

ENABLERS FOR USAGE OF THE MOBILE WALLET BY MSMEs IN RURAL INDIA: USING THE INTERPRETIVE STRUCTURAL MODELLING APPROACH

REENA AGRAWAL¹, MANEESH YADAV²

Abstract

In today's digital era, it is all the more desirable that all businesses, whether gigantic or minor in operation, should adopt financial technology and grow their businesses within their region and outside of the region. The Micro, Small & Medium Enterprises (MSME) segment is the mainstay of the Indian economic environment thus it is crucial that MSME players adopt financial technology in their routine commercial transactions. The present research study was conducted to investigate the enablers of usage of a Mobile Wallet by MSMEs in rural areas of India using interpretive structural modeling. It aims to categorize the foremost enablers and assess the relative relations between the recognized ten key enablers and proposes a hierarchical outline of vital enablers on MSME entrepreneurs from several hill states of India. The most prominent enabler that promoted the use of mobile wallets among MSME entrepreneurs included risk factors and perceived cost. The study suggested that multi-dimensional determinations are required to make certain of the use of mobile wallets by MSME entrepreneurs so that they can assess maximum economic opportunities and support the fiscal expansion of the state and the country.

JEL classification: MOG

Keywords: Mobile Wallet, Perceived Cost, Risk Factor, Merchant Support, Compliance

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INTRODUCTION

In the globalization of the world economy and technological advancement, FinTech is crucial and growing rapidly with huge investments by venture capital fund managers. The data reveals that it grew from 1.8 billion to 56 billion US dollar between 2010-18 (Accenture, 2019). It is also the focused area of private corporate players and governments exploring new market opportunities and advancement of international financial centers. The cost effectiveness, high output, techno-friendly, and customer orientated Fintech has made the financial sector more volatile and lucrative for investment and customer satisfaction. The journey of development has changed with the adoption of FinTech in low-income countries (Lai & Samers, 2021).

Fintech is the resulting product of financial innovation and of modern technological techniques like artificial intelligence and big data to cater to the needs of financial institutions. (Financial Stability Board [FSB], 2017). Technological innovation is the essence of Fintech development and the regular usage of Fintech in financial institutions will lead to product innovation (Chen et al., 2022). The Indian government initiative "Digital India" has a deep-rooted connection with digital technology's evolution in the mid twentieth century by American engineers. Micro, Small & Medium Enterprises (MSMEs) have also come into contact with the profits of digital technologies in their corporate development (Dutta et al., 2020). It is progressively adopted within the foremost tasks of marketing to make the customers aware of the launch of new products or services (Rawat et al., 2022). The adoption of Fintech and innovation has not increased the popularity of the digital mode for financial transactions among Indian users. The cash to GDP ratio is lower than the expected benchmark as equalized with the previous era of demonetization (Ligon et al., 2019). The data reveals that the use of the mobile wallet has shown tremendous growth in the years 2012 to 2016. The wallet transactions increased from 10 to 490 billion in this period. The research estimates shared by a leading research firm shows that Indian wallet transaction market would rise to 144,915039 USD by 2019 (Chakraborty & Mitra, 2018). The data released by the GlobalData Plc has shown that digital payments via M-wallet will increase by 23% between the years 2023-2027 (Livemint, 2024).

The remarkable expansion of the technological space has boosted the growth of M-wallets, financial inclusion in the economy and makeover of the digital space. It has also increased the consumer's dependence on smartphones. (Esawe & Elwkeel, 2020) revealed that the technological space diffraction has created new activities and developments in financial transactions in global economies and also ruled out that the traditional medium of transactions cannot be overruled (Esawe, 2022).

The prominent pillar of the Indian economy is the MSME sector, and it contributes in parallel with the agro sector. It is revealed from the MSME report of 2018 that the sector has shown remarkable development in the last six years. The employment opportunities and the promotion of an entrepreneurial skill set is a positive outcome of the sector with low involvement of capital. The MSME sector is the backbone of heavy industries and helps in the larger economic contribution with various products and services (Kaur, 2021). As per the report of 2018, the sector has contributed to manufacturing GDP and participated in the exports of the country. It has made a 5.50% contribution to manufacturing GDP and more than 48% in exports (MSME, 2021). The participation of the MSME sector in Indian GDP is nearly 28% and fast moving upward. The MSME sector is also a prominent employer of the rural labor force. The upper limit of investment in the MSME manufacturing and services sector is removed from the June 2020 amendment by the Indian Ministry of Finance (Rawat, 2022).

The similarity of the M-wallet with the physical wallet is on equal footing with the added advantage of online money truncation along with the physical transaction with security measures. The greater advantage of the M-wallet is in the small transactions at the vendor shop or person to person transfer or item purchase, etc. Plastic money is also not the alternate of an M-wallet due to fewer features and being limited to organized retail. The use of the M-wallet is also subject to various obstructions like disbelief, apprehension, disorder, discomposure, etc. These psychological obstructions are described as mental costs (Chatterjee & Bolar, 2019). The data reflects that the E-wallet was estimated at 1043 USD in the year 2019 on the international level and predicted to rise to 7580 by the year 2027 (Krishna & Kumar, 2023). In the year 2019, the Indian population of approximately 74 million used the E-wallet for financial transactions. The estimated growth of mobile transactions in the country will be increased by three times by the year 2024 from 36.5 trillion INR in 2019. Digital payment has grown with the joint efforts of government policies and increase in the usage of the internet (Krishna & Kumar, 2023). Increased digital payment reflected by the data released by the RBI shows that the overall increase of 500% had been witnessed in digital disbursements by the traders between April 2021 to September 2021 related to October 2018 to March 2019 and Unified Payments Interface (UPI) payment by 1200%. The increase of the usage of digital payments between March 2019 and March 2022 was nearly 216%. The data reveals the decline in the usage of paper money from 3.83% to 0.88% in the same period in terms of volume and 19.62% to 11.47% in value (Gandhi, 2023). MSMEs can

technology growth story only with adoption and usage of Fintech such as the mobile wallet thus the present study was taken up to seek answers to the following research questions:

- RQ₁: To identify key enablers of usage of the Mobile Wallet by MSME's in rural areas of India,
RQ₂: To evaluate the contextual relationships among identified key enablers,
RQ₃: To develop hierarchical framework of key enablers of usage of the Mobile Wallet by MSME's in rural areas of India.

