PERCEIVED USEFULNESS WITHIN THE TECHNOLOGY ACCEPTANCE MODEL FRAMEWORK AND FINTECH ADOPTION: AN INTEGRATED REVIEW OF FINDINGS FROM DEVELOPING COUNTRIES

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Abstract: This study aims to analyze the role of perceived usefulness in influencing the adoption of financial technology (fintech) using the Technology Acceptance Model (TAM) framework, by integrating findings from literature reviews across various developing countries. As fintech implementation continues to expand as a tool for promoting financial inclusion, understanding the determinants of technology adoption becomes increasingly crucial, especially in countries with varying levels of technological penetration. This research adopts a systematic literature review method of scholarly articles published between 2019 and 2024 to identify patterns, trends, and contextual variables that mediate or moderate the influence of perceived usefulness on fintech adoption intentions and behaviors. The findings reveal that perceived usefulness is a primary determinant in the adoption of fintech in most developing countries. However, its influence is often mediated by external factors such as digital literacy levels, trust in the system, technological infrastructure, and national regulatory frameworks. These results offer theoretical contributions to the expansion of the TAM in cross-cultural contexts and practical implications for policymakers and fintech providers in designing more context-specific and locally responsive adoption strategies.

Keywords: *Perceived Usefulness; Fintech Adoption; Technology Acceptance Model.*

1. Introduction

The development of information and communication technology has driven significant transformation in the global financial sector. One of the most prominent innovations is the emergence of financial technology (fintech), which integrates digital technology into financial services. Fintech not only simplifies transactions but also offers solutions to financial access issues, particularly in developing countries that have long faced challenges in achieving financial inclusion. Nevertheless, the level of fintech adoption varies across developing nations, even though many of them encounter similar obstacles in their conventional financial systems.

In developing countries, fintech has emerged as an alternative to conventional financial systems that often fail to reach all segments of the population—particularly those living in

remote areas, low-income communities, or individuals without a formal banking history. According to the World Bank (2022), over 1.4 billion adults worldwide remain unbanked, the majority of whom reside in developing nations. In this context, fintech solutions such as digital wallets, app-based payment services, and peer-to-peer (P2P) lending have proven to play a critical role in expanding access to financial services (World Bank, 2022).

In Southeast Asia, for instance, fintech adoption has grown exponentially, especially in countries like Indonesia, Vietnam, and the Philippines, which feature large populations and rising internet penetration (McKinsey & Company, 2023). In Africa, mobile payment services like M-Pesa in Kenya have revolutionized how people transact, with significant impacts on economic empowerment. Meanwhile, in Latin America, countries such as Brazil and Mexico have seen a surge in fintech startups focusing on microcredit, digital payments, and inclusive finance (Reuters, 2023).

Nevertheless, the development of fintech in developing countries also faces various structural and social challenges. Digital divides, low levels of financial and digital literacy, and the lack of adaptive regulations serve as major barriers to widespread fintech adoption. Additionally, public trust in technology and service providers plays a critical role in determining the success of fintech implementation (Kou et al., 2021).

The rapid advancement of digital technology has triggered significant transformations across various sectors, including finance, education, healthcare, and commerce. Amidst these changes, the Technology Acceptance Model (TAM) has become one of the most widely used theoretical frameworks for understanding individual and organizational behavior in adopting technology. One of the key variables in TAM is Perceived Usefulness (PU) the user's belief that using a particular technology will enhance their performance or productivity. Previous studies using the TAM approach have shown that positive perceptions of a technology's benefits significantly influence the adoption of fintech services, especially among first-time users in developing countries (Davis, 1989; Oliveira et al., 2020).

Considering these dynamics, the study of fintech development in developing countries becomes crucial not only to enrich academic literature, but also to provide policy recommendations that can accelerate financial inclusion and digitally driven economic development. Research shows that variations in fintech adoption levels across developing countries are influenced by a range of social, economic, and technological factors (Bazarbash, 2019; IMF, 2020).

On the social side, disparities in digital and financial literacy greatly influence how communities understand and use fintech services. For example, in some African and South Asian countries, limited education and a strong preference for cash-based transactions hinder the adoption of digital platforms, even as app-based financial infrastructures begin to emerge (Kou et al., 2021).

