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Challenges of digital financial services in emerging economies and opportunities for application: A comparative study between India and Ghana

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Abstract
The research investigates the obstacles encountered by digital financial services (DFS) in developing economies together with possible implementations in India and Ghana. The research applied descriptive-analytical methods to study and analyze the issues encountered by India and Ghana. The examination of previous studies and international organizations confirmed that India confronts 10 obstacles in DFS sector operation and Ghana encounters 6 such challenges. Excel analysis showed that India leads Ghana by 38% in terms of resolving digital financial service challenges in the industry. The findings led to accepting all hypotheses along with multiple suggestions that will improve DFS implementation success in both countries.

Keywords: Premium, capital formation, insurance business, Nigerian, ordinary least squares

Introduction

Traditional banking services expand through digital financial services (DFS) by using modern technology which includes online banking and mobile-supported solutions and e-money models and digital payment platforms. Modern digital banking services started with ATMs and phone banking during their initial phase yet the rising market interest led financial institutions as well as software companies and service providers to implement enhanced digital banking solutions. Existing customers and unbanked groups have become the target market for a range of innovative products through new applications that financial institutions have created (Abbasi & Weigand, 2017) [2].

DFBs show promising potential to give banking services at reasonable prices with ease and security to unbanked people across developing countries through mobile-based solutions and digital platforms along with e-money models. Digital technologies through which unbanked individuals get access to banking products and services exist. However, DFS face substantial adoption challenges. 2.5 billion people around the globe currently operate without banking accounts holding memberships at any financial institution due to data from the World Bank's Global Findex Database (Rana *et al.*, 2020) [18].

In emerging nations, digital financial services encounter many obstacles that impede their capacity to promote financial inclusion and stimulate economic development. Primary obstacles encompass inadequate digital infrastructure, volatile legal and regulatory frameworks pertaining to fintech, and diminished trust in digital financial systems stemming from poor data protection and privacy protocols. Moreover, several economies experience a deficiency in financial and digital literacy inside their populace. Notwithstanding these challenges, the transition to financial digitalization offers substantial opportunity to enhance access to financial services and foster economic growth in these countries (World Economic Forum, 2021) [21].

The research evaluates digital financial service (DFS) hurdles present in both India and Ghana. The obstacles that face India function differently compared to the obstacles in Ghana. The digital infrastructure in India stands at a higher level compared to the current situation with digital infrastructure in Ghana. India supports fintech through "Aadhaar" digital identity system which serves as one of their regulatory policies.

India achieves success in DFS delivery because its middle class keeps expanding while its population increases in its use of technology. Efforts from Ghanaian officials to improve financial awareness have not eliminated digital and financial illiteracy which prevents fintech adoption. The extensive population size and economic diversity of India opens vast opportunities for the implementation of DFS. The smaller market size of Ghana has potential negative effects on both investment speed and digital financial solution adoption rates (McKinsey & Company, 2019; GSMA, 2020) [16].

Literature Review and Hypotheses Development

David-West & Nwagwu, *et al.* (2018) [10] in their study "Sustainable Development Goals, Digital Financial Services, and Entrepreneurship: Challenges and Opportunities in Africa's Largest Economy," contend that enhanced access to financial services is a crucial element in realizing numerous United Nations Sustainable Development Goals (SDGs). The report underscores the significance of Digital Financial Services (DFS) in advancing the United Nations' Sustainable Development Goals (SDGs) in Nigeria through a compilation of case studies from public and commercial entities employing DFS to promote essential SDGs. These institutions not only foster economic development but also enhance value chains that meet the pervasive needs of the impoverished, in a nation where more than 60% of the populace resides below the poverty threshold. Poverty statistics in Nigeria indicate not just insufficient money but also inadequate access to basic services. Around 44% of Nigeria's adult population is financially excluded, and they could benefit from DFS to enable inclusive economic participation.

Hasan, *et al.* (2020) [14] in their study titled "Promoting Inclusive Finance in China through Digital Financial Services," defined the purpose of their research as exploring the contribution of DFS to enhancing inclusive finance in China. The study offers a theoretical discussion on how DFS play a crucial role in advancing financial inclusion in China. The authors employed a systematic review of qualitative data to achieve the study's objectives. Different forces play varying roles in advancing financial inclusion, but DFS are considered one of the most influential forces shaping inclusive finance in the current global economy. The literature discusses various examples of how DFS improve financial inclusion. Moreover, the study provides several contributions regarding the use of DFS to achieve its aims, helping readers better understand the practical impact and implications of DFS tools in transforming the financial sector.

