FinTech Adoption in Emerging Economies: Integrating Technology Acceptance and Institutional Perspectives.

Mohammad Ekramol Islam [1], Mohammad Rashed Hasan Polas [2*]

[1] Department of Mechanical Engineering, Sonargaon University (SU), 147/I, Green Road Panthapath, 1215, Dhaka, Bangladesh
[2] Department of Business Administration, Sonargaon University (SU), 147/I, Green Road Panthapath, 1215, Dhaka, Bangladesh
[*]Corresponding Author: rashedhasanpalash@gmail.com

Abstract

This paper examines the application of Green Internet of Things technologies to maximize energy efficiency optimization in smart cities. The research is based on a survey of 126 respondents from different age group. A stratified random sample was employed for this cross-sectional study. And, investigates the interaction of the factors that ensure the success of this optimization. We applied structural equation model to analyze the response of the 126 respondents where 3 independent variables, 1 mediating variable's impact was analyzed on the dependent variable "Smart City development" which shows impactful observations that changes according to other variables. Furthermore, the paper will focus on the different applications of energy realization in smart cities and how Green IoT has further enhanced the process. It will also look at the ways the integration of urban infrastructure and the use of renewable sources, including the policies by the government, has contributed to energy optimization. Both residents and businesses perceptions as well as those of city officials ADIES will be compared, aligned, and contrasted such that the study can highlight the critical challenges and opportunities in energy efficiency implementation in a smart city. The results will guide policymakers and other stakeholders in defining effective strategies to address Green IoT's potential in reducing energy consumption for a possible sustainable urban life.

Keywords: *FinTech Adoption, Government Support, Technological Knowledge, Digital Inclusion, Emerging Economies.*

1. Introduction

Financial technology (fintech) has emerged as a transformative force reshaping the global financial ecosystem (Ediagbonya & Tioluwani, 2023; Jahanshahi et al., 2023; Sharma et al., 2024). By integrating advanced digital tools into traditional financial services, fintech has revolutionized how individuals, businesses, and governments interact with financial systems (Singh et al., 2020; Mbarek, 2025). Services such as mobile banking, digital wallets, online payments, and peer-to-peer transfers have enhanced convenience, efficiency, and accessibility (Mondal et al., 2023a; Jena, 2025). For emerging economies, where banking infrastructure is often underdeveloped and large segments of the population remain unbanked, fintech offers both significant opportunities and unique challenges. Understanding the determinants of fintech adoption is therefore critical for policymakers, financial institutions, and scholars seeking to promote inclusive economic growth and digital transformation (Mondal et al., 2023b; Griffiths et al., 2025).

In emerging markets, fintech plays a pivotal role in accelerating financial inclusion and economic empowerment (Singh et al., 2020; Polas et al., 2022; Mbarek, 2025). Traditional banking systems in these regions often face structural limitations such as inadequate branch networks, high transaction costs, and bureaucratic inefficiencies. Fintech platforms provide cost-effective, scalable alternatives by leveraging technologies like big data analytics, artificial intelligence, and blockchain (Griffiths et al., 2025). These innovations enable financial institutions to reach underserved populations, empower small businesses, and reduce reliance on cash transactions. Beyond economic benefits, fintech fosters transparency, reduces transaction frictions, and strengthens participation in the formal economy, laying the foundation for sustainable development (Ediagbonya & Tioluwani, 2023; Sharma et al., 2024).

Bangladesh offers a compelling context for studying fintech adoption. The country's economy is expanding rapidly, supported by a tech-savvy youth population and growing smartphone penetration (Afrin et al., 2020; Ediagbonya & Tioluwani, 2023; Sharma et al., 2024). Yet challenges such as a large unbanked population, limited financial literacy, and regulatory inefficiencies persist. Recent socio-political movements demanding transparency and accountability have further amplified the need for institutional trust and equitable access to financial services (Ahamed et al., 2024). Mobile financial services (MFS) like bKash and Rocket illustrate fintech's potential, but broader adoption depends on factors such as trust, digital literacy, and supportive government policies (Sikder et al., 2021; Rajpal & Manglani, 2025).

Globally, fintech adoption has surged, particularly in Asia, Africa, and Latin America, where it addresses infrastructural gaps and promotes financial integration (Rajpal & Manglani, 2025). Success stories like Kenya's M-Pesa and China's Alipay demonstrate fintech's capacity to revolutionize financial inclusion. However, countries like Bangladesh still rank lower in global fintech indices due to regulatory constraints, limited infrastructure, and trust deficits. This creates both urgency and opportunity for research exploring how institutional support, technological readiness, and user behavior interact to shape fintech adoption (Rebekah & Afjal, 2025).

The present study investigates key factors influencing users' adoption of fintech services in Bangladesh's banking sector. Specifically, it examines the roles of user attitudes, intentions, brand image, government support, perceived ease of use, perceived usefulness, technological knowledge, trust, and user innovativeness. A structured survey was conducted among fintech users, and data was analyzed using a hybrid approach combining Structural Equation Modeling (SEM) and Artificial Neural Network (ANN) analysis. This two-stage method captures both linear and non-linear relationships, offering a comprehensive understanding of adoption determinants.

Findings reveal that government support significantly promotes fintech adoption by enhancing user confidence and trust. Technological knowledge also plays a critical role, equipping users to engage effectively with fintech platforms. Attitudes and trust act as mediators, amplifying the influence of brand image, perceived usefulness, and ease of use on adoption intention. These insights underscore the interplay between institutional trust and individual readiness, highlighting the socio-political context as a key driver of technology acceptance.

This study contributes to fintech literature by integrating socio-political dynamics with technology acceptance frameworks, presenting a context-specific model for emerging economies. Methodologically, it is among the first to apply a hybrid SEM-ANN approach in Bangladesh, enabling nuanced analysis of adoption drivers. Practically, the research offers actionable recommendations for policymakers and financial institutions, emphasizing the need for supportive regulations, digital literacy initiatives, and trust-building strategies. By situating fintech adoption within Bangladesh's broader socio-economic transformation, the study underscores financial innovation's role in fostering inclusive and resilient growth.

The remainder of this paper is organized as follows: Section 2 reviews relevant literature and hypotheses; Section 3 details the methodology; Section 4 presents findings from SEM-ANN analysis; Section 5 discusses theoretical and practical implications; and Section 6 concludes with contributions, policy recommendations, limitations, and future research directions.