LITERATURE REVIEW

The past few years have witnessed digital transaction methods become a crucial backbone of financial inclusion policies. International funding has contributed more than thirty billion dollars to develop mobile money platforms every year (Ligon et al., 2019; The Consultative Group to Assist the Poor, 2023). The shared report on mobile payment services in India shows it has increased tremendously and the customer base has been increased to 1183 million users by February 2019. It is evident from the data that India has the largest mobile user data base and is position third in the world ranking. It works as a booster for financial inclusion and supporter of capital transfer for a major section of society (Sinha & Singh, 2019). The revolutionary change in the acceptance of mobile services has increased the number of mobile users across the globe. The expected growth of mobile data consumption reached 19 GB in 2023 and is expected to reach more than 68.5 GB per user in 2028 in India, Nepal and Bhutan (Ericsson, 2023). The usage of mobile data from 1.24 GB to more than 14 GB increased from 2017 to 2022. Broadband usage increased from 32% to 96% from 2015 to 2022. It is lowest among the BRICS nation with the record of 18.3 % e-transactions (RBI, 2017). Digital payment growth crossed from 0.9% to 21.5% in the period of 2012-2017. The competitive market of e-commerce reduced the cost of mobile data from 268.9 to 6.6/- Indian rupees from 2014 to 2022 (Chand et al., 2023). The expected growth of mobile wallets payments is 23.9% from 2023 to 2027 and transactional value up to 472 trillion in 2027 (Livemint, 2024).

The MSME sector has shown tremendous strength in generating employment, economic uplifting of society and business innovations. The contribution of the sector is 45% in manufacturing, 40% in exports, 28% in GDP, 111 million jobs created with the help of more than more than sixty-three million enterprises. The MSME sector competes with the agriculture sector in terms of employment generation. The advanced technology adopted by the sector enhances the value of products and services. The national manufacturing policy is seeking to increase the participation of the manu-

facturing sector from 16% to 25% by the year 2022 to attract more manufacturing (Srivastava, 2020). The previous decades have shown the use and increase in the acceptance of innovative technology in the area of industrial output and the MSME sector has adopted the new technology in a vibrant manner. It has boosted the growth of industrial output with the optimization of human efforts. (Mitra, 2013). The incessant efforts of the government are also focused on making the economy lean towards more digital payment and a cashless society (Jain et al., 2020). To stimulate digital payments, Aadhaar based e-payments were used for small businesses. It was initiated to create the awareness of digital payments by the Ministry. As a result, digital payments transactions were increased to 92.02% in value and more than 90 % in transaction numbers in the year 2020-21 in the Ministry and other offices (Upasana & Bhawna, 2022). A study reveals that 70% of MSMEs will use the UPI payment mode for their retail sales in the next few years based on a survey of more than 1000 retailers in India and its data base (ETonline, 2023). There has been a growth of nearly 33 per cent 34 Y-o-Y in wallet-based transactions in the last two years (Jain, 2023).

Factors enabling MSMEs in Rural India to use the Mobile Wallet:

1. Security Measures: The M-wallet is the fastest and secure medium of money transfer but with the advancement of technology, security threats also persist like ransomware, phishing and unwanted software applications. Retailers also face similar risks i.e. selling point (POS), malware, MiTM and replay attacks. It also includes the risk of service providers like data leaks, cloud managed profile hacking, etc. (Brid, 2019). Mansi and Dharmendra (2019) worked on the threats involved in the M-wallet and used the data from service providers operating in India and reported that improvements in the mobile application enhanced the advancement of the payment application. It was suggested in the study to find specific solutions to each risk to improve the confidence of the user. Sardar (2016) research revealed that increase of the telecom infrastructure and use of smartphones has led to increase in mobile wallet payments in India. The Wallet is frequently used for faster payment and day to day utility bills to recharge and make quick payments (Barackath, 2021).
2. Awareness and Adoption: M-wallet adoption among customers varies from one to another determinant such as privacy issues, infrastructure support, product awareness and physiological issues, etc. (Oliveira et al., 2016). It is observed in the past research that even though the M-wallets are easier to use and make financial transactions secure as well as steady, but customers are hesitating in the adoption of the

- of the technology (Wu et al., 2017). The cause of the non-adoption of the M-wallet is due to trust issues, lack of security, lack of knowledge of the technology, regular feature updates from the service providers (Zhou, 2012),
3. Merchant support: The Indian Government has started taking progressive steps and providing incentives to encourage digital payments. Even so, a few retailers are not using it due to lack of technological knowledge and despite government incentives based on the transaction value of the trade. Various incentives were associated with the payment of toll tax, insurance, purchase of tickets, etc. (Dave, 2016). The traditional way of payment, i.e. cash and cards, are prevalent among retailers. Only three million traders approximately are using digital payment options which only constitutes 2% approx. of the total Indian trade population and rest are dependent on the traditional methods of transactions. It is reflected by the study that indirect taxes like VAT and GST have reduced digital payments due to tax avoidance practices and tax implications and margin concerns. (Heydari & Bailey, 2016; Singh & Sinha, 2020),
 4. E-Literacy: With the ranking of the fifth largest economy in the world, India has poor digital infrastructure and education connecting the rural part of the country. The fundamental source of the digital illiteracy and lack of tech savvy is the rural population which works in the unorganized sector with no digital payment interface for transactions such as salary or other benefits and they constitute a major population of the country (Seranmadevi et al., 2019). Smartphones have been working as an enabler in the socio-economic uplifting of the users in a multi-faceted manner. In addition to the advancement, the new feature of the payment option with the phone is hoped to expedite financial activities. (Pal et al., 2020),
 5. Compliance: The legal compliance issues related to e-wallets are associated with the control of the payment system, monetary policy administration and regulations governing the Indian banking system. The demand and supply ratio maintenance of the bank reserve is the risk factor in the wallet payment system. Credit card repayment issues also generate credit facility issues. E-wallet payments are also struggling from the clearing and settlement of payments and liquidity issues (Shairwal, 2021). To curb the problems of payment and other supervision issues, the Payment and Settlement Systems Act of 2007 was enacted to monitor the payment transactions through plastic cards, online transactions and E-wallets. In this regard, RBI has also issued a master circular for instruments, i.e. "Policy Guidelines on Issuance and Operation of Pre-Paid Payment Instruments in India" which described the kinds of pre-payment instruments. It also suggested banks which are entitled to get the benefit of the scheme. In another regulatory development, Prepaid Payment Instruments (PPI), 2021 ("PPI Regulations") was issued. It was also holding provisions of the Reserve Bank of India (Issuance and Operation of Prepaid Payment Instruments) Directions, 2017. The master circular by the RBI has included all the circulars issued by the RBI during the period of 2017-2021. The development of the regulating environment of the M-wallets shows the budding nature of governance in pre-payment instruments,
 6. Compatibility: The compatibility of the M-wallet on electronic devices is the major cause of adoption of the wallet service. It is revealed from the research studies that compatibility has a direct positive correlation with the customer's intent to use, IU, and acceptance of technology (Oliveira et al., 2016). The same context is applied to the M-payments and it was observed that compatibility is the strong factor to adoption of digital payment means (Yang et al., 2012; Choudrie et al., 2014)
 7. Digital Infrastructure: The digital infrastructure of the country has improved in the urban area but the growth of the rural area is not so significant. The total number of mobile connections are nearly 1.2 billion and more than 500 million internet users. Even though infrastructure was built for digital payments, routine practice takes time to change. The data reveals that the digital dealings have increased by 42% from the current data of 672 million to 958 million user in 2016. In the next year, it declined and reached 763 million users in 2017. The development of the digital infrastructure, awareness and education (RBI, 2017; Tiwari, 2019),
 8. Frequent advancement in user interface: A study revealed that the user interface, features of the platform, and display have a noteworthy result on the user pattern of electronic purchases. (Bagla & Sancheti, 2018; Ha & Stoel, 2009). The study revealed that adoption of e-commerce in India is grounded on the worth and ease of the service (Malik et al., 2013),
 9. Perceived Cost: The meaning of the perceived value indicates the exchange value between consumers receiving and spending on a product (Amoroso & Magnier-Watanabe, 2012). It is useful in understanding the buying behavior of customers in electronic services (Karjaluo et al., 2019). It also reflects the profits customers assume, receive or predict (Kumar & Reinartz, 2016) and to create long-standing consumer relationships in markets (Shapiro et al., 2019). It will differ from customer to customer, product or services and nature of business (Zeithaml, 1988),
 10. Risk Factor: It is revealed from the study that customers are aware of E-wallet transactions and their advanced features but have concerns related to the