Manzoor, *et al.* (2021) [15], "Digital Financial Services in Pakistan: Opportunities, Challenges, and Recommendations"*:

This study examines how access to and provision of financial services are being transformed through digitalization in Pakistan. Based on secondary data and stakeholder interviews, the research provides an overview of digital financial inclusion and explores the potential opportunities and key challenges facing DFS in Pakistan. Pakistan has made efforts to develop and integrate various DFS systems; however, the study identifies the lack of mechanisms for managing systemic risks, weak infrastructure, an underdeveloped technological ecosystem, low income, limited financial awareness, inadequate banking facilities, and underdeveloped formal institutions. The results suggest that a greater understanding of DFS, enhanced investor confidence and long-term interests, increased competition and trade in ICT products, and improved institutional governance can contribute to the advancement of DFS.

Rana, *et al.* (2020) [18], "Key Challenges Facing Digital Financial Services in Emerging Economies: The Indian Context":

The aim of this study is to identify the key challenges and develop a framework for addressing them by employing Interpretive Structural Modeling (ISM) and the fuzzy MICMAC approach. The researchers explored 18 unique sets of challenges collected from the literature. The application of ISM and fuzzy MICMAC provided an accurate set of driving and dependent variables, which were used to derive a framework. The ISM model was divided into eight different levels. The lowest level consists of the key driving challenge V11 (i.e., the high cost and low return problem), while the highest level includes two highly dependent challenges: V1 (i.e., the risk of using digital services) and V14 (i.e., lack of trust). The described ISM model shows that "the high cost and low return problem (V11)" leads to further challenges facing DFS. Based on this, the first hypothesis is as follows:

H_1: There are challenges facing digital financial services in India.

Anane & Nie (2022) [3], "Determinants of Digital Financial Services Adoption and Usage: Empirical Evidence from Ghana":

Digital financial services have the potential to significantly benefit the poor in developing economies. However, the adoption rate of DFS in Ghana is slow, partly due to the continued reliance on personal cash transfers. Significant variations in adoption levels across important socio-demographic characteristics present another challenge. Using a nationally representative dataset from Ghana, this study explored the determinants of DFS adoption. The study measured the role of socio-demographic factors in estimating DFS adoption determinants using a Logit model. The Logit model indicated that effort expectancy, awareness, facilitating conditions, transaction costs, security, privacy, and self-efficacy positively influence DFS adoption, increasing DFS usage by 0.7%, 2.3%, 28.5%, 3%, 2.1%, and 2.4%, respectively. Based on this, the second hypothesis is:

H_2 There are socio-demographic factors that significantly influence the adoption of digital financial services in Ghana.

H_2: There are challenges facing digital financial services in Ghana.

H_3: There is a statistical gap in digital financial service challenges between India and Ghana.

Theoretical Framework

The Concept of Digital Financial Services (DFS)

Digital financial services refer to a broad range of financial services that are accessible and delivered through digital channels. These include payments, credit, savings, transfers, insurance, and financial information. The term "digital channels" encompasses the internet, mobile phones (both smartphones and feature phones), ATMs, point-of-sale devices, NFC-enabled devices, electronically supported chips and cards, biometric devices, tablets, phablets, and any other digital systems (Abbasi & Weigand, 2017) [2].

Digital financial services also apply innovative digital technologies, including mobile devices, artificial intelligence, cloud computing, blockchain, and the Internet of Things, aiming to significantly improve business processes, enhance customer experiences, optimize operational workflows, or create new business models (Dr. Mushtak, 2023) [23]. These innovative methods provide financial services such as money transfers, currency exchanges, interest rate calculations, and forecasting expected investment profits, all done electronically, with reduced time and cost. The goal is to make these services accessible to the largest possible number of beneficiaries, especially those who cannot access financial services through traditional means (Abdullah, 2024) [1].
Emerging economies, as defined by Bruton (2013) [6], are low-income, rapidly growing countries that use economic liberalization as a primary engine of growth.

