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# Landscape of Mobile App-Based Transactions in Rural Bangladesh: A Qualitative Analysis

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**Abstract**

*The main aim of this study is to depict the factors that influence the adoption of mobile app-based financial transactions and explore the behavioral intention to adopt such transactions. Another aim is to construct a model for adoption willingness that can serve as a foundation for conducting extensive quantitative studies. A qualitative research method is employed in this study, where content analysis is used to analyze the verbatim interview scripts. Following an interpretive research paradigm, this study first explores various barriers and benefits that a smartphone user faces while adopting mobile app-based financial transactions and validates those factors by analyzing 15 interviews conducted through a semi-structured interview guide with participants selected through convenience sampling. By applying both inductive and deductive methods, the interpretive analyses build a theoretical framework comprising a range of factors. Performance expectancy, effort expectancy, economic factors, technology attitude, security, social influence, brand image, e-readiness, government policy, customer buying culture, and promotional offers are the factors to adopt app-based transactions in rural Bangladesh. by capitalizing on the widespread use of smartphones, fostering digital literacy, and addressing key challenges, Bangladesh can create a financial ecosystem that empowers its citizens and fosters inclusive development, which is a significant milestone in the journey towards a smart Bangladesh. The landscape of mobile app-based transactions is a reflection of our evolving relationship with technology and money. The day will come when people will carry only one smart device and all services on it will be immediately available. By adhering to our research methodology, individuals can create a model tailored to the specific context of adoption in any given situation.*

***Key words:*** *App-based transaction, landscape, smart Bangladesh, behavioral intention, UTAUT model.*

## 1. Introduction

In the ever-evolving digital landscape, mobile app-based transactions have emerged as a driving force behind the transformation of how we engage in financial activities. These transactions encompass a wide array of services and functionalities, ranging from mobile banking and payment processing to e-commerce and peer-to-peer transfers. Mobile applications, commonly known as apps, are standalone software that connects users to the Internet. With a simple click, these apps act as gateways through which users

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access the content they are looking for. As money flows more efficiently and securely, small-scale businesses flourish. Local economies receive a boost as transactions become quicker, reducing time spent in transit or waiting in queues (Islam & Rahman, 2019).

Bangladesh is known for its vibrant culture, lush landscapes and rapidly developing technology scene. The last decade has seen a quiet revolution in rural areas, fueled by the rise of mobile app-based transactions. Using MFS in apps is very convenient and this is the current trend in financial transactions as a cashless alternative. This trend has been driven by the increasing availability of smartphones (Ortega, 2019), affordable internet connectivity, and government initiatives to promote a cashless economy. As smartphones have proliferated rapidly and mobile applications (Apps) have evolved, a new economic landscape called the App economy has emerged.

Rural Bangladesh, once secluded from the digital realm, is now embracing the convenience of mobile app-based transactions. Where agriculture is the main source of livelihood, and traditional banking infrastructure is often scarce, the proliferation of mobile phones has acted as a catalyst for change. The mobile phone has become a gateway to financial empowerment. Mobile app-based transactions are bringing the unbanked population into the fold of the formal financial system. With just a few taps on their screens, villagers can effortlessly send and accept money, settle bills, and even access credit - services that were once distant dreams. Reacting to this evolving consumer behavior, businesses are progressively delving into the creation of mobile platforms as a cost-effective substitute for conventional websites (Wakefield & Whitten, 2006).

The landscape of mobile app-based transactions is a testament to human ingenuity and adaptability, offering us greater control and convenience in our financial lives. As we navigate this ever-changing terrain, it is crucial to remain vigilant, adaptable, and forward-thinking to harness the full potential of this digital revolution while addressing its challenges. In this digital ecosystem, traditional barriers to financial participation are rapidly eroding, empowering individuals and businesses with new tools to navigate the modern economy. From the rise of mobile wallets and contactless payments to the innovative fintech startups that challenge established financial institutions, the landscape is characterized by both disruption and opportunity.

Throughout this journey, we will delve into the key players, emerging technologies, regulatory considerations, and user experiences that define the landscape of mobile app-based transactions. The main aim of this study is to depict the factors that influence the adoption of mobile app-based financial transactions and explore the behavioral intention to adopt such transactions. Another significant target of the paper is to construct a model for adoption willingness that can serve as a foundation for conducting extensive quantitative studies.

### 1.1. Study Context

The landscape of mobile app-based transactions is a dynamic and transformative force reshaping the way we interact with finances and conduct business in the digital age. The journey through this landscape has revealed a multitude of facets, from the convenience and efficiency offered by innovative fintech solutions. As this landscape continues to evolve, it will undoubtedly play a central role in shaping the way we manage our finances and conduct transactions in the years to come.