2. Literature Review

2.1 Theoretical Foundations
Understanding FinTech adoption requires a framework that captures both individual decision-making and institutional influence. This study integrates two complementary theories: the Technology Acceptance Model (TAM) and Institutional Theory (IT). TAM (Davis, 1989; Rebekah & Afjal, 2025; Zerine et al., 2025) explains technology adoption through two core beliefs perceived usefulness (PU) and perceived ease of use (PEU) which shape attitude (ATT) and, ultimately, behavioral intention (BI). Extensions such as TAM2, TAM3, and UTAUT (Venkatesh et al., 2003) add constructs like social influence and user innovativeness. In FinTech, TAM is highly relevant because perceptions of efficiency, reliability, and ease directly affect adoption. Additional factors such as technological knowledge, trust, and brand image further strengthen TAM's explanatory power (Das & Das, 2023; Polas & Jahanshahi, 2025).

Institutional Theory (Meyer & Rowan, 1977; DiMaggio & Powell, 1983) complements TAM by emphasizing the role of institutional legitimacy. Adoption is influenced not only by efficiency but also by alignment with norms and regulations (Hidayat et al., 2022). In Bangladesh, government support through policies, financial inclusion programs, and digital literacy initiatives plays a critical role in building trust. Recent socio-political movements demanding transparency have amplified the importance of institutional credibility in shaping adoption behavior (Hu et al., 2019). By combining TAM and IT, this study offers a holistic model that accounts for micro-level perceptions (PU, PEU, ATT, technological knowledge) and macro-level institutional factors (government support, regulatory environment, trust). This dual-theory approach enhances explanatory power and provides deeper insights into FinTech adoption in emerging economies.

2.2 Attitudes and the Adoption of Fintech Services
Attitude represents an individual's overall evaluation and disposition toward a behavior or innovation (Hu et al., 2019). In technology adoption research, it reflects the degree of favorability toward using a system, while behavioral intention indicates the motivational readiness to perform that behavior (Zhao et al., 2010). Within the Technology Acceptance Model (TAM), attitude is a key determinant of intention, with positive attitudes strongly predicting technology adoption (Gupta & Arora, 2017; Ng & Kwok, 2017).

Empirical studies in banking and financial services consistently confirm this link. Favorable attitudes toward technological innovations significantly enhance customers' willingness to adopt digital financial services (Hu et al., 2019; Mohammadi, 2015; Zhang et al., 2020). In FinTech, users perceive digital integration as improving convenience, accessibility, and efficiency, fostering branchless banking (Qamar et al., 2020). Recent evidence also shows that attitudes toward mobile and internet banking directly influence adoption intention (Wu & Ho, 2022), and FinTech adoption is positively associated with service innovation and firm growth (Bhutto et al., 2023). Collectively, these findings suggest that positive attitudes substantially increase users' intention to adopt FinTech services. Thus, it was hypothesized:
H1: Users' attitudes (ATT) have a positive and significant relationship with their intention to adopt FinTech services in the banking sector of Bangladesh.

2.2 Brand Image and User Attitudes to Adopt Fintech Services
Brand image refers to the overall perception and associations users hold about an organization or its services, shaping evaluations and behaviors (Hu et al., 2019). In the FinTech context, a strong brand

image signals trust, credibility, and service quality critical factors when users share sensitive financial data. A positive brand image reduces perceived risk (Semuel & Lianto, 2014) and fosters confidence, thereby influencing attitudes toward adoption. Prior research in banking and FinTech consistently shows that brand image affects perceptions of trust, quality, and satisfaction, which encourage engagement with innovative financial technologies (Riyadh et al., 2010; Saleem & Rashid, 2011).

Empirical evidence confirms that brand image not only enhances attitudes but also strengthens trust in FinTech services. Hu et al. (2019) found that favorable brand image significantly shaped bankers' adoption intentions by reinforcing confidence in digital services. Similarly, Park et al. (2015) emphasized that credible brands motivate users to pursue financial goals through trusted service provision. Studies in Indonesia further reveal that brand image, alongside government support and perceived usefulness, directly influences trust and adoption in credit FinTech and peer-to-peer lending (Pratama, 2021; Putranto & Sobari, 2021). These findings suggest brand image is a key determinant of both attitudes and trust, leading to the following hypotheses:

H2: Brand image (BI) has a positive and significant influences users' attitudes (ATT) toward adopting FinTech services.

H3: Brand image (BI) has a positive and significant influences users' trust (TRU) toward adopting FinTech services.

2.3 Government Support and User Attitudes to Adopt Fintech Services

Government support encompasses policies, infrastructure, and regulatory frameworks that promote technological adoption and build trust in financial innovations (Jaruwachirathanakul & Fink, 2005; Chong et al., 2010; Mainardes et al., 2023). In the FinTech ecosystem, such support enhances service credibility, reduces uncertainty, and fosters institutional trust through regulatory clarity and awareness initiatives (Hu et al., 2019). Investments in digital infrastructure and financial inclusion programs make FinTech services more accessible, especially in emerging economies like Bangladesh, where state involvement strongly influences innovation adoption. By signaling legitimacy and reducing perceived risk, government support shapes users' confidence and attitudes toward adoption (Puspita et al., 2020).

Empirical studies confirm this role. Hu et al. (2019) found that government backing significantly improves trust and confidence in digital platforms, while Chong et al. (2010) reported its positive effect on internet banking acceptance. Recent research also highlights government support as a key driver of trust, perceived usefulness, and attitudes toward FinTech adoption (Das & Das, 2023; Nurfadilah & Samidi, 2021). Collectively, these findings suggest that government support nurtures favorable attitudes and trust, leading to the following hypotheses:

H4: Government support (GS) has a positive and significant influences users' attitudes (ATT) toward adopting FinTech services.

H5: Government support (GS) has a positive and significant influences users' trust (TRU) toward adopting FinTech services.

2.4 Perceived Ease of Use and User Attitudes to Adopt Fintech Services

Perceived ease of use (PEU), a core construct of the Technology Acceptance Model (TAM), refers to the degree to which individuals believe that using a system will require minimal effort (Davis, 1985; Putranto, & Sobari, 2021). In the FinTech context, PEU reflects how simple and intuitive users find digital financial services, reducing anxiety and effort in transactions. When applications offer user-friendly interfaces and seamless navigation, individuals are more likely to perceive them as convenient and develop favorable attitudes toward adoption (Venkatesh & Davis, 2000; Shahzad et al., 2022).

Empirical evidence strongly supports this relationship. Studies show that ease of use significantly influences attitudes and adoption intentions across FinTech platforms (Hu et al., 2019; Singh et al., 2020), mobile applications (Okumus & Bilgihan, 2014; Zhang et al., 2020), and internet banking (Gounaris & Koritos, 2008; Yusoff et al., 2021). For example, Riquelme and Rios (2010) found that users adopt

FinTech services more readily when they perceive them as easy to navigate, while Chau and Ngai (2010) emphasized that user-friendly experiences enhance engagement and satisfaction. Collectively, these findings indicate that PEU reduces barriers and strengthens positive attitudes toward FinTech adoption (Tsourela & Nerantzak, 2020).

H6: Perceived ease of use (PEU) has a positive and significant influences users' attitudes (ATT) toward adopting FinTech services.