security of transactions through e-wallets (Undale et al., 2021; Brahmhatt, 2018). The other factors are general privacy, transaction security, expected performance, transactional benefits as studied in the research (Soodan & Rana, 2020). Another study reveals that the stored data on the phone is also the concern and factor affecting the use of E-wallets (Chawla & Joshi, 2019).

RESEARCH METHODOLOGY

In Interpretive Structural Modeling (ISM) a set of diverse directly and indirectly linked factors or variables are organized in a comprehensive orderly model. The model so created represents the assembly of complex issues or problems in a sensibly designed pattern (Sage, 1977; Warfield, 1974a, 1974b, 1982a, Watson, 1978). The ISM approach converts an uncertain, poorly expressed mental map of structures into a noticeable and distinct model. ISM in a sense deals with what Flood (1988) labelled as psychological intricacy in different sensitivities of the participants (Flood, 1988). ISM makes use of practical experience and insights of specialists to create a rational ranked structure of factors explored in the study (Al-Muftah et al., 2018; Rana et al., 2019; Agi & Nishant, 2017; Bakshi et al., 2023). ISM modeling includes the following steps: (a) Find the

variables which are pertinent to the study. This can be done through review of existing literature or through a survey. (b) Establish a contextual linkage among the factors. (c) Create a structural self-interaction matrix (SSIM) (d) Create a reachability matrix from the SSIM. (e) Assign levels to the studied variables. (f) Create a digraph built on the final reachability matrix. (g) Convert the digraph into anISM model by substituting element nodes with the statements.

The variables which are pertinent to the study were identified through an extensive review of the existing literature. The sources used for the study were generally from leading databases like Scopus, Web of Science, and EBSCO. The initial search was done using the title of the articles and the abstract. We identified seventy-three articles that we considered relevant to the research. We then studied the articles in detail and removed the articles that were not found to be of much relevance. In total, the study identified ten variables that were found to be extremely relevant for the study. We vetted the identified variable with the experts and once we received their opinion then we moved ahead to create a matrix that we used to capture the viewpoint of our respondents. Given below is the matrix that was used for the study (Table 1).

Table 1: Expert Response Matrix

Code	Enablers	E10	E9	E8	E7	E6	E5	E4	E3	E2	E1
E1	Security Measures										
E2	Awareness and Adoption										
E3	Merchant Support										
E4	Compatibility										
E5	Compliance										
E6	Compatibility										
E7	Digital Infrastructure										
E8	Advancement in user interface										
E9	Perceived Cost										
E10	Risk Factor										

Source: Author's creation.

In this study MSME players were located operating in isolated rural areas of Himachal Pradesh, Ladakh, Jammu & Kashmir, and Uttarakhand. The main reason for choosing these regions was to evaluate whether micro small and medium enterprises located in these hilly regions were using the fintech services or traditional mode of transactions. As per Rana et al. (2019) and Kumar et al. (2016), the ideal sample size for Interpretive Structural Modeling Technique is ten to eighteen experts. In total, twenty MSME owners were contacted but out of these six MSME owners were unwilling to spare the time. Finally, fourteen MSME owners

were interviewed. These included Himachal Pradesh (3), Ladakh (3), Jammu & Kashmir (3) and Uttarakhand (4). Multiple meetings were conducted in order to understand the perception of these MSME owners about the various enablers chosen for the study. These MSME owners were mostly operating retail businesses such as sweets shops, travel agencies, general stores, motels, rented car service, medical stores, etc. The annual turnover of these MSMEs ranged between INR 1.5 hundred thousand to INR 2.5 hundred thousand. Most of the respondents were graduates and between the age group of 40-50 years.

FINDINGS AND DATA ANALYSIS

4.1 SELF-STRUCTURED INTERACTION MATRIX (SSIM)

After confirming the enablers of usage of the Mobile Wallet by MSME's in rural areas of India, a self-structured interaction (SSIM) matrix was made to understand the contextual relations among the pair of enablers (Priti et al., 2023; Warfield, 1974a). Several

codes were used to represent the trend of relationship among the two elements (i and j): (a) if variable i influenced variable j that we denoted by V (b) if variable i was influenced by variable j it was denoted by A (c) if variable i and j influenced on another, it was denoted by X (d) if variables i and j are unrelated, it was denoted by O (Table 2).