Bangladesh's digital financial services and payments sector is poised for significant growth, driven by the shift in consumer preferences towards digital, contactless and cashless transactions. As of February 2023, there were approximately 6.6 million users of app-based banking services. Mobile Financial Service (MFS) providers such as Bkash, Rocket, Nagad, and Upay also play a pivotal role in facilitating app-based transactions. During February 2023, the total value of app-based transactions surged to Tk 293.86 billion, with an average daily volume of Tk 10.49 billion, slightly lower than the Tk 10.94 billion recorded in January 2023. These trends underscore the burgeoning potential of Bangladesh's digital financial landscape (Faijullah, 2023).

Bangladesh government has the slogan ‘My village-My town’ through which rural people are getting urban facilities. At present, 60.29% of the 172.1 million people live in rural regions in Bangladesh (World Bank, 2022). In Bangladesh, approximately 90% of the population utilizes mobile phones, with around 31% owning smartphones (Tribune Desk, 2022). At the start of 2023 internet diffusion raised at 38.9% (Digital 2023: Bangladesh Report). Mobile applications can serve as a supplementary option to old-style payment systems such as cash, cheques, credit cards, and debit cards (Uddin, 2014). The combination of smartphones and internet access has become an essential aspect of individuals' lives (Jeno et al., 2019).

In Bangladesh, users are increasingly growing their digital lifestyle, but still, most users are not aware of the advanced functions of mobile apps (Hossain & Haque, 2014). Many rural users think an app can only be used for cash in and cash out. Some locals believe mobile app-based transactions are only for the upper class (Regmi, 2015). Despite many advantages of app-based transactions for both consumers and merchants (Dahlberg et al., 2015), the rate of adoption is still not meeting expectations, consequently the extensive embrace of mobile payments has not yet transpired (Zhou, 2014). Rural regions continue to primarily rely on cash, and the level of adoption for digital currency remains considerably limited. Despite the rapid growth of mobile apps adoption, there are also the rejection and discontinuance of the use of some mobile apps (Okonkwo, 2019). To secure widespread adoption of mobile app-based transactions, it is essential to examine consumers' technology inhibition landscape. Despite the widespread fascination with mobile apps among broad users, relatively few studies have delved into the factors that influence their usage (Wang, 2018).

In the next section, we offer a concise summary of the existing literature, followed by the "research method" section. The subsequent part encompasses the "findings and implications," with the final section focusing on "conclusions and future research."

## 2. Literature Review

The term ‘app’ originated from ‘software application’ (Light et al., 2018). Mobile applications are designed for users to download onto mobile devices. (Olmstead & Atkinson, 2015). Apps were developed for smartphones in 2008 for iPhones and in 2009 for Androids. Following the introduction of mobile phone applications, there has been a substantial proliferation in the diversity and categories of apps (Nielsen, 2014).

The advent of mobile applications has significantly transformed the role of smartphones in individuals' lives, enabling them to carry out daily tasks such as ticket reservations, education, social interaction, gaming, entertainment, shopping, managing financial matters, and settling bills (Aydin & Burnaz, 2016). These apps also facilitate fund transfers, account management, mobile-based marketing, and various forms of monetary transactions (Oliveira et al., 2016). Smartphones, with their diverse multitasking capabilities and portability, have integrated into everyday existence (Falke et al., 2007), offering suitability, autonomy, and adaptability (Sarwar & Soomro, 2013), as well as flexibility, rapid accessibility, and pervasiveness to users, thereby boosting productivity across various facets of their lives.

Several recognizable earlier researchs utilized Diffusion of Innovation (DOI) theory (Eastin 2002; Azam et al., 2021) to investigate the behavior of adopting and using technology. Adoption can be described as the psychological disposition through which an individual either embraces or declines the use of an innovation (Azam, 2014). The process of spreading individual adoption is predominantly linked to the individual's awareness, knowledge, personality, and motivation. As per Rogers (1995), embracing a new concept is shaped by five essential attributes of that innovation, which include its relative benefit, compatibility, intricacy, feasibility of testing, and how visible it is to users within a social context.

A substantial factor to the widespread adoption and triumph of these applications is the increasing comfort and familiarity customers have developed with technology. In the present era, these apps have become so intuitive and user-friendly that even individuals who have had no prior experience with smartphones swiftly grasp how to operate and utilize them (Hew et al., 2015). In China, people are using mobile phones for their daily transactions and all financial services (Vijai, 2019). Countries like Bangladesh, however, may still have a long way to go in this regard.