2.5 Perceived Usefulness and User Attitudes to Adopt Fintech Services

Perceived usefulness (PU), a core construct of the Technology Acceptance Model (TAM), refers to the extent to which individuals believe that using a technology will enhance their performance or efficiency (Davis, 1985; Zhang et al., 2020). In the FinTech context, PU reflects users' belief that digital financial services deliver tangible benefits such as time savings, convenience, and improved access to resources. When users perceive these advantages, they are more likely to form positive attitudes toward adoption, making PU a critical driver of behavioral intention in banking and financial services (Ediagbonya & Tioluwani, 2023).

Empirical evidence consistently supports this relationship. Studies show that PU significantly influences attitudes and adoption intentions in FinTech (Hu et al., 2019; Singh et al., 2020; Griffiths et al., 2025), mobile banking (Hanafizadeh et al., 2014; Mohammadi, 2015), and internet banking (Alsajjan & Dennis, 2010). Research also indicates that PU mediates the effects of ease of use, trust, and risk perception on technology acceptance (Chawla & Joshi, 2019; Mainardes et al., 2023). Collectively, these findings suggest that recognizing the practical benefits of FinTech services strongly enhances user attitudes toward adoption.

H7: Perceived usefulness (PU) has a positive and significant influences users' attitudes (ATT) toward adopting FinTech services.

2.6 Technological Knowledge and User Intention to Adopt Fintech Services

Technological knowledge (TK) refers to an individual's awareness and ability to effectively use new technologies. In an increasingly digital environment, TK reduces uncertainty, builds confidence, and fosters readiness to adopt innovations (Lichtenthaler, 2016; Sharma et al., 2024). In the FinTech context, users with sufficient knowledge of tools such as mobile banking, online payments, or blockchain-based services are more likely to perceive these solutions as beneficial and manageable, thereby increasing their intention to adopt. Conversely, limited knowledge can create barriers, diminish trust, and slow the diffusion of financial innovations (Crook & Kumar, 1998; Yaqub et al., 2013; Sharma et al., 2024).

Empirical studies confirm TK as a critical determinant of adoption intention. Alam et al. (2021) found that users with higher FinTech-related knowledge were more inclined to adopt such services, while Puspita et al. (2020) reported that product knowledge significantly shaped attitudes and intentions toward Islamic FinTech. Similarly, research on SMEs and MSMEs in Indonesia highlights TK's role in enabling financial inclusion through digital platforms (Purnamasari et al., 2020; Hidayat et al., 2022; Mbarek, 2025). Collectively, these findings suggest that technological knowledge enhances user confidence and perceived usefulness, directly influencing adoption intentions.

H8: Technological knowledge (TK) has a positive and significant influences users' intention to adopt FinTech services.

2.7 User Trust and User Intention to Adopt Fintech Services

Trust refers to an individual's belief in the reliability, integrity, and competence of a system or service provider. In the FinTech context, trust is critical because users share sensitive financial data and conduct high-value transactions (Hu et al., 2019; Bhutto et al., 2023). Confidence in security, transparency, and reliability reduces perceived risk and uncertainty, encouraging users to adopt digital financial platforms (Rajpal & Manglani, 2025).

Empirical evidence consistently highlights trust as a key determinant of adoption intention. Hu et al. (2019) found that trust mediates the effects of brand image, government support, and user innovativeness on attitudes toward FinTech. Similarly, Chawla and Joshi (2019) confirmed trust as a strong predictor of mobile banking adoption, while Malaquias and Hwang (2016) emphasized its role in mitigating perceived risk in digital finance. Recent studies also show that trust significantly influences customer satisfaction and adoption in FinTech services (Mainardes et al., 2023). Collectively, these findings indicate that trust not only reduces uncertainty but directly strengthens users' intention to adopt FinTech services.
H9: User trust (TRU) positively influences the intention to adopt FinTech services.

2.8 User Innovativeness and User Attitude to Adopt FinTech Services
User innovativeness (UI) refers to an individual's tendency to adopt new technologies early, reflecting openness to experimentation and tolerance for uncertainty. Highly innovative users are more curious and adaptable, which leads to favorable attitudes toward technological innovations (Adeiza et al., 2017; Sandvik et al., 2014; Das & Das, 2023). In the FinTech context, innovativeness is particularly relevant because digital financial platforms often involve novel processes and advanced features. According to Diffusion of Innovation theory, innovative individuals perceive lower risks and exhibit stronger willingness to explore new technologies (Mohammadi, 2015; Zheng et al., 2021; Hidayat et al., 2022). Thus, UI acts as a psychological driver shaping attitudes and trust toward FinTech adoption.

Empirical evidence supports this role. Hu et al. (2019) found that UI directly influences adoption intention and trust in FinTech services. Similarly, Kim et al. (2010) and Morosan (2014) reported that consumers with higher innovativeness are more likely to adopt mobile and digital financial solutions. Recent studies confirm these findings in emerging markets: Setiawan et al. (2021) showed UI positively affects FinTech adoption in Indonesia, while Shahzad et al. (2022) demonstrated that innovativeness, along with ease of use and trust, significantly shapes attitudes and behavioral intentions (Hidayat et al., 2022). Collectively, these findings suggest that UI fosters positive attitudes and trust, which in turn strengthen adoption intentions.
Hypotheses:
H10: User innovativeness (UI) has a positive and significant influences users' attitudes (ATT) toward adopting FinTech services.
H11: User innovativeness (UI) has a positive and significant influences users' trust (TRU) in FinTech services.
H12: The relationship between user innovativeness (UI) and FinTech adoption intention (FAI) is significantly mediated by trust (TRU).

2.9 Mediating Effect of User Trust
User trust (TRU) refers to an individual's belief in the integrity, reliability, and competence of a system or service provider, which reduces uncertainty and perceived risk in technology adoption. In the FinTech context, trust is critical due to the sensitivity of financial transactions and concerns over security, fraud, and privacy (Malaquias & Hwang, 2016; Hidayat et al., 2022). When users perceive a platform as trustworthy, they are more likely to adopt it despite inherent risks. Factors such as brand image, government support, and user innovativeness often strengthen trust, which then translates into higher adoption intentions (Hu et al., 2019; Khatun & Tamanna, 2020). Thus, trust acts as a key psychological mechanism that converts positive perceptions into behavioral outcomes.

Empirical studies confirm this mediating effect. Al Nawayseh (2020) found that trust fully mediated the link between perceived risk and intention to adopt FinTech services. Similarly, Chiu et al. (2017) reported that trust mediated the influence of infrastructure quality, privacy, and cost on mobile banking adoption, while Noor and Ram Al Jaffri (2016) demonstrated its mediating role between attitudes, service quality, and compliance behavior. Beyond FinTech, trust has been shown to mediate relationships in e-commerce and crowdfunding contexts (Giantari et al., 2013; Zhang et al., 2022). Collectively, these findings underscore trust as a central mechanism through which institutional and perceptual factors drive

adoption.

