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Article

The Role of Social Influence as a Moderator in Evaluating Factors Affecting the Intention to Use Digital Wallets

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Abstract

Digital wallets (DWs) have experienced significant growth in recent years. Still, at the same time, there are substantial differences in the level of adoption of these financial technologies between EU Member States. This research investigates the key factors affecting the intention to use DWs by analyzing previous research and applying an extended Technology Acceptance Model. In total, 418 respondents from the Baltic states participated in the online survey in 2024. Using partial least squares–structural equation modeling (PLS-SEM), the analysis revealed that the factors studied, such as perceived usefulness, perceived ease of use, social influence, facilitating conditions, and perceived trust, significantly influenced users' intent to use DWs for financial services. Perceived trust emerged as the strongest predictor, and social influence moderated perceived ease of use and facilitated conditions that impacted users' intent to adopt DWs. This study provides important insights into the factors that shape users' intentions to use DWs and the interactions between these factors. In addition, the extension of the TAM strengthened the theoretical framework for the study of DW adoption.

Keywords: digital wallet; intention to use; social influence; perceived usefulness; perceived ease of use; facilitating conditions; perceived trust



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1. Introduction

The rapid development of information technology in recent decades has paved the way for more convenient and simple payment methods. Fintech innovations such as digital wallets (DWs), an online payment method, have recently garnered much interest and recognition (Barroso & Laborda, 2022). A DW software system securely stores payment information and passwords and allows transactions using smartphones, smartwatches, or other connected devices without carrying physical cards (Williams, 2024).

According to the Worldpay Global Payments Report, DWs retain global supremacy in e-commerce, reaching 50% of global transaction value in 2023. DWs are the fastest-growing e-commerce payment method, with a projected 15% compound annual growth rate through 2027 (Worldpay, 2024).

According to the ECB SPACE 2024, the share of e-payment solutions, such as payment wallets and mobile apps, was 29% (26% in 2022). The share of e-payments in online payments ranges from 76% in the Netherlands to 46% in Germany, 13% in Estonia, and 17% in Cyprus. By payment volume, the share is 66% in the Netherlands, 33% in Germany, 9% in Lithuania, and 12% in Cyprus (ECB, 2024).

In recent years, researchers like Hopali et al. (2022), Kajol et al. (2022), Tounekti et al. (2022), Liswanty et al. (2023), Madan and Kour (2023), Panetta et al. (2023), Das and Shekhar (2024),

Ha et al. (2024), Kamboj et al. (2024), Pizzan-Tomanguillo et al. (2024), and Ramayanti et al. (2024) have published several systematic literature reviews (SLRs). These reviews provide in-depth insights into research trends, commonly used frameworks, methods of analysis, and factors that significantly affect the use of DWs. The analyzed SLRs conclude that researchers have insufficiently studied the specifics of the intention to use DWs in the European market. There are very few studies on the countries of Eastern Europe. Moreover, there are no studies on the Baltic states. Second, only a few studies analyze moderators and their impact on the relationship between factors and the intention to use DWs. The moderating effect of social norms on the determinants of DW use has not been studied.

This research investigates the factors influencing DW adoption and evaluates social influence (SI) as a moderator of the relationship under investigation.

After reviewing the existing models and theories, this study attempts to expand the Technology Acceptance Model (TAM) to assess perceived usefulness, perceived ease of use, facilitating conditions, perceived trust, and social influence, which influence users' intentions toward DWs.

2. Literature Review

2.1. Main Theories and Factors Influencing Users' Intention to Adopt DWs

Current systematic literature reviews (Panetta et al., 2023; Das & Shekhar, 2024; Ramayanti et al., 2024) suggest that the most commonly used frameworks in similar studies are the TAM and Unified Theory of Acceptance and Use of Technology (UTAUT). Fred Davis developed the TAM and suggested that if users perceive a technology as practical and easy to use, they will have a positive attitude toward it, increasing their intention to use it, ultimately leading to actual usage (Davis, 1989). The TAM is a popular framework for understanding how users adopt and utilize technology (Malatji et al., 2020; Kim & Kim, 2022; Liu et al., 2022; Senali et al., 2022; Malik et al., 2023; Rosli et al., 2023; Tian et al., 2023; Belmonte et al., 2024).

An analysis of studies utilizing the TAM reveals both its strengths and limitations. One of its primary advantages lies in its conceptual clarity, as it centers on two fundamental constructs—perceived usefulness and perceived ease of use—making it accessible and easy to implement. The model also demonstrates strong predictive validity, effectively forecasting user acceptance and behavior regarding technology use. Its extensive application across various technological contexts has further validated its utility and established it as a reliable framework for comparative research (Davis, 1989).

Despite these strengths, the TAM has notable limitations. It tends to focus narrowly on individual perceptions, often neglecting broader contextual or environmental factors that may influence technology adoption. Additionally, the model assumes a static view of adoption, failing to account for the evolving nature of user attitudes and external influences over time. Its reliance on only two predictors may also oversimplify the complex and multifaceted nature of user behavior (Venkatesh et al., 2003).

Venkatesh et al. (2003) developed the UTAUT, extended it as the UTAUT2, and saw it gain wide application (Koenig-Lewis et al., 2015; Oliveira et al., 2016; Jung et al., 2020; Liébana-Cabanillas et al., 2020; Yang et al., 2021; Bommer et al., 2022; Esawe, 2022; Migliore et al., 2022; Mulyati et al., 2023; Elasaria, 2024; Othman et al., 2024).

The UTAUT2 presents several notable advantages that contribute to its widespread application in technology adoption research. One of its key strengths is its comprehensive framework, which extends the original UTAUT model by incorporating additional constructs, such as social influence, facilitating conditions, hedonic motivation, price value, and habit. This expansion allows for a more holistic understanding of the factors influencing user behavior (Oliveira et al., 2016; Migliore et al., 2022; Venkatesh et al., 2023;

Elasaria, 2024). Moreover, the UTAUT2 demonstrates considerable contextual flexibility, enabling researchers to adapt the model to various technological environments and user demographics. Its enhanced predictive power, resulting from including multiple variables, further strengthens its capacity to accurately forecast user intentions and behaviors.