Scholars have contended that factors like perceived utility and perceived ease of use indeed exert a positive and straightforward effect on customer trust. Among other elements of app adoption, the most influential role is played by economic benefits. Customers expect mobile apps to be economically viable, convenient, effortless, and error-free transaction method (Ali et al., 2021). Drawing from a Nielsen report in 2018, a

robust correlation exists between the duration individuals spend using their mobile phones and the evolution of usage patterns. Users of cheaper mobile phones tend to have a greater preference for utilizing lightweight versions of applications.

In the literature, one of the initial obstacles to technology adoption is insecurity, which is characterized as an absence of confidence in the technology and its capacity to perform effectively (Parasuraman, 2000). Zhang et al. (2012) demonstrated that perceived risk had a noteworthy adverse impact on behavioral intention.

In the individual adoption process, the influence of family, friends, and peer groups becomes significant (Bombardi-Bragg, 2017). Social identification significantly influences a user's intention to make in-app purchases (Hsu and Lin, 2016). In mobile app adoption, consumers may use the following information: the review in app stores, the icon of an app, user feedback on websites, news stories about some apps, and word of mouth (Zhang, 2018). Pleased customers act as a reference to use the innovation (Hoque & Sorwar, 2017; Venkatesh et al., 2012).

Block et al. (2017) have proposed that attitudes play a crucial role in participation in activities. Attitudes serve as a robust predictor of the intention to persist in using an application (Shaikh & Karjaluoto, 2015). Meuter et al. (2003) indicate that technology-related anxiety has a significant adverse effect on customer acceptance and the customer experience, particularly in the realm of self-service technologies. The degree of Internet proficiency and personal valuation of the Internet are additional moderating variables that influence the impact of convenience and collaboration on app utilization (Ahuja, 2016).

In adoption research, the reputation and physical presence of a company offering online services have shown a statistically significant connection with customer trust, as indicated by studies by Beldad et al. (2010). Numerous researchers have consistently identified and advocated the idea that a positive reputation of a company fosters a trustworthy relationship with its customers. Conversely, when a company has a negative reputation among consumers, it diminishes the trustworthiness (Beldad et al., 2010). Additionally, the smoothness of transactions has been found to have a clear impact on this relationship.

Researchers have frequently regarded behavioral intention as a crucial aspect of comprehending real usage actions. This perspective stems from mounting empirical proof indicating that behavioral intention is among the most reliable predictors of actual usage behavior, as demonstrated by studies such as Zhang et al., (2012) and Venkatesh et al., (2012). Wang et al., (2013) investigated the factors influencing the behavioral intention of app users and proposed that consumers' values regarding user experience play a pivotal role in influencing the intention to employ information technology.

In spite of challenges such as low internet access, limited information, weak legal and regulatory frameworks, insufficient financial support, traditional payment methods, a

shortage of skilled personnel, and high internet expenses, the government has outlined its ambitions to transform Bangladesh into a technology-driven society (Azam, 2014).

The adoption behavior of individuals is commonly examined using well-known theories such as the Theory of Reasoned Action (TRA) (Montano & Kasprzyk, 2015), Diffusion of Innovations (DOI) Theory (Rogers, 2010), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Hoque & Sorwar, 2017; Venkatesh et al., 2012).

## 3. Methodology

The research employed a qualitative research approach to accomplish its objectives. The approach includes a comprehensive analysis of existing literature as well as an in-person exploration. The preliminary step involved a comprehensive examination of prior research to establish an initial grasp of the elements influencing the acceptance of mobile app-based financial transactions. Subsequently, a field study was carried out to delve into and authenticate these factors and variables. This phase encompassed 15 in-depth interviews with individuals of significance, meticulously chosen through purposive sampling. These interviews aimed to gather expert opinions and valuable insights pertaining to the subject of the study.

### 3.1. Sample

We utilized a blend of convenience and purposive sampling methods to identify participants with direct experience in e-transaction processes (Clarke and Braun, 2013) who were willing to take part in our field study. In this research, we adopted the idea of conducting interviews until reaching the 15th case, as we had achieved information saturation and theoretical richness (Lincoln and Denzin, 2003). Participants for the interviews were chosen based on their engagement in app-based transactions, accessibility, and ease of contact. Our interview group comprised fifteen smartphone users with diverse educational backgrounds, all possessing a comprehensive grasp of our study's objectives. We made deliberate efforts to ensure diversity among the participants sampled. The demographic profiles and relevant participant information from our qualitative survey can be found in Table 1.