Table 2: Self-Structured Interaction Matrix (SSIM)

Code	Enablers	E10	E9	E8	E7	E6	E5	E4	E3	E2	E1
E1	Security measures	V	V	O	A	O	A	A	O	A	
E2	Awareness and Adoption	V	V	V	O	O	V	V	O		
E3	Merchant support	V	V	V	O	O	O	O			
E4	Compatibility	V	O	O	A	O	A				
E5	Compliance	V	V	V	O	V					
E6	Compatibility	O	O	O	O						
E7	Digital infrastructure	V	V	O							
E8	Advancement in user interface	V	V								
E9	Perceived cost	V									
E10	Risk factor										

Source: Author creation.

4.2 INITIAL REACHABILITY MATRIX (IRM)

The following step was to make the initial reachability matrix (IRM) from SSIM. The SSIM (Table 2) is changed to IRM (Table 3) by substituting the V, A, X or O codes in SSIM with 0s and 1s. The guidelines used were: (a) In SSIM if the (i, j) entry was shown as V, then the (i, j) entry in IRM alters to 1 and the (j, i) entry con-

verts to 0. (b) In SSIM if the (i, j) entry was shown as A, then the (i, j) entry in IRM converts to 0 and the (j, i) entry converts 1. (c) In SSIM if the (i, j) entry was shown as X, then the (i, j) entry in IRM converts to 1 and the (j, i) entry also converts to 1. (d) In SSIM if the (i, j) entry is O, then the (i, j) entry in IRM converts to 0 and the (j, i) entry also converts to 0.

Table 3: Initial Reachability Matrix (IRM)

Code	Enablers	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1	Security Measures		0	0	0	0	0	0	0	1	1
E2	Awareness and Adoption	1		0	1	1	0	0	1	1	1
E3	Merchant Support	0	0		0	0	0	0	1	1	1
E4	Compatibility	1	0	0		0	0	0	0	0	1
E5	Compliance	1	0	0	1		1	0	1	1	1
E6	Compatibility	0	0	0	0	0		0	0	0	0
E7	Digital Infrastructure	1	0	0	1	0	0		0	1	1
E8	Advancement in user interface	0	0	0	0	0	0	0		1	1
E9	Perceived Cost	0	0	0	0	0	0	0	0		1
E10	Risk Factor	0	0	0	0	0	0	0	0	0	

Source: Author creation.

4.3 FINAL REACHABILITY MATRIX (FRM)

The study tried to identify the transitivity among the studied variables and from that created the Final Reachability Matrix (Table 4). The transitivity helps to map the inter-relationship between the studied variables. The basic principle of transitivity is: If A leads to

B and B leads to C then it is believed that A shall lead to C. So, we checked for this transitivity among each pair of enablers and on identifying such relationship if the instance carried zero it was changed to 1*. We could find two such instances of transitivity and in all such places the value 0 was replaced with 1*.

Table 4: Final Reachability Matrix (FRM)

Code	Enablers	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1	Security Measures		0	0	0	0	0	0	0	1	1
E2	Awareness and Adoption	1		0	1	1	1*	0	1	1	1
E3	Merchant Support	0	0		0	0	0	0	1	1	1
E4	Compatibility	1	0	0		0	0	0	0	1*	1
E5	Compliance	1	0	0	1		1	0	1	1	1
E6	Compatibility	0	0	0	0	0		0	0	0	0
E7	Digital Infrastructure	1	0	0	1	0	0		0	1	1
E8	Advancement in user interface	0	0	0	0	0	0	0		1	1
E9	Perceived Cost	0	0	0	0	0	0	0	0		1
E10	Risk Factor	0	0	0	0	0	0	0	0	0	

Source: Author creation.

4.4 ASSIGNING OF LEVELS

We conducted five iterations for the segregating of levels. We used a final reachability matrix to assign the levels to the enablers of usage of the Mobile Wallet by MSME's in rural areas of India. For instance, 'Perceived Cost' and 'Risk Factor' were assigned level 1, 'Security

Measures' was allotted level 2, 'Compatibility' and 'Advancement in user interface' were allotted level 3, 'Merchant Support' and 'Compliance' were allotted level 4 and 'Awareness and Adoption', 'E Literacy' and 'Digital Infrastructure' were allotted level 5 (Table 5).

Table 5: Iterations for partitioning of the levels

Code	Enabler	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E1	Security Measures	1, 9, 10	1, 2, 4, 5, 7	1	3
E2	Awareness and Adoption	1, 2, 4, 5, 6, 8, 9, 10	2	2	5
E3	Merchant Support	3, 8, 9, 10	3	3	4
E4	Compatibility	1, 4, 9, 10	4, 5, 7	4	4
E5	Compliance	1, 4, 5, 6, 8, 9, 10	2, 5	5	5
E6	Compatibility	6	2, 5, 6	6	1
E7	Digital Infrastructure	1, 4, 7, 9, 10	7	7	5
E8	Advancement in user interface	8, 9, 10	2, 3, 5, 8,	8	3
E9	Perceived Cost	9, 10	1, 2, 3, 4, 5, 7, 8, 9	9	2
E10	Risk Factor	10	1, 2, 3, 4, 5, 7, 8, 9, 10	10	1

Source: Author creation.

4.5 INTERPRETIVE STRUCTURAL MODELING

Using the final reachability matrix, the primary digraph is obtained (Figure 1). A digraph is a visual repre-

sentation of the variables explored and their inter-linkages.

