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SUSTAINABLE CORPORATE FINANCE AND INVESTMENT

SACHINTHA NADEERA, LOSE PATABENDIGE

IMPACT OF GENERATIONAL DIFFERENCES ON DIGITAL PAYMENT SOLUTIONS ADOPTION IN SRI LANKA	KARTŲ SKIRTUMŲ POVEIKIS SKAITMENINIŲ MOKĖJIMO SPRENDIMŲ DIEGIMUI ŠRI LANKOJE

Student(-s) _____
(signature (-s))
Supervisor _____
(signature)
Dr. Ash Anirban
_____
Name, surname, academic title, scientific degree of the supervisor
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SUMMARY IN ENGLISH

VILNIUS UNIVERSITY BUSINESS SCHOOL

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STUDENT NAME: Sachintha Nadeera, Lose Patabendige

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Brief description of the Master's thesis:

This Master's thesis examines the impact of generational differences on the adoption of digital payment solutions in Sri Lanka. Although digital payment solutions are expanding rapidly, their adoption remains uneven across generational cohorts. The study integrates the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) with Generational Cohort Theory to explain variations in adoption behavior among different generations.

Research problem, aim, and objectives:

The research problem addresses the unequal adoption of digital payment solutions across generations in Sri Lanka. The aim of the study is to evaluate the determinants of digital payment adoption and to identify whether their effects differ among Generation X, Millennials, and Generation Z. The objectives include analyzing relevant literature, developing a conceptual framework, formulating hypotheses, conducting empirical analysis, and comparing adoption behavior across generations.

Research methods applied:

The study employs a quantitative research approach with a cross-sectional survey design. Data were collected using a structured online questionnaire and analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM), bootstrapping procedures, and multi-group analysis in SmartPLS software.

Research findings and results:

The results indicate that performance expectancy, effort expectancy, facilitating conditions, hedonic motivation, price value, and habit have a statistically significant positive effect on digital payment solutions adoption. Multi-group analysis reveals significant differences in adoption behavior across generational cohorts.

SUMMARY IN LITHUANIAN

SANTRAUKA

VILNIAUS UNIVERSITETO VERSLO MOKYKLA

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Magistro baigiamasis darbas aprašomas trumpai:

Šiame magistro baigiamajame darbe analizuojamas kartų skirtumų poveikis skaitmeninių mokėjimo sprendimų diegimui Šri Lankoje. Nors skaitmeniniai mokėjimo sprendimai sparčiai plinta, jų naudojimas išlieka nevienodas tarp skirtingų kartų. Darbe integruojama Vieningos technologijų priėmimo ir naudojimo teorijos (UTAUT2) sistema bei Kartų teorija, siekiant paaiškinti šiuos skirtumus.

Magistro baigiamojo darbo problema, tikslas ir uždaviniai:

Tyrimo problema – nevienodas skaitmeninių mokėjimo sprendimų diegimas tarp skirtingų kartų Šri Lankoje. Darbo tikslas – įvertinti skaitmeninių mokėjimo sprendimų diegimo veiksnius ir nustatyti, ar jų poveikis skiriasi tarp X kartos, tūkstantmečio kartos ir Z kartos. Uždaviniai apima literatūros analizę, konceptualaus modelio sudarymą, hipotezių formulavimą, empirinių duomenų analizę ir kartų palyginimą.

Magistro baigiamajame darbe taikyti tyrimo metodai:

Tyrime taikytas kiekybinis tyrimo metodas ir skerspjūvio apklausos dizainas. Duomenys rinkti naudojant struktūrizuotą internetinę anketą, o analizė atlikta taikant dalinių mažiausių kvadratų struktūrinių lygčių modeliavimą (PLS-SEM), bootstrap procedūras ir kelių grupių analizę, naudojant „SmartPLS“ programinę įrangą.

Atliktas tyrimas ir gauti rezultatai:

Tyrimo rezultatai parodė, kad veiklos nauda, naudojimo paprastumas, palankios sąlygos, hedoninė motyvacija, kainos vertė ir įprotis turi statistiškai reikšmingą teigiamą poveikį skaitmeninių mokėjimo sprendimų diegimui. Kelių grupių analizė atskleidė reikšmingus skirtumus tarp kartų.

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The rapid advancement of digital technologies has transformed global financial systems and changed how individuals, businesses, and governments conduct transactions. A key result is the widespread adoption of digital payment solutions that enable electronic transactions without cash. These solutions including mobile banking apps, electronic wallets, QR-code payments, and real-time transfer platforms are now essential to modern financial ecosystems, providing greater efficiency, convenience, and accessibility (World Bank, 2022).

Globally, digital payment adoption has accelerated due to greater smartphone use, improved internet access, and supportive regulations. The World Bank (2022) reports a substantial rise in adults making or receiving digital payments, especially in developing and emerging economies. Digital payments are promoted to enhance financial inclusion, lower transaction costs, and improve transparency. However, adoption rates still vary widely across countries and groups, indicating that technological readiness alone does not ensure widespread use.

The uneven spread of digital payment solutions underscores the role of behavioral and contextual factors in adoption. Users' decisions depend on perceived usefulness, ease of use, security, trust, and compatibility with current financial practices. Therefore, understanding digital payment adoption requires frameworks that address both individual perceptions and broader socio-economic factors.

Technology adoption perspectives and digital payment

Scholars have developed several technology acceptance theories to explain why individuals adopt or resist new technologies. The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) is a comprehensive framework for analyzing consumer technology adoption. UTAUT2 expands earlier models by including performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit, capturing both utilitarian and experiential aspects of consumer behavior (Venkatesh et al., 2012).

UTAUT2 is well-suited for analyzing digital payment solutions, which users often adopt voluntarily and integrate into daily routines. Studies applying UTAUT2 in various contexts

consistently show its strong ability to predict consumer adoption, especially in digital financial services (Fernandes & Oliveira, 2021). Speed and convenience are key drivers of adoption, while habit plays a growing role as technologies become part of everyday life.

Recent research suggests that the importance of UTAUT2 constructs varies with the maturity of digital ecosystems and user characteristics (Mensah, 2024). In mature digital environments, ease of use and infrastructure may be less influential as users become more familiar with technology. These findings show that adoption behavior is dynamic and context-dependent, highlighting the need for further study

Generational differences in technology adoption

Technology acceptance models offer valuable insights but often assume users respond similarly. In reality, adoption behavior varies across demographic groups, especially generations. Generational Cohort Theory helps explain these differences by suggesting that people born in the same period share formative experiences that shape their values and behaviors over time (Choudhary et al., 2024).

Generational differences are especially evident in digital technology use. Millennials and Generation Z often grow up with digital devices, internet services, and mobile apps, leading to higher digital literacy, greater confidence, and faster habit formation. In contrast, Generation X typically encounters digital technologies later and may adopt them more cautiously due to concerns about security, trust, and reliability (Agárdi & Alt, 2024).

Many studies note age-related differences in digital payment adoption, but often treat age as a control variable rather than a key analytical factor. This limit understanding of how adoption drivers differ across generations. Combining Generational Cohort Theory with UTAUT2 allows for a more nuanced analysis of both which factors influence adoption and why their effects vary by generation.

Digital payment adoption in Sri Lanka

Sri Lanka offers a unique and timely context for studying digital payment adoption. As a lower-middle-income country experiencing rapid digital transformation, Sri Lanka has seen major changes in its financial services over the past decade. Greater smartphone use, expanded mobile broadband, and affordable digital devices have supported the spread of digital payment technologies (International Telecommunication Union, 2022).

Institutional and regulatory efforts have further supported this transformation. The Central Bank of Sri Lanka has promoted digital payment systems by modernizing payment infrastructure and reducing reliance on cash (Central Bank of Sri Lanka, 2022). Digital payment solutions are now widely used in banking, retail, e-commerce, and government services, marking a shift toward a more digital financial ecosystem.

Despite these advances, digital payment adoption in Sri Lanka remains uneven across demographic and socio-economic groups. Although awareness is high, actual and sustained use varies. Studies show that concerns about security, trust, usability, and habit formation still limit adoption, especially among older users and in non-urban areas (Weerakkody et al., 2021; (Rathnasiri et al., 2024).

Research on digital payment adoption in Sri Lanka is limited in scope. Many studies focus on specific technologies, such as mobile banking or QR payments, without using comprehensive theoretical frameworks. Few examine generational differences with robust methods like multi-group analysis. As a result, there is little empirical evidence on how adoption factors differ across Generation X, Millennials, and Generation Z in Sri Lanka.

Research problem and research gap

Although prior research has advanced understanding of digital payment adoption, several important gaps remain. First, many empirical studies apply partial versions of technology acceptance models, excluding key constructs such as habit, thereby limiting insight into sustained and routine usage behaviors.

Second, despite growing recognition of demographic heterogeneity, explicit integration of generational perspectives into digital payment adoption research remains limited, particularly in emerging economy contexts.

Third, the Sri Lankan digital payment landscape is underrepresented in theory-driven, generationally comparative research. Existing studies often Third, theory-driven, generationally comparative research on Sri Lanka’s digital payment landscape is limited. Existing studies often use descriptive analysis or narrow samples, reducing generalizability and depth. Much of the literature also focuses on behavioral intention rather than actual and continued use, which is less informative where digital payments are already common in digital payment adoption in Sri Lanka.

Research question

To address these research gaps, this study is guided by the following research question:

- How do generational differences influence digital payment solutions adoption in Sri Lanka?

To answer this question, the study examines digital payment adoption using UTAUT2 and assesses whether adoption factors differ significantly across Generation X, Millennials, and Generation Z through multi-group analysis.

Research objectives

To answer the research question, the study pursues the following objectives:

- to examine the influence of UTAUT2 constructs on digital payment solutions adoption in Sri Lanka;
- to analyst whether the effects of adoption determinants differ across Generation X, Millennials, and Generation Z;
- to provide empirical evidence on generational differences in digital payment adoption using a multi-group analytical approach

Significance of the study

This study extends digital payment adoption research in an emerging economy by integrating UTAUT2 and Generational Cohort Theory. By focusing on actual and continued use and explicitly examining generational differences, it addresses key theoretical and methodological gaps in current research.

Practically, the findings provide valuable insights for policymakers, financial institutions, and digital payment providers in Sri Lanka. Understanding generational differences in adoption drivers supports the development of targeted strategies for inclusive and sustainable digital payment adoption, advancing Sri Lanka’s digital transformation.

1. LITERATURE REVIEW

The rapid advancement of digital technologies has significantly transformed financial systems worldwide, leading to fundamental changes in how individuals conduct monetary transactions. Among these transformations, the emergence and widespread diffusion of digital payment solutions have reshaped consumer payment behavior, reduced reliance on cash, and enhanced the efficiency of financial transactions (Liébana-Cabanillas et al., 2022).

Despite the technological maturity of many digital payment platforms, adoption levels vary considerably across countries and population groups. Prior studies indicate that such variation cannot be explained solely by technological availability; instead, behavioral, social, and contextual factors play a decisive role in shaping adoption outcomes (Fernandes & Oliveira, 2021). Consequently, understanding the determinants of digital payment adoption remains an important academic and policy-oriented challenge, particularly in emerging economies.

In recent years, scholars have increasingly recognized that technology adoption behavior varies significantly across age groups. Key themes in the literature underscore how technology adoption is shaped by the interplay of generational cohorts' socio-economic contexts, technological exposure, and formative experiences, which collectively influence attitudes and responsiveness to innovation (Priporas et al., 2017). A critical review of the sources, however, reveals notable differences in research emphasis and methodology. For example, studies focusing on socio-economic determinants tend to emphasize access to resources and education, sometimes overlooking psychological factors such as perceived usefulness or trust, which are foregrounded by other research streams. Furthermore, although both theoretical and empirical recognition of generational differences is evident, few studies provide comprehensive cross-country or cross-cultural comparisons, particularly in developing country contexts such as Sri Lanka (Jayatissa, 2023). As a result, findings often lack generalizability, highlighting not just fragmentation but also gaps in the applicability of existing models (Almoghayer & Mahmoud, 2025). This lack of coherence signals a critical need for integrative analyses that systematically compare and contrast the diverse determinants and methodological approaches across the literature (Ly et al., 2025).

Against this backdrop, the purpose of this literature review is threefold. First, it critically examines the evolution of digital payment solutions and the broader digital transformation of financial services. Second, it reviews existing empirical evidence on digital payment adoption from global and emerging economy perspectives. Third, it establishes a theoretical foundation

for analyzing generational differences in digital payment adoption by synthesizing technology acceptance theories and generational cohort literature. In systematically reviewing prior studies, this chapter highlights a key unresolved research gap: the limited integration of generational cohort analysis with technology adoption models in emerging economies such as Sri Lanka. Addressing this gap provides a strong basis for developing the conceptual framework and hypotheses of the present study.

The literature review presents a structured review of the academic literature on the adoption of digital payment solutions and generational differences in technology use and based on an analysis of approximately 60 peer-reviewed journal articles and scholarly publications, primarily published between 2019 and 2025. The reviewed studies were selected from recognized academic databases on digital payment adoption, on technology acceptance theories, and on generational cohort analysis.

The literature review progresses from a broad discussion of digital payment solutions and global technology adoption, followed by studies focusing on emerging economies and the Sri Lankan context. This is complemented by a theoretical review of technology adoption models, with particular emphasis on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and Generational Cohort Theory. The chapter concludes by synthesizing empirical findings to identify research gaps and develop the conceptual framework for the present study.

1.1 Digital transformation and the evolution of digital payment solutions

Digital transformation refers to the integration of digital technologies into organizational and societal processes, resulting in fundamental changes in how value is created, delivered, and consumed (Zhang & Wang, 2024). Within the financial sector, digital transformation has reshaped traditional financial services by enabling faster, more accessible, and more efficient transaction mechanisms through the application of financial technologies (Vial, 2019). One of the most prominent outcomes of this transformation is the emergence and rapid diffusion of digital payment solutions, enabling individuals and organizations to conduct financial transactions electronically without relying on physical cash.

Digital payment solutions encompass a broad range of technologies, including mobile banking applications, electronic wallets, QR-code-based payment systems, online banking platforms, and real-time payment infrastructures. These technologies are designed to streamline transaction processes, reduce transaction costs, and provide users with greater

flexibility and control over financial activities (Calderon, 2025; Li & Jiang, 2025). The expansion of digital payment systems has been facilitated by increased smartphone penetration, improvements in internet infrastructure, and the introduction of supportive regulatory frameworks that encourage digital financial innovation (World Bank, 2023).

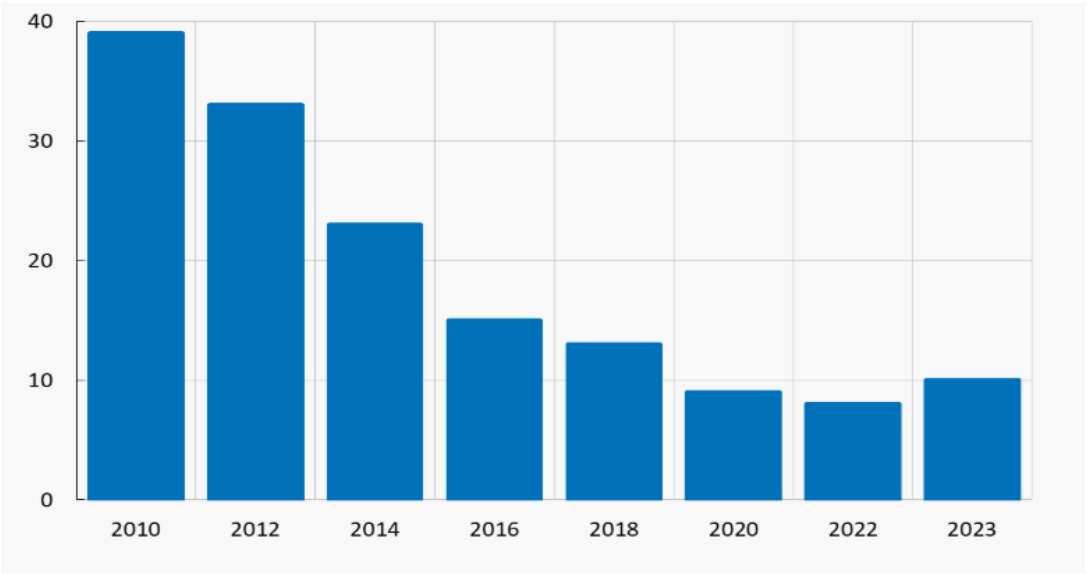
From a macroeconomic perspective, the diffusion of digital payment solutions has been closely associated with efforts to enhance financial inclusion, particularly in developing and emerging economies. By reducing entry barriers to formal financial services, digital payment systems enable participation by previously unbanked or underbanked populations. According to the World Bank, (2022), the proportion of adults globally who made or received digital payments increased from 67 per cent in 2017 to 76 per cent in 2021, with the most pronounced growth observed in emerging regions.

