EXPLORING MOBILE BANKING ADOPTION AMONG STREET HAWKERS AND VENDORS IN ISLAMABAD

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CERTIFICATE

This is to certify that this thesis entitled: **"Exploring Mobile Banking Adoption Among Street Hawkers and Vendors in Islamabad."** submitted by Hibba Zaheer is accepted in its present form by the PIDE School Policy, Development and Governance, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Development Studies.

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LIST OF ABBREVIATIONS

AW	Awareness
AC	Access
BOE	BANKING ON EQUALITY
CD	Customer Demand
CO	Cost
EU	Ease of Use
FL	Financial Literacy
FI	Financial Inclusion
ISM	Interpretive Structural Modelling
NFIS	National Financial Inclusion Strategy
NR	Network Reliability
UTAUT	Unified Theory of Acceptance and Use of Technology
SBP	State Bank of Pakistan
SDG	Sustainable Development Goals
TR	Trust
UN	United Nations

ABSTRACT

This study was conducted to explore the determining factors, usage patterns, and user perceptions of mobile banking adoption among street hawkers and small vendors in Islamabad, Pakistan. The research explains the hierarchical interplay of social, economic, and technological factors shaping mobile banking adoption behaviours in the informal urban market of Islamabad. The study implies a qualitative methodological approach based on Interpretive Structural Modelling (ISM) and is framed by the Unified Theory of Acceptance and Use of Technology (UTAUT). Data was collected through in-depth interviews with small vendors and field observations. Findings reveal that mobile banking adoption pattern is a multi-staged process initiated by foundational driver awareness, followed by enabling factors such as accessibility, customer demand, social influence and trust in service provision, and sustained by outcome-level factors such as ease of use and financial literacy of users. Insights from the study suggest that vendors largely use mobile banking platforms for business transactions, while usage of these mobile banking platforms for savings, investments and other services is constrained by low financial literacy and digital infrastructural barriers. Findings validate the core constructs of the unified theory of acceptance and use of technology (UTAUT) within interpretive structural modelling (ISM) hierarchy, emphasising the need for practical interventions focusing on user awareness campaigns, digital infrastructural enhancements, user-friendly app design and enhancement of digital literacy initiatives to foster sustained financial technology (fintech) adoption in informal sectors. This research contributes theoretical insights and practical implications for policymakers, fintech providers and researchers aiming to boost digital financial inclusion in Pakistan.

Key Words

Financial technology (FinTech), Mobile Banking, Unified Theory of Acceptance and Use of Technology UTAUT, Interpretive Structural Modelling ISM, financial Literacy, and Street Vendors.

CHAPTER 1

INTRODUCTION

1.1 Background

In the contemporary global economy, financial inclusion has emerged as a critical driver of socio-economic development. International organisations such as the World Bank and United Nations (UN) have constantly emphasised the significance of financial inclusion for uplifting low-income groups, economic development and inclusive growth, particularly within the Sustainable Development Goals (SDG) framework (Le et al., 2019). Technological innovation has played a crucial role in improving access to financial services, particularly through financial technology (fintech). In recent years, financial technology (Fintech) has revolutionised the global financial landscape by offering rapid, cost-effective and widespread access to financial services. Within the broader sphere of fintech-driven innovations, mobile banking has emerged as a transformative tool, enabling the delivery of financial services through mobile applications.

The rise of financial services such as instant fund transfer, digital wallets, digital investments and branchless banking through mobile banking applications has redefined how individuals and businesses interact with financial systems (Arner et al., 2018). According to Hollanders, (2020) Fintech innovations such as mobile banking enhance access, lower transaction costs, and improve efficiency. Recent trends in the mobile banking industry exhibit rapid growth. The GSMA Mobile Money Report (2025) highlights that there are over 28 billion registered mobile money accounts globally, with 63 billion transactions processed annually and an annual growth rate of 20%. Regional insights from the report mention that Africa leads with 70% of global transactions, while the Asia-Pacific region continues to have strong adoption. Key drivers of increasing trends include the rapid increase of smartphone users reaching 5.3 billion, expansion of agent networks, and enhanced strategic partnerships with mobile network operators (Raithatha et al., 2023).

Following these global trends, Pakistan has also witnessed a major shift from traditional banking channels towards digital banking and digital financial platforms. Financial technology (fintech) based solutions, particularly mobile banking (EasyPaisa, Jazz Cash, UPaisa, etc.), have

gained considerable momentum in Pakistan during the past decade, driven by increased smartphone penetration, access to affordable internet and government-led initiatives for improvement in financial inclusion. Mobile banking platforms offer a range of financial services such as microfinance, micro investment, micro saving and digital fund transfer to underserved segments of the population. Moreover, government initiatives such as the National Financial Inclusion Strategy (NFIS) and the State Bank of Pakistan's branchless banking regulations have been crucial for the acceleration of financial inclusion (Noreen et al., 2022). However, despite these initiatives, a large segment of informal workers in urban economies, including street hawkers and small vendors, still face substantial barriers to digital financial inclusion.

Pakistan being a developing country, with a major portion of unbanked or under banked population, the benefits of digital financial transformation have not been disseminated equitably across all socio-economic segments. The informal urban work force, including street hawkers and vendors, face multi-dimensional barriers to financial inclusion (Ali, 2024). Operating without formal registration of their small businesses, street hawkers and vendors face challenges such as lack of digital literacy, trust concerns, limited access to digital platforms and lack of awareness (Dharejo et al., 2022). These barriers limit their participation in mobile banking services, highlighting a significant gap in the promise of increased financial inclusion and the reality faced by these informal workers. Mobile banking offers a transformative opportunity for street hawkers and vendors to access formal financial services. Given that street hawkers and vendors constitute a substantial portion of the urban informal economy in Pakistan, their integration into digital financial systems is crucial for inclusive economic development.

Previous studies in Pakistan have explored socio-economic challenges facing street Hawkers in Sindh province, highlighting their limited access to digital platforms as the main reason for limited growth in small-scale businesses (Dharejo et al., 2022). However, limited empirical research in Pakistan has explored the dynamics (specific drivers and adaptation patterns) of mobile banking adoption by street hawkers and vendors. This study seeks to address this gap by exploring the unique experiences, determinants and usage patterns of mobile banking services by street hawkers and vendors in the capital city of Pakistan (Islamabad). Moreover, the study aims to examine user perceptions regarding the usage of mobile banking apps.

1.2 Statement of Research Problem

Mobile banking services have transformed the financial inclusion landscape around the globe, particularly in developing countries. Pakistan has leveraged a significant amount of resources for the flourishing of fintech-based banking platforms such as EasyPaisa, Jazz Cash, SadaPay, etc., as part of national financial inclusion initiatives (State Bank of Pakistan, 20225). However, their benefits have not reached all potential socio-economic groups, notably informal workers such as street hawkers and vendors in major cities like Islamabad. Despite significant contributions to the urban economy in Islamabad, street hawkers and vendors often lack participation in digital financial services, making them less prominent in the overall financial sector. While prior studies in Pakistan have focused on financial inclusion, fintech and mobile banking adoption for the general public, there is a significant gap in research on drivers of mobile banking adoption, usage patterns and user perceptions for mobile banking adoption among small vendors in urban centres. This study seeks to fill this gap in the literature by examining socioeconomic and technological drivers, usage patterns and user perceptions influencing the use of mobile banking platforms, focusing on street hawkers and vendors in Islamabad.

1.3 Research Problem

Based on the narrative of SOP, as stated in the preceding text, the Research topic is narrowed down as **"**Exploring mobile banking adoption among street hawkers and vendors in Islamabad: A study using UTAUT and ISM" and is operationalised into the following research questions and research objectives.

1.4 Research Objectives

- To identify key determinants of mobile banking among street hawkers and small vendors in Islamabad.
- To examine usage patterns of mobile banking among street hawkers and small vendors in Islamabad.
- To examine User Perceptions of mobile banking adoption among street hawkers and small vendors in Islamabad.

1.5 Research Questions

- What social, economic and technological factors influence mobile banking (E.g. Easypaisa, JazzCash) adoption among street hawkers and vendors in Islamabad?
- How do street vendors and Hawkers in Islamabad utilise mobile banking platforms (e.g. Easypaisa, JazzCash) in terms of transaction type, frequency and purpose, including fund transfer, micro investment and access to digital credit?
- How do Street hawkers and small vendors perceive mobile banking services based on usefulness, ease of use and social influence?

1.6 Explanation of Key Terms

- **Street Hawkers and Vendors**

Informal workers who sell goods and services in public spaces are referred to as street hawkers and vendors. They often operate on roadsides, parks, markets and footpaths. Typically operating without a permanent structure, hawkers often play a significant role in the urban informal economy (Bhowmik, 2005). According to (OIT, 2002), street vendors are a subset of informal workers who sell goods to the public without having a permanent building or structure, but with a mobile structure.

- **Hawkers** are mobile informal workers who carry their merchandise on bicycles, carts, baskets or even on foot. This mobility allows them to move across neighbourhoods, targeting multiple customers through the day (Bhowmik, 2005).
- **Vendors** are non-mobile informal workers who operate from a fixed or semi-fixed location such as a pavement, roadside or market corner where they set up a temporary stall, table or shelter to showcase their products (Roever & Skinner, 2016).

In the context of this research, the terms **'Street Hawkers' and 'Street Vendors'** are used interchangeably to refer to informal entrepreneurs who operate in public spaces in Islamabad. They carry out selling activities on a small scale, either on stalls or physically. Both groups are considered under a single analytical category to reflect shared economic characteristics, informal nature and common changes. These workers are often excluded from the formal financial inclusion system due to challenges such as a lack of access to digital financial services and a lack of digital literacy. Understanding the technology adoption behaviour of street hawkers and vendors as

informal workers is essential for improving financial inclusion through mobile banking platforms in Pakistan.

- **Financial Technology**

  Fintech is conceptualised as the use of technology to deliver financial products and services. Fintech-led initiatives range from blockchain technologies, peer-to-peer lending, digital payments, mobile banking and much more. These technologies are aimed at improving financial accessibility and efficiency (Giglio, 2021).

  In the context of this study, fintech refers to mobile banking platforms which facilitate street hawkers and vendors in accessing financial services via smartphones, providing them with tools to save money, receive payments, and conduct financial transactions. The research investigates how street hawkers in Islamabad perceive and interact with fintech-based tools, particularly mobile banking.

- **Mobile Banking**

  Mobile banking refers to the use of mobile devices to access banking services and perform financial activities remotely. According to Shaikh & Karjaluoto, (2015), mobile banking is a subset of electronic banking that allows customers to access banking services anytime and anywhere using mobile technology. These services include transferring funds, payment of utility bills, and managing savings and loans. Mobile banking is a significant component of financial technology (fintech) and plays a crucial role in the enhancement of financial inclusion in developing countries with limited formal banking structures (Donner & Tellez, 2008)

  In the context of this research, mobile banking is referred to as a means towards achieving financial inclusion for street hawkers and vendors operating in the informal economy in Islamabad. Access to digital financial services through mobile banking can potentially facilitate money transfer, saving, borrowing and investment without requiring them to visit a bank branch. However, these individuals typically lack access to formal financial services due to challenges such as limited financial literacy, lack of awareness of digital financial platforms and limited or no access to banking institutions. The research will focus on unfolding the significance of mobile banking platforms for the enhancement of financial inclusion.

- **Digital Financial Inclusion**

  Digital financial inclusion is conceptualised as the provision of formal financial services through the internet via digital platforms such as mobile banking, branchless banking and e-services. The

goal is to make financial services accessible, affordable and efficient for low-income groups and those in remote areas who are traditionally excluded from the financial inclusion fabric. These services include digital payments, savings, credit, insurance, etc. (Demirgüç-Kunt & Klapper, 2013). The integration of financial platforms with financial services is crucial to register the informal economy, contributing to the broader objective of improved financial stability and inclusion (Ozili, 2018).

In the context of this research, digital financial inclusion is operationalised as a mechanism for street hawkers and vendors to become a part of the financial system through the adoption of mobile banking services. Digital financial inclusion serves as a means towards achieving improved access to financial services beyond traditional banking practices. The focus of the research is to explore socio-economic and technological determinants along with individual perceptions, for improved financial inclusion through digital platforms such as mobile banking.

1.7 Units of Data Collection

- **Street Hawkers and vendors**

  These include Individuals engaged in informal vending operating in markets, streets, and mobile setups within Islamabad.

  Justification

  Street hawkers and vendors are the main units from which data will be collected through interviews and observations. Their lived experiences and perceptions are crucial for understanding mobile banking adoption patterns. This UDC directly aligns with constructivist ontology and interpretivist epistemology, which emphasise subjective and context-specific meanings.

- **Mobile Banking Agents**

  These include mobile banking agents and service providers.

  Justification

  Agents are key intermediaries between financial institutions and users. They possess firsthand knowledge of common usability challenges, digital literacy gaps and user behaviours, particularly among low-literacy and low-income users. Their insights will be useful for validation and enrichment of data gathered from street vendors, ensuring credibility and contextual depth. Moreover, including this group will help cross-verify patterns observed in user interviews.

- **Policymakers**

Representatives from the State Bank of Pakistan (SBP) and other regulatory bodies.

Justification

Policymakers play a critical role in shaping the digital financial ecosystem in which informal workers like street hawkers and vendors operate. They can provide insights for regulatory perspectives of fintech penetration, agent banking and mobile wallet usage. Their inclusion allows for triangulation of data by offering insights into the rationale behind financial strategies. These perspectives will be useful for assessing the alignment between policy intent and on-ground realities.