H13: *The relationship between brand image and users' intention to adopt FinTech services is mediated by user trust.*

H14: *The relationship between government support and users' intention to adopt FinTech services is mediated by user trust.*
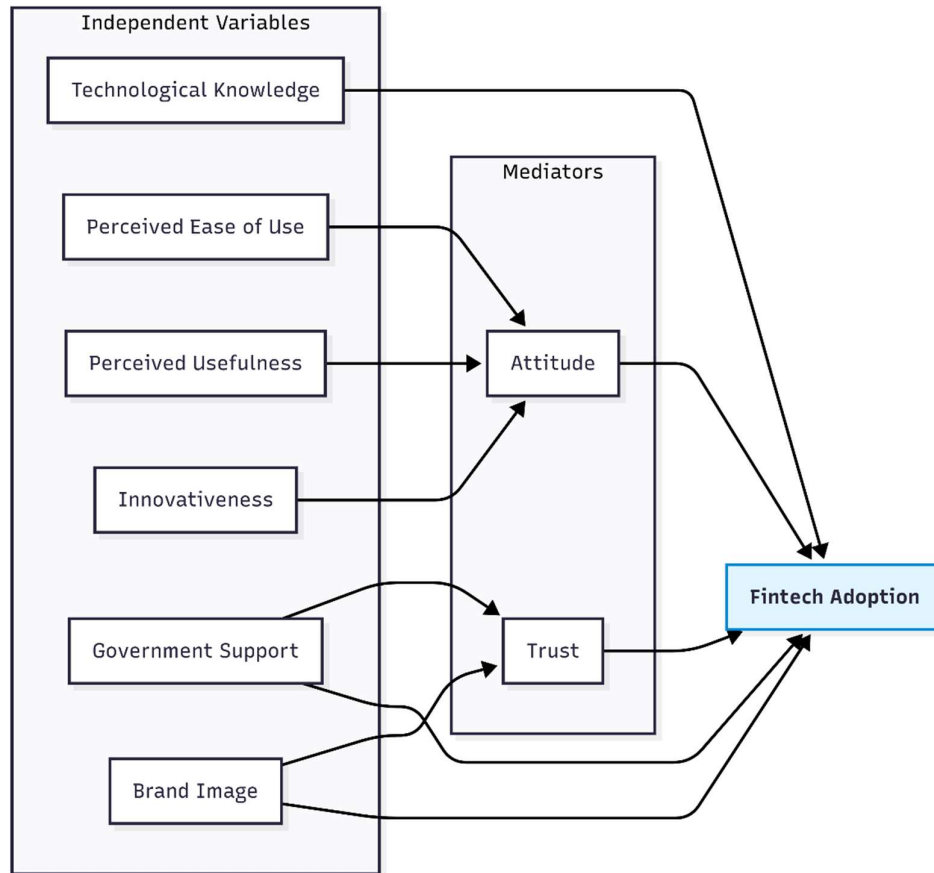

Figure 1: The Conceptual Framework of the study

3. Methodology

3.1 Research Design

This study adopted a quantitative research design using a structured questionnaire survey to examine the factors influencing fintech adoption in Bangladesh. Quantitative methods are widely applied in social sciences and management research for hypothesis testing and establishing causal relationships (Wiersma & Jurs, 2009; Rehman, 2021; Polas, 2026). Based on an extensive literature review, hypotheses were developed, and a conceptual framework was constructed to explore the roles of government support and technological knowledge, along with the mediating effect of trust.

The survey instrument comprised two sections: the first collected demographic data such as gender, age, education, profession, banking experience, and fintech usage patterns (see Table 1), while the second measured constructs including Attitude (ATT), Brand Image (BI), Fintech Adoption Intention (FAI), Government Support (GS), Technological Knowledge (TK), Perceived Ease of Use (PEU), Perceived Usefulness (PU), and Trust (TRU) using validated scales from prior studies (see Table 2). Responses were recorded on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). A total of 388 respondents participated in the survey, with the majority being male (71.9%) and aged between 20–29 years (48.5%). Most respondents held a diploma or undergraduate degree (63.1%) and were students (47.9%), followed by private job holders (29.1%). Banking experience varied, with 57.2% having 3–6

years of experience, while fintech usage was frequent among 44.6% of respondents. The use of validated measurement items ensured reliability and content validity for the constructs examined in this study.

Table 1: Respondents Profile

Variables	Particular	Frequency	Percentage (%)
Gender	Male	279	71.9
	Female	109	28.1
Age	20-29 years	188	48.5
	30-39 years	146	37.6
	40-49 years	50	12.9
	50 and above	4	1
Education	HSC or below	34	8.8
	Diploma/undergraduate	245	63.1
	Post-graduate	109	28.1
Profession	Student	186	47.9
	Government Job-holder	19	4.9
	Private Job-holder	113	29.1
	Self employed	44	11.3
	Other	26	6.7
Status of using bank	less than 3 years	89	22.9
	3 to 6 years	222	57.2
	Above 6 years	77	19.8
	Never	15	3.9
Fintech service usage	Occasionally	67	17.3
	Usually,	133	34.3
	Frequently in everyday	173	44.6
Total sample: 388			

Table 2: Survey Items

Variable	Item	Description	References
Attitude (ATT)	ATT1	I believe using banking-Fintech products is advantageous	(Hu et al., 2019)
	ATT2	My experiences with FinTech services have been enjoyable.	
	ATT3	FinTech services spark my interest and curiosity.	
Brand Image (BI)	BI1	The bank offering FinTech solutions strikes me as credible and dependable.	(Hu et al., 2019; Ruparelia et al., 2010)
	BI2	I am confident in the bank's ability to securely handle my financial transactions through FinTech.	
	BI3	The bank's FinTech solutions align with my individual financial circumstances and needs.	
	BI4	The unique features and services of this bank's FinTech offering differentiate it from competitors.	
	BI5	I feel a positive emotional connection with the bank offering this FinTech service.	
Fintech Adoption (FA)	FA1	I plan to utilize FinTech services in the foreseeable future.	(Hu et al., 2019; Yan et al., 2021)
	FA2	I anticipate regular usage of FinTech services.	
	FA3	I would readily recommend FinTech services to others.	
	FA4	If I have used FinTech services, I am open to continued use.	
Government Support (GS)	GS1	Government actions enhance and promote the usage of FinTech services.	
	GS2	Government legislation and regulations favor FinTech services.	
	GS3	Government involvement in infrastructure development positively impacts the promotion of FinTech services.	
	GS4	The government consistently communicates and educates about the benefits and application of FinTech in banking.	