Regional and multilateral institutions similarly emphasize that digital payment systems contribute to improved access to financial services for individuals and small businesses, thereby supporting broader economic participation and integration (ADB, 2025). In response, governments and central banks in emerging economies have increasingly promoted cashless payment initiatives as part of broader digital economy strategies. These efforts are often embedded within national policy frameworks aimed at improving transaction efficiency, expanding financial inclusion, and strengthening payment system interoperability. Examples include national digital payment initiatives in countries such as India and Kenya, where policy support has played a central role in accelerating adoption (Central Bank of Kenya, 2025).

Despite these advancements, the adoption of digital payment solutions remains uneven across countries and demographic groups. Developed economies such as Sweden and Singapore have achieved near-universal adoption of digital payments, supported by robust institutional frameworks, high levels of technological readiness, and strong socio-cultural acceptance of digital transactions (Liébana-Cabanillas et al., 2022). In Sweden, for example, the sharp decline in cash usage is evident as the payments market becomes almost entirely digital, with more than 345,000 businesses and nearly 9 million individuals connected to Swish by the end of 2024 (Riksbank, 2025). Similarly, Singapore’s Smart Nation initiative has promoted widespread adoption of digital payments through platforms such as PayNow and NETS, supported by high digital literacy and robust infrastructure. conditions that facilitate technology uptake (Ministry of Digital Development and Information, 2024).

Figure 1

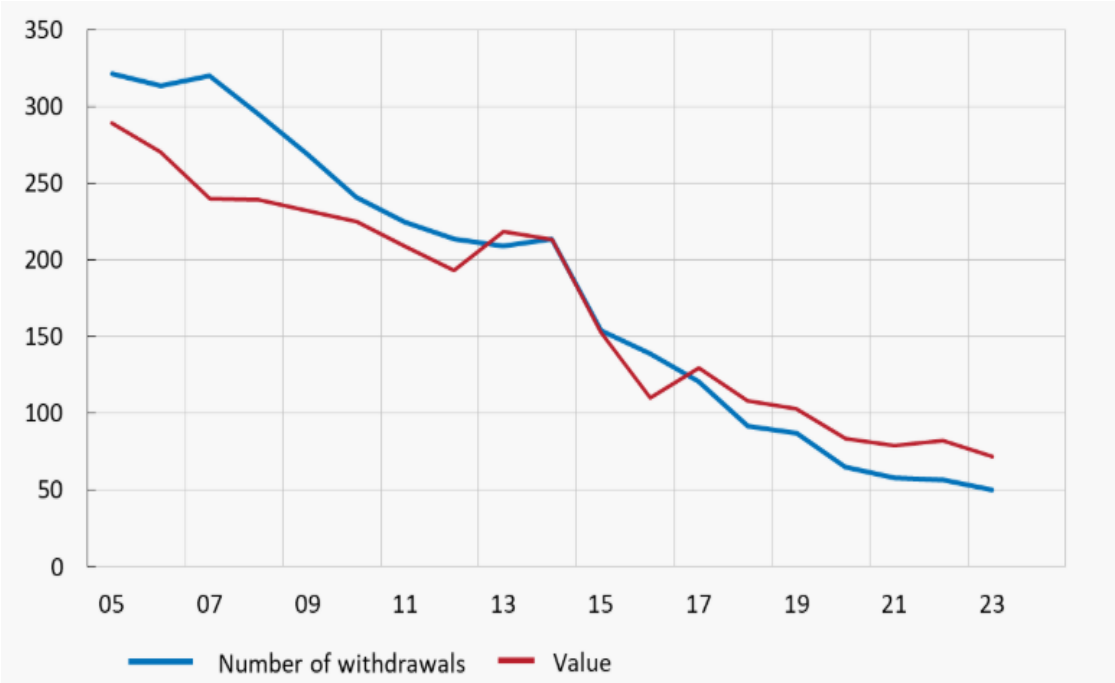
Percentage of people who paid cash for their last in-store purchase.



Source : (Riksbank, 2025)

Figure 2

Cash withdrawals, number of millions of transactions and transaction value in SEK billion



Source : (Riksbank, 2025)

In contrast, emerging economies display more heterogeneous adoption patterns. While technological solutions may be available, adoption outcomes are often shaped by disparities in infrastructure quality, digital literacy, and regulatory effectiveness. Empirical

evidence from countries such as India demonstrates that initiatives like the Unified Payments Interface (UPI) have accelerated digital transaction volumes through policy support and improved connectivity; however, significant rural–urban adoption gaps persist (Johari, 2024). In Sub-Saharan Africa, Kenya's widespread adoption of M-Pesa illustrates how extensive agent networks and institutional support can foster favorable conditions for the diffusion of digital payments, whereas countries such as Nigeria continue to face adoption challenges due to infrastructure limitations and lower exposure to formal financial systems (IMF, 2025).

These cross-country patterns indicate that the diffusion of digital payment solutions cannot be explained solely by technological availability. Rather, adoption outcomes reflect the interaction between technological characteristics and broader institutional, socio-economic, and behavioral conditions. Although widely applied technology acceptance frameworks, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), provide useful insights into individual-level adoption drivers, their explanatory power may be constrained when contextual factors are not sufficiently considered. Emerging evidence suggests that factors such as trust in digital platforms, perceived security, and user familiarity with technology play a particularly important role in shaping adoption behavior in developing contexts ((Chawla & Joshi, 2019 ; Patnaik et al., 2023).

Importantly, digital payment solutions are inherently consumer-facing technologies, and adoption decisions are influenced not only by functional considerations such as efficiency and convenience but also by experiential and behavioral factors, including ease of use and perceived enjoyment (Upadhyay et al., 2022). These observations highlight the need for theoretical frameworks that account for both individual perceptions and contextual conditions in explaining digital payment adoption. Accordingly, the following section examines technology acceptance theories in greater detail, with particular attention to their applicability and limitations in diverse economic and demographic contexts (Nnaji et al., 2023).

1.2 Determinants of digital payment adoption in developed and emerging economies

A substantial body of academic literature has examined digital payment adoption from a global perspective, identifying a range of technological, behavioral, and institutional factors that influence consumer adoption decisions. Research conducted predominantly in developed economies has consistently highlighted performance-related benefits such as transaction efficiency, speed, and convenience as primary motivators for digital payment adoption (Fernandes & Oliveira, 2021). In these contexts, digital payment solutions are often perceived as superior alternatives to cash and traditional banking instruments, particularly for reducing

transaction time and enhancing user convenience in everyday financial activities (Al-Qudah et al., 2024).

In addition to performance-related benefits, studies in advanced economies emphasize the importance of perceived ease of use and perceived usefulness as key determinants of adoption. These factors align closely with core constructs of established technology acceptance frameworks, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Empirical evidence suggests that when digital payment systems are intuitive, reliable, and seamlessly integrated into existing financial infrastructures, consumers are more likely to adopt and continue using them (Liébana-Cabanillas et al., 2022). Social influence also plays a role, particularly in the early stages of adoption, as users are often influenced by peers, employers, or service providers who promote digital payment usage as a normative behavior. (Al-Qudah et al., 2024)

In contrast, research on emerging and developing economies reveals a more complex, context-dependent landscape of adoption. While functional benefits such as convenience and efficiency remain relevant, adoption decisions in these settings are often shaped by additional structural and contextual factors, including infrastructural constraints, institutional trust, and levels of financial and digital literacy (Patil et al., 2020). Consumers in emerging markets frequently encounter barriers, including inconsistent internet connectivity, limited access to smartphones or compatible devices, and concerns about the security and reliability of digital payment platforms (Munawaroh & Widuri, 2025). As a result, adoption cannot be explained solely through individual-level perceptions but must be understood within broader socio-economic and institutional environments.

Empirical studies indicate that infrastructural readiness is a particularly critical determinant of digital payment adoption in emerging economies. Limitations such as inadequate broadband coverage, unstable network connectivity, and insufficient digital support systems can undermine the perceived usefulness and reliability of digital payment solutions, even when users recognize their potential benefits. In such contexts, infrastructural constraints represent a significant barrier to adoption, highlighting the importance of facilitating conditions, including access to technological resources, technical support, and compatible infrastructure, in shaping both initial adoption and continued usage of digital payment systems (Jeje, 2025). This contrasts with developed economies, where infrastructural adequacy is often taken for granted and thus receives less analytical attention.

Institutional trust and perceived security have been widely identified as salient determinants of digital payment adoption in emerging market contexts. In environments where trust in formal financial institutions is relatively low, consumers may be reluctant to adopt digital payment solutions due to concerns related to fraud, data breaches, and the reliability of transaction processes. Empirical evidence suggests that perceptions of security encompassing data privacy protection, system reliability, and confidence in institutional safeguards significantly influence users' willingness to adopt and continue using digital payment technologies, particularly among first-time or less experienced users (Beheri, 2025); (Jeje, 2025). These concerns are often compounded by limited consumer protection mechanisms and lower awareness of digital security practices, underscoring the importance of regulatory frameworks and consumer education in fostering the diffusion of digital payments. (Dinh et al., 2023).

Social and cultural norms further differentiate adoption patterns between developed and emerging economies. In many developing contexts, individual financial decisions are strongly influenced by family members, peers, and community networks (Su & Duan, 2025). Empirical evidence indicates that social influence, including recommendations from peers, family members, and community networks, plays a significant role in shaping digital payment adoption behavior, as information shared within social circles increases awareness, reduces uncertainty, and encourages usage of digital payment solutions (Linh et al., 2024) . Social influence thus extends beyond mere exposure to technology and becomes embedded in collective norms and shared experiences. This highlights the importance of social context in understanding adoption behavior and suggests that technology acceptance models must be interpreted alongside cultural and relational factors.

Another important distinction between developed and emerging economies lies in the maturity of digital payment ecosystems. In many advanced economies, digital payment solutions are deeply embedded in everyday transactions, leading to habitual use. Consumers frequently use digital payments for routine activities such as retail purchases, transportation, and bill payments, leading to repeated, automatic use over time (Worldpay, 2024). In such contexts, habit emerges as a strong predictor of continued usage, reinforcing the long-term sustainability of digital payment systems (Mensah, 2024).

By contrast, in many emerging economies, users are still transitioning from cash-based systems to digital alternatives. This transitional stage implies that habit formation is ongoing and uneven across population segments. While early adopters may quickly integrate digital payments into their daily routines, other users may rely on digital payments only intermittently,

particularly when cash remains widely accepted and socially preferred (Vlaicu, 2025). As a result, habit formation in emerging economies is influenced not only by individual behavior but also by the availability of use cases, merchant acceptance, and broader ecosystem development.

Recent literature increasingly recognizes that demographic heterogeneity plays a significant role in shaping digital payment adoption across both developed and emerging contexts. Younger users often demonstrate higher adoption propensity due to greater familiarity with digital technologies and higher levels of digital literacy, whereas older users tend to adopt digital payment solutions at slower rates, influenced by factors such as confidence, usability perceptions, and reliance on traditional financial practices (Panetta et al., 2025). These age-based differences suggest that demographic factors should be considered integral to understanding adoption behavior, rather than treated merely as control variables.

In contrast, older users may be less inclined to adopt digital payment solutions due to perceived complexity, lower confidence in using digital technologies, and heightened concerns related to security, privacy, and usability. Empirical evidence indicates that older adults tend to rely more heavily on established payment methods and often exhibit higher levels of technology anxiety, which can inhibit their willingness to engage with mobile and digital financial services. Consequently, stronger facilitating conditions such as user support, simplified system interfaces, and trust-building mechanisms are required to encourage digital payment adoption among older users (Han & Ko, 2025). These age-related differences suggest that adoption drivers are not uniform across demographic groups and that behavioral responses to digital payment technologies vary systematically across the life course.

Despite increasing recognition of demographic heterogeneity, relatively few studies provide explicit, theory-driven comparisons of digital payment adoption behavior across generational cohorts. Existing research often treats age as a control variable rather than as a central analytical lens, thereby limiting the ability to capture nuanced generational differences in adoption determinants (Panetta et al., 2025). Moreover, comparative analyses using advanced analytical techniques, such as structural equation modelling and multi-group analysis, remain limited, particularly within South Asian contexts. This gap is especially notable given the rapid growth of digital payment initiatives in the region and the coexistence of multiple generations with differing levels of digital exposure.

Overall, the global and emerging economy literature suggests that while digital payment adoption is influenced by common behavioral drivers, such as perceived usefulness

and ease of use, the relative importance of these factors varies across contexts. In developed economies, adoption is primarily driven by performance-related benefits and habitual usage within mature ecosystems. In emerging economies, adoption is shaped by a more complex interplay of infrastructural readiness, institutional trust, social influence, and demographic characteristics. These differences underscore the need for analytical frameworks that account for both individual perceptions and contextual conditions when examining digital payment adoption across diverse economic settings. Such an approach is particularly relevant for understanding generational differences in adoption behavior, which are explored further in subsequent sections of this study.

1.3 Technology adoption theories and the role of generational differences

Understanding the adoption of digital payment solutions requires a theoretical framework that explains not only general consumer acceptance of technology but also heterogeneity in adoption behavior across population groups. Digital payment systems are embedded within complex socio-technical environments, where individual perceptions interact with institutional structures, social norms, and technological infrastructure. Consequently, technology adoption research has developed multiple theoretical perspectives over time to explain how individuals evaluate, accept, and use new technologies. Among the most influential frameworks in this domain are the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Unified Theory of Acceptance and Use of Technology (UTAUT). These models provide complementary insights into the cognitive, behavioral, and contextual drivers of technology adoption and, together, form the conceptual foundation for analyzing digital payment usage.

The Technology Acceptance Model (TAM) represents one of the earliest and most widely applied frameworks for explaining technology acceptance. Originally developed by Davis & Davis, (1989), TAM posits that an individual's intention to use a technology is primarily determined by two cognitive beliefs: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which an individual believes that using a technology will enhance task performance, while perceived ease of use captures the degree to which the technology is perceived as effortless. TAM has been extensively applied in studies of electronic banking, mobile payments, and digital wallets, consistently demonstrating its ability to predict early-stage adoption intentions (Saputra & Gürbüz, 2021).

Despite its empirical robustness, TAM has been widely criticized for its limited explanatory scope, particularly in consumer-oriented and socially embedded technologies. By emphasizing rational cognitive evaluations, TAM tends to underplay the role of social influence, institutional trust, and contextual constraints that shape adoption decisions in real-world settings. Digital payment adoption often occurs within environments characterized by regulatory oversight, infrastructural dependencies, and collective usage norms, factors that cannot be fully captured by individual-level perceptions alone Venkatesh & Davis, (2000) argue that TAM's focus on usefulness and ease of use, while analytically elegant, risks over simplifying the complex processes underlying technology adoption, particularly in contexts where social endorsement, trust, and facilitating conditions are critical.

The Theory of Planned Behavior (TPB) extends behavioral analysis by incorporating subjective norms and perceived behavioral control alongside attitudes toward behavior (Ajzen, 1991). Subjective norms reflect perceived social pressure from important referent groups, such as family members or peers, while perceived behavioral control captures individuals' perceptions of their ability to perform the behavior. TPB has been applied in studies of online banking and mobile payment adoption to account for social influence and perceived capability (Shaikh & Karjaluoto, 2015). However, TPB is a general behavioral theory rather than a technology-specific framework. As a result, it lacks constructs that explicitly capture system-related attributes, such as usability, compatibility, and technological support, thereby limiting its explanatory power in complex digital environments.