1.8 Significance of Research

This study holds significant value in addressing a critical gap in the discourse on digital financial inclusion of informal workers (Street Hawkers and vendors) in Pakistan. While mobile banking has rapidly expanded nationwide, the informal urban workforce, particularly street hawkers and vendors, remains underrepresented in academic research. By focusing on this overlooked population in Islamabad, the study is expected to contribute to a deeper understanding of how socio-economic, technological, and institutional factors influence mobile banking adoption. Moreover, the application of UTAUT combined with ISM in a new socio-cultural context for the examination of mobile banking adoption exhibits a novel aspect in academic and social research in Pakistan. The findings are expected to inform policy adjustments for inclusive policymaking.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Systematic Literature Review

This chapter synthesises extensive literature on financial inclusion, financial technology (Fintech) and their intersection with the informal economy, with a particular focus on Street hawkers and small vendors. The review is structured around six key themes, including drivers of fintech adoption, challenges and limitations in the adoption process and specific cases of informal workers, most crucial in understanding the dynamics of the Fintech industry, particularly mobile banking adoption patterns. Gathering insights from global, Regional and local context, the review highlights progress and gaps in the existing body of literature, establishing the foundation for understanding determinants, usage patterns and user perceptions of mobile banking adoption among low to medium-income street hawkers and vendors in Pakistan's capital city (Islamabad)

2.1.1 Drivers of Financial Inclusion

Financial inclusion is a multidimensional concept shaped by socio-economic, infrastructural, technological and behavioural factors. The nature of drivers of financial inclusion varies across developed and developing countries. In the context of developed and transitioning economies such as European countries, access to the financial market and financial services is driven by advancements in ICT infrastructure, mobile phone subscription and high internet usage (Bayar et al., 2021). Research in the Asian context reveals a complex pattern. According to (Le et al., 2019), Asian countries with higher economic growth, high income and higher levels of literacy tend to show greater financial inclusion. Similarly, (Ngo, 2019), highlights that financial inclusion in Asian countries is influenced by digital infrastructure, urbanisation and digital literacy. Narrowing down the focus to the South Asian context, socio-economic and demographic factors such as population size, gendered roles, and access to banks serve as key drivers of financial inclusion in South Indian states (Nandru et al., 2016). Similarly, studies have found that education, income, and distance to financial institutions shape household-level financial behaviour in Tanzania (Kaliba et al., 2023). which presents significant developmental challenges. In Pakistan, financial

inclusion is driven by improved access to digital financial platforms. Although there is for the formulation of gender sensitive policies for improved financial inclusion (Razzaq et al., 2024).

Table2. 1: Literature on Drivers of Financial Inclusion

Source	Summary	Methodology	Finding	Remarks
(Nandru et al., 2016)	The article investigates determinants of financial inclusion in South Indian states, aiming to identify key barriers to access to financial services specifically for women. The author analyzed various infrastructural and socio-economic variables.	Quantitative approach. Use of the financial inclusion index calculated by CRISIL. on.	Large population, greater density of bank branches, high deposit ratio and balanced gender ratio positively impact financial inclusion. literacy rate showed insignificant impact in case of south Indian states.	The paper highlights that access to banking services is crucial for improvement in the status of financial inclusion in the southern Indian region. Policy makers should focus on measures for increasing access to banks and services.
(Bayar et al., 2021)	The study investigates the influence of mobile phone and internet subscription in	Quantitative approach. Panel co-integration and causality analysis.	Mobile phone subscription rates positively impact access to financial markets. High	Evidence for improved access to financial institutions and the financial market in post-communist European countries as a result of greater mobile phone subscription and internet usage.

	11 European countries. The research gages impact of ICT advancements on access to financial institutions and markets. In post-communist transitioning economies.		internet usage rates are also associated with greater access to financial institutions and financial markets.	
(Le et al., 2019)	The paper identifies key determinants of financial inclusion in 20 Asian countries in the period between 2011 and 2016. Considering financial inclusion is crucial for the achievement of SDGs, the author examines	Quantitative approach: Analysis of panel data of 20 Asian countries for the years 2011 to 2016 using Random effects model (RAM). Construct of financial inclusion index to quantify level of access to finance.	Countries experiencing higher economic growth with high income and High literacy leads to greater financial inclusion. Countries with higher unemployment rates show low levels of	The paper identifies economic growth, high literacy and high income as determinants of increased access to finance. Level of financial inclusion varies across regions. Policy makers should focus economic development for improvement in financial inclusion.

	factors that strengthen or deter access to finance in the Asian context.		financial inclusion.	
(Ngo, 2019)	The paper investigates the factors impacting financial inclusion in Asian economies for the period 2008 to 2016. The paper highlights that infrastructure, unemployment and rural ratio are significant factors influencing FI.	Quantitative approach. Formulation of IFI to quantify the level of FI for different Asian countries. Regression analysis to impact of socio-economic factors on IFI.	Higher income and better infrastructure (mobile phone subscription) positively impact FI. High unemployment and a rural population adversely affect FI.	Policy makers in Asian countries should focus on improving digital infrastructure, reducing unemployment and promoting urbanisation for enhancing FI.
(Ozili, 2021)	The paper provides a comprehensive review of recent literature on financial inclusion around the	Literature review approach to study the status of financial inclusion. Analysis of emerging	Financial inclusion both affects and is influenced by factors such as poverty level, financial literacy, state of	The paper highlights patterns and practices influencing the state of financial inclusion around the world.

	world. Highlights themes such as optimal financial inclusion, extreme financial inclusion. Transfer of systemic risks to the formal financial sector.	themes and controversies in literature.	economy, level of financial innovation, regulatory framework and stability of the financial sector.	
(Aziz et al., 2022)	Based on panel data for 8 Asian countries, the paper argues that socio-economic and religious factors influence financial inclusion.	Quantitative: multilevel modelling: two-level logistic regression model	Women are less engaged in formal financial services. Religious norms restrict women's participation. Implementation of gender equality policies lessens the gap.	Policy implementation is vital for the enhancement of the financial status of women in South Asia.
(Sanderson et al., 2018)	Comprehensive overview of determinants of financial	Comprehensive literature review	Higher levels of financial literacy, education,	The study examines various demand and supply-side factors influencing access to financial services.

	inclusion in Zimbabwe. Based on data from the Finscope survey, the authors identify both demand and supply-side factors. Recommend government-led initiatives, such as KYC lite accounts, for the reduction of barriers to financial inclusion.		income, internet connectivity, and age are positively related to financial inclusion. Conversely, Lengthy documentation process and proximity to a financial institution negatively relate to the level of financial inclusion.	There is a need for an effective government policy to reduce barriers to financial inclusion in Zimbabwe.
(Mhlanga & Dunga, 2020)	The study assesses the level of financial inclusion for smallholder farmers in Zimbabwe's manic land province. The research	Quantitative approach. Multiple regression analysis. Developed to measure household-level indicators of financial inclusion	Low financial inclusion, with only 27% participation in the financial system. Determinants of FI include off-farm income, financial	The paper identifies access barriers for small-hold farmers, and the Zimbabwean Government and financial institutions should collaborate to enhance financial inclusion.

	identifies that farmers lack access to formal financial services due to factors such as financial illiteracy, denied access to financial institutions and others.		literacy, distance from bank, level of education and age of household head.	
(M. M. Ali et al., 2020)	This paper explores determinants of financial inclusion in Indonesia. By gathering expert opinions from academia and religious stakeholders, the study identifies demand and supply-side factors influencing financial inclusion.	Analytic network process (ANP) approach	Demand side determinants: financial literacy, socio-economic factors, social influence and religious commitment. Supply side determinants: human capital, Islamic financial products, infrastructure, policies and regulations.	Effective policies for Islamic financial inclusion must include the promotion and implementation of Islamic financial literacy and infrastructure with an adequate supply of human capital.

(KANDARI et al., 2021)	The paper explores socio-economic and demographic factors impacting financial inclusion in underdeveloped and developing regions.	Quantitative approach. Binary logistic regression.	Bank account ownership, usage of mobile banking and equity of credit are identified as of FI. These increase with financial literacy. Targeting economically disadvantaged sectors and the provision of financial literacy are crucial for FI.	Rural areas in developing countries should be targeted for the enhancement of financial inclusion.
(Kaliba et al., 2023)	This article examines determinants and barriers to financial inclusion in Tanzania, using data from world bank's global Findex surveys for the years 2011, 2014 and 2017 the	Quantitative approach. Ordered probit regression model with endogenous treatment effects.	A large population in Tanzania experienced FI over the period 2011 to 2017. Higher levels of formal education and income enhance financial inclusion.	The paper presents trends, determinants and barriers to FI. There is need encourage financial literacy for targeted population. Additionally, implementation of FI strategies is crucial in Tanzania.

	authors setup index for financial inclusion.		A major barrier to FI is lack of funds to maintain accounts.	
(Sha'ban et al., 2024)	The study explores drivers of digital and traditional financial inclusion emphasizing role of digital financial inclusion in promotion of traditional financial services. The paper explores country level determinants focusing of banking. system conditions	Quantitative approach: construct two multi-dimensional indices for the period between 2004 to 2020. Implication of econometric models.	Trends: significant improvement in global financial inclusion, MENA countries exceled in DFI while European nations excelled in TFI. Determinants: stable banking system, higher mobile penetration and urbanization positively impact FI.	The paper provides detailed insights into role of digital FI for expansion of traditional FI. Findings suggest need for robust planning for improved banking system, mobile banking and greater access to financial services.
(Razzaq et al., 2024)	The paper highlights factors contributing to	Quantitative approach.	Policies for financial inclusion are to	Policies must consider gender specific interventions in order to achieve SDGs and enhance

	gender disparities in financial inclusion in Pakistan. Emphasizing gender equality as a mean for achieving SDGs and SDG 5 in particular, the study calls for robust policy interventions tailored to specific needs of women.	Logistic regression analysis.	be made gender specific. Financial institutions should come up with gender responsive policies such as increasing women representation.	financial inclusion level in Pakistan.

2.1.2 Fintech and Financial Inclusion

As digital innovation accelerates globally, fintech has emerged as a key research and policy priority in developing countries and emerging economies where traditional financial systems often exclude large segments of the population. (Buckley & Webster, 2016) Stress the need to understand unique customer journeys while interacting with fintech in developing countries. Similarly, Arner et al., (2018) suggest a foundational framework aimed at involving digital IDs and mobile payments to foster inclusion in regions like Africa, China, and India. The adoption of fintech is greatly influenced by factors such as internet access and capital availability (Haddad & Hornuf, 2019). Regionally, studies highlight how fintech has expanded access and reduced costs across South and Southeast Asia despite digital inequality and data privacy challenges (Nandru et al., 2016). In Ghana (Senyo et al., 2021), emphasised that user behaviour and preferences must be considered in fintech policy design to ensure adoption of fintech. (Ashraf et al., 2022a) analysed that user perceptions, particularly performance expectancy and social influence, considerably impact fintech adoption in Pakistan. These studies assert that while fintech can drive inclusive finance, its success relies on local adaptation, enabling infrastructure, and cohesive policy support.

Table2. 2: Literature on Fin Tech and Financial Inclusion

Source	**Summary**	**Methodology**	**Finding**	**Remarks**
(Buckley & Webster, 2016)	The study highlights various aspects of the customer journey while interacting with fintech in developing countries. Unlike developed countries, policymakers and product designers must consider unique patterns of customer needs for effective gains.	Qualitative approach. Literature review and analysis of case studies across various countries.	Customer journey mapping is crucial in developing countries. Engaging with the local population is useful. Fintech developers face challenges due to cultural disparities in developing countries.	Diverse yet unique aspects of customer experiences, such as the viability of digital technologies and infrastructure, are crucial for effective policy-making.
(Arner et al., 2018)	The paper presents a framework for effective utilisation of fintech technologies such as digital identification and electronic payment systems	Comprehensive literature review, including case studies of China and India.	Key components for digital transformation through fintech include, implementation of digital ID(e-KYC), establishing a digital payment	Financial inclusion via fintech requires the adoption of a digital mode of services in every aspect, such as adaptation to digital identification,

	to foster financial inclusion. The paper presents evidence from Africa, China, India and other previously less digitised countries.		system, enhanced access to digital services and a strong legal framework.	digital payments infrastructure and account and wallet infrastructure.
(Nassiry, 2018)	The study explores the role of fintech for the promotion of green finance in developing countries. It also examines the convergence of green finance innovation with the objective of the SDGs and the Paris Agreement.	Qualitative approach. Literature review and case study analysis	Blockchain technology can enhance the accountability and traceability of funds allocated to development projects. Green bonds can improve investment.	Fintech can be integrated with green finance to generate massive gains in development projects.
(Haddad & Hornuf, 2019)	The paper explores technological and economic determinants encouraging new entrepreneurs to invest and work	Quantitative approach. Regression analysis on panel data, including 64 countries for	Fintech growth was high during the period of economic growth. Mobile phone subscription,	Policy makers should focus on improving technological infrastructure, improving capital markets and addressing

	on fintech. Findings suggest that economic growth and rapid availability of capital are major contributors to the development of the fintech market.	the period(2005 to 2014)	Internet connectivity, workforce availability and access to capital positively impact the development of fintech.	gaps in traditional financial services in order to encourage fintech startups' developments.
(Hollanders, 2020)	The paper reviewed the report of CPMI and the World Bank and highlights the crucial role of transaction accounts and fintech innovation through the application of the PAFI framework. Emphasises the role of stakeholders in promoting access to and usage of these accounts. The paper also	Comprehensive literature review on FI and fintech. Analysis of the payment aspect of financial inclusion(PAFI) framework developed by CPMI and world bank. Evaluation of case studies on fintech and financial innovation.	Opportunities: fintech innovation such as mobile banking enhance access, lower transaction cost and improve efficiency. Challenges: cyber security risks, increase digital divide and exacerbate regulatory concerns.	There is need of collaboration among policy makers, financial institutions and technology providers in order to achieve greater FI. PAFI framework sets basis for inclusive financial system.

	identifies risks associated with fintech adaptation.			
(Baber, 2020)	This study seeks to investigate adaption of fintech and other means for financial inclusion in countries following Islamic versus conventional finance. Findings reveal that fintech adaption and FI is higher in countries practicing Islamic finance. Results indicate improved patterns of FI while fintech adaption is low in Islamic countries.	Quantitative approach. Comparison of financial inclusion metrics for countries practicing Islamic v/s conventional finance. Data from world bank and global Islamic finance report.	Account ownership and women participation in financial activities has increased in countries practising Islamic finance over the study period. Fintech adoption remains low in Islamic countries compared to countries practising conventional finance.	As fintech adoption remains low in Islamic countries, policy should focus on financial literacy to introduce mobile money and digital means to become part of the finance sector, specifically in Islamic countries.