Challenges of Digital Financial Services
This study will rely on the challenges identified by Rana *et al.* (2020) [18], which were explored in the literature through keywords like inhibitors, barriers, and obstacles that suppress the growth of DFS in developing countries. These were gathered from search engines such as Google, Google Scholar, and others. Based on this, 18 key challenges to DFS have been selected:

Challenges of Digital Financial Services (DFS)
Risks of Using Digital Servicesm
Security and privacy risks associated with digital services, such as mobile banking, can discourage individuals from using DFS (Rana, *et al.*, 2020) [18].

Safety and Reliability Issues
Consumer participation in digital payment services decreases due to security loopholes and a lack of fraud protection and defense against cyberattacks in digital payment systems.

Privacy Issues
Consumer trust and participation in DFS diminish when private and confidential information is compromised (Saal, *et al.*, 2017) [20].

Weak or Poor Authentication Process
Consumers may hesitate to utilize digital services when the authentication mechanisms are insufficient or ineffective (Rana, *et al.*, 2020) [18].

Lack of Digital Literacy
Insufficient digital literacy may impede customers from embracing digital financial services (Manzoor, *et al.*, 2021) [15].

Limited Information on the Benefits of DFS
Consumers may intend to utilize DFS but may lack sufficient information on its benefits (Rana, *et al.*, 2020) [18].

Technology and Network Issues
The level of DFS confidence declines when mobile network operators together with consumers encounter crucial problems such as digital disruptions (Saal, *et al.*, 2017) [20].

Lack of Training for Agents/Mobile Network Operators
Agent willingness to effectively manage DFS becomes diminished because organizations fail to create sufficient training programs and skill development initiatives for their representatives (Rana, *et al.*, 2020) [18].

Legal and Regulatory Issues
Customers hesitate to use DFS effectively because there is no legal regulatory framework or digital service guidelines in place (David *et al.*, 2018) [10].

Lack of Adaptation to New Technologies
New technology adaptation failures in banking systems create negative impacts that block DFS promotion (Das *et al.*, 2018) [9].

High Costs and Low Returns
Digital services present profitable challenges to commercial banks because their minimal returns generate investment barriers (Pazarbasioglu, *et al.*, 2020) [17].

Unavailability of Internet Access Worldwide
Widespread DFS implementations face difficulties due to insufficient physical infrastructure that delivers online services beyond selected areas of a country (Wright *et al.*, 2013) [22].

Inability to Reach Mass Consumers
Consumer access to any type of digital payment system determines whether they can obtain DFS benefits (Saal *et al.*, 2017) [20].

Lack of Trust
When consumers lack trust they refrain from using the advantages offered through DFS (Manzoor, *et al.*, 2021) [15].

Lack of Broader Integration and Interoperability
Non-bank financial services need improved connectivity between urban and rural locations in order to promote continued use of DFS as suggested by Pazarbasioglu, *et al.* (2020) [17].

Problem of Inactivity
Active mobile and digital service usage by registered mobile/DFS users hinders the successful implementation of DFS according to (Manzoor, *et al.*, 2021) [15].

Inability to Conduct Low-Value Transactions
Too many low-value exchanges processed inefficiently using minimal operating expenses will negatively impact DFS operational efficiency (Pazarbasioglu, *et al.*, 2020) [17].

Gender Gap in Mobile Phone Ownership
The utilization of DFS by women decreases when mobile smartphones are inaccessible to them (Rana, *et al.*, 2020) [18].

Field Framework
Methodology: Study Approach
The research design used a descriptive-analytical methodology to discover main difficulties which occur in digital financial services for India and Ghana. This method exposed the differences between difficulties and application implementations in these countries.

Data Collection: Data collection for this study depended on previous research and data obtained from recognized

international organizations that appeared throughout the research. The researchers picked this method because they could not locate complete global digital financial service data and there were no time-based records available.

Analysis

Research by previous studies served as the foundation for this analysis since it showed that India and Ghana both struggle to adopt digital financial services. Researchers detected a mismatch regarding the studied topic between India and Ghana.