### 3.2. Data Collection

The research team prioritized qualitative data collection methods over numerical data, aiming to gain insight into participants' perspectives (Bryman, 2017). They conducted individual, face-to-face interviews as part of the qualitative survey, ensuring meticulous organization and recording after securing participants' consent. Before the field study, respondents received a detailed consent form outlining the study's objectives and ethical considerations, emphasizing their voluntary participation and the freedom to withdraw anytime. The researchers framed their inquiries in a "how" format rather than a "why" to

create a friendlier, non-threatening atmosphere, ultimately enhancing outcome quality (Yin, 2017).

We used semi-structured interviews, focusing on (i) factors influencing app-based transaction adoption, (ii) attitudes towards technology, (iii) barriers to participation, (iv) required resources and facilitating factors, (v) customer buying culture readiness, and willingness to use mobile app-based transactions. Each interview lasted approximately 60 minutes, with significant attention paid to nonverbal signals and other indicators to enrich the understanding of findings. We transcribed all interviews the day after each session.

### 3.3. Data Analysis

Due to the interpretive nature of the study, the researchers encountered a hurdle when analyzing the data. Among the various analysis methods commonly used in qualitative research, content analysis (Neuendorf, 2017) was chosen as an appropriate approach for analyzing the interview transcripts. This research thoroughly investigated the in-depth interviews from various perspectives through a meticulous review of the transcribed content. The process of content analysis unfolded in two distinct phases. The initial phase focused on the exploration of single interview transcripts, while the another phase involved the analysis of transcripts spanning multiple interviews. The analysis of content was carried out entirely through manual means, involving a blend of both inductive and deductive methods for classifying factors and variables. The investigation delved into themes, sub-themes, and conceptual explanations related to variables and factors through an inductive approach. Additionally, the process involved an assessment of measurement scales for some variables and factors.

## 4. Findings and Discussions

### 4.1. Demography

The participants engaged in the field study exhibited a wide range of diversity as the 15 respondents include students, business people, service holders, housewives, retired person, school teachers and farmers. Selection of participants was based on their practical experience, technological know-how and an interest in making a contribution to the field of cashless Smart Bangladesh. Most respondents have a so strong formal education in various academic fields.

Table 1: Demographic profiles of study respondents

| Participants | Age Group (Years) | Gender | Occupation | Education | Monthly Income (Tk) | Use App-based Transactions since (Years) | Use Frequency |
|---|---|---|---|---|---|---|---|
| A | < 25 | Male | Student | Honors | < 10000 | 4 | Daily |
| B | 35-44 | Female | Primary School Teacher | Masters | 20000-30000 | 4 | Weekly |
| C | 45-59 | Male | Farmer | Primary | 10000-20000 | 3 | Monthly |
| D | < 25 | Male | Student | HSC | < 10000 | 4 | Weekly |
| E | < 25 | Female | Student | Honors | < 10000 | 3 | Daily |
| F | < 25 | Female | Student | Honors | < 10000 | 5 | Daily |
| G | 45-60 | Male | Business | Honors | 20000-30000 | 6 | Weekly |
| H | 35-44 | Male | Private Service Holder | Masters | > 80000 | 5 | Weekly |
| I | 35-44 | Male | News Reporter | HSC | 30000-50000 | 6 | Daily |
| J | 35-44 | Male | Private Service Holder | HSC | 10000-20000 | 5 | Monthly |
| K | 45-59 | Female | Business | Primary | 20000-30000 | 2 | Monthly |
| L | > 60 | Male | Retired Service Holder | HSC | 20000-30000 | 2 | Monthly |
| M | 35-44 | Male | Outsourcing | HSC | 20000-30000 | 5 | Weekly |
| N | 35-44 | Male | Service Holder | Graduate | 20000-30000 | 6 | Daily |
| O | > 60 | Female | Housewife | Self-Educated | < 10000 | 2 | Monthly |

### 4.2. Factors Influencing Mobile App-Based Financial Transaction's Adoption:

Table 2 presents the factors and variables acknowledged through the analysis of the interviews. A total of 12 factors and 48 variables emerged from the combined insights of the field study and literature review. The following section outlines the origin of these variables, including illustrative quotations from the field study and references to pertinent literature.

In our research, the most influential determinant of intention was discovered to be performance expectancy, confirming our initial expectations. Nearly every participant emphasized that mobile app-based financial transactions offer efficiency and speed. E said "[…] Mobile app saves my money and time." They further expressed that these transactions could be conducted at any time during the day, enabling them to overcome constraints related to location and time. D said "[…] Transactions are very transparent." With app-based transactions, users can complete transactions with just a few clicks on

their smartphones. 7 indicated that app-based financial transactions increase efficiency and productivity. Most of the respondents said that money transfer is very easy and 9 respondents said that app-based transactions made their life hassle-free. The literature on information technology (IT) adoption has recognized performance expectancy as an important predictor of adoption (Venkatesh et al., 2003).