Economic factors also play a critical role. Developing countries with low per capita income often face barriers related to owning digital devices and accessing the internet—both of which are prerequisites for using fintech services. On the other hand, countries with relatively rapid economic growth, such as Indonesia and Vietnam, have seen surges in fintech adoption driven by rising purchasing power and increased investment support for digital finance startups (McKinsey & Company, 2023).

In addition, the capacity of technological infrastructure and national digital readiness are crucial factors. Countries with strong information technology infrastructure—such as stable internet networks and widespread smartphone penetration—tend to adopt fintech services more rapidly. For example, Kenya has successfully built a mobile-based digital financial

ecosystem that has become a global model for fintech adoption in developing countries (World Bank, 2022). In contrast, countries with weak infrastructure and regulatory frameworks that are not yet adaptive to financial innovation experience slower and more limited adoption.

Furthermore, cultural aspects such as public trust in technology and financial institutions also shape fintech adoption patterns. In some countries, distrust of digital systems, concerns about data security, and the prevalence of informal economies act as barriers to the use of modern financial technologies (Alalwan et al., 2021). Research by Sari, Nugroho, and Rahmiyati (2023) indicates that financial knowledge, financial behavior, and digital financial capability significantly affect financial anxiety. Thus, understanding the social, economic, and technological factors that influence fintech adoption is essential in designing context-specific implementation strategies. Cross-country studies can offer valuable insights for formulating approaches that align with local characteristics, thereby promoting sustainable fintech adoption in developing countries.

Perceived usefulness (PU) is one of the key determinants in the Technology Acceptance Model (TAM) developed by Fred Davis. This concept refers to the extent to which an individual believes that using a particular technology will enhance their job performance. Understanding PU is critical because it directly influences an individual's intention to accept and use new technology. When users perceive a system as beneficial and relevant, they are more likely to adopt it.

PU is also closely related to user satisfaction a system perceived as useless is likely to be rejected even if it offers advanced features. Additionally, insights into PU provide a foundation for system developers or decision-makers to design technology that better meets user needs, both functionally and in terms of user training. In organizational contexts, perceived usefulness plays a vital role in ensuring successful technology implementation by fostering internal support and easing the transition process.

PU does not stand alone it interacts closely with perceived ease of use, and together they shape users' attitudes toward using a technology. Therefore, a comprehensive understanding of perceived usefulness is essential to ensure successful technology adoption across various domains, including education, business, and the public sector.

2. Literary Review
2.1. Theoretical Concept: Perceived Usefulness in the Technology Acceptance Model (TAM)

Perceived usefulness (PU) is one of the core components of the Technology Acceptance Model (TAM) developed by Davis (1989). PU is defined as the degree to which a person believes that using a particular technology system will enhance their job performance. In the context of financial activities, PU can be interpreted as the belief that technology is capable of simplifying, accelerating, or improving the efficiency of managing personal or organizational finances.

With the continuous evolution of digital technologies, recent studies have reaffirmed that PU remains a crucial variable in explaining technology adoption by both individuals and organizations. For example, research by Rahi et al. (2022) shows that PU significantly influences users' intention to adopt digital banking services in developing countries. Similarly, Zhang & Lu (2021), in their study on the use of financial applications among younger generations, found that PU is a strong determinant of loyalty and continued use of fintech applications.

Perceived usefulness is also closely related to the perceived utility value of a technology, which is determined by how much users feel assisted by the technology in completing routine tasks. Research by Alalwan (2020) in the context of mobile payments in the Middle East indicates that the higher the perceived usefulness of digital payment applications, the more likely users are to adopt the technology. This finding is supported by a study by Lin et al. (2019), which states that PU is a key predictor of user satisfaction and continued intention to use app-based financial services in China. Across various studies, PU not only acts as a predictive variable but also serves as a mediator between other variables such as perceived ease of use, trust, and attitudes toward technology. Therefore, in research on financial technology, e-commerce, and information systems, PU is often positioned as a central variable in user behavior analysis models.

2.2. The Relevance of TAM in Fintech Adoption Studies in Developing Countries

The Technology Acceptance Model (TAM) has become one of the most commonly used theoretical frameworks to understand technology adoption behavior, including in the context of digital financial services or financial technology (fintech). Within this framework, two core variables perceived usefulness (PU) and perceived ease of use (PEOU) are considered primary factors influencing behavioral intention to use, and ultimately, actual usage. In the context of developing countries, the application of TAM remains highly relevant and even increasingly important because fintech adoption often faces challenges such as low digital literacy, limited infrastructure, and a lack of trust in digital systems. Research by Rahi et al. (2022) in Pakistan demonstrated that PU and PEOU significantly influence users' intentions to use digital banking services. Furthermore, this relationship is strengthened by additional factors such as trust and perceived security. The study confirms that while TAM remains effective as a foundational framework, its application in developing countries requires the integration of contextual variables to better reflect local conditions and behavioral patterns.