Current Status of Digital Financial Services in India

The digitalization initiative in India started on July 1, 2015 during the leadership of Prime Minister Narendra Modi. This venture aimed to deliver fast internet connectivity to persons in rural places while offering dependable network access. The government actively pursues development of an effective unified payment framework which delivers secure and fast services to qualified recipients. The growth of digital financial services throughout India remains inadequate to meet requirements because of inadequate infrastructure and trust issues and lack of knowledge and the associated costs. These challenges have been discussed in emerging economies in the theoretical framework (Rana, *et al.*, 2020) [18].

Types of Digital Financial Services in India

Universal Identification System

Launched in 2009, this system is known as "Aadhaar," meaning "foundation" in Hindi. Its primary purpose was to facilitate social welfare payments for vulnerable groups in India and reduce fraud through the verification of images, fingerprints, and iris scans. Every Indian citizen can claim an Aadhaar card, which helps them access state-provided benefits. The system has since been used for various activities, including school enrollments and hospital admissions, with private companies quickly adopting this public technology package in India.

Digital Payments

Digital payment technology is the most funded element and a driving force behind the financial technology revolution in India, used to generate the highest profits.

Unified Payments Interface (UPI)

UPI is an instant payment system currently used as a means of digital payment in India. It was developed by India's National Payments Corporation to facilitate transactions between banks.

QR Code Technology

The spread of QR code technology for digital payments in retail outlets has eliminated the need for expensive electronic data capture devices previously used to collect and manage customer data.

Prepaid Payment Instruments (PPI)

These tools facilitate the purchase of goods and services, including money transfers, financial services, and remittances, against the value stored within or on the tool.

Zero Transaction Fees

Driven by government incentives and competitive pressures, transaction fees for commercial and economic payments have continuously decreased. The Reserve Bank of India capped the merchant discount rate for debit card transactions at 0.4% for startups. Most fintech companies, such as Paytm, now offer payment services for free.

Digital Financial Services in India

India's fintech market is among the fastest-growing fintech markets globally, with over 2,100 fintech startups as of today. The total value of financial transactions is projected to grow from USD 66 billion in 2019 to USD 138 billion by 2023, with a compound annual growth rate (CAGR) of 20%. The local fintech industry has attracted over USD 10 billion in investments since 2016. India's fintech ecosystem covers a broad range of areas, including payments, lending, health tech, personal finance management, and tech insurance (Haman & Shafia, 2024).

India has made significant strides in expanding access to financial accounts and increasing the volume of transactions via digital channels. Government-led digital payments to individuals have also risen significantly. In the past three years, over 300 million adults have gained access to banking accounts in India. The percentage of adults with bank accounts grew from 53% in 2014 to 80% in 2017, while the gender gap in account ownership shrank from 20% to 6% during the same period. Alongside this increase in financial access, India's real-time payments system has enabled the instant transfer of funds between two bank accounts using mobile apps from banks and third-party providers. Statistics from 2016 showed the system managed 17.9 million digital transactions monthly yet this number exploded to reach 1.3 billion transactions per month in 2020.

The Indian government accomplished major success by digitizing large-scale government-to-person (G2P) payment systems. The Indian banking system through 925 financial institutions performed 106.75 million G2P transactions totaling more than INR 44.14 billion in digital electronic bank deposits to beneficiary accounts in 2017 instead of cash payments. The payment system allowed recipients to operate using debit card features and mobile applications which connected to these account funds for both receiving and spending money. Aadhaar serves as the exclusive identifier which joins all accounts to detect when payments get duplicated. Ministry of Communications and Information Technology data from 2017 indicates that direct account transfers generated economic savings of USD 7 billion throughout two and a half years (Pazarbasioglu, *et al.*, 2020) [17].

Analysis of Digital Financial Services Challenges in India

The research study in Table 1 examines the driving force results behind digital financial services challenges in India. The method reflects how each obstacle combines its effects to affect other obstacles. The higher the driving force of a particular challenge, the greater its influence on the rest of the challenges (Rana, *et al.*, 2018) [18]. The driving force analysis conducted following Rana *et al.* (2018) [19] methods generated percentages showing the individual challenge share among all driving force variables. Each challenge's percentage value demonstrates its significance toward the entire system operation. C4 stands out as the challenge with the largest driving force share since it controls 16.95 percent of the system indicating powerful influence on the remaining issues. The influence of C10 on other challenges

proves minimal compared to the other challenges because it holds the lowest percentage at 1.69%. The provided statistics show the distribution of these challenges.