To overcome the fragmented nature of earlier adoption models, the Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed as an integrative framework synthesizing key constructs from eight prominent technology acceptance theories, including TAM and TPB (Venkatesh et al., 2003). UTAUT identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as the primary determinants of behavioral intention and technology use. Empirical evidence demonstrates that UTAUT explains a substantial proportion of variance in technology adoption across diverse organizational and consumer settings, making it one of the most influential frameworks in information systems research.

However, the original UTAUT model was developed primarily for organizational and mandatory-use contexts, such as workplace information systems. As digital technologies increasingly shifted toward voluntary, consumer-driven environments, scholars recognized that UTAUT's organizational orientation limited its ability to explain everyday consumer behavior. To address this limitation, UTAUT2 was introduced to enhance the framework's

applicability to consumer technologies (Venkatesh et al., 2012). UTAUT2 extends the original model by incorporating hedonic motivation, price value, and habit, thereby capturing both utilitarian and experiential dimensions of consumer behavior in voluntary adoption contexts.

UTAUT2 has been widely adopted in studies of mobile payments, digital wallets, and online financial services, consistently demonstrating strong explanatory power (Liébana-Cabanillas et al., 2022; Patnaik et al., 2023). The inclusion of hedonic motivation allows the model to account for enjoyment and intrinsic satisfaction derived from technology use, while price value reflects users' evaluations of perceived benefits relative to associated costs. Habit captures the automaticity of behavior that develops through repeated usage, a particularly important factor in mature digital payment ecosystems.

Despite these strengths, UTAUT2 does not explicitly theories behavioral heterogeneity across age groups. Although age is included as a moderating variable, the model does not explain why individuals from different generational cohorts may interpret and respond to adoption drivers differently. Empirical research increasingly suggests that age-related differences in technological exposure, digital confidence, learning capacity, and risk perception systematically shape technology adoption behavior (Panetta et al., 2025; (\Han & Ko, 2025). This limitation highlights the need to complement UTAUT2 with a theoretical perspective that explicitly addresses generational differences.

Generational Cohort Theory provides a suitable framework for addressing this gap. The theory proposes that individuals born within the same historical period share formative social, economic, and technological experiences that shape their values, attitudes, and behavioral patterns over time (Priporas et al., 2017). These shared experiences influence how different cohorts perceive technological change, evaluate risks and benefits, and adapt to digital innovations. Integrating Generational Cohort Theory with UTAUT2 enables a more nuanced understanding of digital payment adoption by recognizing that adoption drivers may operate differently across age groups, driven by cohort-specific experiences and socialization processes.

1.4 UTAUT2 framework and generational differences in digital payment adoption

This study adopts UTAUT2 as the primary theoretical framework to explain digital payment adoption, while Generational Cohort Theory is employed as a complementary lens to capture age-based behavioral differences. UTAUT2 provides a structured approach to identifying core adoption drivers, whereas Generational Cohort Theory explains why these

drivers may exert varying effects across generational groups. Each UTAUT2 construct is therefore reviewed with explicit consideration of generational variation in adoption behavior.

Performance expectancy refers to the degree to which individuals believe that using digital payment solutions enhances the efficiency and effectiveness of their financial transactions (Venkatesh et al., 2012). In digital payment contexts, performance expectancy is closely associated with transaction speed, convenience, and accessibility. Empirical studies consistently demonstrate that performance expectancy is a strong predictor of adoption intentions, particularly among younger users who priorities efficiency and time savings in daily transactions (Al-Qudah et al., 2024). Older users, however, may place less emphasis on performance gains if these benefits do not sufficiently outweigh perceived risks, learning costs, or concerns related to security and reliability.

Effort expectancy captures the perceived ease of using digital payment systems. Technologies perceived as complex or difficult to use can discourage adoption, especially among individuals with lower digital confidence. Research indicates that younger cohorts generally perceive lower effort expectancy due to greater familiarity with mobile applications and digital interfaces, whereas older users report higher perceived complexity and usability concerns (Han & Ko, 2025). These differences suggest that effort expectancy plays a particularly important role in shaping adoption intentions among older users, underscoring the need for intuitive system design and accessible user support.

Social influence reflects the extent to which individuals perceive that important others believe they should use a particular technology. In digital payment contexts, social influence may originate from peers, family members, employers, or broader community norms. Empirical evidence shows that social influence is especially salient during early adoption stages and within emerging market contexts, where collective endorsement can reduce uncertainty and perceived risk (Linh et al., 2024). Generationally, younger users may be more influenced by peer networks and online communities, while older users may rely more heavily on family endorsement or institutional credibility.

Facilitating conditions refer to the perceived availability of resources and support necessary to use digital payment systems effectively, including access to compatible devices, reliable internet connectivity, and technical assistance. Studies indicate that facilitating conditions are particularly critical for older users and individuals in emerging economies, where infrastructural and support limitations can inhibit adoption (Jeje, 2025). Younger users

may be more adaptable to infrastructural constraints, but sustained adoption still depends on reliable system support.

Hedonic motivation captures the enjoyment or pleasure associated with using a technology. In digital payment contexts, hedonic motivation may relate to interface design, perceived modernity, or experiential convenience. Empirical research suggests that hedonic motivation plays a stronger role among younger cohorts, who often associate digital payments with lifestyle integration and technological novelty, whereas older users tend to priorities functional reliability over enjoyment (Patnaik et al., 2023).

Price value reflects the trade-off between perceived benefits and the costs associated with using digital payment systems, such as transaction fees, data usage costs, or device expenses (Venkatesh et al., 2012). Younger users may be more sensitive to price considerations due to budget constraints, while older users may focus more on perceived value stability and trustworthiness, particularly in relation to financial risk.

Finally, *habit* represents the extent to which digital payment usage becomes automatic through repeated behavior. Habit is a critical determinant of continued usage, particularly in environments where digital payments are frequently used for everyday transactions (Hakim et al., 2024). Younger users often develop usage habits more rapidly due to frequent interaction with digital platforms, whereas habit formation among older users may require sustained positive experiences and ongoing support.

Taken together, the integration of UTAUT2 with Generational Cohort Theory provides a comprehensive framework for analyzing digital payment adoption across generational cohorts. This approach acknowledges both universal adoption drivers and cohort-specific behavioral dynamics, offering a richer and more context-sensitive explanation of digital payment adoption in contemporary financial ecosystems.

Table 1

Theoretical foundations used in the literature review

Theory / Framework	Core Focus	Key Constructs	Relevance to This Study	Key References
Technology Acceptance Model (TAM)	Explains individual acceptance of new technologies based on cognitive beliefs	Perceived Usefulness, Perceived Ease of Use	Provides early foundational understanding of how functional benefits influence digital payment adoption; informs performance and effort-related constructs	Davis (1989); Venkatesh & Davis (2000); Oliveira et al. (2021)
Theory of Planned Behaviour (TPB)	Explains behaviour through attitudes, social norms, and perceived control	Attitude, Subjective Norms, Perceived Behavioural Control	Highlights the role of social pressure and perceived control in payment behaviour; supports inclusion of social influence and facilitating conditions	Ajzen (1991); Shaikh & Karjaluoto (2015); Hasan et al. (2023)
Unified Theory of Acceptance and Use of Technology (UTAUT)	Integrates multiple adoption theories to explain technology use	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions	Serves as the structural foundation for understanding adoption drivers; informs the core explanatory logic of digital payment adoption	Venkatesh et al. (2003); Liébana-Cabanillas et al. (2022)
Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)	Extends UTAUT to consumer and voluntary technology use contexts	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit	Primary theoretical framework of the study; captures both utilitarian and experiential drivers of digital payment adoption	Venkatesh et al. (2012); Patnaik et al. (2023); Al-Qudah et al. (2024)
Generational Cohort Theory	Explains behavioural differences based on shared formative experiences of age cohorts	Cohort-specific values, attitudes, behavioural patterns	Supports analysis of how UTAUT2 constructs operate differently across Generation X, Millennials, and Generation Z	Smits et al. (2010); Priporas et al. (2020); Zhao & Wang (2023)
Perceived Risk Theory (in digital finance context)	Examines how perceived uncertainty and risk affect technology adoption	Security Risk, Privacy Risk, Financial Risk	Explains hesitation and resistance to digital payments, particularly among older cohorts and first-time users	Patil et al. (2022); Jeewananda et al. (2021); Nasiketha et al. (2023)
Habit Formation Theory (consumer behaviour context)	Explains how repeated behaviour becomes automatic over time	Repetition, Automaticity, Routine Behaviour	Justifies measuring digital payment adoption as actual and continued use rather than intention alone	Venkatesh et al. (2012); Mensah (2024)

Source: Compiled by the author based on the reviewed literature

1.5 Generational cohort classification

Generational Cohort Theory provides a robust theoretical foundation for analyzing age-based differences in attitudes and behaviors, including responses to technological innovations. The core premise of the theory is that individuals who are born within the same historical period and experience similar social, economic, and technological conditions during their formative years develop shared value systems, cognitive frameworks, and behavioral tendencies that persist across the life course. Early work on this idea emphasizes the role of sociocultural and historical context in shaping cohort characteristics (Mannheim, 1952). Building on this, subsequent research has shown that cohorts structured by shared historical experiences display distinct attitudinal and behavioral patterns in domains ranging from work values to technology adoption (Twenge & Campbell, 2008;Priporas et al., 2017). In particular,

Schewe & Noble, (2000) argue that generational cohorts internalize the technological and societal conditions prevalent during critical developmental periods, which influence how they interpret and respond to later innovations throughout adulthood. This theoretical perspective aligns with the broader literature on generational effects, which asserts that generational cohorts are not merely age brackets but represent groups shaped by enduring, context-specific influences that affect long-term behavior.

Despite its conceptual strength, empirical applications of Generational Cohort Theory have been criticized for methodological inconsistency, particularly in the definition and operationalization of generational boundaries. Numerous studies label age-based groupings as “generations” without adequate theoretical justification, often relying on arbitrary cut-off points derived from available survey data rather than historically grounded cohort definitions. This practice has been shown to undermine cross-study comparability and risk conflating genuine cohort effects with age or period effects (Lyons et al., 2015;; Irwin, 2011). As Lyons et al., (2015) caution, much of the generational research literature is built on opinion-based categorizations rather than empirically defensible cohort definitions, leading to fragmented findings and limited theoretical accumulation.

To address these limitations, contemporary scholarship increasingly emphasizes the importance of adopting established and theoretically grounded generational frameworks developed by reputable research organizations. Rather than relying on ad hoc age classifications, researchers are encouraged to use cohort definitions that reflect shared historical and socio-technological experiences, thereby strengthening analytical validity and interpretability (Lyons & Kuron, 2014;Costanza & Finkelstein, 2015) Within this context, the generational framework proposed by the Pew Research Centre has emerged as one of the most widely accepted and methodologically rigorous approaches to generational classification.

The Pew Research Centre’s framework conceptualizes generations not merely as age brackets, but as cohorts defined by exposure to distinct social, economic, political, and technological environments during critical developmental stages. Pew explicitly grounds generational boundaries in major societal shifts such as the expansion of digital technologies, economic restructuring, and changes in communication practices arguing that these contextual forces shape long-term behavioral patterns (Pew Research Center, 2023). This approach aligns closely with the foundational principles of Generational Cohort Theory, which emphasize the enduring influence of formative experiences on attitudes and behavior (Mannheim, 1952) .

The methodological strength of the Pew framework lies in its consistency, transparency, and empirical grounding. By clearly articulating the rationale behind generational boundaries, Pew enables researchers to avoid arbitrary classifications and enhances the comparability of findings across studies and contexts. The framework has therefore been widely adopted across social science disciplines, including labor economics, political behavior, digital sociology, and technology adoption research. Its extensive use in empirical research has contributed to the accumulation of comparable evidence on generational differences in digital engagement, financial behavior, and innovation adoption (Pew Research Center, 2018;Pew Research Center, 2019b).

In the context of technology adoption and digital transformation, the Pew generational framework has proven particularly valuable. Numerous studies examining internet use, mobile technology diffusion, and digital financial behavior have employed Pew's classifications to investigate generational variation in adoption patterns, digital confidence, and risk perception (Pew Research Centre, 2020). The consistent application of this framework enables researchers to systematically compare how different cohorts respond to technological change, making it especially appropriate for analyzing adoption dynamics in rapidly evolving digital ecosystems such as digital payment systems.

According to the Pew Research Center, Generation X consists of individuals born between 1965 and 1980, Millennials were born between 1981 and 1996, and Generation Z includes individuals born from 1997 onward (Pew Research Center, 2023). These cohorts differ substantially in their exposure to digital technologies and the socio-economic environments that shaped their formative years. Generation X largely encountered digital technologies during adulthood, adapting to the proliferation of personal computers, the internet, and mobile communication technologies primarily in professional or transactional contexts (Pew Research Center, 2019b). As a result, their digital engagement tends to be pragmatic and goal-oriented, with greater emphasis on functionality, reliability, and institutional trust.

Millennials, by contrast, experienced the transition from analogue to digital environments during adolescence and early adulthood. This cohort witnessed the rapid diffusion of the internet, the emergence of social media, and the early development of online and mobile financial services. Their formative experiences include adapting to technological change while actively integrating digital tools into social, educational, and economic activities (Jayatissa, 2023). Consequently, Millennials often display a balanced orientation toward digital technologies, valuing both convenience and experiential aspects of use, while also demonstrating awareness of digital risks and institutional constraints.

Generation Z represents the first cohort to grow up in a fully digital ecosystem characterized by continuous internet connectivity, ubiquitous smartphone use, and widespread reliance on mobile applications for communication, entertainment, and financial activities. For this cohort, digital technologies are not perceived as innovations but as embedded components of everyday life. Empirical research consistently demonstrates that Generation Z exhibits high levels of digital literacy, rapid adaptation to new technologies, and strong integration of digital tools into daily routines (Pew Research Center, 2019a; Y. Wang et al., 2023). These characteristics have significant implications for digital payment adoption, as digital transactions are often perceived as default rather than optional behaviors.

These generational distinctions are particularly salient in the study of digital payment adoption. A substantial body of research indicates that younger cohorts, particularly Millennials and Generation Z, exhibit higher adoption rates and more frequent use of digital payment solutions than older cohorts (Jayatissa, 2023). Higher levels of technological familiarity, digital confidence, and habitual technology use among younger users contribute to stronger adoption intentions and faster integration of digital payments into everyday financial behavior. These cohorts are more likely to perceive digital payment systems as convenient, efficient, and compatible with their lifestyles, reinforcing sustained usage.

In contrast, Generation X users often exhibit more cautious adoption behavior. Although many individuals in this cohort actively use digital technologies, their adoption decisions are often shaped by heightened concerns about security, privacy, system reliability, and institutional credibility. Empirical research suggests that older cohorts tend to evaluate digital financial technologies through a risk–benefit lens, placing particular emphasis on regulatory safeguards, transaction security, and trust in service providers (Priporas et al., 2017;; Pew Research Center, 2019b; Han & Ko, 2025). These concerns may slow adoption or limit usage frequency, even when functional benefits are recognized.

Such generational differences indicate that the determinants of digital payment adoption are unlikely to exert uniform effects across age groups. Rather, adoption drivers and barriers interact with cohort-specific experiences, technological socialization, and risk perceptions. These insights reinforce the need to explicitly incorporate generational classification into empirical models of digital payment adoption, particularly when examining heterogeneous populations in emerging economies.

In designing the research scope of the present study, both theoretical relevance and methodological feasibility have been carefully considered. The analysis is deliberately limited

to Generation X, Millennials, and Generation Z. From a theoretical standpoint, these cohorts represent distinct trajectories of digital socialization, enabling meaningful comparison of behavioral responses to digital payment technologies. From a practical perspective, these cohorts constitute the most economically active segments of the population and account for the majority of digital payment users in Sri Lanka and comparable emerging economies.