(Senyo et al., 2021)	The paper identifies pathways to enhance FI through mobile money in Ghana. Based on a survey of 294 users, research implies theoretical and empirical methods to identify user typologies and pathways influencing financial inclusion.	Fuzzy set qualitative comparative analysis (QCA)	Four pathways to enhance FI. Three user typologies, including ease of use driven users, behavioural intention driven users and coverage price driven users.	User typologies suggest that users in Ghana have diverse needs and preferences. Policy makers should consider these diversities to increase FI through fintech, such as mobile money.
(Morgan, 2022)	The study presents an analysis of fintech practices in Asian countries and India. Highlighting risks and opportunities, the author suggests policy	Mixed method approach. Policy reviews. Data from findex. Comparison of India with other Asian countries.	Fintech has improved FI in Southeast Asia and India by expanding access, lowering costs and improving efficiency. Cybersecurity, data privacy and increased	There is a need for collaboration between government and private institutions to reap the benefits of fintech and digital advancements.

	recommendations for improvements in fintech adaptation. Results indicate enhanced infrastructure, digital literacy and innovation.		inequalities are some of the risks associated with digital financial inclusion.	Moreover, an enhancement in digital infrastructure can lead to greater FI.
(Yang & Zhang, 2022)	The paper provides a micro-level analysis of the impact of fintech adoption on household consumption in China. Results show a significant decline in consumption inequality and a sharp increase in digital payments, indicating improved conditions for low-income consumers.	Quantitative approach. Combined regional-level data with national household data.	Fintech adoption reduces consumption inequality. Profound impact on the consumption patterns of low-income households Traditional infrastructure holds significance in promoting financial inclusion.	Fintech plays a crucial role in enhancing consumer welfare, resulting from increased access to financial products and services.

(Ashraf et al., 2022a)	Based on the unified theory of acceptance and use of technology, the paper presents an empirical investigation into factors influencing the adoption of fintech in Pakistan. The research identifies determinants for individuals' behavioural intentions and actual usage, which in turn impact financial inclusion in the country.	Quantitative approach. Application of the UTAUT model.	Results indicate that performance expectancy, effort expectancy, social influence and degree of facilitating conditions influence adaptation of fintech and ultimately financial inclusion.	The study is conducted in Bahawalpur in Pakistan, but the results are generalizable to the entire country. Financial infrastructure should be improved to encourage financial collusion. There is a need to change user perceptions and promote user-friendly fintech solutions to enhance financial inclusion.
(Demir et al., 2022)	The study investigates the role of fintech in addressing financial inclusion and income	Quantitative approach: Quantile regression analysis on panel data from Findex for the	Fintech reduces income inequality through the financial inclusion channel.	Fintech serves as a channel for enhancing financial inclusion and reducing

	inequalities. The study utilises data from the Global Findex and	years 2011, 2014, and 2017 for 140 countries	High-income countries experience more benefits of fintech-driven financial inclusion	income inequalities. Developing countries and emerging countries need more pronounced efforts to reap of FI.
(Datta, 2024)	The paper highlights the current status, drivers and challenges to financial inclusion in Bangladesh. The study emphasises the role of fintech in improving access to financial services.	Quantitative approach. Secondary data from the Central Bank of Bangladesh. Comprehensive literature review.	Fintech usage is considerably smooth in Bangladesh, and such other fintech services are being adopted by users. Major barriers to fintech include low financial literacy, regulatory concerns.	Effective policy implementation and leveraging the benefits of fintech to improve financial inclusion.

2.1.3 Fintech and Hawkers

The adoption of financial technology (Fintech) has gained considerable importance in developing and emerging economies. While intersection of financial technology (fintech) and street hawkers presents opportunities for economic empowerment through enhanced financial inclusion, it also encounters challenges for adoption of digital financial services (Donovan, 2012).

A wide range of studies in literature emphasise that fintech solutions can enhance business performance, but, their uptake among hawkers remains uneven due to various structural and socio-psychological barriers. According to (Bakhshi et al, 2024), perceived risks, lack of trust and poor financial literacy often hinder fintech adoption among informal workers in India. As these barriers are interconnected, addressing one (e.g., awareness) may positively influence others (e.g., trust).

Many studies in the literature empirically show that ease of use, security, social influence, and perceived usefulness positively impact digital technology adoption, which in turn boosts daily sales by an average of 15% (Kunal et al., 2025). Similarly, Ahmad et al. (2021) highlight that attitudes toward fintech and behavioral intentions strongly correlate with actual system usage. Emphasizing the crucial role of digital literacy in fintech adoption, (Rajkonwar, 2024) brings attention to the foundational role of financial literacy, revealing that only 35% of street vendors in Assam (India) possess financial literacy.

Table2. 3 Literature on Fintech and Hawkers

Source	Summary	Methodology	Finding	Remarks
(Bakhshi et al., 2024)	The paper provides an analysis of barriers hindering the adaptation of fintech by street hawkers in India. Using interpretive structural modelling ISM, the paper identifies the interrelationship of barriers facing informal workers.	Interpretive structural modelling	Key barriers include: perceived risk, lack of trust, lack of awareness, lack of benefit, perceived social influence, and lack of financial literacy.	Hawkers lack formal guidance on the benefits of fintech adoption for the growth of their businesses.
(Kunal et al., 2025)	The paper investigates the determinants influencing FinTech adoption among hawkers in Tamil Nadu, India, and evaluates its impact on their	Partial least squares modelling (PSLM) Theoretical framework: TAM and UTAUT combined with service quality attributes.	Adoption of fintech led to an average increase of 15% increase in daily sales. Variations in growth were observed depending on	The adoption of financial technology (Fintech) by informal workers can lead to improvements in efficiency.

	financial performance. The research provides empirical evidence on how digital payment adoption affects the livelihoods of informal entrepreneurs.		age and literacy levels.	
(Ahmad et al., 2021)	The paper highlights determinants of fintech adoption among street hawkers and Vendors in India. The papers utilise the technology acceptance model(TAM) as a theoretical framework.	Structural equation modeling(SEM)	Perceived ease of use, perceived usefulness, attitude towards use, social influence and behavioural intention to use all positively impact hawkers.	Targeted awareness strategies for the enhancement of users' efficiency can lead to improvements in
(Rajkonwar, 2024)	The paper explores the impact of demographic factors on the	Statistical analysis using ANOVA and F tests	Only 35% of participants possessed financial capability,	Inclusion of informal workers into the formal economy is crucial for the improvement of their social security conditions.

	financial literacy, behaviour and attitude of street vendors in Assam. Findings suggest that access to formal financial services such as savings accounts, microfinance and digital payment systems enhances vendors' business stability and income security.		indicating gaps in financial inclusion. Access to formal financial services and digital payments led to an improvement in social and economic empowerment.	

2.1.4 Hawkers and Street Vendors

Despite its contextual differences, street hawking and vending are universally recognised as informal economic activities. A comparative literature review conducted by Recchi, (2021) Reveals how street vending is more regulated and systematised in developed nations, where it often serves as a part-time occupation or an income source for marginalised populations such as immigrants. In contrast, developing countries rely more heavily on street vending as a primary source of livelihood for individuals with limited education and formal employment opportunities.

Research on informal street vending in the global south emphasises the socio-political complexity of informal vending, highlighting how urban exclusion, gender discrimination, and poor access to public spaces are major barriers for street vendors (Peimani & Kamalipour, 2022). Moreover, literature points to the fact that street vending is a globally persistent urban phenomenon, contributing significantly to urban economies by serving underserved markets and offering employment to marginalised groups. However, vendors often face barriers such as harassment, eviction, and a lack of social protections due to institutional neglect (Bromley, 2000).

Studies in Pakistan offer various aspects of street hawking and vending, examining hawking activities in Sindh, (Dharejo et al, 2022) Emphasises their essential role in urban economies and the socio-economic hardships they endure, including restricted access to financial services, which impedes their ability to grow. Similarly, Ahmed et al. (2021) explore the case of Karachi, where vendors show resilience despite facing multiple challenges in their business activities.

Table2. 4: Literature on Street Hawkers and Small Vendors

Source	Summary	Methodology	Finding	Remarks
(Recchi, 2021)	The study provides a comprehensive literature review on street hawking from developing and developed countries. Developed countries experience more regulated and systematic street hawking, while developing countries lack regulations.	Comprehensive literature review	Developing countries: primary source of income for less educated or informal workers. Developed countries: often part part-time earning source or income source for illegal immigrants.	Both developed and developing countries consider street hocking as an informal economic activity.
(Peimani & Kamalipour, 2022)	The paper discusses informal street vending in urban areas of the global south. The study	Systematic literature review	Vendors often face exclusion due to poor urban policies, gender discrimination, and a lack of access to public space. There is an emerging trend	Informal street vending is a diverse and context-specific activity which requires policy-making.

	highlights the importance of effective policymaking for the working conditions of street wanders in cities.		of digital technology adoption,	
(Bromley, 2000)	The paper examines the global persistence of street vending as an urban phenomenon. Despite massive contributions to urban economies, street vendors face challenges due to the ignorance of the government and the business communities.	Literature review	Street vending fills gaps in the formal retail sector, provides earning opportunities to marginalised individuals. Key challenges include harassment, eviction and lack of social protection.	Street vendors face multiple socio-economic challenges due to disparities in the policy framework.

(Ahmed et al., 2021)	The paper provides an overview of street hawking in Karachi, Pakistan. Highlighting challenges for accessibility to public spaces and administrative hurdles, the study emphasises vendors' resilience for their sustenance.	Interviews and observations	Vendors are vulnerable to evictions and harassment due to the absence of regulations. Limited access to public spaces and informal payments to administration hinder their business activities.	Effective policy-making is crucial for the legal and smooth functioning of informal vending services in Karachi.
(Dharejo et al., 2022)	The paper provides insights into the socio-economic dynamics of street hawkers in Sindh province of Pakistan. The author emphasises	Semi-structured interviews followed by thematic analysis.	Despite limited capital, street hawkers provide essential goods in urban areas. Hawkers face challenges in accessing financial services, hindering business growth.	Street hawking contributes to the economic and social well-being of individuals.

	their economic contributions and challenges hindering hawking activities.			

2.1.5 Barriers to Financial Inclusion

The literature on barriers to financial inclusion suggests that developing and emerging economies face a wide range of supply and demand-side challenges. Focusing on rural South Africa (Simatele & Maciko, 2022) reveal that high bank charges and physical distance to financial institutions are significant barriers limiting the usage of financial services. Their qualitative study, based on focus group discussions, finds that many individuals only open bank accounts to receive salaries or grants, rather than for active financial participation. Similarly, Ediagbonya & Tioluwani, (2023) examine the Nigerian context and explore how the adoption of fintech can potentially be helpful in the mitigation of financial exclusion. The study identifies financial illiteracy, inadequate digital infrastructure, information asymmetry, high service charges, and data privacy issues as major hurdles in fintech adoption.

In the case of Pakistan, it suggests that fintech has the potential to extend digital banking services to the unbanked population but cautions that regulatory, security and awareness-related issues still need attention (Qaiser & Fahad, 2024). Highlighting prominent challenges for limited access to digital banking, delve into customer experiences with financial services in Pakistan. Their findings point to financial illiteracy, poor access to digital services and underdeveloped digital infrastructure as key barriers to financial inclusion. They recommend awareness campaigns and targeted policy measures to promote broader usage of digital financial services, thereby contributing to inclusive financial growth.

Collectively, literature on fintech suggests that financial inclusion is not solely a matter of access but also of affordability, digital infrastructure, awareness, and trust. Addressing these barriers through coordinated efforts between governments, financial institutions, and fintech companies is crucial for inclusive economic development.

Table2. 5: Literature on Barriers to Financial Inclusion

Source	Summary	Methodology	Finding	Remarks
(Simatele & Maciko, 2022)	The paper provides insight into the usage patterns of financial services in rural South Africa. The study identifies supply and demand side factors affecting financial inclusion. Results indicate that bank charges and distance are major usage barriers.	Qualitative approach. Focused group discussions	High bank charges cause financial exclusion. Distance is identified as a major barrier to financial exclusion. Most individuals open a bank account to receive salaries or grants.	The study highlights usage barriers to financial inclusion for the rural population in South Africa. There is a dire need for technology advancement, such as mobile money adoption, for the enhancement of financial inclusion.
(Ediagbonya & Tioluwani, 2023)	The paper presents the case of Nigeria to explore the role of fintech for financial inclusion in emerging economies. The paper highlights	Qualitative analysis: Content analysis. Data from policies, journals and existing legislation.	Financial inclusion gap has widened due to factors such as financial illiteracy, poor digital infrastructure, information asymmetry, high	Developing and emerging economies should improve their digital infrastructure to encourage financial inclusion.

	challenges hindering FI in Nigeria and provides recommendations for the government, fintech companies and financial institutions addressing them.		charges and data breaches.	
(Qaiser & Fahad, 2024)	The study explores the potential benefits of fintech adoption in Pakistan. Based on a comprehensive analysis of existing literature and secondary data, the study reveals implications of fintech in banking, business, AI and much more.	Comprehensive literature review. Analysis of secondary data	Fintech provides an opportunity to reach the unbanked population. There exist regulatory and security concerns in fintech adoption. Need for effective policy implementation.	Existing disparities in fintech penetration can be overcome by increasing public awareness of the usage and access to fintech.

(Nizam & Rashidi, 2024)	The study explores customer experience with financial services in Pakistan. Highlighting challenges and opportunities, the paper draws significant implications to spread awareness regarding digital financial services.	Qualitative approach. Interviews Endive software for analysis.	Key barriers include financial illiteracy, lack of access to digital financial services and poor digital infrastructure.	Policies and general awareness campaigns should focus on means to enhance the use of financial services, which will, in turn, lead to financial inclusion.