Despite these advantages, the UTAUT2 also presents certain limitations. The model's complexity, stemming from its broad scope and numerous constructs, can pose challenges in application and interpretation. This complexity often necessitates extensive data collection and sophisticated analytical techniques. Additionally, some constructs within the model may overlap or interact in ways that are challenging to disentangle, potentially complicating empirical analysis. The resource-intensive nature of implementing the UTAUT2—particularly in terms of time, effort, and data requirements—may also limit its feasibility for certain studies or research contexts.

Both the TAM and the UTAUT2 model have strengths and weaknesses. The choice between them depends on a study's specific context and objectives and the data available for model calibration. The TAM is helpful because it is simple and easy to use, while the UTAUT2 provides a more comprehensive and nuanced understanding of technology adoption. Given this study's objective, conceptual clarity, and the desire to focus on the most important determinants of DW use, the TAM was chosen as the basis for this study.

Previous studies conducting bibliometric analyses of DW research based on databases like Scopus, Web of Science, and others highlighted key factors influencing the adoption of digital wallets.

Table 1 summarizes the most often mentioned SLR factors determining the intention to use prospective technologies. The following subsections will analyze these factors in more detail.

Table 1. Variables under investigation.

#	Variables	Meaning	Source
1	Perceived Usefulness (PU)	The degree to which a person believes using a particular technology will enhance their job performance or daily activities. Users who find the technology helpful are more likely to adopt it.	Davis (1989); Venkatesh et al. (2003)
2	Perceived Ease of Use (PE)	The degree to which a person believes using the technology will be effort-free. Users are more likely to accept technologies that are easier to use.	Davis (1989); Venkatesh and Bala (2008)
3	Facilitating Conditions (FCs)	The availability of resources and support, such as customer service and technical support, make it easier for users to adopt and use digital wallets.	Venkatesh et al. (2003); Yang et al. (2021)
4	Perceived Trust (PT)	The level of trust users have in the digital wallet provider can mitigate perceived risks and encourage adoption.	Venkatesh et al. (2003); Khan and Abideen (2023)
5	Social Influence (SI)	The impact of peer pressure, recommendations, and social norms on users' decisions to adopt digital wallets.	Venkatesh et al. (2003); Oliveira et al. (2016)
6	Intention to Use (IU)	The degree to which a person has formulated conscious plans to use the technology.	Venkatesh et al. (2023)

Source: own elaboration.

2.2. Perceived Usefulness

Perceived usefulness (PU) refers to the degree to which a person believes using a particular technology will enhance their performance or significantly benefit their daily activities (Davis, 1989). PU plays a crucial role in DW adoption and continued usage.

Recent research highlights several key factors contributing to the perceived usefulness of digital payment systems. One of the primary benefits identified is enhanced efficiency, as users often view these systems as valuable tools that facilitate faster and more convenient transactions compared to traditional payment methods (Khan & Abideen, 2023; Belmonte et al., 2024). This efficiency contributes to a more positive user experience, increasing the likelihood of continued use. Systems perceived as helpful and user-friendly tend to foster user satisfaction and loyalty (Mew & Millan, 2021; Malik et al., 2023).

Moreover, perceived usefulness is critical in reducing resistance to new technologies. When users recognize clear advantages, they are more inclined to overcome initial hesitations and adopt the system (Malik et al., 2023). This perception also significantly influences behavioral intention, as individuals who find the technology beneficial are more likely to intend to use it, a tendency that often translates into actual usage behavior (Khan & Abideen, 2023; Malik et al., 2023).

Overall, perceived usefulness strongly predicts DW initial adoption and ongoing use. It highlights the importance of demonstrating clear, tangible benefits to potential users. Hence, we can formulate the first hypothesis as follows:

H1. *Perceived usefulness positively affects the intention to use DWs.*

2.3. Perceived Ease of Use

Perceived ease of use (PE) is critical to adopting and sustaining DWs. Prior research underscores that users will likely continue engaging when they find a DW intuitive and enjoyable. This enjoyment may stem from various factors, including the interface's simplicity, the design's aesthetic appeal, or the efficiency with which consumers can complete transactions (Khan & Abideen, 2023; Belmonte et al., 2024). Such positive experiences contribute significantly to user satisfaction, as individuals who enjoy using the system are more inclined to report higher satisfaction levels, supporting user retention (Mulyati et al., 2023).

Furthermore, perceived enjoyment has been shown to influence behavioral intention. When users find the experience of using a digital wallet pleasurable, they are more likely to form a firm intention to use it regularly. This intention often serves as a precursor to actual usage behavior, reinforcing the importance of designing functional and enjoyable systems (Mulyati et al., 2023).

Overall, PE is a crucial factor that can enhance user satisfaction, increase behavioral intention, and drive DW adoption and continued use. Based on the depiction above, we can formulate the second hypothesis as follows:

H2. *Perceived ease of use positively affects the intention to use DWs.*

2.4. Facilitating Conditions

Facilitating conditions (FCs) play a pivotal role in adopting and continuing DWs, encompassing the resources and support systems that enable users to engage with the technology effectively. Access to essential technological infrastructure—such as smartphones, stable internet connectivity, and compatible payment terminals—ensures users can utilize digital wallets efficiently (Yang et al., 2021). In addition, the availability of technical support, including customer service and troubleshooting assistance, enhances user confidence and helps resolve potential issues that may arise during usage (Yang et al., 2021).

Educational initiatives and user training also contribute significantly to reducing barriers to adoption. When users have clear guidance and instructions on navigating DW systems, they are more likely to adopt and use them effectively (Yang et al., 2021). Furthermore, a robust technological and commercial infrastructure—characterized by widespread merchant acceptance and seamless integration with banking systems—facilitates smoother adoption processes (Othman et al., 2024).

The regulatory environment further influences adoption by establishing a secure and trustworthy framework for digital payments. Supportive policies that ensure data privacy, consumer protection, and transaction security can foster a more favorable climate for digital wallet usage (Othman et al., 2024). Lastly, compatibility with users' lifestyles is a critical factor; digital wallets that align with daily routines and integrate well with commonly used applications and services are more likely to be embraced by users (Yang et al., 2021).