However, when it comes to effort expectancy, there was a divergence of views. Among the 15 respondents, 12 expressed that ease of use played a role in their intention to adopt or use mobile app-based financial transactions. 10 respondents felt that app-based transactions are clear and understandable while 10 respondents felt that it is user-friendly and easy to learn.

Mobile apps are often cheaper than traditional channels for financial transactions. This is because they do not require the same level of infrastructure and overhead costs. Factors that have been identified through a combination of literature research and field studies have demonstrated diverse impacts in certain instances. For example, Five of the 15 respondents felt that smartphone devices are reasonably priced. 11 respondents said that using mobile app-based financial transactions saves money. Eleven of the 15 respondents felt that charges for internet services are high. 11 respondents said that the cost or fee of smartphone app-based services is high. F said "[…] The cost of cash out charge and internet package is very high." Only 4 respondents felt that mobile app-based services increase unnecessary transactions.

We found that Technology attitude is significant in our field study, whereas it is reported to be insignificant in the literature. 6 respondents said that they have enough courage, while ten of the respondents indicated their constant readiness to embrace app-based services. 7 respondents said that they would adopt new technology after gathering knowledge. G said "[…] if the government make the app-based payment compulsory, then the attitude of people will be changed."

Mobile app-based transactions raise security concerns. As these transactions involve the transfer of funds, there is a risk of fraud and cybercrime. Ensuring the presence of required security measures to safeguard users' financial information is crucial.

It was observed that 10 respondents have trust in the effectiveness and precision of the technology, but 8 respondents have doubts on the authority's honesty and integrity, misuse of personal information, and hacking. E said "[…] I completely trust my app providers." F said "[…] I have closed my MFS account because of hacking." Instances of fraud have been reported where deliveries are supposedly completed, but customers later complain of non-delivery. 5 respondents said that mobile app-based financial transactions create tension. Skepticism about security and privacy lingers, demanding heightened cybersecurity measures to foster trust (Karim & Rahman 2022).

Interestingly, our study has detected that social influence plays a significant role. This outcome aligns with prior research, which has consistently demonstrated that social influence strongly impacts an individual's intention to accept and use IT. 6 respondents

were influenced by important people, whereas 8 respondents were influenced by family and friends. D said "[…] I have not influenced by my family and friends, I use app because of necessity" 10 respondents said that social media influenced them to use mobile app-based financial transactions.

