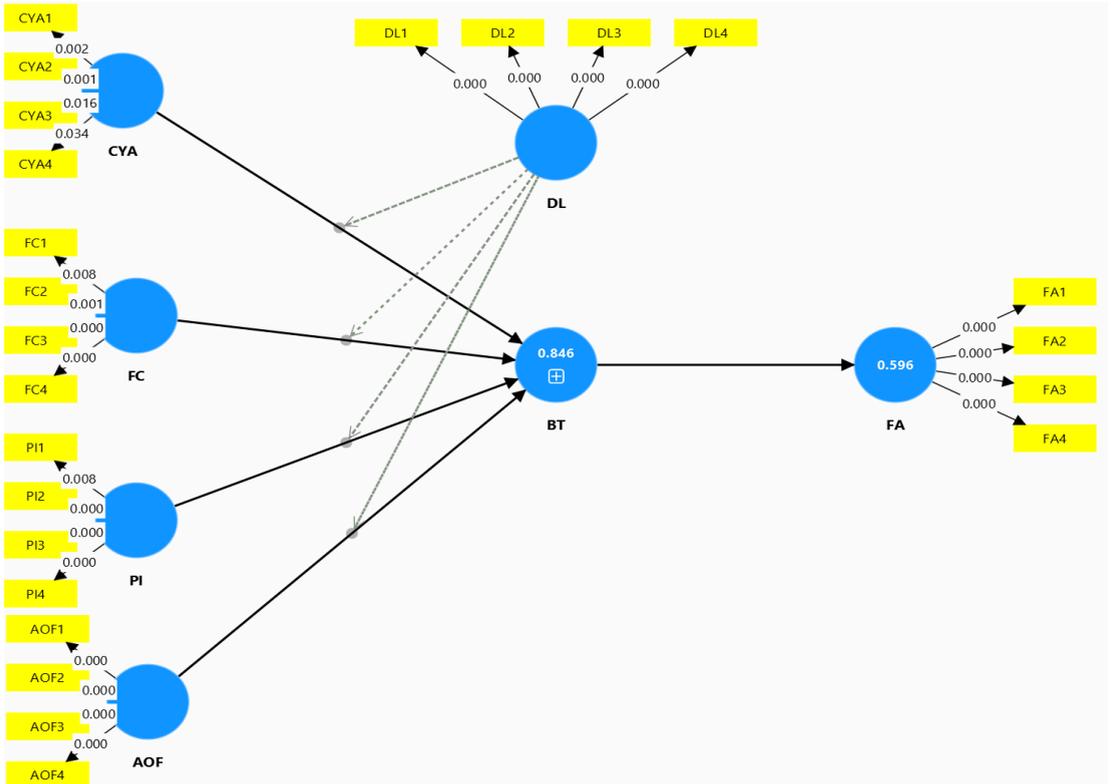


Figure 3: R Square Values

DISCUSSION

The study empirically investigated the influence of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital payments. The role of digital literacy as a moderator was also tested. Depicted results indicated that cybersecurity awareness positively and significantly affects the banking trust. The results of positive influence have been supported by the extant literature that emphasizes the importance of cybersecurity in raising trust in digital financial services (Afzal et al., 2024). De Kimpe et al. (2022) also supported the view where they indicated that users who are well-informed about cybersecurity risks and protective measures are more likely to engage with fintech platforms confidently. These findings emphasize that companies should invest in comprehensive cybersecurity awareness programs that educate users about potential threats and the measures in place to protect their data. By enhancing users' understanding of cybersecurity, fintech firms can build a more secure environment that fosters trust and encourages adoption.

Further findings show that facilitating conditions also significantly impact digital banking trust. The result supports the Technology Acceptance Model (TAM) which

indicates that facilitating condition is a critical determinant of technology adoption (Davis, 1989). The results are in line with the following studies Wirani and Ibrahim (2022), where they also supported this notion, indicating that when users perceive that the necessary conditions for using fintech services are in place, their trust in these platforms increases. Therefore, fintech companies should prioritize creating supportive environments that enhance user experience and facilitate seamless interactions with their services which could increase the company's acceptance in the international market.

Additionally, findings highlight the positive significant influence of personal innovativeness on the banking trust which shows the significance of user characteristics in the adoption of fintech solutions. Therefore, study findings could be supported by the results of Wirani and Ibrahim (2022) who also showed that companies' innovations significantly increase the culture of creativity which increases the adoption of the latest technologies. Generally, by raising innovative culture and encouraging users to explore new fintech solutions, companies could enhance user trust and drive adoption. This could be enhanced through targeted marketing strategies that highlight the benefits of innovative financial technologies and showcase user testimonials to build credibility. It is recommended that businesses develop a well-defined innovation strategy to build customer trust, which will increase the adoption of digital payment solutions.