	GS5	Government provisions, such as financial incentives or grants, support the adoption of FinTech by banks and customers.	(Hu et al., 2019; Marakarkandy et al., 2017)
Perceived Ease of Use (PEU)	PEU1	I find FinTech services user-friendly.	(Hu et al., 2019)
	PEU2	Access to necessary equipment for using FinTech services is straightforward.	
	PEU3	The user interface of FinTech applications is intuitive and easy to comprehend.	
	PEU4		
Perceived Usefulness (PU)	PU1	FinTech services contribute to time-efficiency.	(Hu et al., 2019)
	PU2	FinTech services enhance overall productivity.	
Technological Knowledge (TK)	TK1	I possess substantial knowledge about the FinTech services provided by my bank.	(Najib et al., 2021)
	TK2	I am comfortable with digital technology for banking transactions.	
	TK3	I can quickly adapt to and learn new technology applications in banking.	
	TK4	I understand the security implications and potential risks of using FinTech services.	
User Innovativeness (UI)	UI1	Upon hearing about a new product, I seek opportunities to experiment with it.	(Hu et al., 2019)
	UI2	Among my peers, I often pioneer the adoption of new products.	
User Trust (UT)	UT1	I place my trust in the Fintech services platform.	(Hu et al., 2019; Yan et al., 2021)
	UT2	I am confident in the Fintech platform's reliability.	
	UT3	I perceive Fintech services as worthy of trust.	

The responses were scored on a five-point Likert rating scale, where 1 represents "strongly disagree" and 5 denotes "strongly agree."

3.2 Sample and Data Collection

According to World Bank data (July 12, 2023), Bangladesh has approximately 848 bank users per 1,000 adults, indicating a significantly large population base. For large populations exceeding 100,000, Lamola and Yamane (1967) recommend a sample size of around 400 to achieve a 95% confidence level. Additionally, Green (2010) and given that this study includes eight independent variables, the minimum sample size should be approximately 114 and 112, respectively, based on these formulas. Furthermore, Memon et al. (2020) argue that a sample size between 160 and 300 is suitable for multivariate analysis techniques such as PLS-SEM (Polas, 2026). These guidelines indicate that sample size determination is not fixed but rather context dependent. Considering the large population and methodological requirements, the sample size for this study was calculated using Yamane's formula, ensuring adequacy for robust statistical analysis.

$$n = \frac{pqz^2}{d^2}$$

Where p = assumed proportion in the target population estimated to have a particular
characteristic = 0.5 (assumed for this study)
q = 1-p = 1-0.5 = 0.5
z = standard normal deviate = 1.96 at 5% level
d = the degree of dispersion = 4.87% = 0.0487

Thus, $n = \frac{pqz^2}{d^2} = \frac{0.05 \times 0.05 \times 1.96^2}{0.0487^2} = 404.94 \approx 405$

Based on the sample size estimation, the required number of respondents ranged between 112 and 405. In this study, data were collected from 384 respondents, which falls well within the recommended range for robust statistical analysis. The primary objective was to identify factors influencing bank users' adoption of fintech services in the post-COVID era within an emerging economy like Bangladesh. To examine the relationships among the study variables, data collection was conducted between January and March 2025 using a convenience sampling technique. An online survey questionnaire was employed to

reach participants efficiently, ensuring coverage of diverse demographic groups while maintaining accessibility during pandemic-related restrictions.

3.3 Study Area and Population
The study focused on bank users residing in Dhaka, the capital city of Bangladesh. The target population comprised individuals engaged in diverse professions, including students, government job holders, private sector employees, self-employed individuals, and others. This demographic was selected to capture a broad representation of fintech adoption behavior among active banking customers in an emerging economy.

3.4 Data Collection
This research is empirical in nature and relies primarily on surveyed primary data, as comprehensive secondary data for the variables under investigation were unavailable. A total of 384 valid responses were collected using a structured questionnaire. Among these respondents, 186 were students, 19 government job holders, 113 private job holders, 44 self-employed individuals, and 26 categorized as others. Gender distribution included 273 male and 109 female participants. The study employed a quantitative methodology and analyzed the data using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4. The model was evaluated using reliability tests, discriminant validity, factor analysis, and goodness-of-fit measures to ensure robustness in hypothesis testing.

3.5 Common Method Bias (CMB)
Since data for both independent and dependent variables were collected from a single source using a questionnaire survey, the possibility of common method bias (CMB) was considered. CMB is a critical concern in self-reported data as it can inflate relationships between constructs (Podsakoff & Organ, 1986; Conway & Lance, 2010). To mitigate this risk, respondents were assured of confidentiality and informed that their data would not be shared with third parties (Kraus et al., 2020). Additionally, Harman's single-factor test was applied to assess CMB. The total variance explained by a single factor was below the 50% threshold, indicating that CMB was not a significant issue in this study. These measures ensured the credibility and validity of the research findings.
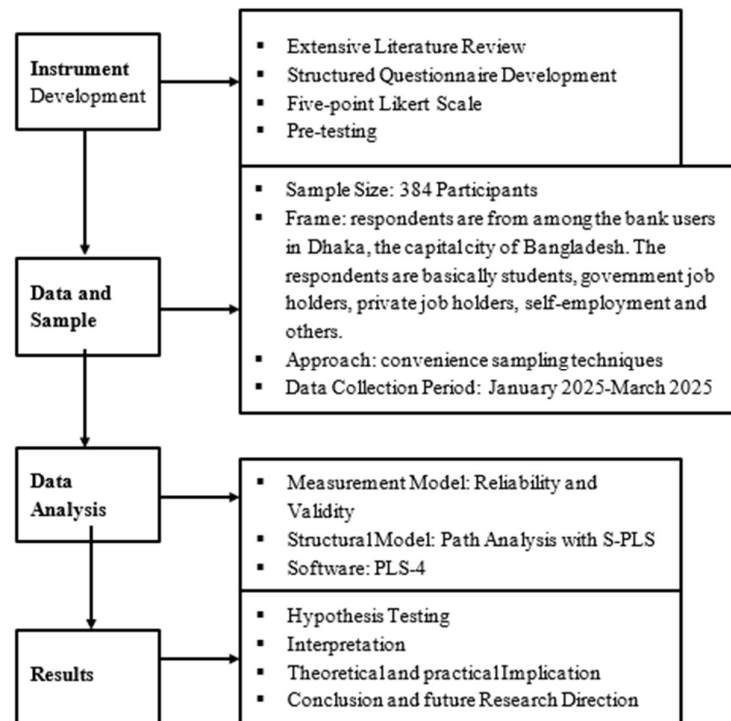

Figure 2: Research Summary developed by authors

4. Results

4.1 Measurement Model
To evaluate the reliability of the constructs, Composite Reliability (CR) and Cronbach's Alpha (CA) were employed. The results indicate that all CR values exceeded the recommended threshold of 0.70, with most constructs achieving values above 0.80, confirming strong internal consistency (Hair et al., 2019). Similarly, Cronbach's Alpha values for all constructs were above the acceptable limit of 0.70, except for User Innovativeness (UI) and User Trust (UT), which recorded values of 0.621 and 0.686, respectively. Since CA values between 0.60 and 0.70 are considered acceptable in exploratory research, the reliability of UI and UT remains satisfactory. These findings collectively support the reliability assumption for the measurement model.