The risks related to digital service usage stand at 3.39% which demonstrates financial threats are substantially lower than other difficulties. Organization security systems together with financial risk assessment appear effective according to these results. This low number indicates opportunities exist to invest more in digital services that would promote economic progression. Nevertheless, this challenge necessitates effective risk management and precise evaluation of the measures in place.

Security breaches resulted in substantial losses according to (6.78%) of the participants who participated in the survey which could produce additional financial burdens. Consumer trust in digital services gets harmed when security breaches occur which demands organizations to execute steady risk management techniques while developing reliability policies.

This factor regarding privacy received a rating of (6.78%) because data breaches trigger financial expenses through legal penalties which decreases digital service usage willingness. The necessity exists to develop distinct plans for safeguarding privacy standards.

The challenge of a lack of digital literacy received a score of (16.95%), indicating a need for investment in educational and awareness programs. While this may increase initial costs, it poses a significant challenge to stimulating consumption and increasing the use of digital services. Therefore, training programs should be developed, and awareness about the benefits and risks should be enhanced.

As for the lack of awareness and knowledge, this was rated at (13.56%), which necessitates investment in awareness and educational campaigns that may impact the budget, as the lack of awareness limits the acceptance of digital services, ultimately affecting economic growth. This requires strategies to improve communication with customers.

Technology and network issues received a percentage of (10.17%), necessitating investment in technological infrastructure, which can be costly and affect the quality of services provided. There is an urgent need to improve systems and networks.

The challenge of not keeping up with new technologies was also rated at (10.17%), due to outdated technologies that can lead to market losses, hindering innovation and negatively impacting competitiveness. Continuous assessment of the technologies used is essential.

In terms of the global unavailability of internet access, this was rated at (16.95%), which could lead to missed economic opportunities and limit the use of digital services in certain areas. The government needs to collaborate with partners to improve internet access.

The lack of access to a critical mass of consumers scored (13.56%), affecting returns and increasing challenges in attracting new consumers. Therefore, effective marketing strategies should be established to reach a wider audience.

Finally, the percentage for the lack of trust was (1.69%), indicating it is relatively a minor challenge, suggesting that trust may have been adequately addressed, which influences consumer decisions. This requires building a trust-based relationship with customers.

Based on this analysis, we accept the first hypothesis, which posits that there are challenges to digital financial services in India.

Table 1: Challenges of Digital Financial Services in India.

Challenges	Driving Force	Percentage
Risks associated with digital services	2	3.39%
Security and reliability issues	4	6.78%
Privacy concerns	4	6.78%
Lack of digital literacy	10	16.95%
Lack of awareness and knowledge	8	13.56%
Technology and network issues	6	10.17%
Inability to keep up with new technologies	6	10.17%
Limited global internet availability	10	16.95%
Limited access to a critical mass of consumers	8	13.56%
Lack of trust	1	1.69%

***Source*:** Rana, N., Luthra, S., & Rao, H. R. (2018) [18]. Developing a framework using interpretive structural modeling for the challenges of digital financial services in India.

Digital Financial Services in Ghana

Non-banking entities, especially mobile network companies, were authorized to issue electronic currency. Prior to 2015, mobile money services were confined to conventional financial institutions, with mobile network providers functioning exclusively as agents, just facilitating a platform for these institutions. In 2015, new regulations were implemented, permitting mobile network carriers to create companies capable of issuing electronic currency. These subsidiaries will be directly overseen by the Bank of Ghana. Mobile money may now be issued by both traditional financial institutions and regulated mobile network carriers. This regulation modification resulted in a significant rise in investments by service providers in agent networks, an escalation in active accounts, transaction volumes, and the quantity of active agents across the nation. As a result, mobile money account ownership surged by almost 200%, with 35% of persons in rural regions indicating their utilization of mobile money services (Pazarbasioglu, *et al.*, 2020) [17].

Ghana has invested in essential infrastructure for payment systems. The Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), a fully owned subsidiary of the Bank of Ghana, underpins the nation's digital payment infrastructure. GhIPSS enables interbank transfers, ATM networks, local card transactions, ACH, and mobile money interoperability. In May 2018, the Bank of Ghana enhanced the expansion of digital financial services by requiring interoperability between mobile money services and bank accounts. In accordance with this directive, by December

2018, all mobile money providers were integrated into the GhIPSS infrastructure, facilitating complete interoperability between mobile money providers and banks. This configuration facilitates the effortless transfer of funds among mobile money accounts, banks, and e-zwich accounts (Ghana's native prepaid payment card brand) (https://ghipss.net).