**Table 2: Factors and variables, along with their sources**

| Factors | Variables | Interviewee | | | | | | | | | | | | | | Literature |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | |
| **Performance Expectancy** | Enables performing tasks more quickly and time-saving | √ | √ | | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | Bankole et al. (2011); Lee et al. (2011); and Zhou (2014); |
| | Increases productivity | √ | √ | | √ | | | | | | √ | √ | √ | √ | | √ | Bankole et al. (2011); Zhou (2014 |
| | Use it from anywhere at any time | √ | √ | √ | √ | √ | √ | √ | √ | | | | √ | √ | √ | √ | Bankole et al. (2011); Zhou (2014); |
| | Money transfer is very easy | √ | √ | √ | √ | | √ | √ | | | √ | √ | √ | √ | √ | √ | Venkatesh et al. 2003; |
| | Hassle-free life | √ | | | √ | √ | | √ | √ | √ | | | √ | √ | √ | | Hossain et al. (2021) |
| **Effort Expectancy** | The system is easy to use | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | √ | | Venkatesh et al. 2003; |
| | Clear and understandable | √ | √ | | √ | √ | √ | √ | | √ | √ | | | √ | √ | | Venkatesh et al. 2003 |
| | User-friendly and easy to learn | √ | √ | √ | √ | √ | √ | √ | | | √ | | | √ | √ | | Zhou (2014) & Huh et al. (2009) |
| **Economic Factors** | Devices are reasonably priced | √ | √ | | √ | | | | | √ | √ | | | | | | Field study |
| | App-based transactions saves money | √ | √ | √ | √ | √ | | √ | | √ | √ | √ | | √ | √ | √ | Stockdale and Standing, (2004); Bakos, (1998) |
| | High charges | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | | √ | | Stockdale and Standing, (2004); |
| | Increase unnecessary transaction | √ | √ | | | √ | | | | | | | | √ | | | Field study |
| **Technology attitude** | Courageous | | √ | | | | | √ | √ | √ | | | | √ | √ | | House et al. (2004) |
| | Gathering knowledge before use | √ | | √ | √ | √ | | | | | √ | | √ | | | √ | House et al. (2004) |
| | Adoption readiness | √ | √ | | √ | √ | | √ | √ | √ | √ | | | √ | √ | | Field study |
| | Necessity | √ | √ | √ | √ | | √ | | √ | √ | √ | √ | √ | √ | | √ | Field study |
| **Security** | Personal information may be misused | √ | √ | | | | √ | | √ | √ | √ | | | √ | √ | | Sarkar et al. (2020) |
| | Hacking | √ | √ | √ | | | √ | √ | | √ | √ | √ | | | √ | | Sarkar et al. (2020) |
| | Trust/ Credibility | √ | √ | | √ | √ | | √ | √ | | √ | √ | | √ | | √ | Lee et al. 2011 |
| | Create Tension | | | √ | | √ | √ | | √ | | | | | √ | | | Field study |
| **Social Influence** | People important to me use it | | √ | √ | | √ | | | | √ | √ | √ | | | | | Venkatesh et al. 2003 |
| | Encouraged by my family and friends | √ | √ | √ | | √ | √ | | √ | √ | | √ | | | | | Venkatesh et al. 2003 |
| | Good reviews on mass/social media | √ | √ | | √ | √ | √ | √ | √ | | √ | | | √ | √ | | Shan & King (2015 ) |
| **e-Readiness** | Sophistication of the Internet | √ | √ | | √ | √ | √ | √ | | | √ | | | √ | | | Azam (2014) |
| | Transaction speed | √ | √ | | √ | √ | √ | √ | √ | | √ | | | √ | √ | | Field study |
| | Low digital literacy | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | | Field study |
| | Many people do not have a smartphone | √ | √ | √ | | √ | | | √ | | √ | | | | | | Field study |
| | Laws relating to consumer protection | √ | √ | | √ | √ | | | | √ | | | | √ | | | Zhu & Kraemer (2005); Azam and Quaddus, 2012 |
| | Available app-based MFS | √ | √ | √ | √ | √ | √ | √ | √ | √ | | | | | | | Zhu & Kraemer (2005) |
| | Not accepted everywhere | √ | √ | √ | √ | √ | √ | √ | √ | | √ | | | | √ | | Field study |
| **Brand Image** | Goodwill | | √ | | √ | | √ | | | | √ | | | √ | √ | | Field study |
| | Well-known/ Familiarity | | | | √ | | | | | | √ | | | √ | | | Field study |
| | Offer varieties of services | √ | | √ | | √ | | | √ | | √ | | √ | | √ | | Field study |
| | Advertisement | | √ | √ | √ | √ | √ | √ | √ | | √ | | | √ | √ | | Field study |
| **Government Policy** | Government's motivational program | √ | √ | | √ | √ | √ | √ | | √ | | | | √ | √ | | Azam (2014) |
| | Government grants/ Vata | √ | √ | √ | √ | √ | √ | | √ | | √ | | | √ | √ | √ | Azam (2014) |
| | Curbing black money | √ | √ | | √ | √ | √ | | | √ | √ | | | | | | Zhu & Kraemer (2005) |
| **Customer Buying Culture** | Cash dominant transactions | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | Świecka et al. (2021) |
| | Worried about the quality of product | √ | √ | | √ | | √ | √ | √ | √ | | √ | | √ | √ | | Field study |
| | Prefer goodwill | | √ | √ | √ | | √ | | | | √ | | | √ | √ | | Field study |
| | Compare offers before buying | | √ | | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | | Field study |
| | Distant dream to be cashless | √ | √ | √ | | | √ | | √ | | √ | √ | | √ | √ | | Field study |
| **Promotional** | Cashback | √ | √ | √ | √ | √ | | √ | √ | √ | √ | | | √ | √ | | Field study |

The majority of the participants voiced apprehensions regarding infrastructure and e-readiness. Their concerns revolved around issues such as the speed and intricacy of the

Internet, transaction velocity, and server-related problems. D said "[…] I can forget my moneybag, but never forget to take my mobile." Many people have lower levels of education, low digital literacy and lack of training. E said "[…] to encourage app-based transactions, adequate training in necessary." Digital literacy remains a hurdle, as many rural users are still learning to navigate the complexities of mobile apps. Many people do not have a smartphone. Most of the respondents are aware of legal readiness. 10 respondents said that "[…] Mobile app-based financial transactions are not accepted everywhere."