Table 6: Levels assigned to enablers

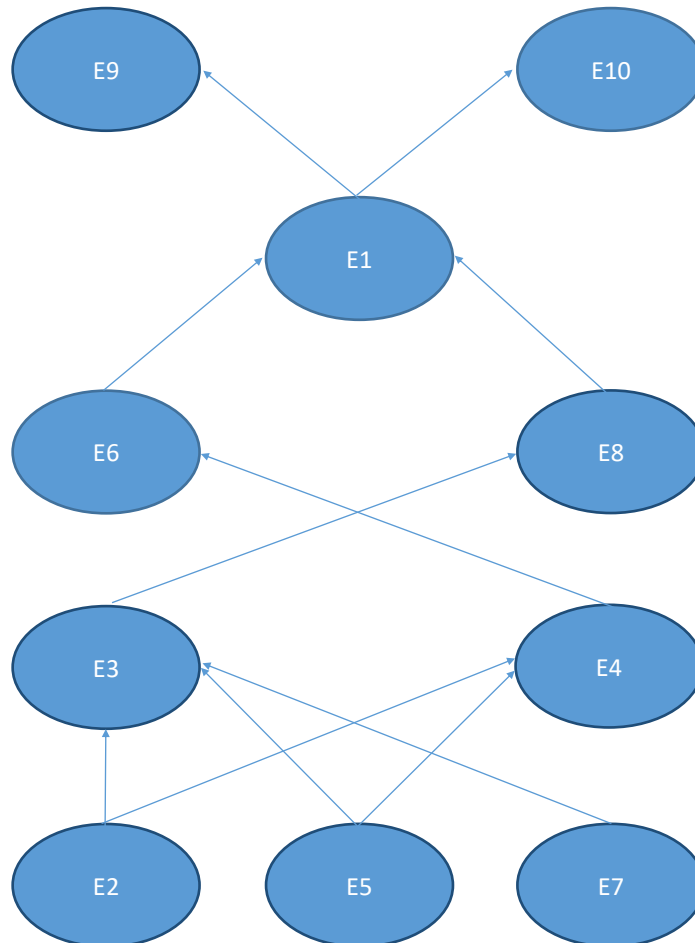
Iteration Number	Level	Enablers in Usage of Mobile Wallet
1 st	I	Perceived Cost (E9) Risk Factor (E10)
2 nd	II	Security Measures (E1)
3 rd	III	Compatibility (E6) Advancement in user interface (E8)
4 th	IV	Merchant Support (E3) Compliance (E5)
5 th	V	Awareness and Adoption (E2) E illiteracy (E4) Digital Infrastructure (E7)

Source: Author creation.

This diagram is a conceptual model that shows the placement of the factors investigated in the study and also shows the interlinkages among those factors. The diagram (Figure 1) clearly demonstrates that enablers E9 and E10 found their place at Level I, enabler number E1 found its place at level II, E6 and E8 were placed at

level III, E3 and E4 found their place at level IV, and E2, E4 and E7 were at level V. This diagram was then used to develop a hierarchical framework of key enablers of usage of the Mobile Wallet by MSME's in rural areas of India (Figure 1).

Figure 1: Diagram for Enablers of Usage of Mobile Wallet by MSME in Rural India

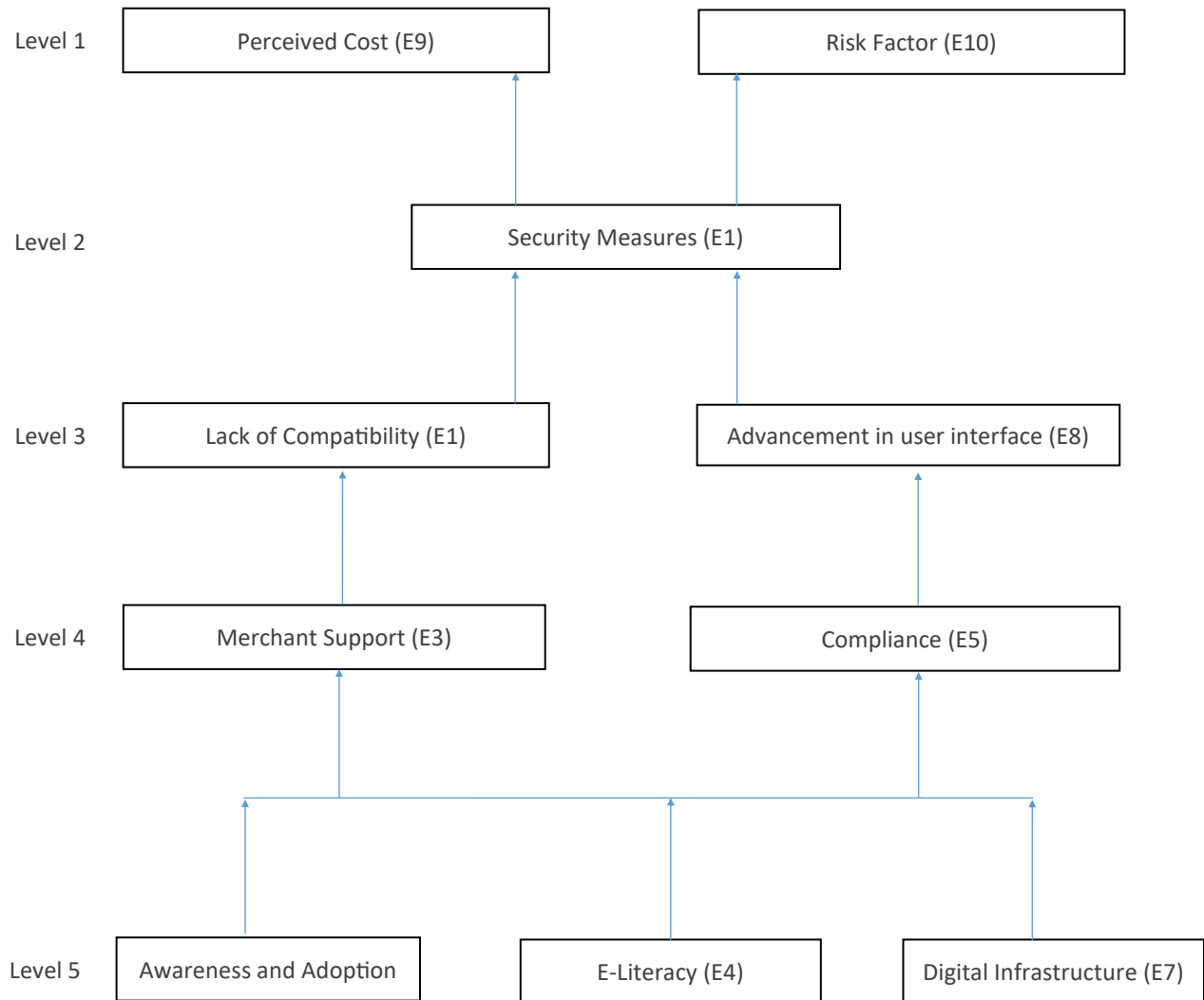


Source: Author creation.

In the Interpretive Structural Modeling (ISM) the subsequent step was to build the model so Figure 1 and Table 6 which demonstrated the interlinkages and lev-

els assigned to enablers were used to develop the same (Figure 2).

Figure 2: ISM model of enablers of usage of mobile wallet by MSME in rural India



Source: Author creation.