Overall, facilitating conditions play a significant role in reducing barriers and enhancing the ease of use, which can drive the adoption and continued usage of DWs. Consequently, we formulate the third hypothesis as follows:

H3. *Facilitating conditions positively affect the intention to use DWs.*

2.5. Perceived Trust

In the context of DWs, perceived trust (PT) refers to the level of trust users have in the DW provider, which can mitigate perceived risks and encourage adoption. Several studies explore the impact of PT on the usage of DWs. Khan and Abideen examined how PT, perceived risk, and service quality influence DW usage behavior. They found that PT significantly moderates the relationship between perceived risk and DW usage, highlighting the importance of PT in reducing perceived risks and encouraging usage (Khan & Abideen, 2023). Yang et al. investigated the factors that affect the intention to use and adopt DWs, including PT. Their study concluded that PT positively affects the intention to use and adopt DWs (Yang et al., 2021). These studies underscore the critical role of PT in the adoption and continued use of DWs. Trust reduces perceived risks and enhances users' confidence, making them more likely to use these digital payment systems.

PT is a critical factor influencing DW adoption and sustained use, as it shapes users' confidence in the technology and their willingness to engage with it (Belmonte et al., 2024). Trust in the security features of digital wallets—such as encryption protocols and fraud prevention mechanisms—plays a central role in reducing perceived risk. When users believe their financial information is protected, they are more inclined to adopt and continue using the service (Khan & Abideen, 2023; Belmonte et al., 2024).

Reliability is another essential dimension of trust. Users are more likely to engage with DWs that consistently perform well and are free from technical disruptions. Over time, dependable performance fosters a sense of trust and reinforces user confidence (Belmonte et al., 2024). Additionally, trust in the platform's ability to safeguard personal data and uphold privacy standards significantly influences adoption decisions. Users who feel assured that their data will not be misused are more likely to embrace the technology (Chin et al., 2022).

Trust also contributes to overall user satisfaction. When users perceive a digital wallet as trustworthy, they tend to have more positive experiences, which enhances satisfaction and encourages continued use (Khan & Abideen, 2023). Furthermore, high levels of trust can foster user loyalty. Satisfied users who trust the platform are less likely to switch to alternative services, supporting long-term retention (Khan & Abideen, 2023).

Overall, PT is essential for overcoming initial adoption barriers and fostering long-term usage of digital wallets. It influences users' perceptions of security, reliability, and

privacy, which is crucial for building a loyal user base. Therefore, we formulate the fourth hypothesis as follows:

H4. *Perceived trust positively affects the intention to use DWs.*

2.6. Social Influence

Social influence (SI) refers to how others' opinions affect an individual's technology usage (Venkatesh et al., 2003). Research by Bommer et al. (2022) indicates that social influence (SI) has a positive impact on individuals' behavioral intention to adopt DWs. We expect SI to emerge as the most significant and impactful factor in predicting the adoption of new financial technology (Oliveira et al., 2016; Belmonte et al., 2024). Social acceptance and the opinions of others can influence users' decisions to adopt mobile payments (Bland et al., 2024).

SI is pivotal in shaping individuals' decisions to adopt and continue using digital wallets (DWs). One of the primary mechanisms through which SI operates is peer influence. When individuals observe friends, family members, or colleagues using digital wallets and sharing positive experiences, they are more likely to perceive the technology as trustworthy and beneficial, increasing their likelihood of adoption (Belmonte et al., 2024). This peer-driven dynamic is closely linked to the formation of social norms. As digital wallet usage becomes more widespread and socially accepted, individuals may feel more inclined to conform to these norms, reinforcing adoption behaviors (Adiani et al., 2024).

In addition to peer influence, the role of opinion leaders—such as technology influencers, financial advisors, and bloggers—is also significant. These figures can shape public perceptions by endorsing digital wallets, demonstrating their functionality, and highlighting their advantages. Such endorsements help reduce perceived risks and build trust among potential users (Yang et al., 2021; Khan & Abideen, 2023). Cultural context further moderates the impact of social influence. In collectivist societies or cultures that are more receptive to technological innovation, the collective attitudes and behaviors toward financial technologies can significantly affect adoption rates (Zhao & Pan, 2023; Yang et al., 2021).

SI can enhance a DW's perceived value and trustworthiness, making individuals more likely to adopt and use them regularly. Thus, we formulate the fifth hypothesis as follows:

H5. *Social influence positively affects the intention to use DWs.*

2.7. Moderating Effect of Social Influence

In this study, we define a moderator as a variable that influences the strength or direction of the relationship between independent and dependent variables. It is an interactive element that alters how these variables are associated under varying conditions. Prior research suggests that consumers are more likely to adopt mobile payment systems when they are socially accepted and actively endorsed by others (Oliveira et al., 2016; Liébana-Cabanillas et al., 2020). Singh et al. examined the moderating effect of innovativeness, stress to use, and SI on users' perceived satisfaction and recommendation to use DW services. They determined the significant moderating effect of stress to use and SI on users' perceived satisfaction and recommendation of mobile wallet services (Singh et al., 2020). Bommer et al. researched whether theoretically based moderators affect the relationships between antecedents and DW use intention and concluded that no relationships were significantly moderated (Bommer et al., 2022). Senali et al. tested the moderating effect of personal innovativeness and propensity to trust (Senali et al., 2022). Shetu et al. investigated the moderating role of perceived technological innovativeness but did not find enough evidence to support the initial hypothesis (Shetu et al., 2022). Khan and Abideen studied the moderating roles of perceived service quality and perceived trust. Their study

emphasized the complex interplay between these factors and suggested that enhancing trust and service quality can encourage digital wallet adoption despite perceived risks (Khan & Abideen, 2023).

The preceding arguments suggest that SI may moderate the relationship between PU, PE, FCs, PT, and intention to use DWs. Accordingly, the sixth to the ninth hypotheses are formulated as follows:

H6. Social influence moderates the relationship between perceived usefulness and intention to use DWs.

H7. Social influence moderates the relationship between perceived ease of use and intention to use DWs.

H8. Social influence moderates the relationship between facilitating conditions and intention to use DWs.

H9. Social influence moderates the relationship between perceived trust and intention to use DWs.

The conceptual model in Figure 1 highlights the relationships under investigation.