Another study by Boateng et al. (2020) conducted in Ghana also found that PU (Perceived Usefulness) and PEOU (Perceived Ease of Use) significantly influenced the adoption of mobile money services. This suggests that the TAM framework can explain fintech adoption behavior even in environments with limited technological infrastructure. Similarly, Alalwan et al. (2021) in their study in Jordan expanded the TAM model by incorporating cultural and trust variables, demonstrating that while the core TAM remains relevant, localized adaptations are necessary to produce more accurate and contextually grounded results. In Indonesia, research by Setiawan & Prasetyo (2023) showed that TAM variables continue to be dominant in explaining the adoption intention of fintech applications among MSME (Micro, Small, and Medium Enterprises) actors, particularly when related to practical benefits such as ease of transactions, bookkeeping efficiency, and access to funding. These findings indicate that, although TAM originated in developed countries, it is both adaptable and applicable for understanding technology adoption behavior in developing countries, including within informal sectors. Thus, TAM holds strong relevance in fintech adoption studies across developing contexts due to its simplicity, flexibility, and extensibility, which allow it to capture complex user behavior across diverse socio-economic environments.

3. Research Method

This research is a library study (library research) employing a descriptive qualitative approach. The main objective of this study is to identify, compare, and integrate various

findings from scholarly literature that discuss Perceived Usefulness and Fintech Adoption within the framework of the Technology Acceptance Model in developing countries. The data for this research were obtained from scholarly journal articles published over the last five years, specifically from 2019 to 2024. The primary sources include reputable international journals such as the Journal of Retailing and Consumer Services, Telematics and Informatics, International Journal of Bank Marketing, and Technology in Society. Literature searches were conducted using major academic databases such as Scopus, ScienceDirect, Emerald, Springer, and Google Scholar. The geographical focus of this study is limited to developing countries in Asia, Africa, and Latin America, in line with the study's aim to examine the dynamics of PU within the TAM framework in these settings.

Data analysis was conducted using a thematic content analysis method. The first stage involved initial coding of key recurring themes in the literature, such as perceived usefulness, trust, security, and ease of use. Subsequently, the findings were classified based on geographical regions, user groups (e.g., MSMEs, students, or the general public), and types of fintech services studied, such as mobile banking or e-wallets. Finally, a comparative synthesis was carried out to identify common patterns, contextual differences across regions, and how perceived usefulness (PU) contributes to influencing users' intentions and behaviors in adopting digital financial technology using the TAM framework.

4. Results and Discussion

4.1. Integration of Findings from Developing Countries : The African Region: Fintech as a Solution to the Limitations of Conventional Banking Services

In many Sub-Saharan African countries, limitations in conventional banking services such as geographical distance, high costs, and limited physical branches—have prompted communities to turn to financial technology (fintech) solutions. In Kenya, fintech platforms like M-Pesa have become an essential part of daily life by filling the gap in access to formal financial services. According to research by Omwansa & Waema (2021), fintech has proven to be more inclusive than traditional banking systems, as it can be accessed with basic mobile phones without the need for a bank account. Similarly, in Nigeria, fintech services serve as a primary alternative for the unbanked and underbanked populations. Ejiaku et al. (2020) note that fintech applications such as Flutterwave and OPay have reached consumers in urban and semi-urban areas previously untouched by traditional financial institutions.

Perceived usefulness (PU) in the African context is often directly linked to the practical value of the services offered. In Kenya, a study by Mburu & Wambua (2023) emphasizes that the perception of fintech usefulness is strongly influenced by tangible functions such as interregional money transfers, bill payments, and access to microcredit. For example, farmers and small traders use services like Tala or Branch to obtain microloans quickly without bureaucratic procedures. Meanwhile, in Nigeria, Ayo et al. (2021) found that users consider fintech useful primarily due to time efficiency, lower costs, and the ease of conducting daily transactions. This perceived usefulness subsequently influences users' intentions and behavioral inclinations to adopt and continuously use fintech services.