6 respondents said that goodwill influenced them to use mobile app-based financial transactions. 10 respondents were influenced by advertisements. J said "[…] I have influenced by goodwill and advertisement of app-based transactions." A significant number of respondents expressed their desire to embrace online services that have a strong reputation and a physical offline presence.

It is interesting to note that, eleven respondents mentioned government grants/ vata as an influential factor. 9 respondents said that Government's motivational program for accepting mobile payment is still low. H said "[…] upobritti, widow vata enhanced the app-based transactions."

Customer buying culture greatly influenced the use of mobile app-based financial transactions. I said that "the society is still cash dominant". Most of them are worried about the quality of the product ordered, they have lower e-payment habits. H said that "[…]it is a distant dream to be cashless."

The promotional offer of different app service providers has a direct effect on adoption decisions. Except for 3 respondents all of them said that "cashback, price cut/ discount influenced them to use mobile app-based financial transactions." 10 respondents said that they compare different types of offers before buying.

### 4.3. Causal Links:

We conducted a thorough analysis of the interview scripts to extract relationships among the previously identified variables, which are depicted in Table 3.

Table 3: Causal links

| | Participants | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Constructs** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | **M** | **N** | **O** |
| *PE & INT* | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ |
| *EE & INT* | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | √ | |
| *EF & INT* | √ | √ | √ | √ | √ | | √ | | √ | √ | √ | | √ | √ | √ |
| *TA & INT* | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| *SEC & INT* | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | | √ | | √ |
| *SI & INT* | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | |
| *ERED & INT* | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | √ | √ | | |
| *BI & INT* | | √ | √ | √ | √ | | | √ | | √ | | √ | √ | √ | |
| *GOVP & INT* | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | |
| *CBCUL & INT* | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | |
| *PO & INT* | √ | √ | | √ | √ | √ | √ | √ | | √ | √ | | √ | √ | |
| *INT & Adoption* | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |

Note: PE: Performance Expectancy; EE: Effort Expectancy; EF: Economic Factors; TA: Technology Attitude; SEC: Security; SI: Social Influence; BI: Brand Image; ERED: e-Readiness; GOVP: Government Policy; CBCUL: Customer Buying Culture; PO: Promotional Offer; INT: Intention to Use

The table displays all the elements examined during the analysis of the field study and founds a causal connection among them. For instance, the concept of "PE & INT" signifies that performance expectancy positively influences the willingness to engage in mobile app-based financial transactions. It was noted that all participants agreed that performance expectancy directly affected their willingness to use mobile app-based financial transactions. The connection between these two factors was discovered and substantiated through the responses and observations of the participants. A said, "[…] Individuals residing in various regions of the country have the convenience of placing orders and receiving home delivery services for their purchases." M opined the same by saying, "I believe that performance expectations are pivotal in the adoption of new technologies. Users are inclined to embrace a technology when they perceive it as advantageous and capable of enhancing their performance and efficiency." Nine participants agreed that Mobile app-based transactions contribute to a seamless shopping experience, echoing similar observations. For instance, H said, "A significant number of individuals prefer not to visit markets due to the unsanitary and unclean surroundings, […], traffic jam troubles the people, […] they experience a convenient and trouble-free shopping experience through a mobile app." Respondent A said, "He can use app-based transactions anytime from anywhere, […]." K said that "app-based transactions save time, cost and increase productivity."

### 4.4. Adoption Model

As previously mentioned, one of the key goals of our paper is to create a model for the adoption of mobile app-based financial transactions, based on our field study. Initially, we primarily utilized the UTAUT model to establish a foundational conceptual framework for our study, which was subsequently refined and enhanced through the scrutiny of data collected via in-depth interviews.

Using the connections between the variables outlined in Table 3, we formulated distinct adoption models for each participant in the interviews. Subsequently, we amalgamated these individual models to create a complete model, as depicted in Fig. 1. The figure also illustrates several moderating variables, including "age," "gender," "education," and "occupation."