The Government of Ghana has advanced an inclusive digital financial system by enacting the Payment Systems and Services Act in 2019. This new law, pending the President's signature, seeks to enhance competition and innovation by formalizing the licensing procedure for fintech businesses, possibly transforming the financial industry. In September 2019, more over one million transactions were documented among users of various mobile money providers, indicating a 250% increase relative to the same month in 2018. Almost all government-to-person (G2P) and government-to-government (G2G) payments are conducted digitally. Ghana has introduced the Ghana Electronic Payment Platform (GEPP), aimed at streamlining electronic payments for government services utilized by residents, corporations, and other organizations interacting with the government. The electronic payment platform accommodates many payment methods, including card transactions, mobile money, and bank transfers. Services offered encompass payments for set prices, physical items, service charges, and tax obligations. Nonetheless, transaction fees are imposed on users utilizing the platform (Pazarbasioglu, *et al.*, 2020) [17].

Challenges Related to Digital Financial Services in Ghana:

Sources: (Anane & Nie, 2022; Bachas *et al.*, 2018; Arora, 2020) [3, 5, 4].

Challenges of Digital Financial Services in Ghana

Over-reliance on Cash Transactions

Statistics indicate that 98% of financial transactions in Ghana are conducted in cash and in-person.

Low Adoption Rates among Women and Rural Populations

Women in Ghana participate in the formal financial system at lower rates than men, and adoption in rural areas is lower than in urban areas. Among men, 39.7% use digital financial services, compared to only 26.1% of women.

Financial Illiteracy

Financial illiteracy significantly contributes to low savings rates in Ghana, as many people perceive digital financial services as unsuitable for their needs.

High Transaction Costs

High transaction costs are a major barrier, with a 1% reduction in transaction costs correlating with a 3% increase in the likelihood of adopting digital financial services.

Lack of Awareness

Low awareness of digital financial services is a considerable challenge. A 1% increase in awareness correlates with a 2.3% increase in adoption likelihood.

Security and Privacy Concerns

Concerns about the security of personal information negatively affect consumer trust, with a 1% improvement in security correlating with a 2.1% increase in adoption likelihood.

Analysis of Digital Financial Services Challenges in Ghana

The results presented in Table 2 are derived from the study by Anane & Nie (2022) [3]. The cash-based transaction challenge received a coefficient of 0.127, indicating a weak positive effect on the challenges: as cash-based transactions increase, challenges are expected to rise by a rate of 0.127. The p-value (0.034) is less than 0.05, indicating strong statistical significance, which suggests a clear relationship between this variable and the challenges. Thus, improving this variable may help reduce challenges.

The lack of awareness coefficient was 0.420, showing a strong impact on challenges. The higher the lack of awareness, the greater the challenges, with an increase rate of 0.420. The p-value (0.014) indicates strong statistical significance, emphasizing that raising awareness could substantially reduce challenges, highlighting the importance of education and training in this area.

The financial illiteracy coefficient was 0.167, suggesting a relatively weak effect on challenges. With an increase in financial illiteracy, challenges increase by 0.167. The p-value (0.000) is below 0.01, indicating very strong statistical significance. This highlights financial illiteracy as a crucial factor in challenges, and thus, financial education should be prioritized to mitigate them.

The high transaction cost coefficient was 0.552, indicating an extremely strong effect on challenges. As transaction costs rise, challenges increase by a rate of 0.552. The p-value (0.018) suggests strong statistical significance, reflecting the importance of transaction costs as a primary factor influencing challenges, necessitating strategies to reduce these costs.

The security and privacy coefficient was 0.381, indicating a moderate impact on challenges. With increased security concerns, challenges rise by 0.381. The p-value (0.020) signifies strong statistical significance, meaning that enhancing security and privacy could help mitigate challenges.

The gender factor had a coefficient of 0.430, showing a strong impact on challenges, with challenges expected to increase at a rate of 0.430. The p-value (0.060) is close to the significance level, indicating a potentially important but not statistically robust relationship. This suggests the need for further research to understand how gender affects challenges better.