DISCUSSION

The Model (Figure 2) has replicated the result that the M-wallet usage from MSMEs in rural India has major enablers i.e., perceived Cost (E9) and Risk Factor (E10). It is correlated with the research conducted by (Soodan & Rana, 2020) and (Chawla & Joshi, 2019). They have inquired as to the mindset to opt the e-wallet in the emerging economy and two variables i.e. attitude of the consumer and intention to adopt and embrace the M-wallet in India. It disclosed that the main basis for these two enablers was Security Measures (E1) which at level II was leading to apprehension about higher cost and also provoking perceived risk in the minds of the MSME players. The study also demonstrated that Compatibility (E1) and Advancement in user interface (E8) were at level III founding base for Security Measures (E1). Bagla and Sancheti, (2018), who explored the gaps in customer satisfaction with digital wallets also hinted at the same. Merchant

Support (E3) and Compliance (E4) were at level IV and our results match the findings of Singh and Sinha (2020) who mapped the perceived trust which mediated business willingness to use the M-wallet. It is also revealed that merchant support and compliance lead to advancement in user interface. At the main foundation of the ISM model were Awareness and Adoption (E2), E-Literacy (E4) and Digital Infrastructure (E7). Oliveira et al. (2016) found the same deterrents in their research on understanding the determinants of customer adoption and intention to use M-payments.

REGULATORY MEASURES

The fast-growing adoption of the M-wallet is also increasing the risk of security breach and data fraud. It is desirous to upgrade the wallet regularly to avoid risk of financial fraud. The Indian regulatory bodies are governing and supporting all kinds of e-payment from fraud and mismanagement with safety measures like

E-KYC, limits on transactions, etc. and interoperability guidelines for wallets. The legal framework of the MSMEs is governed from the Micro, Small and Medium Enterprises Act, 2006. It also helps in the categorization of the enterprise into three broad categories working in the manufacturing or service sector (MSMED Act, 2006). The publication of the directions given out by the statutory body i.e. RBI in the duration of 2017-2021 and consolidated circulars and the PPI regulations along with the parent act reflects the nurturing of governance with the advancement of the E-wallet. In comparison with the UPI regulations versus PPI payments, tightening of rules by the RBI reflects the fear of governance lapse. Fintech companies are innovating various techniques to make faster and easier transactions which creates regulatory risk and need of compliance. Rapid growth of unlicensed lenders also creates risk of transaction monitoring for the regulator. There is urgent need to regulate the licensing process in a structured manner. Security and privacy will remain main concerns for the regulators in the fintech innovative landscape.

CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

The study has concluded that enablers i.e., e-literacy, digital infrastructure, awareness and adoption are the most crucial factors that eventually give support to other explored enablers. So, the government should make efforts to augment the awareness about usage of technology in day-to-day routine, commercial transactions and educate residents about e-literacy and mobile technology. Companies should ensure the expansion of digital infrastructure to attract

MSME players to avail themselves of and use mobile wallets in their daily business transactions. Fintech companies can take necessary measures to promote the use of mobile wallets at grassroots level to improve financial inclusion (Agrawal, 2022) in the region. Foremost regulatory issues involved in the smooth functioning of the M-wallet related to the licensing to service provider, data protection, credit frauds, and risk management are the major concerns in India. The regulatory governance of the M-wallet is developing with the deduction of new problems in the M-wallet. The enabling factors are the major cause of the acceptance of digital payment through the M-wallets. The regulatory check of the Reserve Bank of India on the payment system of the mobile wallet service providers (i.e. Paytm case) has boosted the confidence in the end user.

This study has several limitations to mention. Some are that the study focused only on some specified hill states of India. It will thus be desirable to replicate similar studies in non-hilly regions of India as well. Another limitation is that this study used a single research method and that is interpretive structural modelling, future researchers can think of using more than one research method to have more comprehensive understanding. This exploration is also restricted to one nation while comparable studies can be piloted across various developing nations and a comparative analysis can be done which will further improve comprehension. Scholars can also think of taking up a study wherein they can compare the usage of mobile wallets, internet banking, and UPI and come up with enriching insights which can be used by the banks, fintech companies, government and telephony service providers.

REFERENCES

- Agi, M.A. & Nishant, R. (2017). Understanding influential factors on implementing green supply chain management practices: An interpretive structural modelling analysis. *Journal of Environmental Management*, 188, 351-363.
- Agrawal, R. (2022). Role of Fintech Companies in Increasing Financial Inclusion. *Journal of Applied Management-Jidnyasa*, 14(1), 24-36.
- Al-Muftah, H., Weerakkody, V., Rana, N.P., Sivarajah, U. & Irani, Z. (2018). Factors influencing e-diplomacy implementation: Exploring causal relationships using interpretive structural modelling. *Government Information Quarterly*, 35(3), 502-514.
- Amoroso, D.L. & Magnier-Watanabe, R. (2012). Building a research model for mobile wallet consumer adoption: The case of mobile Suica in Japan. *Journal of Theoretical and Applied Electronic Commerce Research*, 7(1), 94-110.
- Bagla, R.K. & Sancheti, V. (2018). Gaps in customer satisfaction with digital wallets: challenge for sustainability, *Journal of Management Development*, 37(6), 442-451.
- Bakhshi, P., Agrawal, R., Mendon, S., Birau R. & Bărbăcioru, I. (2023). Framework of SDG leadership among SMEs in South Asian nations-using Interpretive Structural Modelling. *Cogent Business & Management*, 10(3), 1-25.