2.1.6 Evaluation of Financial Inclusion Policies

The evaluation of financial inclusion policies across various countries reveals various aspects of financial inclusion policy-making tailored to varying national contexts. However, a critical examination exposes gaps between policy formulation and actual implementation. (Akhtar, 2003) assesses the State Bank of Pakistan's financial inclusion strategy, underscoring low financial penetration with only 37% of adults holding bank accounts and borrowers comprising just 3.7% of the population. This reveals a substantial gap in financial inclusion in the country. Similarly, A study conducted by Noreen et al., 2022) highlights SBP's recent initiatives, including gender-focused policies like the Banking on Equality (BOE) framework. Although the study praises collaborative efforts with national and international stakeholders, it lacks a deeper critique of the institutional inertia and social norms that continue to restrict women's access to financial services.

From an international perspective, literature offers an institutional analysis of financial inclusion in the U.S, stressing that over 68 million adults rely on alternative financial service providers due to systemic institutional exclusion rather than personal financial illiteracy, pointing towards gaps in effective policy implementation even in developed countries. (Figart, 2013). In India, (Sakariya, 2013) and (Aggarwal & Klapper, 2013) emphasise the need for context-specific financial inclusion policies, making emphasis on mobile banking adoption, simplified account access, and public-private collaboration. Similarly, assessing Nepal's financial inclusion policies studies outlines key strategies such as expanding microfinance institutions and improving financial literacy for the enhancement of financial inclusion (Pant, 2016). Providing an explicitly critical evaluation of India's financial inclusion initiatives from 1990 to 2014 (SINHA & PIEDRA, 2021) rightly note that many policies have prioritised short-term visibility over long-term impact, and that poor outreach has limited the effectiveness of policy efforts.

The insights from previous literature offer a diverse overview of existing financial inclusion policies and their hindered implications, but also reveal a shared tendency to frame financial inclusion as a largely technical issue solvable through better regulation or innovation.

Table2.6: Literature on Financial Inclusion Policies

Source	Summary	Methodology	Finding	Remarks
(Akhtar, 2003)	The article discusses SBP's financial inclusion Strategy, highlights reasons for financial exclusion and reforms in the banking sector. The author suggests microfinance expansion and regulation reforms for improved financial inclusion in Pakistan.	Policy analysis. Quantitative data analysis on data from the SBP, world bank. Comparative analysis	Financial penetration remains low in Pakistan, only 37% adults hold bank account, borrowers make up only 3.7% of population. Challenges include: geographical constraints, financial illiteracy, weak law enforcement for agricultural credit.	The paper gives practical solutions such as public-private partnership, regulations, reforms and technological advancements to encourage financial inclusion.
(Figart, 2013)	The paper explores financial inclusion in the U.S focusing on economic structure and institutions. 68 million adults in U.S rely use	Qualitative approach. Analysis of financial services in U.S. Institutionalist interpretation of capabilities approach.	Institutional barriers rather than lack of financial literacy hinders financial inclusion in the U.S. Policies should focus on	Policies focusing on regulation of institutional structure is crucial to enhance financial inclusion.

	AFSPs. The author emphasizes policies for regulation of industry to cater financial needs.		regulating AFSPs and promoting accessible banking services.	
(Sakariya, 2013)	The paper provides insights into components of India's financial inclusion policy based on World Bank's 2012 framework. The paper emphasises the adoption of FI policies according to the specific needs of a country.	Qualitative approach. Primary and Secondary data.	Key components of FI policy include regular data collection, clear goals, collaboration between the public and private sector and protection of consumer interest.	Financial inclusion policies must be context-specific according to the needs of developing countries.
(Aggarwal & Klapper, 2013)	The paper examined diverse strategies. Highlighting the fact that half of the world's adult population lacks access to financial services, the study provides policies to address barriers to FI.	Qualitative approach. Literature review and review of case studies.	Simplifying the bank opening process, rapid access to mobile banking services, utilisation of local agents for banking models and collaboration of public and private financial	The policies for financial inclusion should be context-specific and regulated according to the specific needs of each country.

			institutions are crucial for FI.	
(Pant, 2016)	The paper highlights the existing policy framework for financial inclusion in Nepal. Discussing Nepal's strategic plan 2012-2016, launched by NRB, and monetary policy 2016-2017, the author posits that FI is not a choice but a necessity for Nepal's economic growth.	Descriptive analysis of policies and secondary data from sources such as the IMF, World Bank, NBW and other nation	The study follows recommendations for FI in Nepal: Financial literacy, Active usage of Banks, special role of MFIs, formulation of national financial inclusion policy.	Being a developing country, Nepal requires an active formulation and implementation of a financial inclusion policy to achieve the targeted SDGs by 2030.
(Sinha & Piedra, 2021)	The study examines India's financial inclusion policies for the period 1990 to 2014, focusing on their potential to reduce the unbanked population.	Qualitative approach. Gofio methodology.	The majority policies were focused on immediate solutions rather than prolonged fixes. Policies failed to achieve targets due to a lack of outreach.	Financial inclusion policies should be explicitly disseminated for outreach to the general public.

(Noreen et al., 2022)	The study provides insights into SBP's initiatives undertaken to enhance financial inclusion in Pakistan. Sighting evidence from past and ongoing policies and partnerships with national and international organisations, the study highlights financial literacy, credit, gender gender-specific policies.	Qualitative approach. Literature review from national and international sources.	SBP has undertaken multiple initiatives for financial inclusion in collaboration with governmental and private bodies. BOE is the most recent policy for gender inclusion in the financial sector.	There is a need for the enhancement of financial literacy and awareness for enhancement of financial inclusion in Pakistan.

2.2 Literature Gap

These insights from literature highlight the critical role of research and effective policy-making for the enhancement of the financial capabilities of street hawkers and vendors in Pakistan. The literature points towards gaps in understanding how street hawkers and vendors in urban cities like Islamabad engage with mobile banking platforms. Most of the studies focus on the broader informal sector, but unique financial behaviours, financial literacy level and socio-economic challenges facing informal workers, such as street hawkers and vendors, are often overlooked. (Ahmed et al., 2021. While frameworks such as UTAUT and TAM have widely been used to examine technology adoption patterns, their application to marginalised populations such as street vendors is limited.

CHAPTER 3

METHODOLOGY

3.1 Research Philosophy

Philosophical position of the researcher guides assumptions about the world and influences all stages of the research process (Khan, 2023a). In social research, **ontology** refers to the nature of reality, which involves views about what exists and how it can be understood, while **epistemology** deals with how knowledge is produced and how it can be interpreted (Scotland, 2012). In this study, the ontological stance is **constructivist,** which implies that reality is considered to be constructed subjectively based on social interactions, individual experiences and contextual influences. This aligns with the idea that technology adoption is not guided by universal laws rather it depends on and is shaped by the socio-economic environment of users (Creswell & Poth, 2016). The study is based on **an interpretive** epistemological position, which holds that knowledge is subjective and is understood through the meaning that individuals assign to the phenomena in their surroundings rather than testing predefined hypotheses (Willis, 2007).

As the research aims to explore how street hawkers and vendors engage with mobile banking platforms, a constructivist ontological position combined with an interpretive epistemological stance enables a clear understanding of participants' lived experiences, contextual realities and socially constructed meanings associated with the use or non-use of mobile banking services. The Unified Theory of Acceptance and use of Technology (UTAUT) was implied as the theoretical foundation, which aligns with interpretivist epistemology. It guides the exploration of how street hawkers and vendors in Islamabad perceive and adopt mobile banking platforms. Constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions provide insights into subjective experiences of users.

3.2 Research Design

This research was based on an exploratory research design. The research aimed to understand how and why street hawkers and vendors utilise mobile banking services, a topic which is relatively under-researched in the context of the informal economy in Islamabad. This makes an exploratory research approach ideal. As street vendors primarily operate in an informal network, a qualitative

exploratory research design allows for capturing social, technological, and economic aspects. (Stebbins, 2001) Highlight that exploratory research helps develop insights rather than testing existing hypotheses. Moreover, this research design allows for data collection and interpretations, serving as a foundational step in unfolding mobile banking adoption behaviour in the informal economy and contributing to broader discussions on financial inclusion in Pakistan.

3.3 Research Strategy

This Research was based on a Qualitative research strategy**.** Since this study seeks to explore various aspects of mobile banking adoption by street hawkers and vendors in Islamabad, it required a strategy that allows for rich, descriptive, and contextually grounded insights. Qualitative research strategy is suitable for such research as it enables flexibility in data collection and analysis for a deeper understanding of social, economic and technological factors involved in the adaptation of mobile banking services (Creswell & Poth, 2016). According to (Khan et al., 2023b), Qualitative research is suited to exploring complex social phenomena, especially when the aim is to understand participants' subjective experiences, meanings and interactions in context. The strategy allows themes to emerge from data collected from end users/respondents rather than deriving themes from hypotheses, which supports an exploratory research design. Furthermore, the strategy aligned well with the use of a theoretical framework based on the Unified Theory of Acceptance and Use of Technology (UTAUT), combined with interpretive structural modelling (ISM), which examined technology adoption patterns and structural relationships among influencing factors.

3.4 Theoretical Framework

This study seeks to investigate factors influencing mobile banking adoption among street hawkers and vendors in Islamabad. The theoretical foundation of this research is based on the Unified Theory of Acceptance and Use of Technology (UTAUT). This theory serves as a guiding lens for understanding mobile banking (Technology) adoption patterns by street hawkers and vendors. To enhance the understanding of hierarchical relationships among influencing factors, the study integrates interpretive structural modelling as a complementary method within a theoretical framework.

3.4.1 Foundational Theory: UTAUT

Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed by (Venkatesh et al., 2003a). UTAUT is established on elements from eight prior technology acceptance models and is based on four constructs that influence technology adoption. These constructs include performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). (Attuquayefio & Addo, 2014). These constructs are shown to be adaptable in diverse socio-economic environments such as in informal economies (Dwivedi et al., 2019).

3.4.2 Integration of Interpretive Structural Modelling (ISM)

Interpretive structural modelling (ISM) is implied as an analytical method to systematically explore hierarchical relationships among variables involved in particular phenomena under consideration. ISM enables the formation of the structural model, which clearly identifies which factors are foundational (root cause) and which factors are more surface level (outcomes) (Warfield, 1974).

3.4.3 Relevance to Study Context

In the context of this study, Unified Theory of Acceptance and Use of Technology UTAUT is applied through constructs such as performance expectancy (PE) i.e. the degree to which hawkers believe that using mobile banking will improve their business performance, effort expectancy (EE) i.e. the perceived ease of usage and learning for mobile banking platforms, social influence (SI) i.e. the extent others influence hawkers' choice of mobile banking adoption and facilitating conditions (FC) i.e. availability of infrastructure, institutional and technical support. These constructs are crucial for understanding behavioural intentions influencing mobile banking adoption, However, the complex and multifaceted nature of such informal activities requires more than just identification of behavioural patterns involved in adoption of mobile banking technology. To address this complexity, Interpretive Structural Modelling (ISM) is integrated as a complementary approach to UTAUT. ISM will provide hierarchical illustration of various factors interlinked in the process of mobile banking adoption. This theoretical framework provides depth and structure to analyse how hawkers and street vendors engage with and perceive mobile banking adoption.

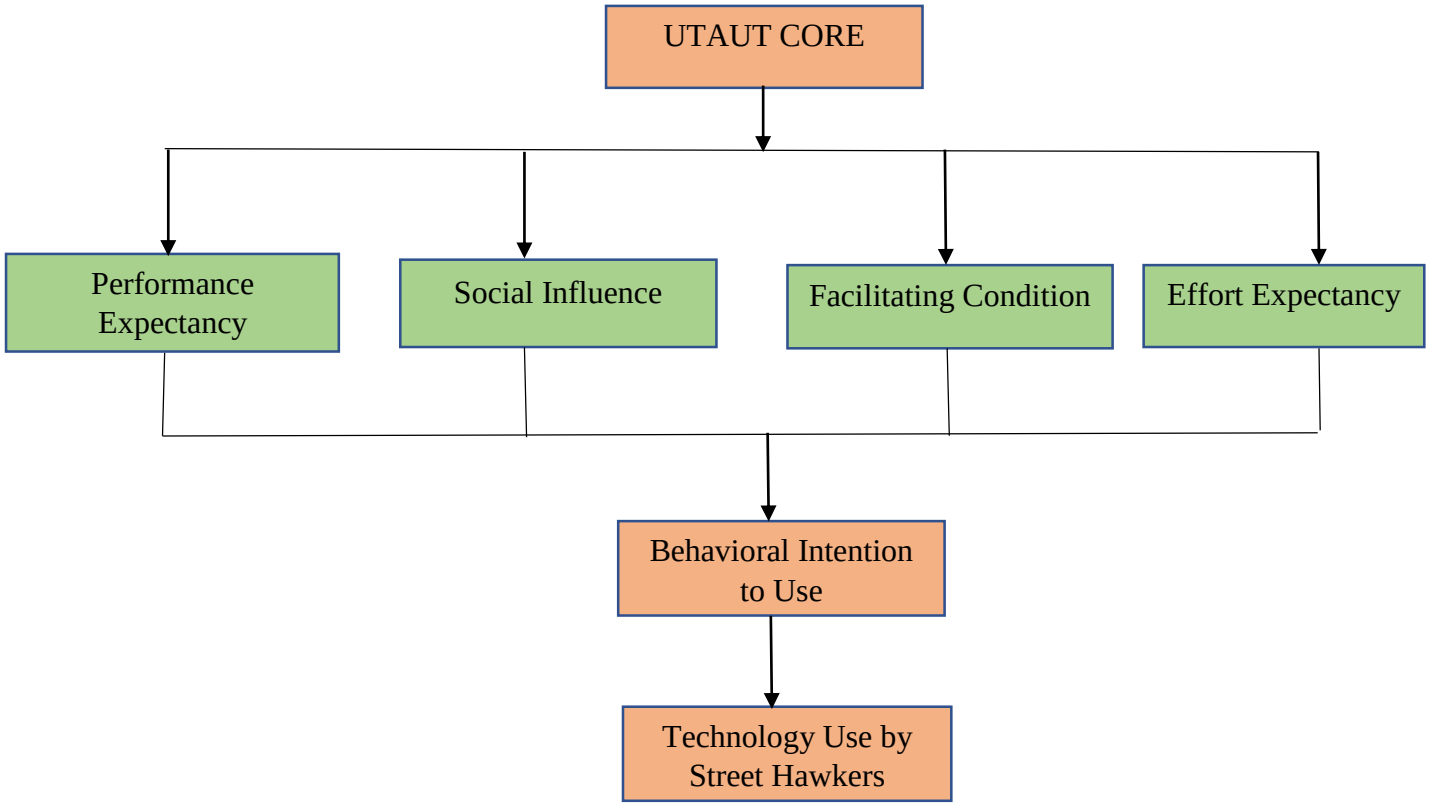

Figure 3. 1: Theoretical Framework

The above diagram is built around the Unified Theory of Acceptance and Use of Technology (UTAUT) as the central theoretical lens. The aim is to examine factors influencing the adoption and use of mobile banking technology by street hawkers and vendors in Islamabad. Key constructs-performance expectancy, effort expectancy, social influence and facilitating conditions are used to understand their behavioural intentions (perceptions) and actual use of mobile banking services.