Thus, we accept the second hypothesis, which states that there are challenges in Ghana's digital financial services.

Table 2: Challenges of Digital Financial Services in Ghana.

Challenges	Challenge Coefficient	P-value
Cash Transactions	0.127	0.034
Lack of Awareness	0.420	0.014
Financial Illiteracy	0.167	0.000
High Transaction Costs	0.552	0.018
Security/Privacy	0.381	0.020
Gender	0.430	0.060

***Source*:** Anane, I., & Nie, F. (2022) [3]. Determinant factors of digital financial services adoption and usage level: Empirical evidence from Ghana. *International Journal of Management Technology, 9(1), 26-47.

Comparison of Digital Financial Services Challenges between India and Ghana

Table 3 presents a comparison of digital financial services challenges between India and Ghana, highlighting differences in the impact of digital infrastructure, awareness, transaction costs, security and privacy, and gender.

Digital Infrastructure Challenges

India: Significant structural challenges exist, such as lack of internet availability (16.95%) and low digital literacy (16.95%), which pose substantial obstacles to widespread digital financial services adoption.

Ghana: Digital infrastructure challenges are not as prominent. However, high transaction costs (coefficient of 0.552) represent a major barrier, suggesting that affordability, rather than access, is a critical issue.

Lack of Awareness and Knowledge

India: Users face challenges due to a lack of knowledge and awareness (13.56%), hindering the adoption of digital services.

Ghana: Similar issues with awareness exist, with a challenge coefficient of 0.420, reflecting similar barriers but with a somewhat lesser impact.

Transaction Costs

India: High transaction costs are not listed among the primary challenges.

Ghana: High transaction costs (coefficient of 0.552) represent the most significant challenge, directly affecting the usage of digital financial services.

Security and Privacy

India: Security and privacy are substantial concerns, with both areas highlighted (6.78% for security, 6.78% for privacy), indicating user anxiety about these aspects.

Ghana: Security and privacy are also concerns, though with a relatively lower impact (0.381 coefficient) compared to India.

Gender

India: No notable gender-based differences are evident in the available data.

Ghana: Gender has a noticeable impact on digital financial services access (coefficient of 0.430), suggesting disparities between male and female users.

This comparison underscores the differences in the nature and intensity of digital financial service challenges between the two countries. While India grapples with infrastructure and literacy issues, Ghana's challenges are more cost- and gender-focused.

Analysis and Comparison of Digital Financial Services Challenges in India and Ghana

India faces significant challenges in digital financial services primarily due to digital infrastructure and digital literacy limitations. The lack of digital literacy and limited internet access are major obstacles. In contrast, Ghana's main challenges focus on high transaction costs and low awareness, alongside issues related to security, privacy, and gender. India’s challenges are more complex regarding infrastructure, whereas Ghana’s challenges are related to costs and awareness.

Based on these findings, the overall gap in digital financial services challenges between India and Ghana is approximately 38.72%. Thus, while India may be slightly better positioned in addressing these issues, each country faces unique challenges that require tailored strategies. This supports the acceptance of Hypothesis 3, which posits a gap in digital financial service challenges between India and Ghana.

Table 3: Comparison of Digital Financial Services Challenges between India and Ghana

Challenges in India	Percentage	Challenges in Ghana	Coefficient
Digital Service Usage Risk	3.39%	Personal Cash Transactions	0.127
Security and Reliability Issues	6.78%	Lack of Awareness	0.420
Privacy Issues	6.78%	Financial Illiteracy	0.167
Low Digital Literacy	16.95%	High Transaction Cost	0.552
Lack of Knowledge and Awareness	13.56%	Security/Privacy Concerns	0.381
Technology and Network Issues	10.17%	Gender Disparity	0.430
Difficulty Adopting New Tech	10.17%		
Limited Internet Access	16.95%		
Limited Consumer Reach	13.56%		
Lack of Trust	1.69%		

Application Opportunities in Emerging Economies

Digital financial services create various business prospects throughout emerging economies not limited to India and Ghana while these nations demonstrate different implementation rates of challenges.