The study further also highlighted a positive significant impact of access to finance in influencing the banking trust. This shows that when the access to finance to any individual is increased the digital payment also increased. These findings are specifically important in the financial inclusion context because many individuals in traditional financial services might face barriers in their transactions. The results are in line with the study of Charfeddine et al. (2024), where they indicated that access to finance can significantly enhance access to financial services for low-income individuals which helps in increasing their trust in these platforms. These findings highlight that ensuring access to finance for individuals is designed to be inclusive and accessible where companies can increase trust among users who may have previously felt marginalized by traditional banking systems. This approach not only enhances user trust but also contributes to broader economic empowerment and financial inclusion. In other words, banking trust also positively and significantly increases the trust of digital banking users. These results emphasize the central role of increasing trust which plays an integral role in the decision-making process of fintech users. This finding is consistent with previous studies that have established trust as a critical determinant of technology adoption in the financial sector (Meyliana & Fernando, 2019). Jafri et al. (2024) These studies also argued that when users trust fintech platforms, they are more likely to engage with these services which leads to increased adoption rates and improved financial outcomes. Therefore, fintech companies must prioritize building and maintaining trust through transparent practices, strong security measures, and

responsive customer service. By doing so, they could be able to create a positive feedback loop where increased trust leads to higher adoption rates.

Digital literacy moderating effect highlights the significant role in the relationship of cybersecurity awareness, personal innovativeness, and facilitating conditions in shaping user trust in fintech services for digital payment. In the moderating effect, results indicate that cybersecurity awareness not only increases trust directly but also increases through moderating effect. Users who are well-informed about cybersecurity measures are more likely to engage with fintech platforms, and this relationship is strengthened when users exhibit a higher degree of personal innovativeness, suggesting that openness to new technologies fosters greater trust. Digital literacy also positively and significantly moderates the relationship between personal innovativeness and trust. These results show that when the digital literacy of individuals increases then the innovations among the individuals also increase which leads to improved digital payments. This relationship emphasizes the significance of a strong approach for fintech companies which is emphasizing the need to simultaneously promote cybersecurity education, encourage innovative mindsets, and ensure supportive environments to build trust and drive adoption among users.

Lastly, access to finance and trust relationships is also positively and significantly moderated by digital literacy. These findings indicate that digital literacy is playing a significant part in improving the relationship between access to finance and trust, as it empowers individuals to navigate financial technologies confidently and understand their functionalities. Therefore, it is argued that by improving users' knowledge and skills, digital literacy increases greater trust in financial services could lead to increased access to finance and promote fintech adoption. As the digital literacy moderating effect was tested for the first time in the study variables, therefore direct studies could not be supported. [Krisnaresanti et al. \(2024\)](#) and [Lu and Khan \(2024\)](#) studies have been conducted and found a significant digital literacy moderating influence. Thus, based on the above it is argued that digital literacy is a moderating variable in fintech adoption and trust which is influencing how users perceive and engage with financial technologies. Its strength lies in enhancing users' confidence and understanding, which in turn increases trust and encourages broader adoption of fintech services.

IMPLICATIONS

This study's findings make a valuable contribution to the theoretical understanding of fintech adoption by introducing a first-time moderating role of digital literacy among fintech users. This novel perspective emphasizes that digital literacy is not merely a prerequisite for engaging with technology but also a critical factor that enhances the relationship between cybersecurity awareness, personal innovativeness, access to finance, facilitating conditions, and banking trust. Therefore, in the integration of digital literacy in the extant models of technology, this study highlights significant findings to

encourage scholars to explore how varying levels of digital literacy can influence user experiences and outcomes in fintech environments. Furthermore, the relationship between cybersecurity awareness, financial innovativeness, facilitating conditions, and access to finance within a combined model provides a comprehensive understanding of the factors that drive trust in fintech services. This theoretical advancement invites further research to investigate the interactions among these constructs and their implications for user behavior in the rapidly evolving fintech emergence. Methodologically, the study also contributed to the literature by incorporating digital literacy as a moderating variable which offers a strong understanding of how user competencies affect the association in trust and fintech adoption.