3.5 Tools of Data Collection

The primary tool for data collection was Semi-structured interviews.

3.5.1 Semi-Structured Interviews

The study implied semi-structured interview as primary method of data collection Semi-structured interviews are a widely used qualitative data collection method combining flexible interview structure with guided questioning. The method allows the researcher to explore specific themes while getting detailed responses from participants (Kallio et al., 2016). These interviews provide deeper insights into participant responses, uncovering contextual drivers, social influences and

technological challenges. These interviews maintain a balance between flexibility of open-ended conversations and consistency of a guided framework (Adams, 2015).

For this study, Semi-structured interviews were essential for exploration of perceptions, experiences and usage patterns of mobile banking for street hawkers and vendors in Islamabad. This method aligned with the study's interpretivist epistemological stance as it highlights participants' voices and supports meaning-making processes, Moreover, it complemented the exploratory design of the research, allowing themes to be identified organically through iterative dialogue. Interviews were conducted at their convenient places, mostly near their business areas and in their preferred language, mostly Urdu, Punjabi and Pashto. In order to ensure respondents' comfort and data authenticity, interviews were semi-structured so that clarification of responses could be made.

3.5.1.1 Transcription

Participants' consent was taken for audio recording before conducting the interviews. After that all the responses were transcribed and documented in the form of a Word document. The responses were transcribed in a way that conveyed the real meaning providing contextual annotations where required. Non-verbal cues and any interruptions like background activity were also recorded which added more depth to the conversations. Responses to each question in the interview guide were documented.

3.5.1.1 Coding

After recording the transcriptions, a review of the transcripts was conducted in order to produce an initial codebook comprising of all themes identified by participants' responses and provided in UTAT and ISM framework.

Coding Procedure

I read each transcript several times for familiarization. Then I identified the parts of text that related to the research questions i.e. determinants of mobile banking adoption, perception of usefulness, usage patterns and societal influence. Codes were linked to meaningful phrases or sentences from participants' responses from the initial codebook. The major themes that I identified include usage patterns of mobile banking apps, perceived benefits, Literacy barriers, social influence and

business impacts. All coding was performed in Excel so that comparison could be made easily and data could be retrieved later. This ensured an in-depth and comprehensive thematic structure.

3.6 Sampling

The study was based on a **purposive sampling** technique. Purposive sampling is widely used in qualitative studies to identify cases which can provide maximum and rich information on the issue under consideration (Palinkas et al., 2015). A convenience-based purposive sampling technique was implied for selection of respondents (street hawkers and vendors) who were most accessible and relevant to the objectives of the study. As the targeted population operates in informal settings, obtaining a complete sampling framework was not feasible. Therefore, participants were purposefully chosen from Islamabad who were either currently using mobile banking services (such as EasyPaisa, Jazz Cash, etc.) or are potential users of these services and conveniently accessible from targeted market locations. In order to ensure diversity in perspectives, the sampling considered variations in terms of age, gender, education and type of vending activity.

The research participants were males, aged between 20 – 60 years. Most of them had completed middle level of education with some having no formal education. Their linguistic background was also diverse, most of them could understand Urdu. Their preferred languages were Punjabi and Pashto. Their business experience varied from 1-2 years to longer periods of almost 15-20 years. Most of them worked in partnership with family members, having fixed stalls, selling food items, households and jewellery. Some operated mobile stalls, selling fruits, vegetables, ice cream and other food items. Their average daily earnings ranged from 1000-3000 PKR.

The technological familiarity of the participants was also varied, some of them could comfortably use smartphones for social media or for financial banking apps, while there were others who used cell phones only for calls, as they had limited competency in using mobile technology. Most of the participants had not received any formal training for mobile banking apps for their businesses, they learned it either from their peers, customers or through observation. This diverse sample provided a rich context for analyzing the determinants of mobile banking in Islamabad's vibrant street economy.

3.7 Locale

The study was conducted in selected commercial zones across Islamabad that are known for high concentration of informal economic activity in Islamabad. These include Jinnah Super Market (F-7 Markaz), Super Market (F-6 Markaz), F-10 Markaz, Aabpara Market (G-6), G-11 Markaz and I-10 Markaz. These areas represent diverse urban clusters within Islamabad's metropolitan structure.

3.8 Tool of Data Analysis

This study was based on a two-step qualitative data analysis process to explore the drivers of mobile banking adoption among street hawkers and vendors in Islamabad. The analysis integrated thematic interpretation of collected data with structured modeling to provide a deeper understanding of systemic relationships among key variables.

3.8.1 Interpretive Structural modeling

Interpretive structural modeling (ISM) is a well-established qualitative analysis technique designed to analyse factors defining a particular issue or problem. Initially developed by John N. Warfield in 1973, the primary objective of ISM is to study complex issues as logical and understandable graphs (Warfield, 1974) The technique transforms poorly articulated models into clearly structured and hierarchical frameworks. According to Attri et al., (2013), ISM is defined as a process aimed at assisting the human being to better understand what he/she believes and to recognise clearly what he/she does not know.

ISM provides researchers with a systemic approach to impose direction and order to otherwise complex set of elements/factors. Based on expert opinion and judgements, ISM allows the generation of a multilevel structure model for the identification of independent (influencer) and dependent (influenced) factors. This identification leads to a deeper understanding of the issue as a whole. (Warfield, 1978). Given the complex nature of mobile banking adoption by street hawkers and vendors in an urban area like Islamabad, ISM offers a practical approach for explanation of hierarchical influence of various determinants (Socio-economic and technological). In this study, ISM was utilised for the assessment of various elements contributing to mobile banking adoption by street hawkers and vendors in commercial as well as residential areas of Islamabad.

Why ISM in this Study?

Interpretive structural modeling (ISM) offers a context-sensitive approach to studying the dynamics of complex issues. (Ravi & Shankar, 2005).. As major focus of this study was to explore the structural relation among barriers and facilitators of mobile banking adoption, the ISM technique provided an in-depth exploration. The technique allowed identification of analysis of social, technical and institutional factors influencing mobile banking adoption by street hawkers and Wenders in Islamabad. ISM accommodated expert opinions, judgements and contextual input making it adaptable to local realities where empirical data may be scares. This is critical for policy makers who focus on addressing the root cause of an existing problem rather than the symptoms.

Application of ISM:

Interpretive structural modeling ISM has extensive application across various fields and disciplines which deal with a complex and interrelated set of variables. The flexibility and clarity of ISM enables researchers to identify and map key variables in complex environments. (Attri et al., 2013). ISM has widespread application in fields such as supply chain management, environment sustainability, policy planning, technology adoption and organizational strategy (Ebrahimi & Eynali, 2019). Practitioners imply ISM to identify dependent elements, derive variables and visualise the hierarchical structure among them. For example, in the domain of technology adoption, ISM helps in understanding how social, technological, and organizational factors interact to influence decision-making processes. (Sage, 1977). Moreover, the method is useful in contexts where empirical data is limited but expert judgment is available, making it a suitable choice for exploring systems with qualitative complexity and unclear causal linkages.

Steps Involved in ISM:

1- Identification of variables:

A comprehensive list of variables relevant to the issue under consideration is formulated based on literature review, expert opinions and contextual knowledge. These elements serve as variables for modeling.

2- Establishing Contextual Relationship:

A structural self-interaction matrix is developed to establish a pairwise relationship among the elements identified earlier. It provides information about direction of influence from one variable to another.

3- Developing Reachability Matrix

At this stage SSIM IS converted into a binary format to get the reachability matrix. This matrix is checked for transitivity, i.e. if A Influences B and B Influences C, then A influences C.

4- Partitioning the Reachability Matrix

The reachability matrix is divided into reachability, antecedent and interaction sets. At this stage, hierarchical levels are defined

5- Constructing ISM Based Model

A directed graph (diagraph) is created according to identified levels. Visual representation of elements provides a clear understanding of drivers and influencers.

3.8.2 Thematic Analysis

Thematic analysis was used as the primary method of data analysis for data collected through interviews. The process involved identification, analysis and interpretation of themes generated through recurring patterns in interview data. In-depth reading of transcripts was carried out in order to become familiar with the data. The analysis provided detailed accounts of user perspectives and experiences related to mobile banking services. Codes were deducted inductively from the data. These themes include mobile banking adoption patterns, perceived benefits, social influence, challenges, business impacts and general attitude of users. After that, themes were verified and coherence was identified across and within interviews, and data was modified where required. At the end, themes were refined to ensure alignment with research objectives and the theoretical framework.

CHAPTER 4

FINDINGS AND ANALYSIS

4.1 Thematic Findings

The insights from in-depth interviews are presented through thematic analysis below.

4.1.1 Technological Engagement and User Experiences

Everyday experiences of street vendors with mobile banking reflect diverse patterns. Their engagement/ usage of mobile banking apps is shaped by multiple factors, including direct encouragement from peers and customers, perceived value in terms of security and efficiency and benefits of digital access (Venkatesh & Bala, 2008). Responses suggest that vendors mostly learned about mobile banking through social networks. Many respondents reported that their initial adoption of online payments (mobile banking) was prompted by the influence of friends, *"My friend also uses mobile banking so, I have learned from him"* Another major aspect was ongoing customer demand *"Customers used to ask for online payments so I started using it"* This signifies the role of peer learning and market pressure for technology adoption.

The availability of up-to-date technology, such as suitable devices and internet connectivity, further enhances user experience and influences mobile banking adoption. (Bhatt & Bhatt, 2016). The respondents with smartphones were able to explore a broader range of app features *"I use a smart smartphone, can easily use Easypaisa"*, while those with basic phones remained restricted in capability to experience mobile banking through apps ", I use a simple feature phone for calls only". Vender's perceptions of ease of use and user-friendliness also play a decisive role in technology adoption, some describe mobile banking as "Easy to use and makes my work fast" whereas others struggle with literacy barriers, stating that the app is complex: "I do not understand all app options, but I work by recognising signs on the app".

Other key factors shaping user experience are network reliability and transaction costs. Respondents mentioned these barriers as making their mobile banking experience difficult *"I face network issues, connectivity issues"* are frequently cited problems. Concerns about fees *"Shopkeeper charges me for sending money"* are also addressed by respondents. Moreover, trust on app reliability and safety of the app encourages mobile banking adoption reported as *"Yes, it*

keeps my money secure and I do trust mobile banking" Thus a blend of factors including social influence, user perceptions and physical structure of mobile banking play a crucial role in shaping user experiences of mobile banking adoption (Ashraf et al., 2022b).

4.1.2 Perceived Value and Business Impact

Mobile banking adoption patterns directly depend on users' awareness and perceptions of possible improvements in business activities. According to most of the respondents, the perceived value of mobile banking adoption is rooted in its ability to provide convenience, efficiency and security in business transactions. Highlighting the tangible advantages of mobile banking for streamlining business activities, one vendor mentioned, *"Yes, use of apps saves my time and money,"* while another respondent stated that *"It makes my work fast."* Another aspect of vendors' perceptions about mobile banking apps is money safety and security, which emerged as a strong theme in interviews. As one of the respondents said, *"It is helpful because money cannot be stolen from this app*." Underscoring the peace of mind offered by digital cash handling relative to managing cash manually on busy streets, a respondent quoted, *"It saves me from carrying too much cash"*, pointing to a reduction in risk, especially for vendors and hawkers working on busy streets. These responses highlight positive user perceptions for the adoption of mobile banking services. (Davis, 1989).

The business impact of mobile banking is reflected through changes in individual workflow and customer demand relation and retention. (Shareef et al., 2018). Specifically highlighting changes in the demographic profile of their clientele due to mobile banking adoption, a respondent said, *"More customers come to my stall due to online payments,"* and another stated, *"I do not lose customers as I give them the facility of digital banking."* A hawker at a busy area reported, *"Yes, more students come to my stall because I accept online payments"* The convenience of not needing to keeping *"extra change"* was quoted by a respondent as *"Now, I manage cash batter, less change is needed"* these responses suggest that digital payment options are contributing to smoother transactions and quicker service during busy periods.

Despite recognising the value of mobile banking, multiple vendors repeatedly highlighted concerns about service charges and cash-out costs. Multiple respondents shared, *"The shopkeeper charges me Rs 20 for a 1000 cash withdrawal"* These extra costs eat into already tight margins, shaping usage patterns and even discouraging full adoption. Not using any mobile banking apps

urged that *"There are hidden charges on transactions."* Some vendors, despite using the digital payment apps, continue to prefer cash for most transactions because, as one respondent explained, *"I prefer cash over online payments,"* reflecting an attempt to avoid avoidable expenses.