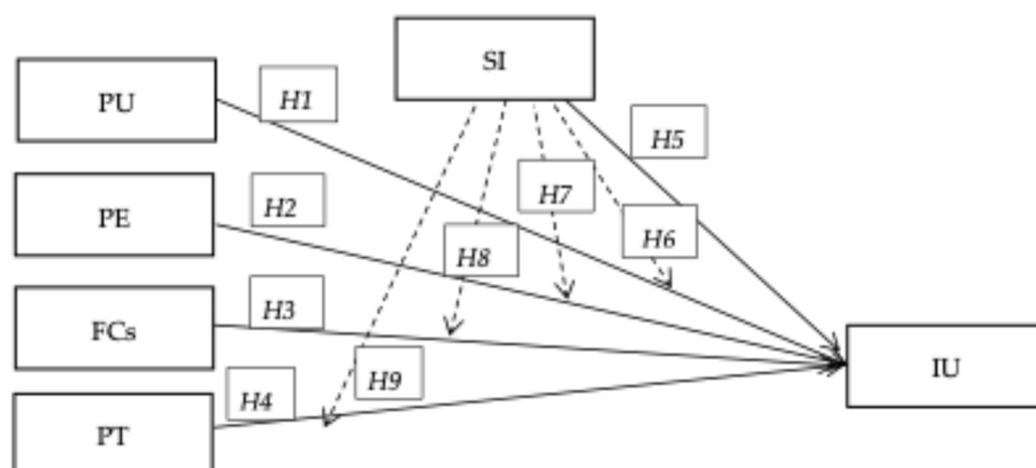


Figure 1. Conceptual model. PU: Perceived usefulness; PE: Perceived ease of use; FCs: Facilitating conditions; PT: Perceived trust; SI: Social influence; IU: Intention to Use.

3. Research Methodology

3.1. Questionnaire Design and Data Collection

This study used the survey method for data collection and statistical analysis to gain insights into customer behavior and intention to use DWs. We considered the online survey one of the most suitable study methods because it offers convenience and cost-effectiveness. A questionnaire was designed to gather data on customer attitudes toward DW adoption based on previous research (Oliveira et al., 2016; Liébana-Cabanillas et al., 2020; Singh et al., 2020; Yang et al., 2021; Bommer et al., 2022; Chin et al., 2022; Ilieva et al., 2023; Khan & Abideen, 2023; Malik et al., 2023; Mulyati et al., 2023; Adiani et al., 2024; Belmonte et al., 2024; Othman et al., 2024) analysis results; see Table 2. Responses were collected during Q3 2024 in Google Forms using a five-point Likert scale, the most common method used in similar studies (Yang et al., 2021; de Blanes Sebastián et al., 2023; Ilieva et al., 2023; Khan & Abideen, 2023), ranging from “Strongly disagree” to “Strongly agree”.

Table 2. Constructs and items under investigation.

Construct	Definition	ID	Items
Perceived Usefulness (PU)	The degree to which a person believes that using a DW will enhance their performance or convenience	PU1	A DW makes it easier for me to make daily payments
		PU2	A DW helps me accomplish financial transactions more quickly
		PU3	A DW allows me to improve my productivity
		PU4	A DW allows me to make financial transactions more efficiently
		PU5	A DW is more useful than traditional banking solutions for my payments
Perceived Ease of Use (PE)	The degree to which a person believes that using a DW will be free of effort	PE1	Learning to use a DW is easy for me
		PE2	It is easy to remember how to make payments with a DW
		PE3	I like that payments with a DW require minimal effort
		PE4	Interaction with the DW is clear and understandable
		PE5	DW is convenient and easy to use
Facilitating Conditions (FCs)	The availability of resources and support to use a DW	FC1	I have the technological resources needed to use a DW
		FC2	DW is compatible with other technologies I use daily
		FC3	I have the knowledge needed to use a DW
		FC4	I have the skills needed to use a DW
		FC5	I have access to the support and help I need to use my DW
Perceived Trust (PT)	The belief that the DW provider is reliable and will protect user interests	PT1	I believe that financial transactions with a DW are safe
		PT2	I trust that payments made through a DW will be handled securely
		PT3	I believe DW providers keep the interests of customers in mind
		PT4	I know that in the case of problems, the DW provider will help me
		PT5	I believe that DW providers comply with consumer protection laws
Social Influence (SI)	The degree to which an individual perceives that important others believe they should use a DW	SI1	People who influence my behavior advise me to use a DW
		SI2	People who are important to me advise me to use a DW
		SI3	People in my community use a DW
		SI4	Most of my friends use a DW
		SI5	My family members use a DW
Behavioral Intention to Use (BI)	The degree to which a person has formulated conscious plans to use a DW	BI1	I intend to use a DW for my payments when I have access
		BI2	I intend to use a DW for my payments if the costs are reasonable
		BI3	I intend to use a DW for my payments when I am sure of its safety
		BI4	I use a DW for my daily payments
		BI5	I intend to use a DW more often for my payments

Source: own elaboration.

We used pilot testing to validate the questionnaire, determine its correctness, validity, and relevance, and estimate the time required for completion. Experts should decisively evaluate a preliminary version that validates the content (Geisen & Murphy, 2020). To ensure the questionnaire was suitable for the Baltic context, we first shared it with experts in digital financial services for evaluation. Following this, a pilot test was conducted with 41 participants from diverse demographic backgrounds to verify the clarity and relevance of the survey items. Based on the feedback received during the pilot phase, we made several refinements to improve the questionnaire, creating 30 items under the constructs. Table 2 lists the constructs and items.

This research targeted financial services users in the Baltic countries, using the convenience sampling method as it is cost-effective, time-efficient, and valuable for exploratory research. The online survey took place in Q3 2024. On average, each participant completed the survey in 9–12 min. After cleaning the dataset, excluding 14 incomplete questionnaires, we retained 418 valid responses to ensure the reliability of the empirical findings, validate the proposed conceptual model, and test the research hypotheses.

3.2. Survey Respondents' Demographics (Characteristics)

The survey respondent sample comprised 229 (54.8%) females and 189 (45.2%) males; the descriptive statistics are in Table 3. About 17.5% of the respondents were below 25 years of age; the largest respondent group (22.7%) belonged to the 25–34 years age group, and the next largest (19.4%) belonged to the 45–54 years age group, followed by 18.4% in the 35–44 years age group, 12.4% in the 55–64 years age group, and 9.6% in the 65+ years age group. Many respondents (37.3%) were secondary graduates, fewer (31.1%) were bachelors, and 28% were masters. Regarding country residence, the most significant proportion of respondents (37.3%) were from Lithuania, 35.9% were from Latvia, and 26.8% were from Estonia. This convenience sample broadly mirrored the distribution of financial payment services users in the Baltic states regarding age, gender, education level, and residence.