- Barackath, B. (2021). The Impact of Digital Wallets Threats and Safety Measures On the Level of Usage – A Study with Reference to Chennai, *Turkish Journal of Computer and Mathematics Education*, 12(6), 95-100.
- Barreto, E., Freitas, N. & Volin, M. (2019). Global FinTech investments surged in 2018 with investments in China taking the lead, Accenture analysis finds; UK gains sharply despite Brexit doubts. Accenture, <https://newsroom.accenture.com/news/2019/global-fintech-investments-surged-in-2018-with-investments-in-china-taking-the-lead-accenture-analysis-finds-uk-gains-sharply-despite-brexite-doubts>, (Accessed: 23.02.2024).
- Brahmbhatt, M. (2018). A study on customers' perception towards E-Wallets in Ahmedabad city. *IUJ Journal of Management*, 6(1), 11-15.
- Brid, P.R. (2019), Study of security issues and solutions for E-wallet transactions. *Think India Journal*, 22(32), 106-108.
- Chakraborty, S. & Mitra, D. (2018). A Study on Consumers Adoption Intention for Digital Wallets in India. *International Journal on Customer Relations*, 6(1), 38-57.
- Chand, K., Jangra, S., Singh, P.C., Tiwari, R.S. & Tiwari, R. (2023). Sustainability of Mobile Wallets in the Era of Low Cost Data Usage in India, In: Anubha & H. Sharma (Eds.), *Data-Driven Approaches for Effective Managerial Decision Making* (pp. 102-126). IGI Global, Hershey.
- Chatterjee, D. & Bolar, K. (2019). Determinants of Mobile Wallet Intentions to Use: The Mental Cost Perspective. *International Journal of Human-Computer Interaction*, 35(10), 859–869.
- Chawla, D. & Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India – An empirical study. *International Journal of Bank Marketing*, 37(7), 1590-1618.
- Chen, X., Yan, D. & Chen, W. (2022). Can the digital economy promote FinTech development? *Growth & Change*, 53(1), 221–247.
- Choudrie, J., Pheeraphuttharangoon, S., Zamani, E. & Giaglis, G. (2014). Investigating the Adoption and Use of Smartphones in the UK: a Silver-Surfers Perspective (Hertfordshire Business School Working Paper 2014), <https://uhra.herts.ac.uk/handle/2299/13507>, (Accessed: 23.02.2024).
- Dutta, G., Kumar, R., Sindhvani, R. & Singh, R.K. (2020). Digital transformation priorities of India's discrete manufacturing SMEs: A conceptual study in perspective of Industry 4.0. *Competitiveness Review: An International Business Journal*, 30(3), 289–314.
- Ericsson (2023). 5G to account for 25 percent of mobile data traffic this year, <https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/mobile-traffic-forecast>, (Accessed: 23.02.2024).
- Esawe, A.T. & Elwkeel, E.M. (2020). Managing the digital transformation, strategic management, and tactical actions to implement GFMS: An Egyptian case study. *Journal of Management Research*, 38(3), 63-83.
- Esawe, A.T. (2022). Understanding mobile e-wallet consumers' intentions and user behavior, *Spanish Journal of Marketing- ESIC*, 26(3), 363-384.
- ETonline (2023). 70% MSMEs believe UPI will be the driver of retail sales, <https://economictimes.indiatimes.com/small-biz/sme-sector/70-msmes-believe-upi-will-be-the-driver-of-retail-sales/articleshow/100269206.cms?from=mdr>, (Accessed: 23.02.2024).
- Financial Stability Board (2017). 4th Annual Report, <https://www.fsb.org/wp-content/uploads/P160118.pdf>, (Accessed: 23.02.2024).
- Flood, R. (1988). Situational complexity, systems modelling and methodology. *Transactions of the Institute of Measurement and Control*, 10(3), 122-129.
- Gandhi, M. (2023). The Indian payments handbook – 2022–2027, <https://www.pwc.in/assets/pdfs/the-indian-payments-handbook-2022-2027.pdf>, (Accessed: 23.02.2024).

- Ha, S. & Stoel, L. (2009). Consumer e-shopping acceptance: Antecedents in a technology acceptance model. *Journal of Business Research*, 62(5), 565–571.
- Jain, M. (2023). Fintech in India - Powering mobile payments. <https://assets.kpmg.com/content/dam/kpmg/in/pdf/2019/08/Fintech-in-India%E2%80%93Powering-mobile-payments.pdf>, (Accessed: 23.02.2024).
- Karjaluo, H., Shaikh, A.A., Saarijärvi, H. & Saraniemi, S. (2019). How perceived value drives the use of mobile financial services apps. *International Journal of Information Management*, 47, 252-261.
- Kaur, K. (2021). A Review of the Financial Schemes and Policies Concerning the MSME Sector. *Research Horizons*, 11, 23-34.
- Krishnakumar, P. (2023). Digital wallets: the genesis, current usage, and future use healthcare payments in India, <https://fintechforhealth.sg/digital-wallets-the-genesis-current-usage-and-future-use-healthcare-payments-in-india/>, (Accessed: 23.02.2024).
- Kumar, S., Luthra, S., Govindan, K., Kumar, N. & Haleem, A. (2016). Barriers in Green Lean Six Sigma Product Development Process: An ISM Approach. *Production Planning & Control* 27(7–8), 604–620.
- Kumar, V. & Reinartz, W. (2016). Creating enduring customer value. *Journal of Marketing*, 80(6), 36–68.
- Lai, K.P.Y. & Samers, M. (2021). Towards an economic geography of FinTech. *Progress in Human Geography*, 45(4), 720–739.
- Ligon, E., Malick, B., Sheth, K. & Trachtman, C. (2019). What explains low adoption of digital payment technologies? Evidence from small-scale merchants in Jaipur, India. *PLoS ONE*, 14(7), 1–22.
- Livemint (2023). Mobile wallets market in India to surpass \$5 trillion in 2027, says Global Data, <https://www.livemint.com/news/india/mobile-wallets-market-in-india-to-surpass-5-trillion-in-2027-says-globaldata-11684315747857.html>, (Accessed: 23.02.2024).
- Malik, A., Kumara, R. & Srivastava, V. (2013). Determinants of consumer acceptance of m-commerce. *South Asian Journal of Management*, 20(2), 102-126.
- Mansi, B. & Dharmendra, P. (2019). Wallet Payments Recent Potential Threats and Vulnerabilities with its possible security Measures. *International Journal of Computer Sciences and Engineering*, 7(1), 810-817.
- Ministry of Micro, Small and Medium Enterprises, New Delhi: Government of India. (2021). Contribution of MSMEs to GDP, <https://pib.gov.in/PressReleaseframePage.aspx?PRID=1884734>, (Accessed: 23.02.2024).
- Oliveira, T., Thomas, M., Baptista, G. & Campos, F. (2016). Mobile Payment: Understanding the Determinants of Customer Adoption and Intention to Recommend the Technology. *Computers in Human Behavior*, 61, 404-414.
- Pal, A., Herath, T., De', R. & Rao, H.R. (2020). Contextual facilitators and barriers influencing the continued use of mobile payment services in a developing country: insights from adopters in India. *Information Technology for Development*, 26(2), 394–420.
- Rana, N.P., Barnard, D.J., Baabdullah, A.M., Rees, D. & Roderick, S. (2019). Exploring barriers of m-commerce adoption in SMEs in the UK: Developing a framework using ISM. *International Journal of Information Management*, 44, 141-153.
- Rawat, R.S., Kothari, H.C. & Chandra, D. (2022). Role of the Digital Technology in Accelerating the Growth of Micro, Small and Medium Enterprises in Uttarakhand: Using TAM (Technology Acceptance Model), *International Journal of Technology Management & Sustainable Development*, 21(2), 205–227.
- RBI (2017). Data on ATM Withdrawals, RBI, <https://rbi.org.in/scripts/ATMView.aspx>, (Accessed: 23.02.2024).