The exclusion of Baby Boomers from the analytical sample is a deliberate methodological choice rather than a theoretical omission. While Baby Boomers play an important role in broader discussions of ageing and technology adoption, empirical evidence suggests that their participation in digital payment ecosystems remains comparatively limited in many developing contexts (Pew Research Center, 2019b). This lower level of engagement can result in insufficient sample sizes for robust statistical comparison, particularly in multi-group analytical techniques such as Partial Least Squares Structural Equation Modelling, where adequate group sizes are essential to ensure reliable parameter estimates (Lamberti & Rocca, 2025). Excluding this cohort, therefore, enhances statistical power while maintaining alignment with the study's research objectives.

Accordingly, this study adopts the Pew Research Centre's generational classification to categories respondents into Generation X, Millennials, and Generation Z. These cohorts serve as grouping variables in the multi-group analysis to examine whether the relationships between UTAUT2 constructs and digital payment adoption differ across generations in Sri Lanka. By applying a standardized and internationally recognized generational framework, the study ensures methodological transparency, facilitates comparison with prior research, and strengthens the internal and external validity of its findings.

Moreover, the use of the Pew framework enables the study to balance global comparability with local contextual relevance. Although generational experiences are shaped by country-specific conditions, Pew's classification provides a common analytical language for examining age-based behavioral differences across diverse settings (Pew Research Center, 2015). This balance is particularly important in emerging economies such as Sri Lanka, where rapid digital transformation coexists with pronounced generational diversity and uneven access to technological resources.

In summary, adopting the Pew Research Centre's generational classification enhances the conceptual coherence, methodological rigor, and analytical depth of the present study. By clearly defining generational boundaries and explicitly linking them to differences in technological exposure, behavioral tendencies, and adoption patterns, this framework

provides a robust foundation for examining generational variation in digital payment adoption. The approach directly supports the study's empirical strategy and contributes to a more nuanced understanding of how digital financial innovations are adopted across age groups in the Sri Lankan context.

1.6 Digital payment adoption in the Sri Lankan context

Sri Lanka offers a distinctive and timely context for examining digital payment adoption, given its ongoing digital transformation and evolving financial ecosystem. As a lower-middle-income country transitioning toward a more digitized economy, Sri Lanka has experienced substantial changes in its payment infrastructure over the past decade. The increasing penetration of smartphones, expansion of mobile broadband connectivity, and widespread availability of affordable digital devices have created favorable conditions for the diffusion of digital payment solutions. According to the International Telecommunication Union, (2022), mobile internet penetration in Sri Lanka has increased steadily, supporting the growth of mobile-based financial services and digital transactions.

In parallel with technological advancements, national policy initiatives have played a critical role in promoting digital payments as part of Sri Lanka's broader digital economy agenda. The government has prioritized digitalization to enhance economic efficiency, improve service delivery, and strengthen financial inclusion. These objectives are reflected in policy frameworks such as the National Digital Economy Strategy and the Digital Government Policy, which emphasize interoperable digital platforms and cashless transaction mechanisms (ICTA, 2021). As a result, digital payment adoption in Sri Lanka must be understood within a broader institutional and policy environment rather than as a purely consumer-driven phenomenon.

From a regulatory perspective, the Central Bank of Sri Lanka (CBSL) has been instrumental in shaping the country's digital payment landscape. Over recent years, CBSL has introduced and supported initiatives to modernize the national payment system, enhance interoperability, and reduce reliance on cash. Key developments include the expansion of the LankaPay network, the introduction of the National QR Code Standard (LANKAQR), and the promotion of real-time payment systems enabling seamless fund transfers across financial institutions (Central Bank of Sri Lanka, 2022). These initiatives reflect a strategic effort to create an inclusive and efficient payment ecosystem that supports both consumers and merchants.

Institutional collaboration between banks, fintech firms, and government agencies has further accelerated the availability of digital payment services. Mobile banking applications, digital wallets, QR-based payment platforms, and government-backed systems such as GovPay have expanded rapidly in recent years. GovPay represents a significant milestone in Sri Lanka's digital finance journey by providing a unified platform for citizens to make payments to government institutions. According to government data, by the end of 2025 GovPay had surpassed LKR 2 billion in cumulative transaction value, signaling increasing acceptance of digital payment channels for both public and private transactions. (PMD, 2025).

Despite these advancements, digital payment adoption in Sri Lanka remains uneven across demographic, geographic, and socio-economic groups. Empirical studies consistently identify a gap between awareness and actual usage of digital payment solutions. While familiarity with mobile banking and card payments has increased, cash remains dominant in routine transactions, particularly in informal markets and rural regions (J J Weerakkody Reg No et al., 2021). This pattern indicates that adoption barriers extend beyond technological availability and include behavioral, psychological, and contextual factors.

Sri Lanka-focused research identifies perceived usefulness and convenience as key drivers of digital payment adoption. Digital payment solutions are valued for their ability to reduce transaction time, minimize the need for physical cash, and improve financial management through digital records. These benefits align with the performance expectancy construct of UTAUT2 and have been shown to significantly influence e-wallet adoption among Sri Lankan users, particularly Millennials (Vitharana, 2024). However, functional advantages alone have not ensured widespread adoption across all population segments.

Concerns related to security, trust, and system reliability remain major inhibitors in the Sri Lankan context. Studies report that apprehension about fraud, data privacy, and transaction failures discourages users from adopting digital payment platforms, especially for high-value transactions (Weerakkody et al., 2021; Munaweera, 2024). Trust in financial institutions and payment platforms, therefore, plays a critical role in shaping adoption intentions. These findings are consistent with the broader emerging-economy literature, which emphasizes the influence of perceived risk and institutional trust on technology adoption.

Age-related differences in digital payment adoption are increasingly evident in Sri Lanka. Empirical evidence indicates that younger users demonstrate higher levels of digital payment adoption compared to older age groups, largely due to differences in digital familiarity, perceived risk, and trust in payment platforms (Weerakkody et al., 2021; Munaweera, 2024).

While digital communication and social media usage are widespread across generations, the adoption of digital payment systems remains uneven, highlighting a persistent generational gap in usage behavior. Younger users, particularly Millennials and Generation Z, demonstrate greater openness toward mobile banking applications, digital wallets, and QR-based payment systems due to higher digital literacy and routine exposure to mobile technologies ((Yapabandara & Nagendrakumar, 2022). In 2021, 64.1 per cent of Sri Lankans reported using digital payments, representing a notable increase from 55 per cent in 2017, with adoption concentrated among younger cohorts (Yapabandara & Nagendrakumar, 2022).

In contrast, older users, particularly members of Generation X, exhibit more cautious adoption behavior. While not digitally excluded, their adoption decisions are shaped by perceived complexity, lower confidence in navigating digital interfaces, and heightened concerns about security and privacy (Rathnasiri et al., 2024). These users often require stronger facilitating conditions, including institutional assurance, user support, and regulatory clarity, before fully adopting digital payment solutions. This pattern underscores the relevance of effort expectancy and facilitating conditions in explaining adoption behavior among older cohorts.

Sri Lanka's socio-economic diversity further amplifies generational contrasts in digital payment usage. Urban residents generally have better access to reliable internet connectivity and digital infrastructure, supporting regular use of digital payments. In contrast, adoption in semi-urban and rural areas remains constrained by limited infrastructure, lower digital literacy, and a continued preference for cash-based transactions (Gunawardhana & Dhashantha, 2025). These contextual factors interact with generational characteristics, shaping how different age groups perceive and engage with digital payment technologies.

Empirical evidence also suggests that behavioral drivers differ across generations. For instance, Nasiketha et al., (2023) find that perceived risk, performance expectancy, and effort expectancy significantly influence digital payment adoption among Sri Lankan youth, while social influence plays a less prominent role. This indicates that generational cohorts respond differently to adoption determinants, reinforcing the need for generationally differentiated analysis.

Despite the growing relevance of digital payments in Sri Lanka, existing empirical research remains limited in scope and analytical depth. Many studies focus on specific technologies without adopting comprehensive theoretical frameworks, and few employs advanced techniques, such as multigroup analysis, to examine generational variation.

Moreover, several studies rely on samples dominated by young adults, limiting the generalizability of findings across age cohorts (Nasiketha et al., 2023).

Accordingly, Sri Lanka represents valuable research setting for examining digital payment adoption through an integrated theoretical lens. By combining UTAUT2 with Generational Cohort Theory, the present study addresses the need for context-specific, theory-driven analysis that captures behavioral heterogeneity across age groups. This approach contributes to academic literature and offers policy-relevant insights for designing inclusive digital payment strategies tailored to generational needs in Sri Lanka.

1.7 Synthesis of literature and identification of research gaps

The preceding review of the literature demonstrates that substantial progress has been made in understanding digital payment adoption from global, emerging-economy, and theoretical perspectives. Across diverse contexts, prior studies consistently indicate that digital payment adoption is shaped by a combination of functional, behavioral, and contextual factors. These include perceived usefulness, ease of use, trust, security, social influence, and facilitating conditions, which together influence consumers' willingness to adopt and continue using digital payment solutions. Technology acceptance frameworks have played a central role in organizing these determinants and explaining adoption behavior in a systematic, theory-driven manner.

Among the available theoretical models, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) has emerged as one of the most comprehensive frameworks for analyzing consumer technology adoption. By incorporating performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit, UTAUT2 captures both utilitarian and experiential dimensions of digital payment usage (Venkatesh et al., 2012). Empirical studies conducted after 2019 confirm the strong explanatory power of UTAUT2 in predicting digital payment adoption across both developed and emerging economies (Fernandes & Oliveira, 2021; Patnaik et al., 2023). Nevertheless, recent evidence suggests that additional behavioral and psychological factors, such as perceived risk and emotional responses to technology use, also influence adoption behavior, indicating that the literature has not yet fully captured the complexity of digital payment adoption dynamics.

The first major research gap relates to the partial and fragmented application of the UTAUT2 framework in prior studies. Although UTAUT2 is widely cited, many empirical

investigations employ reduced versions of the model, frequently excluding key constructs such as habit and price value. This selective application constrains the ability to explain sustained usage and long-term engagement with digital payment systems, particularly in voluntary, consumer-oriented contexts. Recent systematic reviews emphasize that excluding these constructs limits insights into post-adoption behavior and the routinization of digital payments (Alalwan et al., 2020; Fernandes & Oliveira, 2021). Accordingly, there remains a clear need for studies that apply the full UTAUT2 framework to provide a more comprehensive understanding of digital payment adoption.

A second important gap concerns the limited theoretical treatment of generational differences in digital payment adoption research. While age is commonly included as a demographic control variable, many studies do not examine generational cohorts as a central analytical dimension. Recent scholarship highlights those differences in digital exposure, learning patterns, and risk perception across generations can systematically shape how individuals respond to adoption drivers (Wang et al., 2023). However, the absence of explicit generational analysis restricts understanding of behavioral heterogeneity and masks cohort-specific adoption mechanisms. This limitation is particularly relevant in financial technologies, where trust, habit formation, and technological self-efficacy differ markedly across age groups.

The third gap concerns the underrepresentation of the Sri Lankan context in theory-driven research on digital payment adoption. Although several post-2019 studies have examined mobile banking, e-wallets, and QR-based payment systems in Sri Lanka, much of this work remains descriptive or focuses on single technologies without embedding analysis within comprehensive adoption frameworks (Weerakkody et al., 2021; Rathnasiri et al., 2024). Furthermore, many Sri Lanka-focused studies rely on demographically narrow samples, limiting the generalizability of their findings. As a result, there is a shortage of robust empirical evidence on digital payment adoption behavior in Sri Lanka that uses established theoretical models.

Closely related to this limitation is the scarcity of generationally comparative studies employing advanced analytical techniques. Very few empirical investigations in Sri Lanka examine whether adoption determinants differ across Generation X, Millennials, and Generation Z using multi-group analysis within a structural equation modelling framework. Recent international studies demonstrate that failing to compare generational cohorts can obscure meaningful differences in how adoption drivers operate across age groups (Patnaik et al., 2023; Y. Wang et al., 2023). Given Sri Lanka’s socio-economic diversity and uneven

pace of digital transformation, the absence of generational comparison represents a significant methodological and contextual gap.

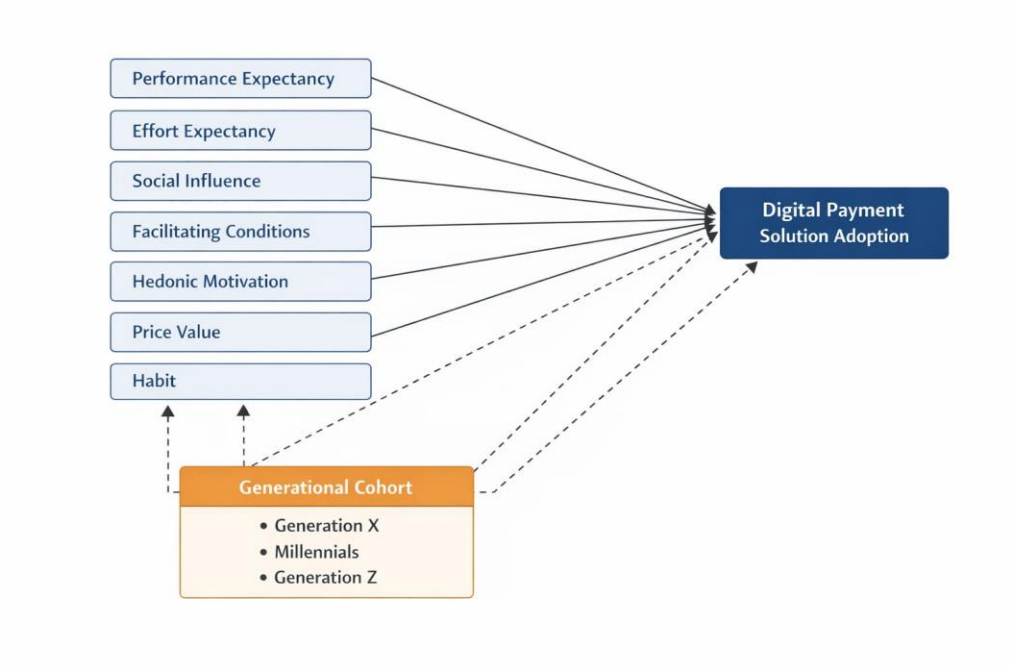
Another limitation identified in the literature is the predominant focus on behavioral intention rather than actual or continued use of digital payment solutions. While intention is a useful predictor of behavior, recent research argues that usage-oriented measures provide more accurate insights in contexts where digital payment systems are already available and increasingly embedded in daily life (Mensah, 2024). Limited attention to habitual and sustained use restricts understanding of long-term adoption dynamics, particularly among younger cohorts for whom digital payments may already form part of routine financial behavior.

Taken together, the reviewed literature reveals clear gaps across theoretical, methodological, and contextual dimensions. Specifically, there is a need for research that *(i) applies the full UTAUT2 framework*, *(ii) explicitly incorporates generational perspectives using post-2019 empirical evidence*, *(iii) focuses on underexplored emerging-economy contexts such as Sri Lanka*, and *(iv) examines digital payment adoption in terms of actual and continued use rather than intention alone*.

In response to these gaps, the present study proposes an integrated conceptual framework that combines UTAUT2 as the primary explanatory model with Generational Cohort Theory as a supporting analytical lens. By positioning digital payment solutions adoption as the dependent variable and examining generational differences through multi-group analysis, this study directly addresses the limitations identified in prior research. This integrated approach extends digital payment adoption literature in an emerging-economy context and provides practical insights for policymakers and financial institutions seeking to promote inclusive and sustainable digital payment adoption in Sri Lanka. The following chapter builds on this synthesis by presenting the conceptual framework and hypotheses derived from the identified research gaps.

Figure 3

Integrated conceptual framework of digital payment adoption across generational cohorts



Source: Compiled by the author developed using ChatGPT (OpenAI) based on UTAUT2 (Venkatesh et al., 2012) and Generational Cohort Theory

2. Methodology

This chapter presents the methodological framework for empirically examining the determinants of digital payment adoption in Sri Lanka, with particular emphasis on how these determinants vary across generational cohorts. As established in literature review, prior literature consistently demonstrates that technology acceptance models particularly the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) provide strong theoretical foundations for explaining adoption outcomes across diverse technological and institutional contexts.