Table 3. Respondents' demographic data.

Variable	Item	Frequency	Share, %
Gender	Female	229	54.8%
	Male	189	45.2%
Age	<25	73	17.5%
	25–34	95	22.7%
	35–44	77	18.4%
	45–54	81	19.4%
	55–64	52	12.4%
	65+	40	9.6%
Education	Secondary	130	31.1%
	Bachelor	156	37.3%
	Magister	117	28.0%
	PhD	15	3.6%
Country	EE	112	26.8%
	LV	150	35.9%
	LT	156	37.3%

3.3. Data Analysis

This study assessed the conceptual model using a two-stage analytical approach employing partial least squares–structural equation modeling (PLS-SEM), as it is suitable for exploratory research and robust in handling complex models with categorical data. Unlike Covariance-Based SEM (CB-SEM), PLS-SEM does not assume multivariate normality, making it more appropriate for behavioral research where data often deviate from a normal distribution. Moreover, PLS-SEM emphasizes the maximization of explained variance in the dependent constructs, aligning with this research’s predictive and theory-building objectives. Its flexibility in accommodating both formative and reflective measurement models, as well as its ability to handle ordinal and categorical indicators (Kline, 2023), and evidence of its efficacy in other similar studies (Oliveira et al., 2016; Yang et al., 2021; de Blanes Sebastián et al., 2023; Ilieva et al., 2023; Khan & Abideen, 2023; Rosli et al., 2023; Adiani et al., 2024; Belmonte et al., 2024) further support its application in this study. These characteristics make PLS-SEM a robust and practical choice for analyzing the structural relationships in behavioral research contexts.

We used a well-known format for reporting the results (Hair et al., 2019). This study evaluated the measurement and structural models using RStudio software Version 2024.09.1+394 (RStudio Team, 2024).

4. Results

4.1. Measurement Model Assessment

Before proceeding with hypothesis testing, it is crucial to validate the measurement model, e.g., to examine indicator loadings, to assess internal consistency reliability through Cronbach’s alpha and composite reliability, and to evaluate both convergent and discriminant validity (Hair et al., 2019). The indicator loadings range between 0.770 and 0.936, as shown in Table 4, fulfilling the threshold of above 0.7 (Hair et al., 2019) and showing that the constructs explain a significant level (>50%) of indicator variance, hence supporting acceptable item reliability. All the measurement model loading estimates are statistically significant at a confidence level > 0.99. The internal consistency reliability Cronbach’s alpha values range from 0.854 to 0.921, all above the threshold of 0.7, showing good reliability (Hair et al., 2019). We found that the composite reliability (ρ_C) values range between 0.896 and 0.941, all higher than 0.7. Hence, we achieved internal consistency reliability regarding indicator loading, Cronbach’s alpha, and ρ_C (Hair et al., 2019).

Table 4. Measurement model validity and reliability indicators.

Construct	α	ρ_C	AVE	ρ_A
PU	0.854	0.896	0.632	0.858
PE	0.921	0.941	0.760	0.922
SI	0.879	0.912	0.674	0.888
FCs	0.897	0.924	0.709	0.901
PT	0.856	0.897	0.634	0.857
IU	0.888	0.919	0.694	0.893

Convergent validity assesses the extent to which theoretically related indicators of a construct correlate. It is evaluated using the Average Variance Extracted (AVE). In this study, the AVE values range from 0.632 to 0.760, indicating that each construct explains more than 50% of the variance in its indicators, thus meeting the recommended threshold for convergent validity (Hair et al., 2019). Discriminant validity refers to the degree to which a construct is wholly distinct from other constructs (Hair et al., 2019). This study

used the Fornell–Larcker criteria and heterotrait–monotrait ratio of correlations (HTMT). Kline advises that constructs should have an HTMT criterion value no higher than 0.85 (Kline, 2023) to secure discriminant validity. In this study, the max HTMT is 0.829. Also, the bivariate correlations are smaller than the square root of the *AVE*, which provides proof of discriminant validity at an acceptable level (Hair et al., 2019).

The Fornell–Larcker criterion is a widely used method to assess discriminant validity, which ensures that each construct in the model is truly distinct from the others (Hair et al., 2019). As all diagonal values of Fornell–Larcker statistics, see Table 5, are greater than their correlations with any other construct (off-diagonal values in the same row/column), discriminant validity is established for all primary constructs (PU, PE, SI, FCs, PT, IU).

Table 5. Fornell–Larcker statistics.

	PU	PE	SI	FCs	PT	PU * SI	PE * SI	FCs * SI	PT * SI	IU
PU	0.795									
PE	0.697	0.872								
SI	0.602	0.625	0.821							
FCs	0.614	0.688	0.638	0.842						
PT	0.654	0.634	0.606	0.726	0.796					
PU * SI	−0.381	−0.352	−0.299	−0.316	−0.234	1.000				
PE * SI	−0.338	−0.465	−0.238	−0.289	−0.189	0.811	1.000			
FCs * SI	−0.321	−0.306	−0.186	−0.287	−0.089	0.719	0.757	1.000		
PT * SI	−0.262	−0.220	−0.146	−0.098	−0.039	0.699	0.691	0.764	1.000	
IU	0.737	0.724	0.674	0.753	0.747	−0.365	−0.310	−0.328	−0.223	0.833

The sign * indicates the moderating influence of SI on the relevant construct.

The heterotrait–monotrait ratio of correlations (HTMT ratio) is another more robust method for assessing discriminant validity in PLS-SEM (Hair et al., 2019). HTMT is the ratio of between-construct correlations (heterotrait-heteromethod) to within-construct correlations (monotrait-heteromethod). It estimates how similar two constructs are based on their indicators. As can be seen in Table 6, discriminant validity is generally supported across all primary constructs. The PU → IU and PT → IU pairs are close to the 0.85 threshold (Hair et al., 2019), suggesting a strong relationship but not necessarily a violation.

Table 6. HTMT ratio statistics.