Table 1: Summary of the measurement model's findings Reliability and Convergent Validity

Constructs	Items	Factor Loadings	CA	Rho_A	CR	AVE
Attitude (ATI)	ATT1	0.841	0.741	0.741	0.853	0.659
	ATT2	0.798				
	ATT3	0.795				
Brand Image	BI1	0.703	0.788	0.794	0.855	0.541
	BI2	0.800				
	BI3	0.743				
	BI4	0.683				
	BI5	0.743				
Fintech Adoption	FAI1	0.786	0.746	0.752	0.839	0.567
	FAI2	0.715				
	FAI3	0.778				
	FAI4	0.730				
Government support	GS1	0.730	0.745	0.748	0.830	0.495
	GS2	0.725				
	GS3	0.639				
	GS4	0.716				
	GS5	0.703				
Perceived Ease of Use	PEU1	0.717	0.711	0.714	0.821	0.534
	PEU2	0.728				
	PEU3	0.746				
	PEU4	0.732				
Perceive Usefulness	PU1	0.915	0.744	0.766	0.885	0.794
	PU2	0.867				
Technology Knowledge	TK1	0.778	0.742	0.747	0.837	0.563
	TK2	0.731				
	TK3	0.733				
	TK4	0.758				
User Innovativeness	UI1	0.841	0.621	0.623	0.841	0.725
	UI2	0.862				
User Trust	UT1	0.749	0.686	0.700	0.824	0.60
	UT2	0.790				
	UT3	0.803				
Note: Cronbach's Alpha: CA, Composite Reliability: CR, Average Variance Extracted: AVE						

Table: 2 Discriminant Validity (Fornell-Larccker Criterion)

Variable	ATT	BI	FA	GS	PEU	PU	TK	UI	UT
ATT	0.812								
BI	0.536	0.736							
FA	0.499	0.516	0.753						
GS	0.593	0.624	0.592	0.703					
PEU	0.502	0.55	0.525	0.571	0.731				
PU	0.437	0.481	0.397	0.475	0.426	0.891			
TK	0.445	0.514	0.501	0.549	0.53	0.432	0.75		
UI	0.486	0.502	0.392	0.518	0.51	0.392	0.39	0.852	
UT	0.487	0.504	0.472	0.533	0.535	0.417	0.476	0.404	0.781

Table 2 shows the Discriminant Validity (Fornell-Larccker Criterion). The square roots of AVE on the diagonal (ATT = 0.812, BI = 0.736, FA = 0.753, GS = 0.703, PEU = 0.731, PU = 0.891, TK = 0.750, UI = 0.852, UT = 0.781) are all greater than the corresponding inter-construct correlations in their rows/columns. The highest correlations (GS–BI = 0.624 and ATT–GS = 0.593) remain below their respective diagonal values, indicating no violations. Thus, discriminant validity is established for all constructs in the model.

Table 3: Discriminant Validity (HTMT Ratio)

Variable	ATT	BI	FA	GS	PEU	PU	TK	UI	UT
ATT									
BI	0.070								
FA	0.658	0.66							
GS	0.803	0.814	0.785						
PEU	0.682	0.729	0.719	0.784					
PU	0.584	0.627	0.53	0.631	0.589				
TK	0.589	0.667	0.656	0.737	0.731	0.582			
UI	0.716	0.713	0.571	0.762	0.753	0.557	0.57		
UT	0.666	0.668	0.638	0.725	0.753	0.575	0.646	0.604	

Table 3 shows Discriminant Validity (HTMT Ratio). All reported HTMT values lie below the conservative threshold of 0.85 (range: 0.070–0.814; highest observed between BI–GS = 0.814). This indicates that each construct is sufficiently distinct from the others, and discriminant validity is established under the HTMT criterion (also satisfied under the more lenient 0.90 threshold).
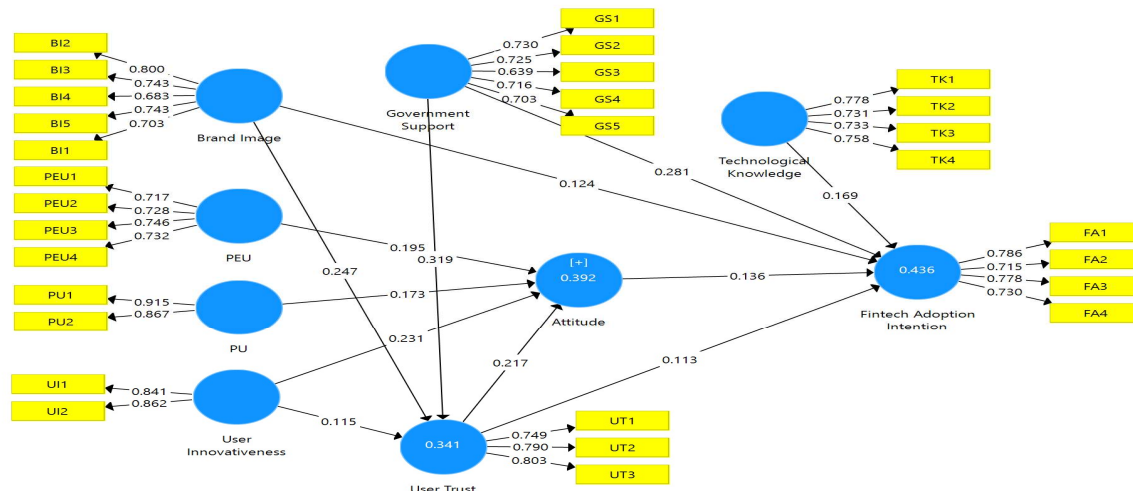
4.2 Structure Model

Figure 3: Standardized PLS-SEM Path Coefficients

Figure 3 illustrates the standardized PLS-SEM path coefficients, showing the relationships among constructs in the model. Fintech Adoption Intention is explained by 43.6% variance ($R^2 = 0.436$), primarily influenced by Perceived Ease of Use ($\beta = 0.247$) and Perceived Usefulness ($\beta = 0.231$), with smaller contributions from Technological Knowledge ($\beta = 0.169$) and Attitude ($\beta = 0.136$). Attitude itself accounts for 39.2% variance ($R^2 = 0.392$) and is mainly driven by Government Support ($\beta = 0.281$), followed by Perceived Ease of Use ($\beta = 0.195$) and Perceived Usefulness ($\beta = 0.173$). User Trust ($R^2 = 0.341$) is positively influenced by User Innovativeness ($\beta = 0.217$). Overall, the model highlights ease of use and usefulness as key determinants of adoption, while government support strongly shapes attitude, and innovativeness fosters trust.