4.2. Latin America Region

In Latin America, fintech has grown rapidly as it is perceived as a viable alternative to the bureaucratic and exclusive traditional financial systems. In the Brazilian context, a study by Dias & Teles (2022) shows that perceived usefulness is a key factor in fintech adoption, as many users view fintech as a solution to the administrative barriers present in conventional

banking systems. For instance, applying for microcredit through fintech applications such as Nubank or Creditas is considered more efficient than going through formal banks with lengthy procedures.

In Mexico, Larios-Hernández & Herrera (2020) found that perceived usefulness increases significantly when fintech services simplify access to financial services such as interregional transfers, bill payments, and microenterprise loans, which were previously difficult to obtain through formal financial institutions. Fintech in this region also shows high adoption rates among the unbanked population those without bank accounts or access to formal financial services. This demographic has become the primary target of mobile-based fintech services and digital wallets due to the practical benefits offered.

A study by Camarena et al. (2021) in Mexico noted that fintech provides direct access to services such as faster transactions, lower costs, and simpler verification processes. This enables the unbanked population to more easily conduct daily financial transactions, such as paying electricity bills, purchasing mobile credit, or obtaining microloans. Similarly, in Brazil, research by Melo & Siqueira (2023) stated that perceived usefulness among low-income communities increased because fintech services help them avoid bureaucratic obstacles and geographic barriers typically associated with traditional financial institutions. Access via smartphones has become a key entry point to more inclusive financial services.

Findings from Brazil and Mexico emphasize that perceived usefulness is closely related to fintech's ability to simplify financial processes that were previously complex, costly, and slow. The tangible benefits directly experienced by users—particularly those in the unbanked segment are the main reason for the significant rise in fintech adoption in the region. This indicates that in developing countries such as those in Latin America, the perceived usefulness of fintech is not only technological but also serves as a tool for economic empowerment among vulnerable communities.

4.3. Contextual Factors Influencing Perceived Usefulness within the TAM Framework

Perceived usefulness (PU), as a key component of the Technology Acceptance Model (TAM), does not function in isolation; rather, it is significantly shaped by various contextual factors. In the context of developing countries, four main elements have been found to strengthen or weaken individuals' perceptions of the usefulness of fintech technologies:

1. Digital Infrastructure: Internet Access and Mobile Devices

    Access to a stable internet connection and ownership of mobile devices are essential prerequisites for forming a positive perception of technology's usefulness. A study by Hasan et al. (2021) reported that the perceived usefulness of fintech applications in Bangladesh significantly increased when users had regular internet access and smartphones with compatible operating systems. This finding is supported by research conducted by Widyastuti & Nugraha (2022) in Indonesia, which found that users in urban areas with fast internet connections were more likely to perceive fintech as a practical and efficient financial solution. Rahi et al. (2022) also confirmed in a broader Asian context that application features such as intuitiveness, lightweight performance, and cross-device compatibility enhanced users' perceptions of usefulness. Similarly, in Indonesia, many fintech platforms are designed to operate without requiring users to have conventional bank accounts, further supporting positive perceptions of their utility.

2. Digital and Financial Literacy

    Digital and financial literacy play a crucial role in enhancing PU. The higher an individual's understanding of technological functions and basic financial principles, the

more likely they are to perceive fintech technologies as beneficial. Alalwan et al. (2020) emphasized that users who understand how digital financial applications work tend to have a more positive attitude toward their usefulness. In the Philippines, Cabral & Capuno (2023) found that integrating financial education with technology training significantly increased PU toward e-wallets and mobile banking services.

3. Trust in Technology and Service Providers

     Trust in fintech service providers also plays a crucial role in shaping perceived usefulness (PU). A study by Boateng et al. (2021) in Ghana demonstrated that even when a technology is considered beneficial, low trust in data security or the reputation of the provider can significantly diminish PU. Similarly, in Brazil, users reported that the reputation of companies like Nubank and responsive customer support contributed to a more positive perception of the usefulness of their applications (Melo & Siqueira, 2023).

4. Government Support and Fintech Regulation

     A supportive policy environment also enhances PU toward fintech. Governments that provide clear regulations, consumer protection frameworks, and support for digital financial inclusion foster a sense of security and increase the perceived usefulness of fintech technologies. For example, Mexico's digital inclusion policy through the CoDi program led by the Central Bank has strengthened PU among micro-entrepreneurs toward digital transactions (Larios-Hernández, 2021). In India, initiatives such as Digital India and the Unified Payments Interface (UPI) have significantly contributed to the public's positive perception of the usefulness of digital payment technologies (Saxena & Upadhyay, 2020).