	PU	PE	SI	FCs	PT	PU * SI	PE * SI	FCs * SI	PT * SI	IU
PU	.	.	.	.	.	.	.	.	.	.
PE	0.781	.	.	.	.	.	.	.	.	.
SI	0.687	0.688	.	.	.	.	.	.	.	.
FCs	0.690	0.755	0.717	.	.	.	.	.	.	.
PT	0.763	0.715	0.700	0.829	.	.	.	.	.	.
PU * SI	0.410	0.367	0.314	0.333	0.255	.	.	.	.	.
PE * SI	0.365	0.485	0.246	0.304	0.206	0.811	.	.	.	.
FCs * SI	0.346	0.319	0.191	0.300	0.098	0.719	0.757	.	.	.
PT * SI	0.283	0.230	0.151	0.102	0.053	0.699	0.691	0.764	.	.
IU	0.847	0.797	0.757	0.838	0.858	0.387	0.327	0.346	0.236	.

The sign * indicates the moderating influence of SI on the relevant construct.

4.2. Structural Model Assessment

The structural model's evaluation includes assessing the nonexistence of multicollinearity, R^2 , adjusted R^2 , and path coefficients. Hair et al. (2019) state that variance inflation factor (*vif*) values between 3 and 5 or higher may indicate potential multicollinearity issues. In this study, all *vif* values range from 1.515 to 3.012 and remain below the critical threshold, confirming the absence of multicollinearity among the constructs in the proposed model (see Table 7).

Table 7. Variance inflation factor statistics of variables.

Item	PU1	PU2	PU3	PU4	PU5	PE1	PE2	PE3	PE4	PE5
<i>vif</i>	2.143	1.831	2.218	1.593	1.973	2.809	2.299	2.923	3.012	2.918
Item	SI1	SI2	SI3	SI4	SI5	FC1	FC2	FC3	FC4	FC5
<i>vif</i>	2.390	2.810	2.544	2.614	1.589	1.993	2.690	2.354	3.010	2.899
Item	PT1	PT2	PT3	PT4	PT5	IU1	IU2	IU3	IU4	IU5
<i>vif</i>	2.316	2.059	2.395	1.842	2.448	2.997	2.205	2.766	1.515	2.526

The coefficient of determination (R^2) represents the proportion of variance in the endogenous variables explained by the independent variables, serving as an indicator of the model's explanatory power. Higher R^2 values suggest stronger predictive accuracy due to more influential predictor variables. In this study, the R^2 value for the intention to use Digital Wallets is 0.759, indicating substantial explanatory power in line with the thresholds recommended (Hair et al., 2019). Perceived trust and perceived ease of use together illustrate 65.1% of the variance in the endogenous construct: intention to use DWs.

The predictor variables of the endogenous construct account for the variance explained by the model. To assess the relative impact of each predictor on the dependent variable, the *f*-squared (f^2) statistic is used. Hair et al. (2019) state that f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. In this study, see Table 8, the observed f^2 values indicate a medium effect size, suggesting a moderate contribution of the predictors to the model's explanatory power regarding the independent variable PU and a small impact for PT, FCs, PE * SI, FCs * SI, PE, and SI.

Table 8. *f*-square (f^2) statistics of independent variables.

Variable	PU	PE	SI	FCs	PT	PU * SI	PE * SI	FCs * SI	PT * SI
f^2	0.170	0.022	0.021	0.037	0.119	0.001	0.035	0.030	0.001

The sign * indicates the moderating influence of SI on the relevant construct.

To test the proposed hypotheses, a non-parametric bootstrapping procedure with 1000 subsamples was employed, following the guidelines of Hair et al. (2019). Path coefficients were used to estimate the relationships within the structural model. The original path coefficient estimates, bootstrapping results, and hypothesis testing outcomes are presented in Table 9. The analysis revealed that the path coefficients for PU, PE, SI, FCs, and PT (hypotheses $H1$ – $H5$) significantly positively affect intentions to use DWs at a confidence level > 95%. PU, PE, SI, FCs, and PT positively influenced intentions to use DWs, validating hypotheses $H1$, $H2$, $H3$, $H4$, and $H5$. Among the independent variables, perceived trust shows the highest influence (0.278) on intentions to use DWs, followed by perceived ease of use (0.216).

Table 9. Structural model path estimates and hypothesis test results.

Paths	Orig.Est	BootMean	Boot.SD	t-Stat	2.5% CI	97.5% CI	H Tests
PU -> IU	0.191	0.193	0.044	4.385	0.111	0.277	H1 Yes
PE -> IU	0.216	0.215	0.052	4.180	0.116	0.319	H2 Yes
SI -> IU	0.124	0.123	0.046	2.672	0.033	0.214	H3 Yes
FCs -> IU	0.191	0.191	0.064	2.960	0.064	0.314	H4 Yes
PT -> IU	0.278	0.276	0.043	6.472	0.190	0.356	H5 Yes
PU * SI -> IU	-0.056	-0.056	0.045	-1.231	-0.149	0.029	H6 No
PE * SI -> IU	0.160	0.156	0.049	3.282	0.065	0.256	H7 Yes
FCs * SI -> IU	-0.144	-0.142	0.052	-2.792	-0.236	-0.039	H8 Yes
PT * SI -> IU	-0.033	-0.032	0.043	-0.769	-0.115	0.056	H9 No

The sign * indicates the moderating influence of SI on the relevant construct.

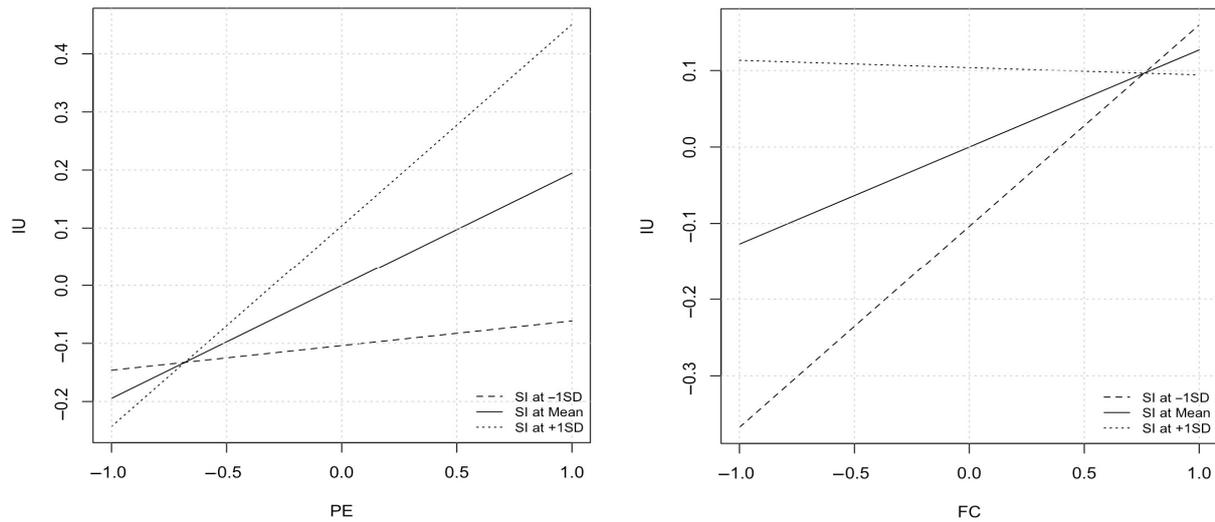
4.3. Moderating Effect of Social Influence on DWs Adoption