Table 4. Model Fit

	Saturated model	Estimated model
SRMR	0.072	0.072
d_ULS	0.981	0.981
d_G	0.329	0.329
Chi-square	608.566	608.566
NFI	0.808	0.808

Table 4 shows the Model Fit. The model shows acceptable fit. The SRMR = 0.072 is below the common 0.08 threshold, indicating good average fit to the correlations. NFI = 0.808 reflects adequate (but not excellent) fit; values closer to 1 are better. The d_ULS (0.981) and d_G (0.329) discrepancies are modest and identical for the saturated and estimated models, suggesting minimal misspecification. The Chi-square (608.566) is high as is typical in SEM so it's less informative in PLS-SEM. Overall, the model fit is acceptable for reporting.

Table 5: Predictive Relevance

Indicator	Value	Threshold
Q² (EE)	0.427	> 0 (Significant)
Q² (EP)	0.472	> 0 (Significant)

Table 5 shows the predictive relevance. The Q² values confirm the predictive relevance of the endogenous constructs, as values greater than zero indicate significant predictive capability. In this study, both constructs demonstrate strong predictive relevance (EE: $Q^2 = 0.427$; EP: $Q^2 = 0.472$) (see Table 5).

4.3 Hypothesis Testing (Direct and Indirect Effects)

Table 6: Hypothesis Testing (Direct and Indirect Effects)

Hypothesis	Structural Path	Beta	T-Statistics	P Values	Remarks
H1	ATT-> FA	0.126	2.072	0.039	Yes
H2	BI -> FA	0.124	1.869	0.062	No
H3	BI -> UT	0.247	3.431	0.001	Yes
H4	GS -> FA	0.281	4.003	0.000	Yes
H5	GS -> UT	0.319	4.611	0.000	Yes
H6	PEU -> ATT	0.196	2.704	0.007	Yes
H7	PU -> ATT	0.173	3.057	0.002	Yes
H8	TK -> FA	0.164	2.593	0.010	Yes
H9	UI -> ATT	0.231	3.949	0.000	Yes

H10	UI -> UT	0.115	2.265	0.024	Yes
H11	UT -> ATT	0.217	3.437	0.001	Yes
Mediation analysis					
H12	UI->UT -> FA	0.116	1.792	0.073	No
H13	BI -> UT-> FA	0.029	1.588	0.112	No
H14	GS -> UT-> FA	0.037	1.670	0.095	No
Moderation Analysis					
H15	TK*ATT -> FA	-0.029	0.419	0.676	No

H1 (ATT → FA), Supported: Users' attitude has a positive, significant effect on FinTech adoption intention ($\beta = 0.126$, $p < 0.05$). This aligns with TAM/UTAUT logic whereby favorable evaluations translate into intention. Similar effects are reported for online banking in Bangladesh (extended TAM) and for mobile wallet/mobile banking contexts, where attitude consistently predicts adoption.

H2 (BI → FA), Not supported: Brand image does not directly drive adoption intention in your sample ($\beta = 0.124$, $p = 0.062$). Recent evidence suggests brand image often acts indirectly (e.g., by first building trust or perceived value) rather than as a strong direct antecedent of intention; some studies even find no direct BI → intention effect in FinTech service contexts.

H3 (BI → UT), Supported: A stronger brand image significantly increases user trust ($\beta = 0.247$, $p = 0.001$). In digital finance, brand reputation and credibility reduce perceived risk and bolster trust—an effect repeatedly observed in banking/FinTech trust studies.

H4 (GS → FA), Supported: Government support positively affects adoption intention ($\beta = 0.281$, $p < 0.001$). Policy clarity, consumer protection and inclusion initiatives lower uncertainty and legitimize FinTech services, which increases users' willingness to adopt—consistent with extended TAM findings and Open Banking work showing institutional support encourages usage.

H5 (GS → UT), Supported: Government support also strengthens trust ($\beta = 0.319$, $p < 0.001$), echoing evidence that regulatory assurance and market governance raise confidence in digital finance. Malaysia's Financial Sector Blueprint (2022–2026) is an illustrative case of policy-led trust building in FinTech ecosystems.

H6 (PEU → ATT), Supported: Higher perceived ease of use translates into more favorable attitudes ($\beta = 0.196$, $p = 0.007$). This is a core TAM result commonly replicated across mobile wallets and digital banking contexts.

H7 (PU → ATT), Supported: Greater perceived usefulness likewise improves attitudes ($\beta = 0.173$, $p = 0.002$). The PU→ATT pathway is widely documented in consumer FinTech and mobile payment studies.

H8 (TK → FA), Supported: More technological knowledge/familiarity increases adoption intention ($\beta = 0.164$, $p = 0.010$). Prior work in Bangladesh (TAM/TRI) and broader FinTech contexts shows that digital literacy and technology familiarity lower uncertainty and strengthen perceived value, thereby nudging users toward adoption

H9 (UI → ATT): Supported: User innovativeness significantly elevates attitudes toward FinTech ($\beta = 0.231$, $p < 0.001$). Innovative users are more open to experimentation and tend to appraise new services favorably, a pattern observed in mobile banking and mobile money studies.

H10 (UI → UT), Supported: User innovativeness also raises trust ($\beta = 0.115$, $p = 0.024$), consistent with findings that innovative consumers more readily infer competence and reliability in technology-enabled services, which improves trust.

H11 (UT → ATT), Supported: Trust positively shapes attitude ($\beta = 0.217$, $p = 0.001$). Across e-payment and Open Banking domains, trust reduces perceived risk and enhances evaluations of service quality, thereby improving attitudes prior to intention.

H12 (UI → UT → FA), Not supported (mediation): The trust-mediated route from user innovativeness to adoption is not significant ($p = 0.073$). In this context, innovativeness appears to act directly on attitude/intention, rather than relying on trust as a mediator—contrasting studies in which trust mediates technology effects on intention.

H13 (BI → UT → FA), Not supported (mediation): The indirect path from brand image via trust to adoption is not significant ($p = 0.112$). Although brand image builds trust (H3), the additional step to intention may be dominated by functional appraisals (PU/PEU) or policy signals, in line with platform research that highlights perceived value and social influence as stronger mediators than trust alone.

H14 (GS → UT → FA), Not supported (mediation): The trust-mediated effect of government support on adoption is not significant ($p = 0.095$). Your results suggest direct effects from policy support to intention (H4) are stronger than indirect trust-mediated routes, which matches evidence that governance can shift intention directly through enabling infrastructure and inclusion measures.