5. Promotion of Benefits

     Public education and marketing strategies that emphasize the practical advantages of fintech such as time savings, queue-free services, and transaction discounts— effectively enhance perceived usefulness (PU). According to findings by Alalwan (2020), value-based promotion is more effective than price-based promotion in encouraging the adoption of mobile payment services.

4.4. Implications for Fintech Adoption Strategies

To ensure optimal fintech adoption, service providers and policymakers must consider strategies that explicitly enhance perceived usefulness (PU) from the users' perspective. Cross-country studies in developing nations reveal that education, inclusive application design, and local collaborations significantly influence the improvement of users' perceived usefulness of fintech services.

1. The Importance of Educating the Public on the Tangible Benefits of Fintech

     Public education on the practical advantages of fintech is a key strategy in shaping perceived usefulness. Communities—especially those in areas with low digital literacy— often do not immediately grasp how fintech can simplify their financial activities. A study by Asongu & Nwachukwu (2019) emphasized that in Sub-Saharan Africa, community-based education programs explaining fintech use for payments, microloans, or money transfers directly improved perceptions of usefulness. In Indonesia, research by Pratama & Nugroho (2022) found that educational campaigns led by fintech providers focusing on concrete benefits such as time and cost efficiency in transactions successfully increased trust and adoption, particularly among MSMEs.

2. Simple and Functional Application Design

A simple and user-friendly interface significantly influences perceived usefulness. Users are more likely to feel comfortable and find the application beneficial when they do not face difficulties accessing core features such as transfers, balance checks, or bill payments. A study by Sharma et al. (2021) in India revealed that minimalist design, intuitive navigation, and uncluttered information were positively correlated with PU and behavioral intention to use. Similarly, in Mexico, Gómez & Rivera (2023) found that features like in-app tutorials and clearly grouped menus were highly effective in helping new users understand fintech functionalities without fear or confusion.

3. Collaboration with Local Institutions to Strengthen the Value Proposition of Fintech

Collaboration with local institutions such as cooperatives, village-owned enterprises (BUMDes), microfinance institutions, and community leaders can serve as a bridge to build trust and embed local context into fintech development. A study by Kamukama et al. (2020) in Uganda found that partnerships with savings and credit cooperatives, combined with training delivered by local agents, enhanced the perception that fintech is not merely a digital tool but a locally relevant financial solution. In Brazil, Souza & Barbosa (2023) highlighted the role of microfinance institutions and church communities in introducing fintech services among unbanked populations more effectively than through digital marketing alone.

Findings from various developing countries indicate that fintech adoption strategies cannot rely solely on technological advancements. To enhance perceived usefulness, a multidimensional approach is needed—one that addresses educational aspects, user experience, and social relationships within communities. Three strategic approaches have proven effective: 1) Providing education focused on tangible benefits, 2) Designing applications that are easily accessible and usable by diverse segments of the population, and 3) Collaborating with local partners to bridge adoption at the grassroots level.

5. Conclusion

Based on the integration of findings from various literature studies conducted in developing countries, it can be concluded that *perceived usefulness* is a key factor in driving fintech adoption within the framework of the Technology Acceptance Model (TAM). The majority of studies indicate that individuals' perceptions of the usefulness of fintech significantly influence their intention and decision to adopt such services. However, the strength of perceived usefulness is not uniform; rather, it is shaped by several contextual factors, including the level of digital literacy, trust in technology, information technology infrastructure, as well as policy and regulatory support from the government.

Factors such as ease of access, digital literacy, simple application design, and promotion of tangible benefits have been shown to strengthen perceived usefulness. Supportive digital infrastructure, government regulations, and trust in service providers are also critical contextual elements that influence the success of fintech adoption. Cross-country findings suggest that effective adoption strategies require educational approaches, inclusive application design, and collaboration with local institutions to build trust and social relevance.

However, research gaps remain and need to be addressed, particularly:

1. The lack of longitudinal studies to monitor the dynamics of perceived usefulness over time;
2. The scarcity of comparative studies among developing countries using mixed-method approaches; and

3. The insufficient integration of local cultural dimensions in the contextual development of the TAM framework.

Bridging these gaps will allow future research to provide deeper, more holistic, and practical insights for promoting inclusive and sustainable fintech adoption in developing countries.

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