- Sage, A.P. (1977). *Methodology for large-scale systems*. McGraw-Hill College, New York.
- Sardar, R.J. (2016). Preference towards Mobile Wallets among Urban Population of Jalgaon City, *Journal of Management*, 3(1), 27-37.
- Section 7 of MSMED Act (2006), https://www.indiacode.nic.in/show-data?actid=AC_CEN_46_77_00002_200627_1517807324919§ionId=9889§ionno=7&orderno=7, (Accessed: 23.02.2024).
- Seranmadevi, R., Praveenraj, D.W. & Natarajan, L.M. (2019). E-Wallet – a Technological Revolution in Digital India, *International Journal of Innovative Technology and Exploring Engineering*, 8(11), 3870-3877.
- Shairwal, S. (2021). E-wallet - a legal overview, <https://www.lexology.com/library/detail.aspx?g=64dfff8-623a-4e92-b1a9-d442d228c4ea>, (Accessed: 23.02.2024).
- Singh, N. & Sinha, N. (2020). How perceived trust mediates merchant's intention to use a mobile wallet technology, *Journal of Retailing and Consumer Services*, 52, 1-20.
- Soodan, V. & Rana, A. (2020), Modeling customers' intention to use e-wallet in a developing nation: extending UTAUT2 with security, privacy and savings, *Journal of Electronic Commerce in Organizations*, 18(1), 89-114.
- Srivastava, S. (2020). Role of MSME Sector in Indian Economy: A Study with special reference to Gujarat, *Pacific Business Review International*, 13(3), 117-126.
- The Consultative Group to Assist the Poor (2023). Data on International Funding for Financial Inclusion in 2016; Database: CGAP Research & Analysis Data, <https://www.cgap.org/research/data/data-on-international-funding-for-financial-inclusion-in-2016>, (Accessed: 23.02.2024).
- Tiwari, T., Srivastava, A. & Kumar, S. (2019). Adoption of digital payment methods in India. *International Journal of Electronic Finance*, 9(3), 217-229.
- Undale, S., Kulkarni, A. & Patil, H. (2021). Perceived e Wallet security: impact of COVID-19 pandemic, *Vilakshan-XIMB Journal of Management*, 18(1), 89-104.
- Warfield, J. N. (1974a). Developing interconnection matrices in structural modeling. *IEEE Transactions on Systems, Man, and Cybernetics: System*, (1), 81-87.
- Warfield, J.N. (1974b). Developing subsystem matrices in structural modeling. *IEEE Transactions on Systems, Man, and Cybernetics: System*, (1), 74-80.
- Warfield, J.N. (1982a). Interpretive structural modelling'. In: Olsen, S.A. (Eds.), *Group Planning and Problem-Solving Methods in Engineering Management* (p. 528). John Wiley & Sons, Hoboken.
- Watson, R.H. (1978). Interpretive structural modeling—A useful tool for technology assessment? *Technological Forecasting and Social Change*, 11(2), 165-185.
- Wu, J., Liu, L. & Huang, L. (2017). Consumer acceptance of mobile payment across time: antecedents and moderating role of diffusion stages. *Industrial Management & Data Systems*, 117(8), 1761-1776.
- Yang, S., Lu, Y., Gupta, S., Cao, Y. & Zhang, R. (2012). Mobile payment services adoption across time: an empirical study of the effects of behavioural beliefs, social influences, and personal traits, *Computers in Human Behaviour*, 28(1), 129-142.
- Zhou, T. (2012). Examining mobile banking user adoption from the perspectives of trust and flow experience. *Information Technology & Management*, 13 (1), 27-37.

APPENDIX

Table ANNEX 1: Iteration 1

Code	Enablers	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E1	Security Measures	1, 9, 10	1, 2, 4, 5, 7		
E2	Awareness and Adoption	1, 2, 4, 5, 6, 8, 9, 10	2		
E3	Merchant Support	3, 8, 9, 10	3		
E4	Compatibility	1, 4, 9, 10	1, 4, 5, 7		
E5	Compliance	1, 4, 5, 6, 8, 9, 10	2, 5		
E6	Compatibility	6	2, 5, 6	6	1
E7	Digital Infrastructure	1, 4, 7, 9, 10	7		
E8	Advancement in user interface	8, 9, 10	2, 3, 5, 8		
E9	Perceived Cost	9, 10	1, 2, 3, 4, 5, 7, 8, 9		
E10	Risk Factor	10	1, 2, 3, 4, 5, 7, 8, 9, 10	10	1

Source: Author creation.

Table ANNEX 2: Iteration 2

Code	Enablers	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E1	Security Measures	1, 9	1, 2, 4, 5, 7		
E2	Awareness and Adoption	1, 2, 4, 5, 8, 9	2		
E3	Merchant Support	3, 8, 9	3		
E4	Compatibility	1, 4, 9	1, 4, 5, 7		
E5	Compliance	1, 4, 5, 8, 9	2, 5		
E7	Digital Infrastructure	1, 4, 7, 9	7		
E8	Advancement in user interface	8, 9	2, 3, 5, 8		
E9	Perceived Cost	9	1, 2, 3, 4, 5, 7, 8, 9	9	2

Source: Author creation.

Table ANNEX 3: Iterations 3

Code	Enablers	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E1	Security Measures	1	1, 2, 4, 5, 7	1	3
E2	Awareness and Adoption	1, 2, 4, 5, 8	2		
E3	Merchant Support	3, 8	3		
E4	Compatibility	1, 4	1, 4, 5, 7		
E5	Compliance	1, 4, 5, 8	2, 5		
E7	Digital Infrastructure	1, 4, 7	7		
E8	Advancement in user interface	8	2, 3, 5, 8,	8	3

Source: Author creation.

Table ANNEX 4 : Iteration 4

Code	Enablers	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E2	Awareness and Adoption	2, 4, 5	2		
E3	Merchant Support	3	3	3	4
E4	Compatibility	4	4, 5, 7	4	4
E5	Compliance	4, 5	2, 5		
E7	Digital Infrastructure	4, 7	7		

Source: Author creation.

Table ANNEX 5: Iteration 5

Code	Enablers	Reachability Set (RS)	Antecedent Set (AS)	Intersection Set $RS \cap AS$	Level
E2	Awareness and Adoption	2, 5	2	2	5
E5	Compliance	5	2, 5	5	5
E7	Digital Infrastructure	7	7	7	5

Source: Author creation.