From a practical perspective, the findings will raise the need to prioritize digital literacy policies for fintech firms, and policymakers. The study finding contributed to fintech firms prioritizing targeted educational programs increasing users' digital skills that could improve personal innovations, facilitating conditions, and cyber security awareness that could increase more attention of individuals towards fintech services. Such measures are critical to building trust in fintech services, especially among underserved populations who may be reluctant to adopt digital financial solutions due to security concerns. Furthermore, the study could also help the policy makers to stress access to finance which emphasizes the importance of inclusive economic products to meet user needs. By addressing these practical implications, fintech can not only increase user engagement and trust but also contribute to greater investment efforts that could increase economic development.

LIMITATIONS AND FUTURE DIRECTIONS

The present study has various limitations for further research. Firstly, the research primarily focuses on specific fintech user characteristics, which may limit the generalizability of the findings across various populations. Therefore, in future research expanding the scope on other countries in expanding moderating effects of digital literacy. Secondly, still limited to the quantitative survey-based method where data was collected through the self-administered questionnaires. Future research could be explored on secondary sources to increase the generalizability of the findings. Lastly, the study employed the cross-sectional research design that restricts the ability to draw causal inferences regarding the relationships among the constructs. Future research should explore longitudinal studies to better understand how digital literacy evolves and its long-term impact on fintech adoption.

CONCLUSION

The study empirically investigated the influence of cyber security awareness, facilitating conditions, personal innovativeness, and access to finance on fintech adoption through increasing customer trust towards digital payments. The role of digital

literacy as a moderating variable was also tested. Quantitative data was collected from 390 digital banking users. A cross-sectional research design was employed to collect the data through a self-administered questionnaire employing a convenient sampling technique. The PLS-SEM findings indicate cyber security awareness, personal innovativeness, facilitating conditions, and access to finance have positive and significant impacts on digital payment trust. Further trust also positively and significantly influences digital payment adoption in fintech. Digital payments also significantly moderated cyber security awareness, personal innovativeness, facilitating conditions, access to finance, and trust. The findings contribute to the literature by establishing a framework that links cyber security awareness, personal innovativeness, facilitating conditions, and access to finance as critical factors influencing digital payment trust and adoption in fintech which is enhancing understanding of user behavior in digital finance contexts. Practical implications indicate that practitioners and policymakers should focus on enhancing cyber security awareness and facilitating conditions to build trust in digital payment systems because these factors significantly influence user adoption and could lead to increased financial inclusion and efficiency in fintech services. The study limitations and future directions were also discussed at the study end.

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Appendix 1: Questionnaire

Construct	Statement
Cyber Security Awareness	Cyber Security Awareness among Payment Banking platform users is essential.
	Awareness of the Cyber Security among Payment Banking platform users is essential for the community or society, especially for my family, friends and relatives.
	Cyber Security for Payment Banking platform is mandatory for the users.
	Before using Payment Banking applications, basic training is essential.
Facilitating Conditions	For Payment Banking a specific person is always available for assistance.
	For me, Payment Banking platform is compatible as compared to conventional banks.
	For Payment Banking I have all the necessary resources.
	For Payment Banking I have necessary knowledge to use it.
Personal Innovativeness	Generally, I spend a lot of time exploring how to use Payment Banking App.
	Among my peers, I am usually the first to try Payment Banking App.
	I like to experiment with Payment Banking Platform.
Trust	I feel safe providing personal and private information over the Payment Banking Apps.
	I'm not worried to use Payment Banking Apps, as I know my transactions will be safe and secured.
	The Payment banking platform will not divulge any of my information to the third party.
	I believe that Payment banks have a strong security system.
Digital Payment adoption	The interface and display on the digital payment platform are comfortable to look at.
	The use of the digital payment platform is easy to navigate in conducting business transactions.
	I find features and services that suit my business when using digital payments.
	In business operations, I feel that using digital payments is convenient because it suits my needs.
	How would you rate your ability to use the Internet or social networking tools to communicate with others
Digital literacy	How would you rate your ability to use the Internet or social networking tools to communicate with others
	How often do you need the help of others when doing network operations or using software
	How would you rate your ability to use Internet tools to search for information
	Do you have the ability to select, analyze, and organize digital information from a variety of sources and convert it into necessary knowledge
Access to Finance	I have access to finance to get any loan amount because the information gap with the traditional financial institutions is kept at a minimum.
	It does not have to go through unnecessary bureaucracy to acquire a loan because traditional financial institutions have reliable information.
	I have been accessing finance from one bank because of a sound relationship built.
	I keep switching from one bank to the other due to problems with loan servicing.