Table 6 shows that the path coefficients for 'PU * SI', 'FCs * SI', and 'PT * SI' have a negative impact, but 'PE * SI' positively impacts intentions to use DWs. Moreover, path coefficients for 'PE * SI' and 'FCs * SI' are significant at a confidence level > 95%, validating hypotheses H7 and H8. As the path coefficients for 'PU * SI' and 'PT * SI' are not significant at a confidence level > 95%, one can conclude that survey results do not provide evidence to support hypotheses H6 and H9. This can be explained by the diversity of respondents' opinions regarding the extent to which their peers influence their opinion on the 'belief that using the DW will enhance their performance or convenience' and the 'belief that the DW provider is reliable and will protect user interests'.

As shown in Table 9, the interaction term 'PE * SI' positively affects 'IU' by 0.160, whereas the simple effect of 'PE' on 'IU' is 0.216. The results suggest that the relationship between 'PE' and 'IU' is 0.216 for an average level of 'SI'. For higher levels of 'SI', i.e., for every standard deviation unit increase in SI, the relationship between 'PE' and 'IU' increases by the size of the interaction estimate value, i.e., $0.216 + 0.160 = 0.376$. On the contrary, for lower levels of 'SI', i.e., for every standard deviation unit decrease in 'SI', the relationship between 'PE' and 'IU' decreases by the size of the interaction term, i.e., $0.216 - 0.160 = 0.056$.

Slope analysis provides a more accurate insight into the 'SI' moderating effect on the 'PE' relationship with 'IU'. The three lines shown in Figure 2a represent the relationship between 'PE' (x -axis) and 'IU' (y -axis). The scales of the x -axes (-1, 1) indicate the range of changes of the independent variables, 'PE' and 'FCs', respectively. In turn, the y -axis scales indicate the range of changes in the dependent variable 'IU'.

The middle (continuous) line represents the relationship for an average level of 'SI'. The other two lines represent the relationship between 'PE' and 'IU' for higher (dotted line), i.e., the mean value of 'SI' plus one standard deviation unit, and lower (interrupted line), i.e., the mean value of 'SI' minus one standard deviation unit, levels of the moderator variable 'SI'. As can be seen, the relationship between 'PE' and 'IU' is positive for all three lines, as indicated by their positive slope. Hence, higher levels of 'PE' are associated with higher levels of intention to use DWs. Due to the positive moderating effect, at high levels of the moderator 'SI', the impact of 'PE' on 'IU' is stronger. While at lower levels of the moderator 'SI', the effect of 'PE' on 'IU' is weaker.



(a) Relationship between 'PE' (x -axis) and 'IU' (y -axis) (b) Relationship between 'FCs' (x -axis) and 'IU' (y -axis)

Figure 2. Slope analysis results for social influence as a moderator effect.

As shown in Table 9, the interaction term 'FCs * SI' negatively influences 'IU' by -0.144 , whereas the simple impact of 'FCs' on 'IU' is 0.191 . The results suggest that the relationship between 'FCs' and 'IU' is 0.191 for an average level of 'SI'. For higher levels of social influence, i.e., for every standard deviation unit increase in 'SI', the relationship between 'FCs' and 'IU' decreases by the size of the interaction estimate value, i.e., $0.191 + (-0.144) = 0.047$. On the contrary, for lower levels of 'SI', i.e., for every standard deviation unit decrease in 'SI', the relationship between 'FCs' and 'IU' increases by the size of the interaction term, i.e., $0.191 - (-0.144) = 0.335$.

Slope analysis provides a more accurate insight into the 'SI' moderating effect on the 'FCs' relationship with 'IU' (see Figure 2b). The three lines shown in Figure 2b represent the relationship between 'FCs' (x -axis) and 'IU' (y -axis). The middle (continuous) line represents the relationship for an average level of 'SI'. The other two lines represent the relationship between 'FCs' and 'IU' for higher (dotted line), i.e., the mean value of 'SI' plus one standard deviation unit, and lower (interrupted line), i.e., the mean value of 'SI' minus one standard deviation unit, levels of the moderator variable 'SI'. Due to the negative moderating effect, at high levels of the moderator 'SI', the impact of 'FCs' on 'IU' is weaker. While at lower levels of the moderator 'SI', the effect of 'FCs' on 'IU' is stronger.

5. Discussion

Drawing from the reviewed scientific articles and the proposed arguments, the model incorporates independent variables like PU, PE, FCs, PT, and SI. These variables have been used in several previous studies and have proved their significance in predicting new financial technology adoption (Flavián et al., 2020; Senali et al., 2022; Malik et al., 2023; Neves et al., 2023; Nguyen et al., 2023; Rosli et al., 2023; Tian et al., 2023; Ramayanti et al., 2024).

This study found that PT is the most influential factor affecting the intention to use DWs, consistent with previous research (Yang et al., 2021; Chin et al., 2022; Migliore et al., 2022; Chawla et al., 2023; Khan & Abideen, 2023; Belmonte et al., 2024; Othman et al., 2024). The second most significant factor was found to be PE, similar to results from previous research (Koenig-Lewis et al., 2015; Kim & Kim, 2022; Senali et al., 2022; Ilieva et al., 2023; Malik et al., 2023). In contrast, in other studies, PE did not significantly impact the adoption of DWs (Othman et al., 2024).