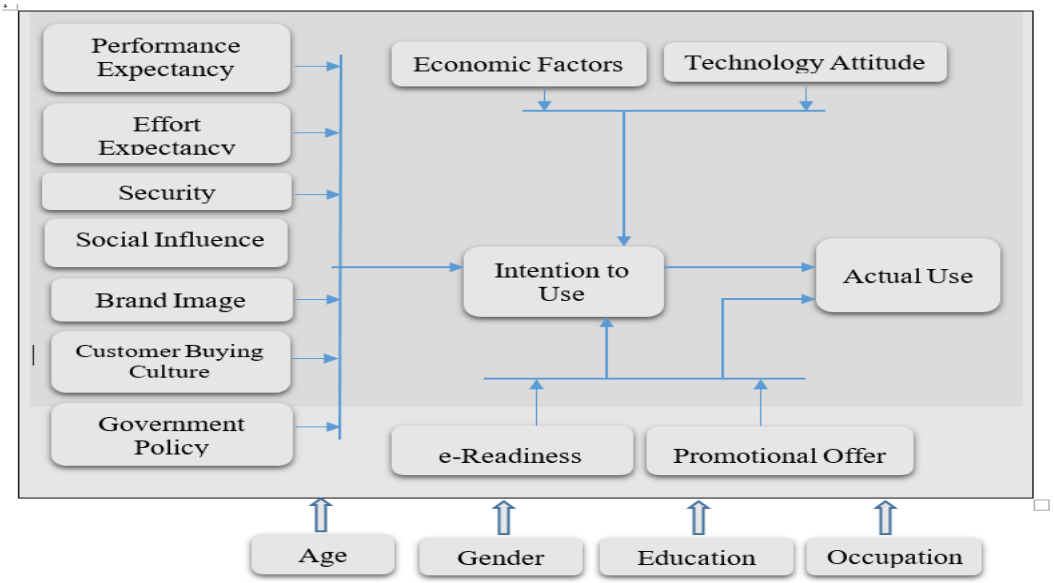


Figure1: Model for Adoption of Mobile App-Based Financial Transactions

Each of these variables serves as a moderating factor that impacts the relationship between the respective antecedents and the "adoption decision." It's important to highlight that the model presented in Figure 1 can serve as the foundation for conducting a comprehensive quantitative study aimed at identifying the significant precursors and moderating variables in the adoption of mobile app-based financial transactions on a larger scale.

## 5. Conclusion and Implications

The landscape of mobile app-based transactions in rural Bangladesh is a testament to the country's resilience, adaptability, and thirst for progress. The landscape of mobile app-based transactions is a reflection of our evolving relationship with technology and

money. The adoption of app-based transactions is a crucial step toward building a smarter Bangladesh. The day will come when people will carry only one smart device and all services on it will be immediately available. In the next few years, all transactions will be processed through the app as this is the most convenient way to do transactions that overcomes time and location obstacles, allowing bankers to expand banking services to rural areas (Azam, 2021). Mobile app-based transactions are more than a financial tool; they are agents of change, breaking down barriers and rewriting the narrative of rural development. Digital assets comprising data ecosystems, building and delivery of unified digital services, digital money, digital transactions, and awareness of cashless transactions, etc. will be the invisible foundation of Smart Bangladesh. The government and the private sector should continue to work together to promote the use of digital payment solutions and educate the masses about their benefits.

As the landscape continues to evolve, it is imperative to address the challenges head-on while maximizing the opportunities for growth. The issues of limited smartphone usage, lack of affordability for smart devices, insufficient awareness of the advantages of digital technologies, and the absence of a cloud-first approach require attention and resolution. Bangladesh should strengthen its current policies regarding cybersecurity and emerging technologies, including AI, Robotics, Blockchain, IoT, and Microprocessor design. Investing in digital literacy initiatives, ensuring robust cybersecurity measures, and fostering collaborative efforts can pave the way for a more inclusive and prosperous rural Bangladesh.

Through this exploratory analysis, a spectrum of factors that influence adoption decisions has been identified which included *Performance Expectancy, Effort Expectancy, Economic Factors, Technology Attitude, Security, Social Influence, Brand Image, e-Readiness, Government Policy, Customer Buying Culture, and Promotional Offer*.

Promoting a cashless society in Bangladesh through the adoption of mobile app-based financial transactions can bring numerous benefits including reduced dependence on physical currency, security, convenience, financial accessibility, especially for underserved communities and remote areas, improved transparency in financial transactions and improved economic efficiency and the potential to combat corruption and tax evasion, thereby promoting a more responsible and sustainable financial ecosystem. Through mobile apps, it is possible to provide timely service and eliminate all kinds of bureaucratic tyranny. Mobile apps reduce the amount of banknote printing required for cash transactions. The use of mobile, app-based financial transactions leads to a smart citizen.

Our research delves into twenty variables derived from the field study, constitutes a substantial augmentation to the existing body of literature. Furthermore, this paper has taken a step forward by crafting a theoretical model. The projected model can assist as an initial point for future research studies aiming at formulating hypotheses for empirical validation, especially from the perspective of developing countries and considering different country perspectives. By adhering to our research methodology, individuals can create a model tailored to the specific context of adoption in any given situation.

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