Another interesting finding is that, not all users experience considerable improvements in business turnover. As one of the respondent shared, *"No my customers are the same as before, as students come to my shop mostly"* suggesting that for certain segments or locations, digital payments have not yet profoundly altered customer patterns or business volume, confirming the findings from developing countries (Aker & Mbiti, 2010). Several vendors mentioned that they only make limited use of mobile banking *"I use app for receiving payments from customers only"* but do not explore other functions like savings, bill payments or business loans. Indicating limited integration of mobile banking into wider business framework for street hawkers and vendors.

4.1.3 Social Dynamics and Influence

The adoption and sustained usage of mobile banking services for street vendors and hawkers is deeply rooted in their social context and relations within their communities. Rather than relying of formal channels, Majority of vendors depend on informal/relational networks for guidance, support and confidence in adopting new technologies which is reflected through statements such as *"My son helps me using the app"* and *"I learned using the app from my friend"*

Majority vendors responded their first interaction with mobile banking platform was through practical demonstration and encouragement of fellow vendors. As one respondent described, *"I learned this from a shopkeeper next to my stall. He showed me step by step how to use the app to send and receive money. There was no training from the company, I just watched him and practiced with his help."* Such responses emphasize the significance of trustworthy and accessible means of instruction as an alternative of formal training (Dholakia et al., 2004). Learning from friends also serves crucial role in shaping positive attitudes toward digital transactions *"My friends also use apps so I learned from them."* The collective experience and endorsement from peers and fellows serve as a catalyst for building initial trust and lowering psychological barriers, as vendors are more inclined to experiment with mobile banking when they see others in similar circumstances managing it successfully.

Furthermore, family dynamics help and reinforce the adoption of technology especially for those having limited or low literacy. Most of the vendors reported that they take assistance for technical

matters from their younger or tech-friendly relatives: *"My son helped me understand the app,"* and *"My brother used it, then he told me to install the app."* These intergenerational influences help in lessoning the barriers related to literacy and language and build more confidence. Family members encourage sustained attention to and engagement with technology through active demonstration and guidance.

Another most emphasised aspect for mobile banking adoption is expectations for online payments from customers. "*Younger customers usually demand digital payments", "Customers mostly prefer online payments," and "Customers used to ask for online payment, so I started using it."* The response of most of the participants indicates that they get encouraged and motivated to update to mobile banking due to their customers' requirements. As more vendors shift to mobile banking, it is becoming common and acceptance is growing throughout the marketplaces: *"Almost everyone uses it now, customers, especially younger ones, prefer it if we accept payments through Easypaisa or JazzCash."*As vendors observe and learn from each other, they get familiarised according to their requirements (Ullah et al., 2022). This leads to a continued cycle of adoption of digital banking and a source where each new adoption becomes an enforcer for others to adopt soon.

4.1.4 Barriers and Challenges

There are various multifaceted and interlinked technical, personal and social factors that become the barriers to adoption and continuous practice of mobile banking among street hauckers and small vendors of Islamabad. The fundamental barriers for vendors in adoption of mobile banking are low literacy levels and limited technical knowledge (Bakhshi et al., 2024). Respondents often reported difficulty in navigating app features that require multiple processing or are presented in unfamiliar language. One vendor shared, *"I am uneducated so I face difficulty in understanding options on the app,"* while another reflected, *"Too many steps confuse me."* Even those who regularly use digital banking apps reported lack of confidence in utilizing all app features. These issues get multiplied for those who cannot read or write as they navigate through icons or colors or they have to rely on some support for their transactions. Moreover, the lack of any formal training for using apps intensifies the matter, most of the respondents reported that they learned operating apps from their friends or family members and have to depend on others for support.

The reliability and trust of users is also affected by continued app connectivity and network issues. Troubles such as internet connections, slow app loading and server errors lead to fear,

apprehensions, anxiety and inconvenience. According to a respondent, *"Sometimes there are network issues, otherwise it's fine,"* while another explained, *"When network is slow, I fear losing money."* Network issues are especially a problem for mobile vendors compared to those with fixed stalls which makes smooth network coverage difficult.

Vendors' concern related to trust and security appear as a significant barrier in both perceived and actual consideration. Some participants reported direct and indirect issues of missing balance, delayed payments and technical errors. As reported by one participant: *"Sometimes balance goes missing, I Don't trust fully."* This creates lack of confidence in apps. There are others who are highly influenced by stories of frauds, they have heard in their social circle: *"I heard fraud cases from my friends, so I will not use mobile banking."* This narrative whether experienced directly or indirectly create a situation full of fear and anxiety and lack of trust especially among older vendors who perceive that technology is not accessible for them.

4.1.5 Facilitating Conditions

Facilitating conditions include both reliable support structure and better enabling resources. These conditions when fulfilled become a source for sustained and continual use of mobile banking adoption (Venkatesh et al., 2012). Informal support system i.e. supports provided by shopkeepers and peers play a significant role in bridging the gap of knowledge and technical awareness. As one of the respondents said: *"I take help from agents or shopkeepers when I get stuck."* Family members especially younger ones are of great assistance in this regard. One participant reported: *"My son and a customer suggested it. That's why I tried."*

Respondents also mentioned technical barriers that limit their use of digital banking facilities. This requires mobile banking companies to make changes in their apps to make them accessible to their potential users. Participants' responses, such as *"operate without internet"* and *"make app easy for people who cannot read"*, are a reflection of their concern for those who have low literacy levels or are facing network issues. These responses depict the notion that technological advances will reduce dependence on others.

Most vendors reported that they did not receive any formal training on the adoption of mobile banking. As participants said: *"No training at all."* Many respondents highlighted the need for basic in-market training in their familiar language and an accessible format. As responded: *"They should guide us in easy language; they should give us training on all options of the app."* Lack of

such institutionalised training not only creates a barrier for new people to adopt mobile banking but also risks the sustenance of the existing users. Respondents also demanded the requirement for engagement with small business owners and training them on digital banking for their businesses. As one vendor put it, *"They should visit markets and explain to people like us,"* and another noted, "More training in markets would help. Also support in simple Urdu." These suggestions highlight a community-based learning requirement.

4.2 Mapping Findings to UTAUT

The alignment between the study's empirical findings generated from in-depth interviews of street hawkers and vendors and constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) provides a comprehensive theoretical lens for interpreting mobile banking adoption among street vendors. Analysis of the narratives of respondents reveals that each of the core UTAUT dimensions, namely performance expectancy, effort expectancy, social influence and facilitating conditions, is reflected in lived experiences, motivation, adoption barriers and decision-making patterns of users and non-users of mobile banking in this context.

4.2.1 Performance Expectancy

Performance expectancy, or the belief that mobile banking will enhance business scale and efficiency, has emerged as a central theme throughout the analysis of vendors' narratives. Respondents consistently cite tangible benefits such as quicker transactions, increased customer satisfaction and improved cash management. Comments like *"Yes, use of apps saves my time and money" and "It helps me secure my money, no chance of theft"* exhibit strong evidence that performance expectancy in terms of perceived usefulness is among the primary motivators for mobile banking adoption. Vendors note that accepting digital payments draws more customers, especially students and young customers, indicating that anticipated business gains are realised in daily practice.

4.2.2 Effort Expectancy

Effort expectancy is reflected through the perceived ease or difficulty of using mobile apps. It is integral to both the adoption decision and the sustained use or non-use of digital banking services. Vendors who find the mobile banking apps useful describe them as *"very useful, easy to use, and make my work fast",* reflecting a higher level of satisfaction. However, for less informed vendors, usage of mobile banking is constrained by challenges including language barriers, lack of digital

literacy and complex or unclear interface reflected through responses such as *"I do not understand all app options, but I work by recognising signs on the app."* Effort expectancy is influenced by a wide range of factors, where ease of use is a strong adoption driver, while perceived complexity or fear of mistakes hinders adoption, particularly for older or less educated respondents.

4.2.3 Social Influence

The social context shaped by extent and role of social interactions is crucial to diffusion and normalization of mobile banking adoption. Analysis of respondent's narratives reinforces the role of peer encouragement and guidance from family as key social influence manifests through persistent encouragement form peers, guidance from family and frequent request from customers. Most of the vendors credit their social network for entry into mobile banking as one of the respondent stated, *"My friends also use mobile banking, so I have learned from them."* Emphasizing the role of customer demand as a catalyst for digital payment acceptance, a respondent cited, *"Customers used to ask for online payment so I started using it."* Hence mutual reinforcement of peer and customer demand creates a powerful social momentum, lowering psychological barriers and prompting those reluctant or unsure to mobile banking. This collective influence accelerates the integration of digital payments within street markets.

4.2.4 Facilitating Conditions

Facilitating conditions is marked by a range of supporting factors including access to supporting digital infrastructure, resources and informal or formal training. The study reveals that device ownership and reliable internet remain foundational facilitators in promotion of mobile banking adoption. findings from respondent's narratives explicitly reveal that practical support most often comes from family members, shopkeepers, or mobile banking agents as cited by the respondents, *"I take help from agents or shopkeepers when stuck.*" One of the most crucial facilitating conditions i.e. training opportunity remains missing from financial landscape as expressed by several respondents as a desire for *"training in simple Urdu", "apps with more symbols," guidance in markets."*

Hence Integrating Unified Theory of Acceptance and use of technology (UTAUT) with the findings of the study enable a structured theory-driven explanation based on varied experiences of small vendors and street hawkers in Islamabad. Each UTAUT constructs was witnessed in the field. Vendors' decision to adopt or restrain from digital finance depends not only on perceptions

of utility and perceived ease, but also on the socio-technical network and infrastructural realities. The UTAUT therefore not only helps explain the patterns observed but highlights actionable areas for intervention such as user education, simplifying interface and community-based training.

4.3 ISM Structural Analysis:

4.3.1 Data Analysis

The analysis is performed using interpretive structural modelling (ISM). detailed analysis is presented as follows.

Step 1: Element Extraction

The following nine elements/factors are identified as determinants of mobile banking adaptation among street hawkers and vendors based on detailed analysis of recurring themes from the interviews.

Awareness (AW): Knowledge of mobile banking apps and their benefits.

Accessibility (AC): Availability of smartphones and internet connectivity.

Trust (TR): Confidence in the security and reliability of mobile banking apps

Ease of Use (EU): Perceived user-friendliness of apps, including language and interface simplicity.

Cost (CO): Transaction fees and financial burdens.

Social Influence (SI): Influence of peers, family, or customers.

Financial Literacy (FL): Understanding of financial concepts and app functionalities.

Network Reliability (NR): Dependability of internet and app performance.

Customer Demand (CD): Pressure from customers to accept digital payments.

Step 2: Structural Self-Interaction Matrix (SSIM)

The SSIM captures pairwise relationships between elements, where:

- V: Element i leads to Element j.
- A: Element j leads to Element i.

- X: Mutual influence.
- O: No relationship.

Table 4. 1: Structural Self-Interaction Matrix (SSIM)

	AW	**AC**	**TR**	**EU**	**CO**	**SI**	**FL**	**NR**	**CD**
AW	-	V	V	V	O	A	V	O	A
AC		-	O	V	V	O	O	A	O
TR			-	V	O	X	V	O	X
EU				-	O	O	A	O	O
CO					-	O	O	O	O
SI						-	V	O	X
FL							-	O	O
NR								-	O
CD									-

Interpretation

The relationship among determinants of mobile banking adoption is explained below.

AW (Awareness) as the Row Factor

AW→AC (V): Greater awareness of online payments services leads vendors to explore and seek out access to mobile banking. The respondents who don't know about digital finance, they are less likely to access it.

AW→TR (V): Becoming aware tends to foster trust on digital payments. Moreover, hearing success stories, marketing, or positive talk enhances confidence among vendors.

AW→EU (V): Awareness campaigns often demystify apps, making them seem easier. Frequent exposure to mobile banking educes hesitation.

AW→CO (O): Awareness does not directly lower transaction costs.

AW→SI (A): Vender's level of awareness is shaped by social influence i.e peers, fellow vendors, family and customers.

AW→FL (V): Awareness is often the entry point for learning key concepts i.e., financial literacy starts with simple awareness.

AW→NR (O): Awareness of mobile banking cannot fix poor networks or infrastructure issues

AW→CD (A): Customer demand drives awareness of mobile banking adoption.

AC (Accessibility) as the Row Factor

AC→TR (O): Having access does not impact the level trust on mobile banking apps.

AC→EU (V): Having access to good quality mobile device and connectivity, ensures that the app is more likely to be "easy" to use.

AC→CO (V): Access (having a smartphone and reliable Internet connection) can lower some transaction barriers/costs.

AC→SI (O): Access to mobile banking services does not drive peer or social influence.

AC→FL (O): Access without financial literacy is possible (and sometimes, a problem).

AC→NR (A): Network reliability is a precondition for accessibility.

AC→CD (O): Access doesn't create demand, but is necessary to serve it.

TR (Trust) as the Row Factor

TR→EU (V): If vendors trust mobile banking, they are less hesitant/reluctant, and thus perceive it as easier to use.

TR→CO (O): Trust does not influence platform fees hence isn't related to cost.

TR→SI (X): Trust and social influence reinforce each other: trustworthy social influence busts trust, trust, in turn, makes vendors more likely to follow peers.

TR→FL (V): Trust in digital finance fosters willingness to learn (to become financially literate about digital finance).

TR→NR (O): Trust doesn't impact or upgrade the network availability.

TR→CD (X): Trust in digital money grows as customer demand for digital payments increase. At the same time, as trust spreads, customer demand can increase further.

EU (Ease of Use) as the Row Factor

EU→CO (O): Ease does not reduce transaction costs.

EU→SI (O): Perceived ease does not drive social influence by itself.

EU→FL (A): Financial literacy (FL) makes the system easy to understand and hence increases ease of use

EU→NR (O): Ease doesn't fix the external network. No network availability ensures ease of use for users

EU→CD (O): Ease alone doesn't drive demand. Nor customer demand derives ease of use.

CO (Cost) as the Row Factor

CO→SI (O): Transaction costs don't directly impact social influence.

CO→FL (O): Costliness doesn't affect financial literacy.

CO→NR (O): Fees don't change network reliability.

CO→CD (O): Transaction charges are not a demand driver.