Building on these well-established theoretical and empirical foundations, the present study adopts UTAUT2 as the primary analytical framework and integrates Generational Cohort Theory to capture heterogeneity in digital payment solutions adoption across Generation X, Millennials, and Generation Z. The literature review revealed a limited number of empirical studies that simultaneously apply UTAUT2 and generational cohort analysis to digital payment solutions adoption in emerging economies, particularly in the Sri Lankan context. This identified gap provides the empirical motivation for the present study.

Given the strong theoretical expectations regarding the nature of the relationships between UTAUT2 constructs and adoption outcomes, this study formulates directional research hypotheses, specifying the expected positive effects of the independent variables on digital payment solutions adoption. The use of directional hypotheses is appropriate when prior theory and empirical evidence provide clear justification for anticipating the direction of relationships under investigation. Accordingly, the study focuses on testing theoretically grounded directional hypotheses rather than formulating and testing null hypotheses.

This chapter, outlines the research approach, research design, research strategy, population and sampling procedures, data collection methods, measurement and operationalization of variables, analytical model specification, and data analysis techniques employed to test the proposed hypotheses. Each methodological decision is grounded in peer-reviewed academic literature to ensure methodological rigor, transparency, and coherence between the theoretical framework established in literature review and the empirical investigation.

2.1 Research approach and design

This study adopts a *quantitative research approach*, with the primary objective of testing theoretically derived hypotheses and examining statistically significant relationships among latent constructs. Quantitative approaches are particularly suitable for theory-driven studies that rely on numerical measurement and multivariate statistical techniques.

UTAUT2 specifies structured causal relationships among latent constructs that require quantitative operationalization and empirical validation (Venkatesh et al., 2012). Prior empirical studies on digital payment and fintech adoption predominantly employ quantitative approaches, ensuring comparability and methodological consistency across studies (Fernandes & Oliveira, 2021). Accordingly, the quantitative approach provides a robust methodological foundation for analyzing the adoption of digital payment solutions in Sri Lanka.

The study employs a *cross-sectional survey research design*. A cross-sectional design involves collecting data from a sample of respondents at a single point in time and is widely used in technology adoption research to examine relationships between multiple constructs simultaneously.

This design is appropriate for the present study for several reasons. First, the research focuses on identifying the determinants of digital payment solutions adoption rather than examining changes in adoption over time, rendering longitudinal analysis unnecessary. Second, cross-sectional designs facilitate efficient data collection from diverse populations, particularly in emerging economies where access to respondents may be constrained. Third, the design enables comparison of adoption determinants across different generational cohorts within the same temporal context.

Empirical evidence indicates that prior UTAUT2-based studies on mobile and digital payment adoption frequently employ cross-sectional survey designs and demonstrate their suitability for testing adoption models using structural equation modelling techniques (Fernandes & Oliveira, 2021; Weerakkody et al., 2021). Thus, the selected research design aligns with both theoretical requirements and established empirical practice.

2.2 Research strategy

To operationalize the research design, this study adopts a survey research strategy. Survey research enables the systematic collection of standardized data from a large number of respondents and is particularly effective for examining adoption outcomes related to digital technologies (Malhotra, 2019).

The use of a structured questionnaire enables consistent measurement of UTAUT2 constructs and facilitates statistical comparisons across generational cohorts. Survey-based strategies are widely used in digital payment adoption research because they efficiently and reliably capture diverse user experiences (Weerakkody et al., 2021).

2.3 Hypotheses formation

Based on the literature review and the conceptual framework developed in Chapter 2, this study formulates a set of directional research hypotheses to empirically examine the determinants of the adoption of digital payment solutions in Sri Lanka. The hypotheses are derived from UTAUT2 (Venkatesh et al., 2012), which provides clear theoretical expectations regarding the positive influence of its core constructs on adoption outcomes. Generational Cohort Theory is incorporated to examine whether these relationships differ across age-based cohorts.

- *H_1: Performance expectancy positively influences the adoption of digital payment solutions*.
- *H_2: Effort expectancy positively influences the adoption of digital payment solutions.*
- *H_3: Social influence positively influences the adoption of digital payment solutions.*
- *H_4: Facilitating conditions positively influence the adoption of digital payment solutions.*
- *H_5: Hedonic motivation positively influences the adoption of digital payment solutions*.
- *H_6: Price value positively influences the adoption of digital payment solutions.*
- *H_7: Habit positively influences the adoption of digital payment solutions.*
- *H_8: The effects of UTAUT2 constructs on digital payment solutions adoption differ significantly across generational cohorts (Generation X, Millennials, and Generation Z).*

H_1-H_7 hypotheses are directional and measure each UTAUT2 construct's influence on digital payment adoption. H_8 is a generational-related hypothesis that measures how these influences vary across generations. This hypothesis was examined using a multigroup analysis, an appropriate method for comparative adoption studies.

2.4 Population and sampling

Target population

The target population of this study consists of individual consumers in Sri Lanka who use or have access to digital payment solutions, including mobile banking applications, e-wallets, and QR-based payment systems. The population is restricted to Generation X (1965-1980), Millennials (1981-1996), and Generation Z (1997-2012), as defined by the Pew Research Center, (2023).

Table 2

Generational cohort classification

Generation	Age group
Generation X (1965-1980)	45-60
Millennials (1981-1996)	29-44
Generation Z (1997-2012)	18-28

Source: Compiled by author based on Pew Research Center, (2023)

This study considers only individuals aged 18 years and above from Generation Z (1997-2012), as digital banking access and independent financial decision-making are typically restricted to adults. Therefore, respondents below the age of 18 were excluded to ensure the relevance and validity of digital payment adoption measures.

Sampling technique

A *convenience sampling technique* is employed. Convenience sampling is commonly used in technology adoption research, particularly in emerging economy contexts where comprehensive sampling frames are unavailable.

The use of convenience sampling is justified on three grounds. First, there is no centralized database of digital payment users in Sri Lanka. Second, the primary objective of the study is theory testing rather than parameter estimation for a population. Third, prior UTAUT2-based studies employing PLS-SEM frequently rely on non-probability sampling while still generating theoretically meaningful insights.

Data collection method

Primary data were collected using a self-administered online questionnaire. Online surveys are particularly suitable for studies on digital payment solutions, as respondents are expected to have internet access and familiarity with digital platforms.

The questionnaire was distributed via social media platforms, email, and messaging applications commonly used in Sri Lanka. Participation was voluntary; respondents were informed of the study's academic purpose, and no personally identifiable information was collected, ensuring anonymity and ethical compliance.

Sample size determination and adequacy

The target sample size for this study was set at 150 respondents. This threshold was determined based on prior empirical research employing Partial Least Squares Structural Equation Modelling (PLS-SEM), which indicates that a sample size between 100 and 150 observations is adequate for models of moderate complexity, particularly when multi-group analysis is applied. Considering the number of latent constructs included in the UTAUT2 framework and the study's objective of comparing digital payment adoption across generational cohorts, a target of 150 respondents was deemed sufficient to ensure reliable parameter estimation and acceptable statistical power. Following data collection and refinement procedures, a total of 157 valid responses were retained for final analysis. The increase beyond the initially targeted sample size resulted from the inclusion of additional complete and consistent responses that met the study's selection criteria after data screening. The final sample size of 157 respondents therefore exceeds the minimum requirement and enhances the robustness of the empirical analysis, supporting the suitability of PLS-SEM and multi-group analysis for examining generational differences in digital payment solutions adoption.

2.5 Measurement and operationalization of variables

Dependent variable

Digital Payment Solutions Adoption is operationalized as actual and continued use of digital payment solutions. Measurement items capture frequency of use, integration into routine financial activities, and sustained adoption over time.

Y = Digital payment solution adoption

This operationalization is consistent with prior adoption studies focusing on actual usage outcomes (Fernandes & Oliveira, 2021).

Independent variables

The independent variables are derived from UTAUT2 (Venkatesh et al., 2012):

X_1 = Performance expectancy
X_2 = Effort expectancy
X_3 = Social influence
X_4 = Facilitating conditions
X_5 = Hedonic motivation
X_6 = Price value
X_7 = Habit

All constructs are measured using reflective multi-item scales adapted from validated instruments and assessed using a five-point Likert scale.

Grouping variable

Generational cohort is used as a categorical grouping variable (Generation X, Millennials, Generation Z) for multi-group analysis rather than as a direct predictor.

2.6 Analytical model specification

The study's analytical framework is based on *Partial Least Squares Structural Equation Modelling (PLS-SEM)*. PLS-SEM is suitable for predictive research and for complex latent-variable models and does not impose strict assumptions about data normality.

Conceptually, the model is specified as:
Digital Payment Solutions Adoption = f (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit)

The analytical model defines digital payment solutions adoption as a function of several behavioral and technological factors based on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). These factors include performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit.

This specification does not represent a deterministic mathematical equation as in classical regression. In Partial Least Squares Structural Equation Modelling (PLS-SEM), it describes structural relationships among latent variables. The notation f(·) shows that

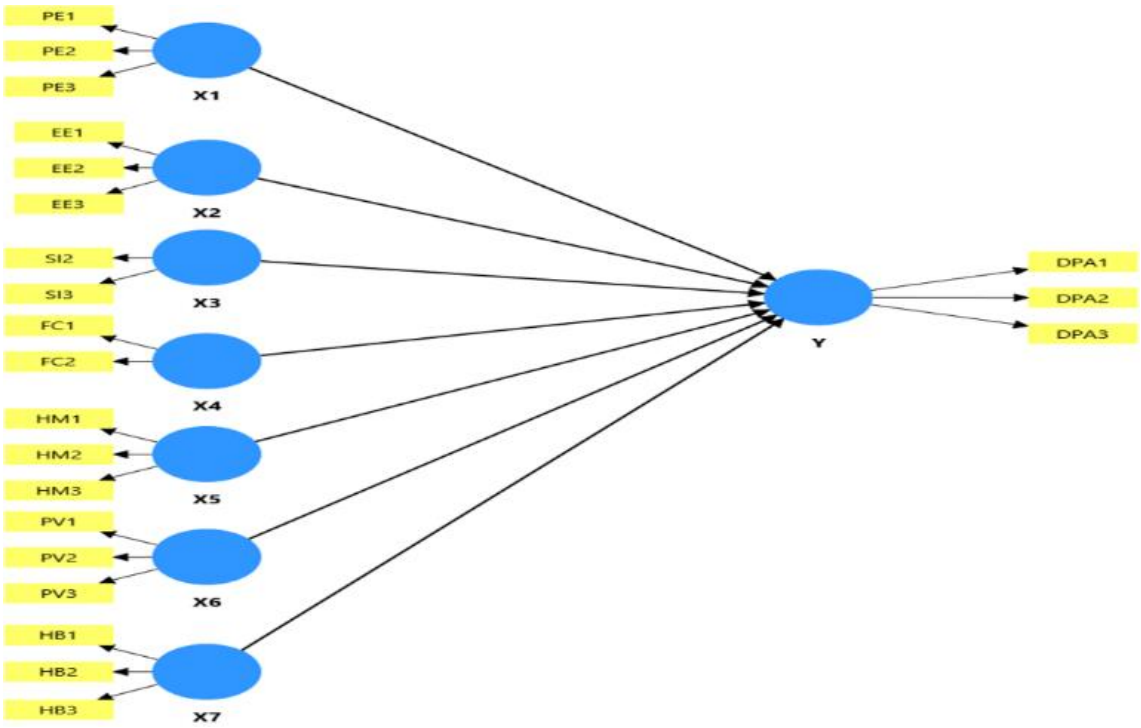
adoption is predicted by the combined effects of the constructs, with the strength and direction of these relationships estimated empirically.

PLS-SEM focuses on prediction and does not require strict assumptions about data normality or error distribution. Relationships between the constructs and adoption are evaluated using estimated path coefficients, which indicate the magnitude and direction of each construct's influence. The model's explanatory power is measured by the coefficient of determination (R^2), and the relative contribution of each predictor is assessed through effect size measures.

Specifying the model in this functional form captures the complex, multidimensional nature of digital payment adoption. This approach is well-suited for analyzing latent constructs measured by multiple indicators and supports the study's theory-driven and predictive objectives.

Figure 4

Developed PLS-SEM model diagram



Source: Compiled by author using SmartPLS 4+

Data analysis tools and hypothesis testing procedure

Data analysis was conducted using Microsoft Excel and SmartPLS software. Microsoft Excel was employed for initial data screening, coding of survey responses, handling missing values, and generating descriptive statistics. Following data refinement, the cleaned dataset was imported into SmartPLS for further analysis. SmartPLS was used to assess the measurement model, estimate the structural model, and conduct multi-group analysis to examine generational differences in digital payment adoption (Hair et al., 2022).

The empirical analysis followed the two-step approach recommended for Partial Least Squares Structural Equation Modelling (PLS-SEM), comprising measurement model evaluation and structural model assessment. The measurement model was assessed to ensure reliability and validity of the latent constructs. Indicator reliability was evaluated using outer factor loadings, while internal consistency reliability was assessed through Cronbach's alpha and composite reliability values. Convergent validity was examined using the average variance extracted (AVE), and discriminant validity was assessed using the heterotrait–monotrait (HTMT) ratio.

Following satisfactory measurement model evaluation, the structural model was assessed to test the proposed hypotheses. In line with the theory-driven and prediction-oriented nature of PLS-SEM, hypothesis testing focused on evaluating the magnitude, direction, and statistical significance of the estimated path coefficients rather than on formal null hypothesis testing. The relationships between UTAUT2 constructs and digital payment solutions adoption were assessed based on standardized path coefficients (β), t-statistics, and p-values. Hypotheses were accepted or rejected at a 5 per cent significance level. Statistical significance was assessed using a bootstrapping procedure with resampling, consistent with established PLS-SEM guidelines (Hair et al., 2022).

To address the study's research question concerning generational differences, multi-group analysis (MGA) was conducted by categorizing respondents into Generation X, Millennials, and Generation Z. This approach enabled the examination of whether the relationships between UTAUT2 constructs and digital payment adoption differ significantly across generational cohorts, thereby providing empirical evidence on the moderating role of generation in digital payment adoption.

Ethical considerations

Ethical standards were maintained throughout the research process. Participation was voluntary, informed consent was obtained, anonymity and confidentiality were ensured, and all collected data were used solely for academic purposes.

3. RESULTS AND DATA ANALYSIS

3.1 Descriptive statistics

Sample profile and generational composition

After reviewing and cleaning the data, 157 valid responses remained. Respondents were divided into three generations using the Pew Research Center's guidelines. Table 03 and Figure 05 show 49 participants from Generation X (31%), 54 Millennials (35%), and 54 from Generation Z (34%). Because the groups are similar in size, the dataset is well-suited for multi-group analysis, and each group meets the minimum sample size required for Partial Least Squares Structural Equation Modelling (PLS-SEM).

Having similar group sizes makes it easier to compare generations and better understand differences in how they adopt digital payments.