H15 (TK × ATT → FA), Not supported (moderation): Technological knowledge does not alter the strength of the attitude → intention link ($p = 0.676$). In consumer technology models, knowledge typically operates as a direct antecedent (or via self-efficacy/trust) rather than moderating attitude's translation into intention; UTAUT2 identifies other moderators (age, gender, experience, habit) as more salient.

5. Discussion

This study examined the factors influencing users' attitudes and intentions to adopt FinTech services in Bangladesh's banking sector. The findings confirm that attitude (ATT) significantly predicts adoption intention ($\beta = 0.126$, $p < 0.05$), consistent with prior research using TAM-based models (Hossain et al., 2020). This underscores the importance of positive user evaluations in driving behavioral intention. Contrary to expectations, brand image (BI) did not directly influence attitudes toward adoption. Instead, BI positively affected user trust (TRU) ($\beta = 0.247$, $p < 0.001$), suggesting that brand reputation primarily builds confidence rather than shaping attitudes directly. This aligns with studies emphasizing BI's role in trust formation rather than attitudinal change (Hu et al., 2019; Nathan et al., 2022; Liu et al., 2022).

Government support (GS) emerged as a critical determinant, positively influencing both attitudes and trust ($p < 0.001$). This finding reinforces the role of regulatory clarity and financial inclusion policies in shaping user confidence and adoption behavior, consistent with previous research on institutional influence in FinTech adoption (Hu et al., 2019; Nathan et al., 2022). The study also validated the impact of perceived ease of use (PEU) and perceived usefulness (PU) on attitudes ($p < 0.01$ and $p < 0.001$), confirming TAM's core assumptions and supporting evidence from prior studies (Zhang et al., 2020; Bamufleh et al., 2021). Similarly, technological knowledge (TK) significantly influenced adoption intention ($p < 0.01$), highlighting the role of digital literacy and familiarity in reducing uncertainty and enhancing confidence.

User innovativeness (UI) was found to positively affect both attitudes and trust ($p < 0.001$ and $p < 0.05$), consistent with research linking innovativeness to openness toward technological change (Lien et al., 2019; Wu et al., 2021). However, trust did not significantly mediate the relationships between UI, BI, GS, and adoption intention, suggesting that cultural and contextual factors in Bangladesh may limit trust's intermediary role. Finally, the hypothesized moderating effect of TK on the attitude–intention link was rejected, possibly due to widespread technology penetration and growing familiarity with FinTech services, which diminish the moderating influence of knowledge.

The study provides valuable insights into FinTech adoption in Bangladesh, confirming the importance of attitudes, trust, government support, ease of use, usefulness, technological knowledge, and innovativeness. These findings emphasize the need for supportive policies, trust-building measures, and digital literacy initiatives to accelerate adoption. Cultural and contextual factors should be considered when examining mediation and moderation effects. Future research could explore additional behavioral and institutional variables and employ longitudinal designs to validate these findings over time.

5.1. Implications of the study

This study offers important theoretical and practical contributions to understanding FinTech adoption in emerging economies. By examining the roles of **government support (GS)** and **technological knowledge (TK)** alongside user attitudes, trust, and innovativeness, the research highlights how institutional and individual factors jointly shape adoption behavior.

The findings reinforce the Technology Acceptance Model (TAM) by confirming the influence of perceived ease of use, perceived usefulness, and attitudes on adoption intention. At the same time, integrating Institutional Theory demonstrates that government support significantly impacts user confidence and trust, extending existing technology adoption frameworks to include institutional legitimacy. The study also emphasizes the role of technological knowledge as a critical enabler, suggesting that digital literacy is not merely a background factor but a direct driver of adoption intention. Although the mediating effect of trust was not fully supported in all cases, its partial influence underscores the need for further research on trust as a psychological mechanism in FinTech adoption.

For policymakers, the results highlight the importance of creating an enabling regulatory environment and promoting financial inclusion through supportive policies and infrastructure. Initiatives such as digital literacy programs and awareness campaigns can enhance technological knowledge and reduce perceived risks, accelerating adoption among underserved populations. For financial institutions and FinTech providers, building trust through transparent practices, robust security measures, and strong brand positioning is essential to foster user confidence and engagement.

This research advances understanding of FinTech adoption in the context of Bangladesh by integrating user-level and institutional factors into a comprehensive framework. It provides actionable insights for designing strategies that promote financial inclusion and digital transformation in emerging economies. Future studies should explore additional behavioral and contextual variables and employ longitudinal designs to validate these findings over time.

5.2. Limitations and Directions for Future Studies

This study has several limitations. First, the findings are context-specific to Bangladesh, which may limit generalizability to other regions with different socio-economic or regulatory environments. Future research should replicate this model in diverse settings to enhance external validity. Second, the study employed a purely quantitative approach, which, while robust for hypothesis testing, may not fully capture the nuanced behavioral and cultural factors influencing FinTech adoption. Incorporating qualitative insights or adopting a mixed-method design, as suggested by Creswell and Plano Clark (2011), could provide a more comprehensive understanding. Third, the model focused on selected constructs;

future studies should integrate additional variables such as perceived risk, social influence, and financial literacy to broaden the explanatory power. Finally, longitudinal research is recommended to examine how user attitudes and trust evolve over time as FinTech ecosystems mature.

6. Conclusion

This study successfully integrated the Technology Acceptance Model (TAM) with institutional perspectives to determine the critical drivers of FinTech adoption within the emerging economy of Bangladesh. The empirical results confirm that while user attitude remains a primary predictor of adoption intention, external and institutional factors play an equally pivotal role. Specifically, Government Support emerged as a cornerstone variable, significantly fostering both user trust and direct adoption intention. This validates the premise that in developing financial markets, regulatory clarity and state-backed inclusion initiatives are essential for legitimizing digital financial services.

Furthermore, the research highlights the significance of individual capabilities; Technological Knowledge and User Innovativeness were found to directly enhance adoption and positive attitudes, respectively. Interestingly, while Brand Image and Trust are important for shaping initial perceptions, they did not mediate the relationship between external factors and adoption intention as strongly as expected. This suggests that in the current Bangladeshi context, direct functional benefits (Perceived Usefulness/Ease of Use) and institutional assurances (Government Support) are more immediate drivers of behavior than indirect psychological pathways.

Ultimately, this research contributes to the literature by demonstrating that FinTech adoption in emerging economies is not solely a technological issue but a socio-institutional one. For sustainable growth, stakeholders must move beyond simple interface design to address the broader ecosystem. This requires a dual-pronged approach: policymakers must ensure robust regulatory frameworks to signal safety, while service providers must invest in digital literacy campaigns to empower users. While limited by its cross-sectional nature and specific cultural context, this study provides a foundational framework for understanding the complex interplay between technology, governance, and user behavior in the digital financial landscape.

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