SI (Social Influence) as the Row Factor

SI→FL (V): encouragement from peers, fellow vendors and family leads to increased learning. Financial literacy grows as friends help friends.

SI→NR (O): Social influence can't fix networks. Nor network availability influence social influence.

SI→CD (X): Social influence and customer demand boost each other (when customers ask, vendors influence peers, and vice versa).

FL (Financial Literacy) as the Row Factor

FL→NR (O): Literacy will not directly improve infrastructure nor network availability can impact financial literacy.

FL→CD (O): Financial literacy doesn't directly create customer demand.

NR (Network Reliability) as the Row Factor

NR→CD (O): Reliability of connectivity does not itself boost customer demand (but it is required to meet it).

CD (Customer Demand) as the Row Factor

No "V", "A", or "X": As a final node, demand is an outcome rather than a driver toward the other factors in this SSIM.

Step 3: Reachability Matrix

At this stage, the SSIM is converted into an initial binary reachability matrix, then adjusted for transitivity to produce the final reachability matrix. The symbols are replaced by binary numbers (0,1) for further analysis. Numbers are assigned based on following a standard set of rules that interpret notations (V, A, O, X)

V (leads to): Row factor influences or enables column factor,

A (is led by): Column factor influences or enables row factor.

X (mutual): Both row and column elements influence each other.

(none): No direct influence or effect.

Table 4. 2: Initial Reachability Matrix

	AW	**AC**	**TR**	**EU**	**CO**	**SI**	**FL**	**NR**	**CD**
AW	1	1	1	1	0	0	1	0	0
AC	0	1	0	1	1	0	0	0	0
TR	0	0	1	1	0	1	1	0	1
EU	0	0	0	1	0	0	0	0	0
CO	0	0	0	0	1	0	0	0	0
SI	0	0	1	0	0	1	1	0	1
FL	0	0	0	1	0	0	1	0	0
NR	0	0	0	0	0	0	0	1	0
CD	0	0	1	0	0	1	0	0	1

Table4. 3: Final Reachability Matrix (with transitivity)

	AW	AC	TR	EU	CO	SI	FL	NR	CD
AW	1	1	1	1	1*	0	1	1*	0
AC	0	1	0	1	1	0	0	0	0
TR	0	0	1	1	0	1	1	0	1
EU	0	0	0	1	0	0	0	0	0
CO	0	0	0	0	1	0	0	0	0
SI	0	0	1	1*	0	1	1	0	1
FL	0	0	0	1	0	0	1	0	0
NR	0	0	0	0	0	0	0	1	0
CD	0	0	1	1*	0	1	1*	0	1

Note: Asterisks (*) indicate transitive relationships.

Driving and Dependence Power:

The classification of driving and dependence power indicates meaningful insights into role of each factor in the system.

- Driving power counts how many elements a factor can reach or influence i.e how much it shapes the system.
- Dependence power counts how many factors influence or reach a given factor i.e how much it is influenced by other elements.

Table4. 4: Dependence power and Driving Power

Element	Driving Power	Dependence Power
AW	7	2
AC	3	2
TR	5	4
EU	1	6

CO	1	3
SI	5	3
FL	2	5
NR	1	2
CD	5	3

Step 4: Level Partitioning

Elements are partitioned into hierarchical levels based on reachability and antecedent sets.

Table4. 5: Level Partitioning

Element	Level
AW	3
AC	2
TR	2
EU	1
CO	1
SI	2
FL	1
NR	1
CD	2

Step 5: ISM Model

The hierarchical model is structured as follows:

- Level 3 (Base): Awareness
- Level 2: Accessibility, Trust, Social Influence, Customer Demand
- Level 1 (Top): Ease of Use, Cost, Financial Literacy, Network Reliability

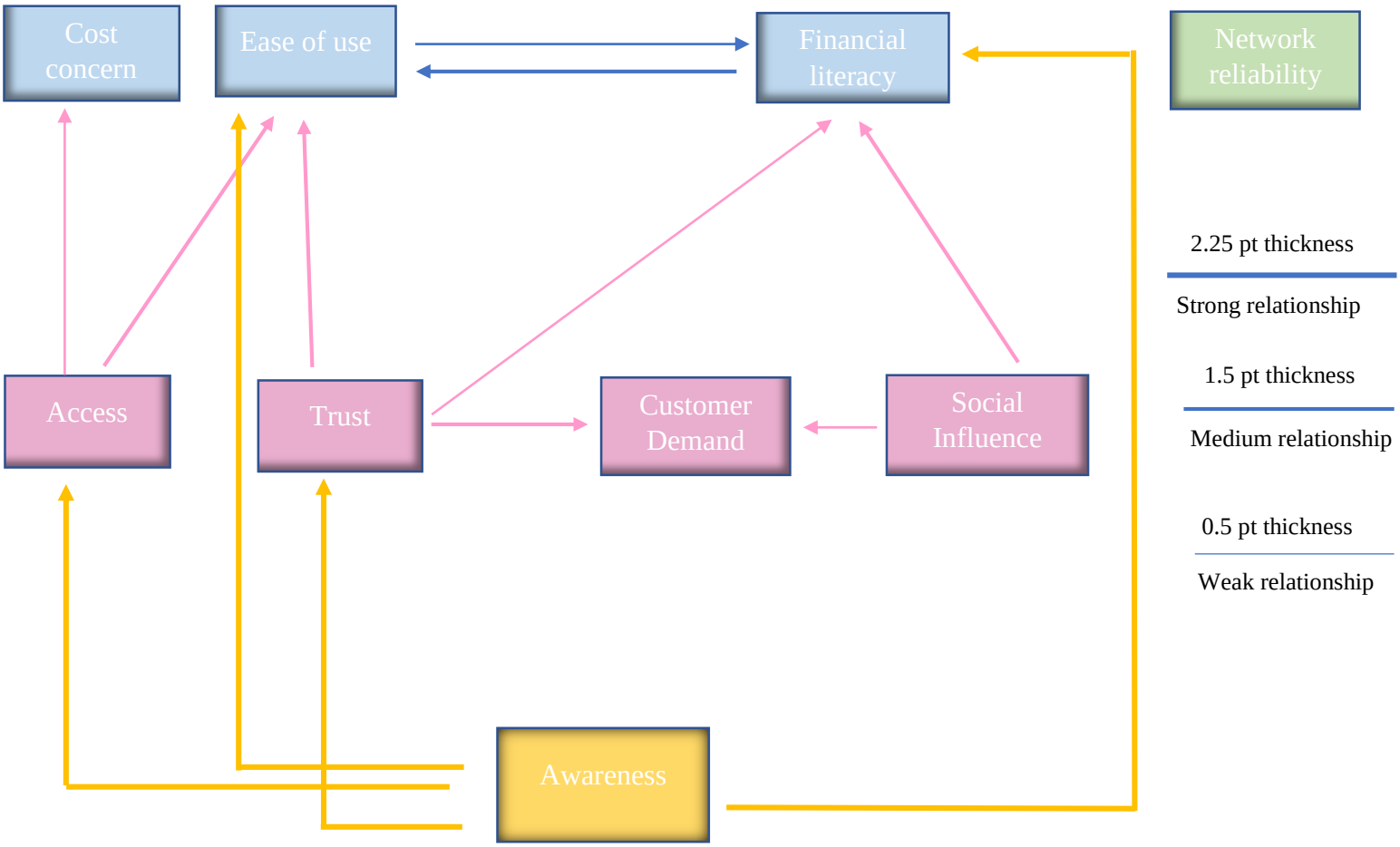

Figure 4.1. ISMDiagraph[1]

[1] Figure 4.1. exhibits the thickness of arrows to represent the strength of the relationship among variables. This representation is not a part of the Interpretive Structural Modelling Framework; rather, it has been added to make the diagram reader-friendly and understandable.

Interpretation

Level 3 Awareness (AW) is the foundational driver, influencing Accessibility, Trust, and Ease of use.

Level 2 elements (AC, TR, SI, CD) act as intermediaries, driven by awareness and affecting outcomes like Ease of Use, Cost and Financial Literacy.

Level 1 elements (EU, CO, FL, NR) are outcomes, indicating that successful fintech adoption depends on addressing lower-level drivers.

Step 6: MICMAC Analysis

Elements were classified based on driving and dependence power into four quadrants:

Autonomous: Network Reliability (NR)

Dependent: Ease of Use (EU), Cost (CO), Financial Literacy (FL)

Linkage: Trust (TR), Social Influence (SI), Customer Demand (CD)

Independent: Awareness (AW), Accessibility (AC)

Table4. 6: MICMAC Analysis

Quadrant	Elements
Autonomous	NR (1,2)
Dependent	EU(1,6), CO(1,3),FL (2,5)
Linkage	TR(5,4), SI(5,4),CD(5,4)
Independent	AW(9,1), AC(4,2)

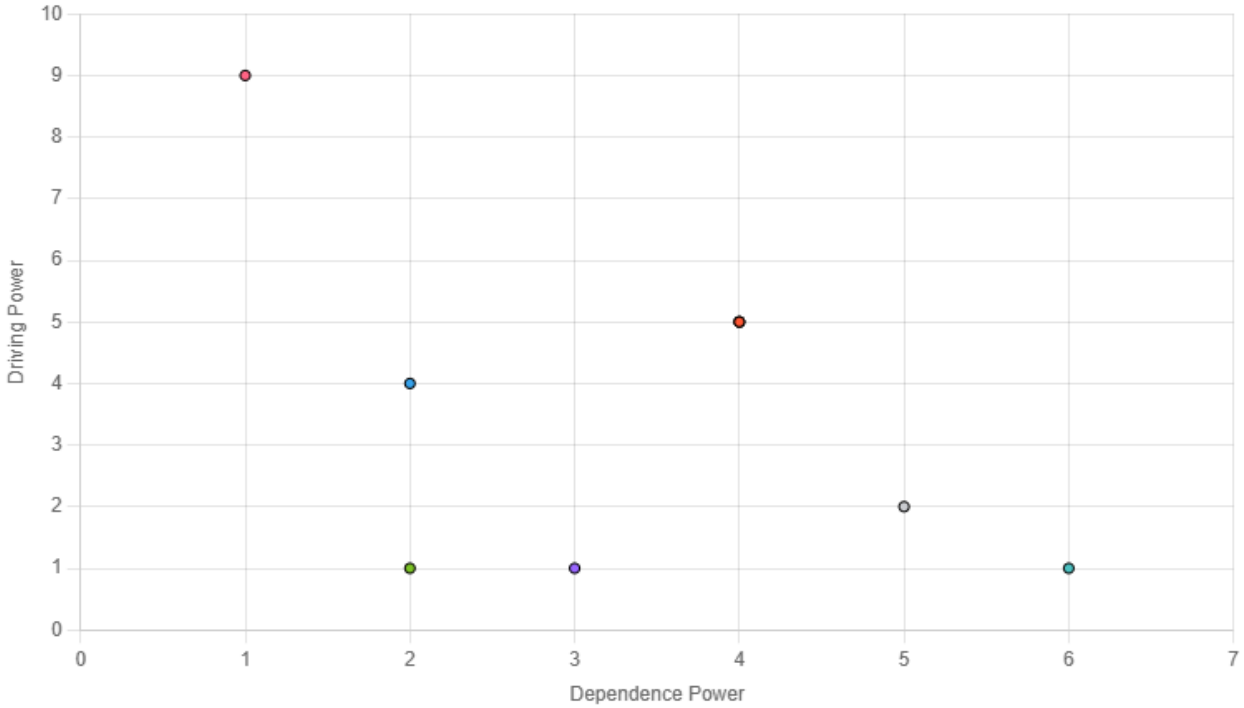

Figure 4. 1: MICMAC Scatter Plot

X-axis: Dependence Power

Y-axis: Driving Power

Points: AW (1,9), AC (2,4), TR (4,5), EU (6,1), CO (3,1), SI (4,5), FL (5,2), NR (2,1), CD (4,5)

Interpretation

The MICMAC analysis generates a systemic categorisation of the determinants of mobile banking adoption among street vendors and hawkers by evaluating each factor's deriving and dependence power.

The analysis reveals that the strongest independent drivers of mobile banking adoption are **Awareness (AW) and Accessibility (AC)**: These elements possess significant influence over the entire adoption framework and are foundational for all subsequent determinants, yet they are themselves minimally influenced by other factors. Linking variables are categorised as **Trust (TR), Social Influence (SI), and Customer Demand (CD)** as they both influence and are influenced by several other factors, making them critical for systemic change but also sensitive to disruptions elsewhere in the digital ecosystem. **Ease of Use (EU), Cost (CO), and Financial Literacy (FL)** emerge as dependent variables, meaning they mainly reflect the outcomes of

interventions elsewhere in the system rather than acting as root causes. Finally, **Network Reliability (NR)** is the only autonomous element, given its low driving and dependence power, indicating its role is more infrastructural and external to the behavioural or social determinants within the vendor community.

Overall, MICMAC analysis indicates that interventions focused on improving awareness and accessibility are likely to have the most crucial impact, while strengthening linkages such as trust and social influence can magnify and sustain adoption across the vendor community.

4.3.2 Hierarchy and Interrelationships

ISM factors are classified based on their role in the system. The factors are classified as key root causes (drivers), intermediaries or linkages and outcomes that emerge from the functioning of driving and intermediary factors.

Driving Factors

Awareness (AW) serves as the foremost driving factor for mobile banking adoption among street vendors. It represents vendors' knowledge of mobile banking services and their potential benefits. Raising awareness of digital technologies is the starting point, as without it, further progress towards mobile banking adoption is impossible. Awareness stimulates curiosity and encourages learning about technology. Awareness is identified as a foundational determinant, catalysing the journey of fintech (mobile banking) adoption by making vendors receptive to new fintech possibilities.