Table 3

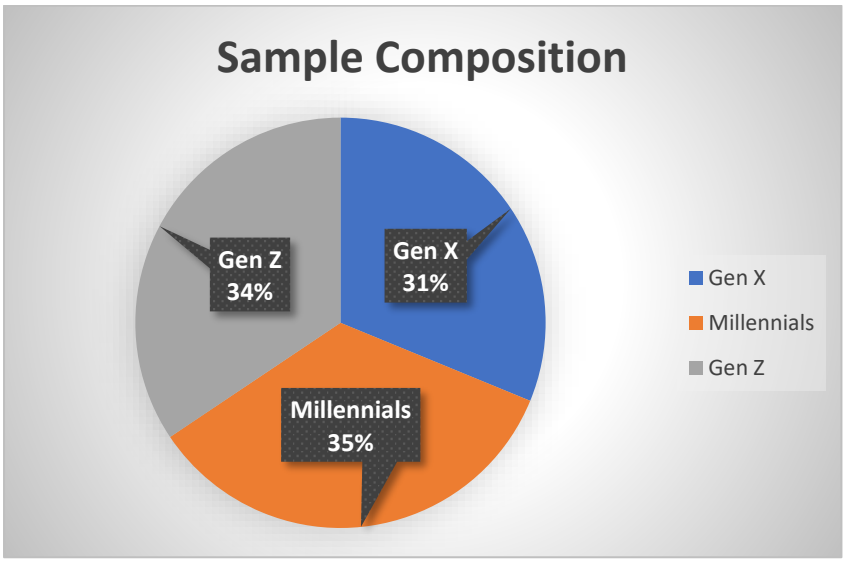
Sample composition

Generation	Responses
Gen X (45-60)	49
Millennials (29-44)	54
Gen Z (18-28)	54

Source: Compiled by author based on survey responses

Figure 5

Sample composition



Source: Compiled by author using Microsoft excel based on survey responses

Descriptive statistics of utaut2 constructs

Table 04 presents the main descriptive statistics for the study's key constructs, measured on a five-point Likert scale. The table lists the mean and standard deviation for each construct, based on the combined items for each variable.

Table 4

Descriptive statistics of variables

Variable	Mean	Standard deviation
Performance expectancy	**4.337666667**	**0.883333333**
Effort expectancy	**4.293**	**0.958333333**
Social influence	**4.091333333**	**1.086333333**
Facilitating conditions	**4.499**	**0.761333333**
Hedonic motivation	**4.254666667**	**1.015**
Price value	**4.333333333**	**0.897**
Habit	**4.193**	**1.028333333**
Digital payment solution adoption	**4.341666667**	**0.862**

Source: Compiled by author using Microsoft excel based on survey responses

Overall, the results show that respondents mostly agree with the survey items, suggesting they have a positive view of digital payment solutions.

- Facilitating Conditions had the highest average score (M = 4.499, SD = 0.761), indicating that most respondents felt they had sufficient resources, technical support, and infrastructure to use digital payment solutions effectively.
- Performance Expectancy also scored high (M = 4.338, SD = 0.883), showing that respondents agreed digital payment solutions make transactions easier and more efficient.

- Price Value (M = 4.333, SD = 0.897) and Hedonic Motivation (M = 4.255, SD = 1.015) suggest that respondents find digital payment solutions both affordable and enjoyable.
- Effort Expectancy (M = 4.293, SD = 0.958) shows that most people find digital payment platforms easy to learn and use.
- Habit (M = 4.193, SD = 1.028) suggests that using digital payments is now a regular part of life for many respondents, although there is more variation here than in other areas.
- Social Influence had a lower average score (M = 4.091, SD = 1.086), indicating that while social factors play a role, people's decisions to use digital payments depend more on their own opinions and the support they receive.

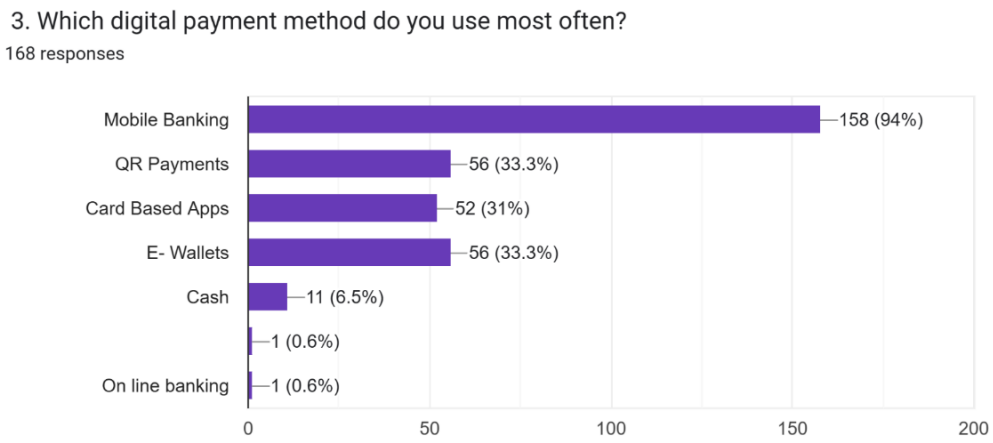
The main outcome, Digital Payment Solution Adoption, had a high average score (M = 4.342, SD = 0.862), showing that most respondents have started using and continue to use digital payment solutions.

Digital payment usage patterns

Figure 06 shows how people use different digital payment methods. Mobile banking is the most popular, with 94% of respondents (n = 158) reporting regular use. This highlights the important role of mobile banking apps in Sri Lanka's digital payment system.

Figure 6

Payment methods used by respondent



Source: Compiled by author based on google form survey responses summary

Other digital payment methods are used less often:

- QR payments and e-wallets were each used by 33.3% of respondents (n = 56),
- Card-based applications were reported by 31% (n = 52).

In comparison, only 6.5% of respondents (n = 11) still use cash, and fewer than 1% use traditional online banking. These findings show a clear shift toward mobile-based digital payments, aligning with Sri Lanka's efforts to go digital.

Overall, the descriptive statistics show that people from all generations in the sample often use and accept digital payment solutions. High average scores for the UTAUT2 constructs suggest that respondents find these solutions useful, easy to use, well-supported, and part of their daily routine. However, the differences in standard deviation, especially for Social Influence and Habit, suggest that the reasons for adopting digital payments may vary between individuals and generations.

These descriptive results set the stage for subsequent parts of the analysis, including assessing the measurement model, analyzing the structural model, and comparing groups. These steps examine how UTAUT2 constructs relate to digital payment adoption among Generation X, Millennials, and Generation Z.

3.2 Measurement Model Assessment

The measurement model was evaluated using guidelines for Partial Least Squares Structural Equation Modelling (PLS-SEM), with a focus on indicator reliability, internal consistency, and construct validity. The assessment followed a step-by-step process to maintain rigor and transparency.

Indicator reliability (outer loadings)

The first step was to check indicator reliability by analyzing the outer loadings of each measurement item on its related latent construct. PLS-SEM guidelines state that indicator loadings of 0.70 or higher are acceptable, indicating that much of the indicator's variance is explained by the construct (Hair et al., 2022).

Table 5

Outer loadings

	Outer loadings
DPA1 <- Y	0.934
DPA2 <- Y	0.963
DPA3 <- Y	0.887
EE1 <- X2	0.938
EE2 <- X2	0.921
EE3 <- X2	0.947
FC1 <- X4	0.896
FC2 <- X4	0.924
FC3 <- X4	0.648
HB1 <- X7	0.872
HB2 <- X7	0.950
HB3 <- X7	0.871
HM1 <- X5	0.858
HM2 <- X5	0.959
HM3 <- X5	0.868
PE1 <- X1	0.817
PE2 <- X1	0.945
PE3 <- X1	0.943
PV1 <- X6	0.911
PV2 <- X6	0.871
PV3 <- X6	0.913
SI1 <- X3	0.489
SI2 <- X3	0.886
SI3 <- X3	0.851

Source: Compiled by author using SmartPLS 4 + analytical tool

As you can see in the Table 05, initial results showed that most indicators had strong outer loadings above the recommended level. However, two indicators had low loadings below 0.70 one for facilitating conditions and one for social influence showing weak reliability. Keeping these indicators could harm the reliability and validity of the constructs.

As a result, these two indicators were removed from the model in accordance with PLS-SEM best practices. Care was taken to make sure that removing them did not affect the content validity of the constructs.

Re-estimation of the measurement model

After removing the low-loading indicators, the measurement model was re-estimated. The updated model showed much better indicator reliability as shows in Table 06, with all remaining indicators having outer loadings above the recommended level. This confirmed that the remaining indicators properly represented their latent constructs.

Table 6

Re-estimated outer loadings

	Outer loadings
DPA1 <- Y	0.935
DPA2 <- Y	0.963
DPA3 <- Y	0.887
EE1 <- X2	0.938
EE2 <- X2	0.921
EE3 <- X2	0.947
FC1 <- X4	0.886
FC2 <- X4	0.945
HB1 <- X7	0.872
HB2 <- X7	0.950
HB3 <- X7	0.871
HM1 <- X5	0.858
HM2 <- X5	0.959
HM3 <- X5	0.868
PE1 <- X1	0.817
PE2 <- X1	0.945
PE3 <- X1	0.943
PV1 <- X6	0.911
PV2 <- X6	0.871
PV3 <- X6	0.913
SI2 <- X3	0.885
SI3 <- X3	0.889

Source: Compiled by author using SmartPLS 4 + analytical tool

Internal Consistency Reliability

Internal consistency reliability was checked using Cronbach's alpha, composite reliability (ρc). As shown in Table X, all constructs had Cronbach's alpha values above 0.70, showing good internal consistency. Composite reliability values ranged from 0.881 to 0.954, confirming strong reliability. These results show that the measurement items consistently measure what they are supposed to. Convergent validity was checked using the average variance extracted (AVE). All constructs had AVEs above 0.50, indicating that each construct explains more than half of the variance in its indicators. This shows that all constructs in the model have adequate convergent validity.

Table 7

Construct reliability and validity measures

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
X1	0.887	0.914	0.930	0.816
X2	0.928	0.928	0.954	0.874
X3	0.730	0.730	0.881	0.787
X4	0.813	0.882	0.912	0.839
X5	0.876	0.883	0.924	0.803
X6	0.880	0.880	0.926	0.807
X7	0.880	0.884	0.926	0.807
Y	0.920	0.921	0.949	0.862

Source: Compiled by author using SmartPLS 4 + analytical tool

In summary, the measurement model demonstrates good indicator reliability, internal consistency, and convergent validity after indicator refinement. Removing the low-loading indicators improved the model's quality without affecting its theoretical basis. These results

confirm that the constructs are measured reliably and validly, providing a solid foundation for further analysis.

Discriminant validity assessment

Discriminant validity was assessed using the heterotrait–monotrait ratio of correlations (HTMT), which is seen as a more reliable and strict way to assess discriminant validity in PLS-SEM than traditional methods (Hair et al., 2022). HTMT values below 0.85 show strict discriminant validity, while values below 0.90 are acceptable for related constructs. HTMT values fall below the conservative threshold of 0.90, indicating adequate discriminant validity among most constructs in the model. This suggests that the latent constructs capture empirically distinct concepts and are not excessively correlated.

However, some pairs of constructs have HTMT values just above 0.90. This is especially true for constructs that are closely related in the UTAUT2 framework, like performance expectancy, effort expectancy, facilitating conditions, and habit. High HTMT values are common in behavioral models where constructs are theoretically close and may overlap. Hair et al., (2022) explains that HTMT values slightly above 0.90 do not necessarily indicate a problem with discriminant validity when the constructs are theoretically distinct and have strong measurement reliability.

Importantly, all constructs demonstrate high internal consistency reliability and strong convergent validity, as evidenced by composite reliability and AVE values above the recommended levels. This means the measurement model is still adequate, even with some high HTMT values. Each construct is also based on well-established theory and measured with different indicators, which supports their conceptual differences to their theoretical relatedness, they remain empirically distinguishable. Therefore, the measurement model demonstrates sufficient discriminant validity to proceed with structural model estimation and hypothesis testing.

Table 8

Heterotrait-monotrait ratio (HTMT) list

	Heterotrait-monotrait ratio (HTMT)
X2 <-> X1	0.988
X3 <-> X1	0.863
X3 <-> X2	0.942
X4 <-> X1	0.992
X4 <-> X2	0.999
X4 <-> X3	0.889
X5 <-> X1	0.907
X5 <-> X2	0.957
X5 <-> X3	0.998
X5 <-> X4	0.926
X6 <-> X1	1.022
X6 <-> X2	1.002
X6 <-> X3	0.935
X6 <-> X4	1.032
X6 <-> X5	0.982
X7 <-> X1	0.852
X7 <-> X2	0.978
X7 <-> X3	0.987
X7 <-> X4	0.884
X7 <-> X5	1.019
X7 <-> X6	0.914
Y <-> X1	0.931
Y <-> X2	0.953
Y <-> X3	0.952
Y <-> X4	0.887
Y <-> X5	0.990
Y <-> X6	0.954
Y <-> X7	0.982

Source: Compiled by author using SmartPLS 4 + analytical tool

3.3 Structural model assessment and hypothesis testing

After confirming the adequacy of the measurement model, the structural model was evaluated to investigate the hypothesized relationships between UTAUT2 constructs and digital payment solution adoption. Consistent with Partial Least Squares Structural Equation Modelling (PLS-SEM) guidelines, the evaluation emphasized the model's explanatory power (R^2), effect sizes (f^2), and the statistical significance of path coefficients through a bootstrapping procedure (Hair et al., 2022).

Explanatory power of the model (R^2)

The explanatory power of the structural model was evaluated using the coefficient of determination (R^2). The results demonstrate that the proposed model effectively accounts for digital payment solution adoption, with an R^2 of 0.871 and an adjusted R^2 of 0.865. These values indicate that approximately 87.1% of the variance in digital payment adoption is explained collectively by the seven UTAUT2 constructs included in the model.

Established PLS-SEM benchmarks classify R^2 values of 0.75, 0.50, and 0.25 as indicative of substantial, moderate, and weak explanatory power, respectively (Hair et al., 2022). Accordingly, the obtained R^2 value reflects substantial explanatory power, demonstrating that the model offers a robust explanation of digital payment adoption behavior in the Sri Lankan context.

Table 9

R-square and adjusted R-square

	R-square	R-square adjusted
Y	0.871	0.865

Source: Compiled by author using SmartPLS 4 + analytical tool

Effect size assessment (f^2)

Beyond explanatory power, effect sizes (f^2) were analyzed to determine the relative contribution of each exogenous construct to digital payment adoption. Effect size thresholds of 0.02, 0.15, and 0.35 correspond to small, medium, and large effects, respectively. (Hair et al., 2022).

The findings show that habit ($f^2 = 0.117$) and performance expectancy ($f^2 = 0.096$) exert the most substantial effects on digital payment adoption, both within the small-to-moderate range. Hedonic motivation also displays a small effect ($f^2 = 0.066$). Conversely, effort expectancy, social influence, facilitating conditions, and price value demonstrate negligible

effect sizes, indicating minimal incremental explanatory contribution when considered with other predictors in the model.

These results indicate that habitual behavior and perceived performance benefits are the primary drivers of digital payment adoption, while the other UTAUT2 constructs have a comparatively weaker influence within the overall model.

Table 10

F-square analysis results

	f-square
X1 -> Y	0.096
X2 -> Y	0.001
X3 -> Y	0.009
X4 -> Y	0.012
X5 -> Y	0.066
X6 -> Y	0.005
X7 -> Y	0.117

Source: Compiled by author using SmartPLS 4 + analytical tool

Hypothesis testing using bootstrapping

A bootstrapping procedure was used to estimate path coefficients, t-statistics, p-values, and confidence intervals for hypothesis testing. In accordance with PLS-SEM methodology, the analysis emphasized the significance, direction, and stability of the estimated path coefficients rather than formal null hypothesis testing (Hair et al., 2022). Relationships were deemed statistically significant when the p-value was less than 0.05 and the 95% confidence interval did not include 0.

Table 11

Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistics (|O/STDEV|)	P values
X1 -> Y	0.313	0.277	0.122	2.571	0.010
X2 -> Y	0.035	0.043	0.149	0.233	0.816
X3 -> Y	0.061	0.063	0.062	0.982	0.326
X4 -> Y	-0.092	-0.106	0.109	0.844	0.399
X5 -> Y	0.260	0.257	0.140	1.863	0.062
X6 -> Y	0.076	0.115	0.144	0.524	0.600
X7 -> Y	0.342	0.343	0.139	2.465	0.014

Source: Compiled by author using SmartPLS 4 + analytical tool

The results indicate that performance expectancy has a positive and statistically significant effect on digital payment adoption (β = 0.313, t = 2.571, p = 0.010). This suggests that individuals are more likely to adopt digital payment solutions when they perceive clear efficiency and usefulness benefits.

Habit also demonstrates a positive and statistically significant relationship with digital payment adoption (β = 0.342, t = 2.465, p = 0.014), confirming that repeated use and behavioral automation are critical factors in sustaining digital payment adoption.