1. The unbanked population can benefit from digital payment platforms since mobile phones enable financial transactions through digital tools such as mobile money.
2. Digital services enable financial institutions to decrease operational expenses for physical bank branches thus making it less expensive to deliver services to customers.
3. Financial institutions can use digital distribution channels to serve a larger population of people as well as locations that were difficult to reach through conventional distribution methods.
4. Bank-Fintech partnerships enable financial institutions along with banks to work with fintech companies for developing enhanced products which increase consumer satisfaction.
5. The expansion of digital financial products enables emerging markets to include more customers in their banking services particularly low-income and remote population groups.

Source: Saal, M., & Starnes, S. (2017) [20].

The analysis shows various special conditions in digital financial services in India and Ghana as they face different obstacles alongside separate growth strategies to improve their performance. India faces difficulties maintaining digital literacy and improved internet accessibility although Ghana encounters more obstacles from high service costs and limited awareness about financial resources. The two countries present separate dilemmas for digital financial inclusion efforts.

Application Opportunities for Digital Financial Services in Emerging Economies

The development of digital financial services presents various implementation options for emerging economies which function equally well in both India and Ghana despite their different levels of technological progress and individual challenges. According to Saal and Starnes (2017) [20] several opportunities exist.

1. Digital financial technology through mobile money enables service provision to people who lack traditional banking access. People can perform electronic financial operations through mobile phones even when they do not have access to physical bank locations.

Cost Reduction

Digital services enable business operation cost reduction which includes bank branch maintenance expenses therefore service providers can provide services at lower prices. Expanding financial services into underlocated territories finds great advantage through this approach.

Expansion Potential

Through digital distribution channels, financial institutions can access a wider range of customers across various geographic areas, including rural regions where conventional banking facilities are limited.

Bank-Fintech Partnerships

Financial institutions can leverage technological innovations by partnering with fintech companies. These collaborations allow banks to offer improved products and services, providing consumers with more efficient and innovative financial solutions.

Enhancing Financial Inclusion

Digital financial innovations increase financial inclusion in emerging markets by offering banking services tailored to the needs of low-income groups and remote communities. This contributes to economic growth and reduces financial disparities.

Discussion of Results: The study discusses the challenges of digital financial services in emerging economies and the opportunities for application: a comparative study between India and Ghana. This research relied on previous studies to understand data collection and analysis methods, as well as to identify the main challenges faced by most countries worldwide. It also established the study's hypotheses and discussed the theoretical framework to grasp the concept of digital financial services and emerging economies. Furthermore, we explored the challenges of digital financial services in India and globally, identifying a total of 16 challenges that most researchers agree upon.

The field results for these two countries were obtained from prior sources and were extrapolated and analyzed in a manner that serves the methodology of this study. The findings indicate that India faces 10 major challenges in the realm of digital financial services, while Ghana encounters 6 challenges. The most significant challenges in India include a lack of digital literacy and limited internet availability, each accounting for 16.95% of the challenges identified. A lack of awareness and knowledge constitutes 13.56%, while the risks associated with using digital services and issues of security and reliability are considered less impactful, at 3.39% and 6.78%, respectively. In Ghana, the challenges are represented by high transaction costs (0.552), followed by a lack of awareness (0.420), with financial illiteracy and concerns about security and privacy also contributing to the reduction in the use of digital services.

When comparing India and Ghana, it is evident that India excels in challenges related to infrastructure, such as internet access and technical awareness. In contrast, Ghana faces challenges more closely related to cost and financial awareness, leading to an estimated gap of 38% between the two countries. This indicates the need for Ghana to enhance its infrastructure and elevate awareness of digital services. Accordingly, we discussed the opportunities for both India and Ghana to expand the scope of digital financial services by reducing costs and increasing access for the unbanked population.

In light of the results, we propose the following: investing in high-speed internet networks by strengthening the internet infrastructure in rural areas and small towns through enhanced partnerships between the government and the private sector. Expanding wireless services can contribute to improving digital connectivity in remote areas. Additionally, it is important to enhance digital and financial awareness by launching educational campaigns targeting citizens about the importance of digital financial services and their benefits, with a focus on security and privacy. We also recommend reducing online transaction fees to encourage greater use of digital services by providing support to reduce transaction costs and motivating companies to lower their fees. Furthermore, collaboration with non-profit organizations that focus on educating marginalized groups and equipping them with the necessary skills to use digital technology is essential. Finally, it is crucial to strengthen data protection laws to provide guarantees to users that their data is secure

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