Linking Factors

The model identifies four major linking factors, including Accessibility (AC), Trust (TR), Customer Demand (CD) and Social Influence (SI). Accessibility refers to practical access to required technology (like smartphones and the internet), which is primarily driven by awareness but also relies on infrastructural support through network reliability. Another critical factor is Trust (TR), which is built through positive experiences and effective app performance. Another important linking factor is Social Influence (SI), as encouragement and observable behaviours among peers or customer demands can prompt initial interest and willingness to try digital payments. Social influence serves as a critical enabler that provides a linkage between foundational awareness and tangible outcomes. All these factors together set an enabling environment for

mobile banking adoption. Trust reduces hesitation and fosters continued digital engagement. Social influence provides a linkage between basic awareness and meaningful use. Vendors who get guidance or awareness from peers and family understand the features and use digital tools are more likely to confidently operate bank apps and benefit from them. These linking factors ensure that initial awareness is converted into digital banking adoption and sustained usage patterns. Customer demand is both an outcome and a reinforcing factor, as customers increasingly expect digital payment options, they drive vendors to adopt mobile banking channels.

Outcomes

The outcomes or dependent determinants of the adoption process are reflected in factors like Ease of Use (EU), Cost (CO), Network Reliability (NR), and Financial Literacy (FL). Ease of use indicates how user-friendly the application feels to the vendor. It is largely dependent on driving and linking factors such as prior financial literacy, trust and quality of the interface. Cost in this context refers to transaction fees and is a key barrier that can limit mobile banking adoption and use patterns. Another determinant is network reliability. It is autonomous in the model, but it determines the smooth functioning of fintech services. Persistent connectivity issues can hinder vendors' motivation to use digital channels.

CHAPTER 5

DISCUSSIONS

5.1 Social, Economic and Technological Factors Influencing Mobile Banking Adoption

The adoption of digital banking among street hawkers and small vendors in Islamabad is influenced by interconnected social, economic and technological factors that collectively determine the extent and manner of engagement with mobile banking services such as Easypaisa, JazzCash, Sadapay, etc.

Among social factors, awareness and social influence stand out as foundational determinants of mobile banking adoption. Vendors typically learn about mobile banking through peer networks, family members and in the majority of cases, customers rather than formal channels. This social dispersal of awareness through social influence aligns with UTAUT's construct of social influence (Venkatesh et al., 2003b). Another aspect is customer demand for acceptance of digital payments, which exerts pressure on vendors, often compelling them to adopt mobile banking out of necessity to retain and serve customers accustomed to cashless transactions. These social influencers reflect the collectivist tendencies in Pakistani informal markets, where community endorsement serves as a key trust signal and motivator for adoption of new technologies (Ashraf et al., 2022b).

Economically, cost factors play a crucial role. Transaction fees, cash-out charges, and opportunity costs related to failed or delayed payments discourage initial adoption as well as sustained use. These financial barriers explicitly influence effort expectancy as frequently cited by street hawkers and small vendors and are highlighted in regional fintech research, illustrating how small-scale entrepreneurs in emerging markets consider affordability while deciding to engage with fintech services (Saxena et al., 2023). Moreover, Technical factors such as accessibility and network infrastructure constitute a basic facilitating condition. Smartphones and reliable internet connectivity encourage use. According to Shareef et al. (2018), network outages and limited device ownership reflect low connectivity reliability. These infrastructural challenges significantly shape the behavioural intention and actual usage patterns by hindering smooth transaction experiences.

This triad of social, economic and technological determinants interacts systematically, as captured through ISM's hierarchical modelling. These factors determine whether mobile banking adoption occurs and is sustainable among informal workers.

5.2 Usage Patterns: Transaction Type, Frequency and Purpose

The adoption of mobile banking services among small vendors and hawkers is primarily for business purposes, with platforms like Easypaisa, JazzCash, SadaPay, etc. being utilised for day-to-day business transactions and fund transfers, focusing primarily on receiving payments from customers and conducting basic fund transfers.

This pattern is consistent with fintech adoption studies in informal economies (Abandu et al., 2025). Insights from the study suggest that vendors generally avoid more advanced features such as digital credit, micro-investments, or saving plans, depicting limited digital and financial literacy, risk aversion, and distrust in digital financial services. This usage behaviour is documented with similar barriers among low-income populations in emerging markets (Ullah et al., 2022). Transactional frequency varies based on several contextual factors, including vendors' digital literacy, customer volume, network reliability and users' comfort with technology adoption.

Facilitating conditions such as smartphone availability and Internet quality enhances usage expansion while interruptions in connectivity, as observed in the data, directly result in failed transactions and user frustration, limiting engagement with mobile banking functionalities (Ho et al., 2020) From an ISM perspective, these usage behaviors reside at the outcome level greatly affected by upstream determinants like social influence, awareness, and facilitating conditions. Limited engagement with advanced financial services such as digital credit and micro-investments depicts structural gaps, including a lack of trust and low literacy, that require targeted interventions to be bridged.

Overall, street hawkers and small vendors in Islamabad adopt mobile banking within their comfort zones, incrementally expanding usage as trust and literacy improve but remaining anchored to familiar and low-risk transaction categories.

5.3 Perceptions of Usefulness, Ease of Use and Social Influence

Perceived usefulness is a powerful motivator and is frequently cited as a reason for trial and initial adoption. As reflected through UTAUT's performance expectancy construct, the vendors

generally identify the usefulness of mobile banking, particularly in terms of transactional convenience, security from theft and improved customer service (Venkatesh et al., 2003c).

However, perceptions of ease of use are mixed. Vendors with higher literacy and prior exposure report navigating mobile banking apps with relative confidence, while those with limited digital and financial literacy express confusion over complex interface, known app features and digital financial terminology. Underscoring UTAUT's effort expectancy dimension, Prior research highlights the critical challenge that limited financial and digital literacy play as barriers in informal sector fintech uptake. (Panos & Wilson, 2020). In most instances, usability concerns and mistrust arising from misunderstanding or past negative experiences lead to hesitation in expanding use beyond basic payments.

Social influence is a strong perceptual driver. Influence particularly from peers, customers, and family, which influences mobile banking adoption. Vendors often adopt mobile banking due to pressure, guidance or encouragement from their social circles, boosting trust and mitigating risk perceptions. This pattern aligns with prior research emphasising social norms' importance in fintech adoption, especially within collectivist societies. (Malik & Sikarwar, 2025). Another aspect of user perceptions is trust. Trust in the security and authenticity of mobile banking platforms further influences adoption, consistent with literature emphasising the importance of perceived security in fintech usage (Malaquias & Hwang, 2016).

Thus, Vendors' perceptions of usefulness, ease of use, and social influence significantly shape vendors' behavioural intentions and actual mobile banking usage patterns, validating UTAUT's relevance while emphasising the need to incorporate these aspects within the structural realities revealed by ISM.

5.4 Application of UTAUT Constructs to Mobile Banking Adoption Practices

The Unified Theory of Acceptance and Use of Technology (UTAUT) provide a comprehensive framework to interpret how street hawkers and small vendors in Islamabad adopt mobile banking platforms such as Easypaisa and JazzCash. Performance expectancy is central to the findings of this study, whereby vendors perceive mobile banking as a means to save time, simplify transactions and increase earnings. These perceived benefits emerged as key motivators driving initial and sustained adoption, confirming the findings from literature which emphasise

performance expectancy as a primary behavioural determinant for mobile banking adoption (Venkatesh et al., 2003b).

Effort expectancy is also significant and is particularly reflected in vendors' ability to navigate app interfaces. Participants with greater digital and financial literacy found the platforms easier to use and felt more confident in utilising them in daily business activities. Conversely, those facing app complexity, language barriers, and literacy reported challenges in operating mobile banking apps. This aligns with findings from emerging market studies highlighting effort expectancy as a crucial driver for sustained fintech adoption (Nassiry, 2018). Finally, social influence holds a key role in the informal market context. Peer and family recommendations, combined with repeated customer requests for mobile payments, act as strong social catalysts encouraging adoption in most cases. Additionally, facilitating conditions, including smartphone ownership and network reliability, allow vendors to overcome initial barriers.

5.5 Application of ISM to Mobile Banking Adoption

The insights from Interpretive Structural Modelling (ISM) provide a valuable perspective on the complex interplay of factors influencing mobile banking adoption among street hawkers and small vendors in Islamabad. ISM analysis reveals that the determinants form a hierarchical structure where awareness of services provided by mobile banking emerges as the foundational root driver. Indicating that without these basic triggers, the entire adoption system remains inactive, this finding echoes prior studies underscoring the critical role of information dissemination and peer endorsement in the diffusion of financial technologies within informal markets. (Abandu et al., 2025). Addressing these foundational factors is the starting point for the acceleration of mobile banking adoption in the informal sector.

At the intermediary level, accessibility, including device ownership and network connectivity, along with trust in the platforms, acts as a bridge between the foundational motivation and real usage. The presence of these enablers provides the necessary infrastructure and confidence for vendors to utilise and engage meaningfully with mobile banking services. Finally, Outcome-level factors such as ease of use, network reliability, associated costs, and financial considerations determine the success, continuity and quality of mobile banking adoption in everyday practice. Failure or barriers in the availability of these determinants disrupt the overall adoption trajectory.

This shows the importance of targeted support such as interface simplification, literacy programs, cost subsidies and network improvements to sustain long-term engagement.

ISM ISM-based hierarchical structure explains the multi-tiered intervention process; foundational determinants should be addressed to build awareness and social acceptance. Secondly, Infrastructural and trust-building strategies and user-focused enhancements campaigns should be launched to overcome day-to-day challenges facing Street hawkers and small vendors.

CHAPTER 6

CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

6.1 Conclusions

The study reveals a multidimensional and categorised set of determining factors that shape the adoption of mobile banking among street hawkers and small vendors in Islamabad. Awareness is the prominent foundational driver for the usage of mobile banking apps. Vendors cannot progress toward the usage of digital payment systems without adequate knowledge of digital payment services. Another critical enabler is accessibility in using smartphones and a reliable network setup, without which awareness cannot lead to adoption. Confidence in the safety/security and reliability of digital banking platforms significantly mediates acceptance and continued use, while social influence from peers, friends, family, and especially from customers, activates mobile banking adoption and normalises digital payments among vendors in the marketplace.

At the empirical level, elements such as ease of use, cost concerns, especially transaction fees, financial literacy of users, and reliability of the network define continued engagement and satisfaction of users. The ISM model conceals a strong causal structure, with base drivers leading through linkages to conclusions, providing a complete understanding of the adoption process. Similarly, alignment with UTAUT constructs indicates that performance expectancy, effort expectancy, social influence, and facilitating conditions are all significant in the context of this informal sector of society.

Particularly, customer demand appears as both a foundation and a consequence, which reflects an opinion loop where vendor adoption of mobile boosts digital payment models, which in turn support acceptance by vendors. Barriers such as network instability, low financial literacy levels of users, and high cost, along with perceived app complexity, limit the adoption of mobile banking, especially for less educated or old age vendors. Overall, the study makes evident that mobile banking adoption among informal vendors in Islamabad is shaped by a multifaceted interchange of social, ec**onomic, technical, and personal factors, organised into a clear hierarchical framework.**

6.2 Limitations

- The sample was geographically restricted to urban areas of Islamabad, which limits the generalizability of findings to rural areas of the city.
- Language and literacy limitations of participants posed challenges in fully capturing lived experiences, even though efforts were made to conduct interviews in local languages.
- Gender-specific barriers and expediters were not explored, presenting an area for further research.

6.3 Recommendations

Built on the multi-level determinants explained by this study, several targeted recommendations are made to improve mobile banking adoption among street vendors of Islamabad.

- Fintech Providers should make user interfaces easier using local language (Urdu) and provide support, adding voice guidance and iconography to assist users with low literacy. Secondly, they should reduce transaction fees for small vendors to lower the cost barriers. Moreover, it will be beneficial to strengthen network flexibility and team up with telecom providers to ensure consistent and reliable connectivity. Improved security features and transparent communication will create and retain user trust.
- Policymakers and Regulators should design and implement comprehensive awareness campaigns through community networks, using social media. Secondly, they should promote digital and financial literacy programs for informal vendors and street hawkers with little or no formal education. Moreover, they can advocate for better mobile infrastructure, for assurance of reliable internet access and affordable data plans. They may also plan to raise partnerships between the government, fintech companies and NGOs to reach marginalised groups of the population.
- Researchers should conduct intervention and longitudinal studies to gauge the usefulness of suggested awareness, literacy, and infrastructure developments. Secondly, they can explore the gender-based differences in the adoption of digital banking. Moreover, rural-urban differences can also be examined, and context-specific adoption models may be developed, incorporating socio-cultural and infrastructural factors.

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Appendix

Appendix A

Iteration 1:				
Element	Reachability Set	Antecedent Set	Intersection	Level
AW	AW,AC,TR,EU,CO,I,FL,NR,	AW, SI, CD	AW	
AC	AC,EU,CO	AW,AC, NR	AC	
TR	TR,EU,SI,FL,CD	AW,TR,SI,CD	TR,SI,CD	
EU	EU	AW,AC,TR,EU,SI,FL,CD	EU	1
CO	CO	AW,AC,CO	CO	1
SI	TR,EU,SI,FL,CD	AW,TR,SI,CD	TR,SI,CD	
FL	EU,FL	AW,TR,SI,FL,CD	FL	1
NR	NR	AW,AC,NR	NR	1
CD	TR,EU,SI,FL,CD	AW,TR,SI,CD	TR,SI,CD	
Levels Assigned: EU, CO, FL, NR (Level 1).				

Appendix B

Iteration 2 (after removing EU, CO, FL, NR):				
Element	Reachability Set	Antecedent Set	Intersection	Level
AW	AW,AC,TR	AW, SI, CD	AW	
AC	AC	AW,AC	AC	2
TR	TR,SI,CD	AW,TR,SI,CD	TR,SI,CD	2
SI	TR,SI,CD	AW,TR,SI,CD	TR,SI,CD	2
CD	TR,SI,CD	AW,TR,SI,CD	TR,SI,CD	2
Levels Assigned: AC, TR, SI, CD (Level 2).				

Appendix C

Iteration 3 (after removing AC, TR, SI, CD):				
Element	Reachability Set	Antecedent Set	Intersection	Level
AW	AW	AW, SI, CD	AW	3
Levels Assigned: AW (Level 3).				