In contrast, effort expectancy, social influence, facilitating conditions, hedonic motivation, and price value do not exhibit statistically significant effects on digital payment adoption, as their p-values exceed 0.05 and their confidence intervals include zero. Although hedonic motivation approaches significance (p = 0.062), it does not satisfy conventional statistical criteria.

Table 12

Directional hypothesis test result

Hypothesis	**Paths**	**Path Coefficient (β)**	**t-value**	**p-value**	**Result**
H1	Performance Expectancy to Digital Payment Adoption	0.313	2.571	0.010	Supported
H2	Effort Expectancy to Digital Payment Adoption	0.035	0.233	0.816	Not Supported
H3	Social Influence to Digital Payment Adoption	0.061	0.982	0.326	Not Supported
H4	Facilitating Conditions to Digital Payment Adoption	−0.092	0.844	0.399	Not Supported
H5	Hedonic Motivation to Digital Payment Adoption	0.26	1.863	0.062	Not Supported
H6	Price Value to Digital Payment Adoption	0.076	0.524	0.60	Not Supported
H7	Habit to Digital Payment Adoption	0.342	2.465	0.014	Supported

Source: Compiled by author using Microsoft excel analytical tool

Confidence Interval Assessment

Bias-corrected bootstrapped confidence intervals further substantiate the robustness of the significant relationships. The intervals for performance expectancy and habit exclude zero, confirming the stability and reliability of these effects. In contrast, the intervals for the remaining constructs include zero, reinforcing the conclusion that these relationships lack statistical support in the current model.

Table 13

Confidence intervals

	Original sample (O)	Sample mean (M)	2.5%	97.5%
X1 -> Y	0.313	0.277	0.047	0.517
X2 -> Y	0.035	0.043	-0.237	0.351
X3 -> Y	0.061	0.063	-0.053	0.190
X4 -> Y	-0.092	-0.106	-0.318	0.113
X5 -> Y	0.260	0.257	-0.017	0.518
X6 -> Y	0.076	0.115	-0.163	0.381
X7 -> Y	0.342	0.343	0.084	0.632

Source: Compiled by author using SmartPLS 4 + analytical tool

Table 14

Bias corrected confidence intervals

	Original sample (O)	Sample mean (M)	Bias	2.5%	97.5%
X1 -> Y	0.313	0.277	-0.036	0.113	0.598
X2 -> Y	0.035	0.043	0.008	-0.240	0.349
X3 -> Y	0.061	0.063	0.002	-0.053	0.191
X4 -> Y	-0.092	-0.106	-0.014	-0.290	0.140
X5 -> Y	0.260	0.257	-0.003	-0.015	0.521
X6 -> Y	0.076	0.115	0.039	-0.239	0.327
X7 -> Y	0.342	0.343	0.001	0.086	0.635

Source: Compiled by author using SmartPLS 4 + analytical tool

Overall, the structural model results demonstrate that digital payment adoption is primarily influenced by *performance expectancy* and *habit*. These findings indicate that users adopt digital payment solutions primarily for perceived functional benefits and habitual use. Other UTAUT2 constructs, such as effort expectancy, social influence, facilitating conditions, hedonic motivation, and price value, do not exert significant direct effects when habitual behavior and performance perceptions are taken into account.

These results are consistent with PLS-SEM's predictive focus and underscore the importance of sustained usage behavior in established digital payment ecosystems. The findings offer a robust empirical basis for the subsequent multi-group analysis, which will assess whether these relationships vary across generational cohorts.

3.3 Multi-group analysis of generational differences

To examine whether the relationships between UTAUT2 constructs and digital payment solution adoption differ across generational cohorts, a multi-group analysis (MGA) was conducted using SmartPLS. Given that SmartPLS allows comparison between only two groups at a time, three separate permutation-based MGA tests were performed: *(i) Generation X versus Millennials*, (*ii) Generation X versus Generation Z*, and *(iii) Millennials versus Generation Z*. This approach is consistent with recommended PLS-SEM practices for analyzing moderating effects of categorical variables such as generation (Hair et al., 2022).

Permutation-based MGA was selected because it provides a robust, nonparametric procedure for assessing whether path coefficients differ significantly across groups. Differences between groups were evaluated based on permutation p-values, with statistical significance assessed at the 5 per cent level. A significant permutation p-value indicates that the strength of the relationship between a given predictor and digital payment adoption differs meaningfully across generational cohorts.

Generation X versus millennials

The comparison between Generation X and Millennials reveals a statistically significant difference in the relationship between X_1 and digital payment adoption ($p = 0.001$). The path coefficient is substantially stronger for Millennials than for Generation X, indicating that this adoption driver plays a more influential role for Millennials. This result suggests that Millennials are more responsive to this factor when adopting digital payment solutions, reflecting their greater familiarity with and reliance on digital financial technologies.

For the remaining constructs, no statistically significant differences were observed between Generation X and Millennials. Although differences in path coefficients exist for some constructs, they are not statistically significant at conventional levels. This finding implies that, aside from X_1, the determinants of digital payment adoption operate similarly for Generation X and Millennials.

Table 15

Path coefficients generation X versus millennials

	Original (Gen X)	Original (Millennials)	Original difference	Permutation mean difference	2.5%	97.5 %	Permutation p value
X1 -> Y	0.118	0.929	-0.811	-0.013	-0.554	0.548	0.001
X2 -> Y	0.045	-0.644	0.689	-0.005	-0.704	0.709	0.062
X3 -> Y	0.013	-0.012	0.025	-0.001	-0.256	0.243	0.839
X4 -> Y	-0.147	0.059	-0.206	-0.013	-0.464	0.469	0.421
X5 -> Y	0.584	0.264	0.320	-0.002	-0.876	0.880	0.656
X6 -> Y	0.268	-0.174	0.442	0.025	-0.785	0.804	0.298
X7 -> Y	0.108	0.615	-0.507	0.006	-0.527	0.546	0.068

Source: Compiled by author using SmartPLS 4 + analytical tool

Generation X versus Generation Z

The comparison between Generation X and Generation Z demonstrates several statistically significant differences. Significant group differences are observed for the relationships between X_1 and digital payment adoption ($p = 0.012$), X_2 and digital payment adoption ($p = 0.004$), X_5 and digital payment adoption ($p = 0.002$), and X_7 and digital payment adoption ($p < 0.001$). In all cases, the effects are notably stronger for Generation Z compared to Generation X.

These results indicate that Generation Z places greater emphasis on several key adoption drivers than Generation X. As Generation Z has grown up in a fully digital environment, these findings suggest greater sensitivity to technology-related, experiential, and behavioral factors when adopting digital payment solutions. In contrast, Generation X appears to evaluate digital payment adoption more conservatively, potentially due to later exposure to digital technologies and greater concerns about risk, complexity, and trust.

No statistically significant differences were observed for the remaining constructs in this comparison, indicating that some adoption drivers exert comparable effects across these two cohorts.

Table 16

Path coefficients generation X versus generation z

	Original (Gen X)	Original (Gen Z)	Original difference	Permutation mean difference	2.5%	97.5%	Permutation p value
X1 -> Y	0.118	0.819	-0.702	0.015	-0.566	0.601	0.012
X2 -> Y	0.045	-0.945	0.990	0.004	-0.620	0.671	0.004
X3 -> Y	0.013	0.091	-0.078	-0.002	-0.336	0.343	0.677
X4 -> Y	-0.147	0.118	-0.264	-0.008	-0.587	0.613	0.370
X5 -> Y	0.584	-0.444	1.027	-0.019	-0.590	0.525	0.002
X6 -> Y	0.268	-0.253	0.521	-0.012	-0.580	0.489	0.060
X7 -> Y	0.108	1.483	-1.374	0.022	-0.706	0.722	0.000

Source: Compiled by author using SmartPLS 4 + analytical tool

Millennials versus generation z

The comparison between Millennials and Generation Z reveals no statistically significant differences across the examined paths. Although variations in path coefficients are observed, none of these differences reach statistical significance based on permutation p-values. This finding suggests that Millennials and Generation Z exhibit broadly similar behavioral responses to the determinants of digital payment adoption.

The absence of significant differences between these two cohorts indicates convergence in digital payment adoption behavior among younger generations. Both Millennials and Generation Z have experienced extensive exposure to digital technologies during formative periods of their lives, which may explain the similarities in how they perceive and respond to drivers of digital payment adoption.

Table 17

Path coefficients millennials versus generation z

	Original (Millennials)	Original (Gen Z)	Original difference	Permutation mean difference	2.5%	97.5 %	Permutation p value
X1 -> Y	0.929	0.819	0.109	-0.004	-0.864	0.790	0.822
X2 -> Y	-0.644	-0.945	0.302	0.000	-1.390	1.327	0.683
X3 -> Y	-0.012	0.091	-0.104	0.003	-0.307	0.316	0.546
X4 -> Y	0.059	0.118	-0.059	-0.040	-1.065	0.963	0.936
X5 -> Y	0.264	-0.444	0.707	-0.023	-1.183	1.103	0.250
X6 -> Y	-0.174	-0.253	0.079	0.021	-0.756	0.792	0.823
X7 -> Y	0.615	1.483	-0.868	0.042	-1.008	1.090	0.129

Source: Compiled by author using SmartPLS 4 + analytical tool

Overall, the multi-group analysis provides strong empirical evidence that generational differences matter, but these differences are primarily driven by contrasts involving Generation X. Significant differences are consistently observed between Generation X and the younger cohorts, particularly Generation Z, while Millennials and Generation Z display largely homogeneous adoption behavior.

These findings support the relevance of Generational Cohort Theory and confirm that generational membership moderates the relationships between selected UTAUT2 constructs and digital payment adoption. The results indicate a clear generational divide between older and younger cohorts, highlighting the importance of considering age-based heterogeneity when analyzing digital payment adoption behavior.

From an analytical perspective, the MGA results complement the structural model findings by showing that the strength of key adoption drivers varies across generations. This

underscores the value of adopting a multi-group analytical approach rather than treating age solely as a control variable. The implications of these generational differences are further discussed in the following chapter, where the results are interpreted in relation to existing theory and prior empirical evidence.

4. COMPARATIVE DISCUSSION OF EMPIRICAL FINDINGS

This chapter examines the study's empirical findings on digital payment adoption, focusing on generational differences in Sri Lanka. Rather than restating theory, it critically assesses how the results align with, extend, or differ from previous research. The discussion is organized around the main outcomes of the structural model and multi-group analysis, ensuring interpretations are directly tied to the study's findings. By integrating UTAUT2 with Generational Cohort Theory, the chapter demonstrates how adoption drivers vary across age groups and reflect broader trends in digital socialization and behavioral change.

4.1 Discussion of overall structural model results

Performance expectancy

Performance expectancy had a positive and statistically significant effect on digital payment adoption, confirming its role as a key determinant in Sri Lanka. This finding aligns with recent research identifying performance benefits such as transaction speed, convenience, and efficiency as primary drivers of adoption (Fernandes & Oliveira, 2021; Liébana-Cabanillas et al., 2022). In emerging economies where cash is still common, digital payments must clearly outperform traditional methods to encourage behavioral change, which explains the strength of this relationship.

This study shows that performance expectancy remains important even as digital payment infrastructure matures. Performance benefits continue to influence ongoing usage, not just initial adoption. In Sri Lanka, the growing use of digital payments across government, e-commerce, and retail is likely reinforcing users' focus on performance. These findings highlight performance expectancy as a consistent and lasting driver of adoption, not just a factor in early stages.

Effort expectancy

Effort expectancy did not have a statistically significant effect on digital payment adoption. While this contrasts with earlier studies that emphasized ease of use as a key driver (Patil et al., 2020; Rathnasiri et al., 2024), it aligns with recent evidence showing usability is less important in mature digital ecosystems (Mensah, 2024; Wang et al., 2023).

This shift reflects technological normalization. As users grow more familiar with mobile applications, usability becomes an expected standard rather than a differentiator. In Sri Lanka,

widespread smartphone uses and familiarity with digital platforms may have reduced perceived complexity, making effort expectancy less influential. These findings support the view that ease of use is now a baseline requirement, rather than an active motivator, for digital payment adoption.

Social influence

The lack of significant social influence suggests that digital payment adoption in Sri Lanka is now more individual-driven than socially motivated. This finding aligns with recent studies showing that peer and family influence declines as digital payments become part of daily financial routines (Linh et al., 2024) . Users increasingly rely on personal experience and perceived utility rather than external validation.

Earlier studies in collectivist or early-adoption contexts found that social influence was a strong predictor (Shaikh & Karjaluoto, 2015). The difference here may reflect Sri Lanka's shift from early adoption to a more mature stage, where social endorsement is less important. These findings support the view that social influence is context-dependent and changes as technologies become established.

Facilitating conditions

Facilitating conditions did not significantly affect digital payment adoption. This result matches studies in contexts where most infrastructural barriers have been resolved (Fernandes & Oliveira, 2021). In Sri Lanka, initiatives like interoperable payment systems and national QR standards have improved access and reduced constraints for most users.

The lack of significance for facilitating conditions suggests that, once basic infrastructure is in place, structural readiness alone does not drive adoption. Behavioral and experiential factors become more important. This highlights the success of infrastructure initiatives and the need to focus on behavioral reinforcement.

Hedonic motivation

Hedonic motivation had a positive, though marginally significant, effect, indicating that enjoyment and experiential value contribute to adoption, though to a lesser extent than functional factors. This aligns with studies showing hedonic elements support adoption, especially among younger users (Patnaik et al., 2023; Mensah, 2024), but remain secondary to performance.

The marginal significance suggests that digital payments in Sri Lanka are mainly utilitarian rather than enjoyable. However, MGA results show that hedonic motivation varies by generation and may become more influential as digital payments connect with lifestyle applications. This finding demonstrates that hedonic motivation is context- and cohort-dependent, not universally influential.

Price value

Price value was not a significant factor in adoption, consistent with recent evidence that low transaction costs and fee-free services reduce the importance of price (Jayatissa, 2023). In Sri Lanka, many digital payment services are subsidized or competitively priced, limiting cost barriers.

This suggests affordability is no longer a primary concern for adoption, shifting the focus to behavioral drivers such as habit and perceived value. The result supports the view that cost sensitivity decreases as digital payments become mainstream.

Habit

Habit was one of the strongest predictors of digital payment adoption, supporting recent findings that habitual use is central to sustained adoption (Mensah, 2024; Wang et al., 2023). Repeated use turns digital payments into routine behavior, reducing effort and encouraging continued use.

The importance of habit suggests that digital payment adoption in Sri Lanka has moved beyond experimentation to become an entrenched behavior. This supports focusing adoption research on actual usage rather than just intention.

4.2 Discussion of generational differences with empirical comparison

Generation X versus millennials

The MGA shows a significant generational difference only for performance expectancy, with Millennials responding more strongly. This aligns with Priporas et al., (2017), who find Millennials actively assess technological benefits due to their transitional digital upbringing.

Generation X's weaker response may reflect reliance on established financial routines and greater risk awareness. This suggests performance-based messaging may be more effective for Millennials than for older cohorts.

Generation X versus generation z

The marked differences between Generation X and Generation Z across several constructs strongly support Generational Cohort Theory. Wang et al., (2023) also find that Generation Z is more sensitive to performance, experiential, and habitual factors.

This study extends previous research by showing these differences in a South Asian context, highlighting that generational digital divides persist even with rapid technological diffusion.

Millennials versus generation z

No significant differences were found between Millennials and Generation Z, indicating behavioral convergence among younger cohorts. This aligns with recent evidence that shared digital exposure leads to similar adoption patterns (Mensah, 2024).

This convergence suggests that future adoption growth may rely more on engaging older cohorts than on further differentiating younger users.

4.3 Theoretical implications

This study provides key theoretical insights for technology adoption research, especially for those using UTAUT2 with generational perspectives. The results confirm UTAUT2 remains a strong framework for explaining digital payment adoption, but show that its constructs differ in importance across generations. This extends UTAUT2 by empirically demonstrating that generational differences significantly influence adoption drivers.

One of the most significant theoretical contributions lies in the strong and consistent role of habit and performance expectancy as determinants of digital payment adoption. While UTAUT2 conceptualizes habit as a key driver of continued use, many prior studies particularly in emerging economies have focused predominantly on behavioral intention rather than actual adoption or usage-oriented outcomes. By positioning digital payment adoption as the dependent variable and identifying habit as a dominant predictor, this study reinforces recent theoretical arguments that adoption research should move beyond intention-based models toward behaviorally embedded explanations. This finding aligns with recent empirical work suggesting that, in mature digital environments, repeated use and routine formation become more influential than initial cognitive evaluations.

In contrast, the lack of significance for effort expectancy and facilitating conditions highlights changes in technology adoption processes. Traditional theories assume ease of use and infrastructure are central, but these findings suggest that once basic familiarity and infrastructure are established, their influence declines. This supports the idea of technological normalization, where usability and access are expected rather than motivating. Theoretically, this means UTAUT2 constructs do not have consistent effects at all stages, emphasizing the need to consider contextual maturity.

Integrating Generational Cohort Theory advances the theoretical framework. While UTAUT2 includes age as a moderator, it does not explain the reasons for age-related differences. This study shows that adoption drivers are influenced by cohort-specific digital socialization, technological exposure, and risk perception. The analysis finds significant differences mainly between Generation X and younger cohorts, especially Generation Z, while Millennials and Generation Z show similar adoption patterns. This supports cohort-based explanations and challenges the idea that age effects are linear or uniform.

The lack of significant differences between Millennials and Generation Z suggests that generational boundaries blur when cohorts share similar digital experiences. This finding refines Generational Cohort Theory by showing that behavioral convergence can occur among digitally native or near-native groups, regardless of generational labels, and Cohort effects are strongest when there are clear differences in technological exposure, as seen between Generation X and younger cohorts.

Overall, this study extends UTAUT2 by showing that its constructs depend on generational context and the maturity of the digital ecosystem. Adoption models should use cohort-based explanations as foundational perspectives, rather than merely as moderators, to better interpret behavioral differences in digital environments.

4.4 Contextual implications for Sri Lanka

In addition to its theoretical contributions, this study provides important insights into the adoption of digital payments in Sri Lanka. The findings show that Sri Lanka is now in a behavior-driven phase, where usage is influenced more by behavioral reinforcement, routine, and perceived benefits than by infrastructure. This marks a shift from earlier stages that focused on access and technological readiness.

The strong influence of performance expectancy suggests that Sri Lankan users continue to evaluate digital payment solutions based on their functional superiority over cash-based ones. Performance expectancy strongly influences Sri Lankan users, who assess digital payments based on advantages over cash, such as speed, convenience, and reliability. These factors are especially important for younger cohorts. Continued innovation and system reliability are essential for maintaining adoption. However, the growing role of habit shows that long-term adoption relies more on repeated use than on ongoing evaluation. Policymakers and institutions should focus on encouraging the routine use of digital payments in daily transactions, and cohorts suggest that Sri Lanka's digital transformation risks becoming uneven if generational disparities are not addressed. Generation X users appear less responsive to experiential and behavioral drivers and may require stronger institutional assurance, clearer communication, and targeted support mechanisms. Without such interventions, older cohorts may remain marginalized within an increasingly digital financial ecosystem.

In contrast, the lack of significant differences between Millennials and Generation Z suggests that a unified policy approach is effective for younger users. For these groups, strategies that reinforce habitual use, such as integrating digital payments into public services, transportation, and retail, are likely to succeed. This convergence also indicates that future adoption growth may rely more on increasing use among older, more cautious segments.

The findings suggest that further investment in digital infrastructure alone may have a limited impact. While expansion is still needed in underserved areas, the lack of significance for facilitating conditions indicates that behavioral barriers are now the main constraint. Policy should therefore focus on building trust, consumer education, and generationally tailored engagement strategies. In Sri Lanka, this could involve targeted digital literacy programs for Generation X, simplified user interfaces, stronger consumer protection, and communication that highlights security and institutional credibility. These measures would support existing infrastructure and encourage broader participation in the digital financial system.

In summary, digital payment adoption in Sri Lanka is mainly driven by performance expectancy and habit, with significant generational effects. The largest differences are between Generation X and younger cohorts, while Millennials and Generation Z show similar behavior. By comparing these findings with previous research, the study offers context-specific insights that advance understanding of digital payment adoption in emerging economies.

CONCLUSION AND RECOMMENDATIONS

This study aimed to identify the factors influencing digital payment adoption in Sri Lanka and to determine whether these factors vary by generational cohort. Using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and Generational Cohort Theory, the research applied Partial Least Squares Structural Equation Modelling (PLS-SEM) and multi-group analysis to examine adoption behavior among Generations X, Millennials, and Z.

The findings show that performance expectancy and habit are the main drivers of digital payment adoption in Sri Lanka. In contrast, effort expectancy, facilitating conditions, price value, and social influence have limited or no impact. This suggests that adoption is now influenced more by behavioral reinforcement and perceived value than by access, usability, or infrastructure.

The multi-group analysis shows that generational differences are most pronounced between Generation X and younger cohorts, especially Generation Z. Millennials and Generation Z display similar adoption behaviors. These results highlight the importance of generational digital socialization and suggest that cohort-based analysis better explains adoption differences than age alone.

Overall, digital payment adoption in Sri Lanka is best described as behavior-driven and generation-sensitive, with sustained usage and routine formation outweighing initial perceptions of ease or availability.

Theoretical contributions of the study

This study offers several clear theoretical contributions to the literature on technology adoption and digital finance.

First, the study refines UTAUT2 by showing that the influence of its constructs depends on both contextual maturity and generational composition. While UTAUT2 identifies seven main adoption drivers, only performance expectancy and habit remain significant in a mature digital payment environment. This challenges the assumption that all UTAUT2 constructs have consistent effects across different contexts and stages of technology adoption.

Second, the study supports a shift from cognition-driven to behavior-driven adoption models. The strong role of habit suggests that digital payment adoption results more from

repeated use than from rational evaluation. This finding aligns with research showing that usage-based outcomes offer better insights than behavioral intention in mature technology contexts.

Third, by combining Generational Cohort Theory with UTAUT2, the study explains why adoption drivers differ across age groups. It shows that generational cohorts respond differently to adoption factors, with Generation X and younger cohorts displaying distinct behaviors. The similarity between Millennials and Generation Z suggests that generational boundaries may blur when cohorts share similar digital experiences.

Finally, the study adds to emerging economy literature by providing strong empirical evidence from Sri Lanka, a context often overlooked in digital payment research. The use of a comprehensive framework and advanced analysis extends the relevance of technology adoption theories beyond developed markets.

Practical and policy implications

These findings have important implications for policymakers, financial regulators, and digital payment service providers in Sri Lanka.

From a policy perspective, the limited impact of facilitating conditions and effort expectancy suggests that expanding infrastructure alone will not accelerate adoption further. While investment in connectivity and interoperability is still needed in underserved areas, policy should increasingly focus on behavioral and trust-based interventions. Promoting routine use through digital public services, recurring payments, and government platforms can strengthen habit formation and increase adoption.

The generational findings underscore the need for age-sensitive digital finance strategies. Generation X is most at risk of partial or inconsistent adoption. Targeted measures for this group should focus on security, regulatory protection, transparency, and institutional credibility. Simplified interfaces, guided onboarding, and dedicated support can help reduce perceived risk and build confidence.

For Millennials and Generation Z, who already show strong adoption, strategies should focus on maintaining engagement rather than encouraging initial use. Integrating digital payments into daily activities such as consumption, transportation, education, and lifestyle

services can reinforce habitual use. The behavioral similarity between these cohorts suggests a unified engagement strategy may be effective for younger users.

For financial institutions and fintech providers, these findings highlight the need to priorities system reliability, transaction efficiency, and seamless user experience over price competition. Since price value has limited influence, competitive advantage is more likely to come from strong performance and behavioral integration than from cost-based incentives.

Limitations of the study

Despite its contributions, this study has several limitations. First, the cross-sectional design limits the ability to track changes in adoption behavior over time. Habit formation and generational convergence are dynamic and would be better examined through longitudinal analysis.

Second, while the sample size is sufficient for PLS-SEM and multi-group analysis, some demographic groups, especially older users and rural populations, may be underrepresented. This could limit the generalizability of the findings to all socio-economic groups in Sri Lanka.

Third, the study examines UTAUT2 constructs and generational moderation but does not explicitly include factors such as perceived risk, trust, or financial literacy as independent variables. Adding these could enhance the model's explanatory power.

Directions for future research

Future research can build on this study in several ways. Longitudinal studies could track how habit formation develops and whether generational differences continue as digital ecosystems mature. Experimental or mixed-method designs may also offer deeper insights into the behavioral mechanisms behind adoption.

Future studies could include additional constructs such as perceived risk, trust, digital literacy, and regulatory awareness to capture a wider range of behavioral influences. Comparative research across South Asian or other emerging economies would help test the generalizability of these generational patterns.

Finally, qualitative research on generational narratives and experiences with digital payments could complement quantitative findings and provide a deeper contextual understanding.

In conclusion, this study shows that digital payment adoption in Sri Lanka is shaped by behavioral reinforcement and generational context. Performance expectancy and habit are the most influential drivers, while generational differences, especially between Generation X and younger cohorts, play a key moderating role. By integrating UTAUT2 with Generational Cohort Theory, the study provides a comprehensive and context-sensitive explanation of adoption behavior, contributing to both academic knowledge and policy. The findings underscore the need for behavior-focused, generation-aware strategies to support an inclusive and sustainable digital financial transformation in Sri Lanka.

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ANNEXES

Appendix A
Research question justification table

Construct Code	Construct Name	Question Code	Purpose	Key References
DEM	Digital Payment Use	USE1	Filter respondents who use or don't use digital payment apps.	Designed for this study
	Most Used Payment Me	APP1	Identify most-used payment solution by generation.	Adapted for this study
	Age/Generation	AGE1	Categorize respondents into Gen Z, Millennials, or Gen X.	Pew Research Center (2023)
X1	Performance Expectancy	PE1	Capture belief that digital payments save time and increase efficiency.	Venkatesh et al. (2012); Alalwan et al. (2017)
		PE2	Assess perceived convenience and control.	Venkatesh et al. (2012); Alalwan et al. (2017)
		PE3	Capture overall usefulness perception.	Venkatesh et al. (2012); Alalwan et al. (2017)
X2	Effort Expectancy	EE1	Measure ease of learning.	Venkatesh et al. (2012); Shankar & Rishi (2021)
		EE2	Assess ease of performing basic actions.	Venkatesh et al. (2012); Shankar & Rishi (2021)
		EE3	Capture self-efficacy and independence.	Venkatesh et al. (2012); Shankar & Rishi (2021)
X3	Social Influence	SI1	Measure direct social pressure.	Venkatesh et al. (2012)
		SI2	Capture peer usage influence.	Venkatesh et al. (2012); Bolton et al. (2013)
		SI3	Capture social media and marketing influence.	Bolton et al. (2013); Shareef et al. (2021)
X4	Facilitating Conditions	FC1	Assess basic infrastructure availability.	Venkatesh et al. (2012); Alalwan et al. (2017)
		FC2	Measure access to help/support.	Venkatesh et al. (2012); Alalwan et al. (2017)
		FC3	Check ecosystem readiness.	Venkatesh et al. (2012); Alalwan et al. (2017)
X5	Hedonic Motivation	HM1	Capture enjoyment.	Venkatesh et al. (2012); Thakur & Srivastava (2014)
		HM2	Measure emotional satisfaction.	Venkatesh et al. (2012); Thakur & Srivastava (2014)
		HM3	Assess fun and engagement aspect.	Venkatesh et al. (2012); Thakur & Srivastava (2014)
X6	Price Value	PV1	Measure perceived economic benefit.	Venkatesh et al. (2012); Gupta et al. (2023)
		PV2	Assess cost & benefit trade-off.	Venkatesh et al. (2012); Gupta et al. (2023)
		PV3	Check overall value perception.	Venkatesh et al. (2012); Gupta et al. (2023)
X7	Habit	HB1	Capture automatic tendency.	Venkatesh et al. (2012); Slade et al. (2015)
		HB2	Measure routine integration.	Venkatesh et al. (2012); Slade et al. (2015)
		HB3	Test strength of habit over alternatives.	Venkatesh et al. (2012); Slade et al. (2015)
Y	Digital Payment Adoption	DPA1	Measure actual usage frequency.	Venkatesh et al. (2012); McKinsey (2023)
		DPA2	Capture continuation intention.	Venkatesh et al. (2012)
		DPA3	Capture advocacy as a sign of strong adoption.	Venkatesh et al. (2012)

Appendix B
Survey questionnaire

Factors Influencing Digital Payment Adoption Across Generations in Sri Lanka

This survey is part of a master's thesis conducted by Sachintha Nadeera, L. P., a master's student in Sustainable Corporate Finance and Investment at the Business School of Vilnius University, Lithuania.

The purpose of this survey is to understand how people from different age groups in Sri Lanka use digital payment solutions.

* Indicates required question

Consent to Participate *

Your participation is voluntary, and all responses are anonymous. No personal identification details are collected, and the information will be used only for academic research.

Mark only one oval.

- ◯ I agree to participate voluntarily

*

1. Which age group best describes you?

Mark only one oval.

- ◯ 18-28
- ◯ 29-44
- ◯ 45-60
- ◯ Other: _____

*

2. Do you use digital payment solutions?

Mark only one oval.

- ◯ Yes
- ◯ No *

3. Which digital payment method do you use most often?

Check all that apply.

- [ ] Mobile Banking
- [ ] QR Payments
- [ ] Card Based Apps
- [ ] E- Wallets
- [ ] Other: _____

Digital Payment Usage and Perceptions

Please indicate how much you agree with the following statements about digital payment solutions.
Use the scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

*

4. Using digital payment apps helps me complete financial transactions more quickly.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

5. Digital payment services make it easier for me to manage my money and pay * bills.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

6. Overall, using digital payments is beneficial for my daily financial activities. *

Mark only one oval.

2 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

7. Learning to use digital payment apps is easy for me. *

Mark only one oval.

3 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

*

8. It is easy for me to complete transactions using digital payment apps.

Mark only one oval.

1 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

9. I can use digital payment apps without help from others. *

Mark only one oval.

1 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

10. People who are important to me think I should use digital payment methods. *

Mark only one oval.

2 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

11. My friends, family, or colleagues use digital payments, and it influences me to * use them as well.

Mark only one oval.

3 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

12. Social media or influencer content positively shapes my attitude toward digital * payments.

Mark only one oval.

4 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

13. I have a digital device and internet access needed to use digital payment * services

Mark only one oval.

5 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

14. I have enough knowledge or support to solve problems when using digital payment apps. *

Mark only one oval.

6 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

15. The banks and merchants I use support or accept digital payments. *

Mark only one oval.

7 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

16. I enjoy using digital payment apps. *

Mark only one oval.

8 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

17. I feel satisfied when I complete a transaction using digital payments. *

Mark only one oval.

9 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

18. Using digital payments is interesting and engaging for me. *

Mark only one oval.

10 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

19. Using digital payments saves me time and other costs (such as travel). *

Mark only one oval.

11 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

20. Any fees or data costs related to digital payments are acceptable compared to * the benefits I get.

Mark only one oval.

12 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

21. Overall, digital payments are cost-effective for me. *

Mark only one oval.

13 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

22. I usually choose digital payments whenever possible. *

Mark only one oval.

14 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

23. Using digital payment apps has become part of my daily routine. *

Mark only one oval.

15 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

24. Even when I can pay with cash, I still prefer digital payments. *

Mark only one oval.

16 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

25. I use digital payment methods for most of my regular financial transactions. *

Mark only one oval.

17 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

26. I plan to continue using digital payment methods in the future. *

Mark only one oval.

18 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

27. I would encourage others to use digital payment methods. *

Mark only one oval.

19 2 3 4 5

Stro ◯ ◯ ◯ ◯ ◯ Strongly Agree

Thank you for taking time to complete this survey.