PU was used in digital payment adoption studies and showed a significant impact on intentions to use—consumers prefer mobile payment technology since they consider it convenient and time-saving (Jung et al., 2020; Liébana-Cabanillas et al., 2020; Liu et al., 2022; Tan et al., 2024). Investigations also confirmed the significant influence of FCs on the intention to use digital payment solutions (Yang et al., 2021; Bommer et al., 2022; Linge et al., 2023; Othman et al., 2024). The results of previous studies confirmed findings that family, friends, peers, and social groups significantly influence the user's intent to use a digital payment solution (Koenig-Lewis et al., 2015; Oliveira et al., 2016; Jung et al., 2020; Lin et al., 2020; Wei et al., 2021; Xie et al., 2021; Kim & Kim, 2022; Migliore et al., 2022; Adiani et al., 2024; Belmonte et al., 2024; Kraiwanit et al., 2024). However, there are also studies in which SI was not found to impact mobile payment adoption significantly (Changchit et al., 2024; Othman et al., 2024).

The social impact of such people and groups has higher credibility, and their recommendations motivate or hinder users from trying a new technology. Respondents agreed with statements such as “I use DW because my friends believe I should use it”. Respondents acknowledged that their decision to adopt a new technology was influenced by family and friends (Migliore et al., 2022; Adiani et al., 2024; Belmonte et al., 2024). Consumers resist using technology when reviews and recommendations in the social eco are negative (Liébana-Cabanillas et al., 2020). Studies have found that a high social impact weakens the relationship between user-perceived satisfaction and the recommendation to use DWs. A high social impact can reduce the user's perceived satisfaction, further affecting the user's recommendation to use DWs. The user may choose another technology if the references approve and recommend its use (Liébana-Cabanillas et al., 2020).

6. Conclusions, Limitations, and Future Research Directions

This study evaluated the factors influencing users' intention to adopt DWs in financial services. A conceptual model grounded in technology adoption theory was developed based on an extensive literature review to identify the key factors influencing and moderating users' intentions to adopt DWs. Using PLS-SEM, we empirically tested various dimensions of technology adoption alongside users' behavioral intentions. This analysis provided insights into the interrelationships among the different variables under investigation. In addition, we examined the moderating effect of social influence on relationships between independent variables and intention to use DWs.

This study's results confirmed how influential a user's recommendation to use a DW for financial services is. According to the structural equation modeling results using the partial least squares method, the conceptual model explained 75.9% of the total variance of the dependent variable—the intention to use DWs. The path estimates were statistically significant at a 95% confidence level.

The key findings of this study align with the existing literature on mobile payment technology acceptance. Furthermore, analyzing the moderating effect of SI on users' intention to adopt DWs, we found that strong SI can have a dual impact—reinforcing and weakening the relationship between factors and dependent variables. High SI strengthens the relationship between PE and intentions to use DWs for financial services, which has a logical explanation. If friends, family, and the social environment have a significant impact and give a clear signal that “learning to use a DW is easy”, “it is easy to remember how to make payments with a DW”, “payments with a DW require minimal effort”, “interaction with the DW is clear and understandable”, and “DW is convenient and easy to use”, then it can manifest itself in a growing intention to use DWs.

In turn, the moderating effect of SI on FCs is the opposite—SI weakens the impact of facilitating conditions on users' intention to adopt DWs. When SI is high, FCs have a lower

impact on the intention to adopt DWs, and when SI is low, FCs have a higher impact on users' intention to adopt DWs for financial services.

This study extends prior research on DW adoption by examining the impact of various behavioral and technological determinants, e.g., PU, PE, FCs, and PT, on users' behavioral intention. This study contributes to the theoretical development of the TAM by integrating SI as a moderating variable rather than treating it solely as a direct predictor. This nuanced role enhances our understanding of how SI interacts with other constructs like PU, PE, FCs, and PT. By focusing on DWs, this research contextualizes general adoption theories within a financial technology setting, offering insights specific to mobile payment behavior in the digital economy. This study adds to the limited research on DW adoption in Baltic contexts, highlighting how social norms and peer influence may vary across regions and affect adoption differently. The findings support the idea that behavioral intention is not only shaped by individual perceptions but also by external social pressures, reinforcing the importance of social context in digital behavior research.

The practical implications of this study are related in several directions. First, regarding marketing and communication strategies, businesses and fintech providers can leverage SI by promoting peer recommendations, testimonials, and influencer endorsements to boost adoption rates. Campaigns that highlight community usage or social approval may be more effective. Second, related to policy and regulatory design, policymakers aiming to increase digital financial inclusion can design awareness programs emphasizing social proof and community-level benefits, especially in regions where trust in digital finance is still developing. Third, understanding that SI moderates adoption behavior regarding user segmentation and personalization allows service providers to tailor strategies for different user segments, e.g., targeting younger users with peer-driven campaigns and older users with trust-based messaging. Fourth, regarding the design of DW platforms, developers can integrate social features (e.g., sharing transactions, referral systems, social rewards) into DW apps to capitalize on SI and encourage network effects. Fifth, regarding cross-cultural strategy development, for multinational fintech firms, recognizing the varying strength of SI across cultures can inform localized strategies that align with regional social norms and behaviors.

This study has several limitations. First, this study used convenience sampling to collect data on DW adoption, which presents certain limitations. While this approach enabled efficient access to participants and facilitated timely data collection, it may have introduced selection bias, as the participants were selected based on their availability and willingness to participate. As a result, the sample may not fully represent the broader population of DW users, particularly regarding demographic diversity, technological literacy, or financial behavior. Consequently, the generalizability of the findings is limited, and caution should be exercised when applying these results to other contexts or populations.

A comparison between countries is outside the scope of this study. Future research should explore how cultural and demographic differences influence the adoption and recommendation of DW services in the context of the European Union. Employing a larger and more diverse sample could yield broader insights and potentially different outcomes. Second, regarding the data collection method, this research was conducted through a cross-section, which does not allow for analyzing the evolution of users' behavior over time. A longitudinal study would allow us to verify the robustness of the established relationships. Future research could also explore and compare users' behaviors before and after adoption, examining how these behavioral shifts influence the continued use of DWs. Finally, given the complexity of user behavior, we propose the inclusion of new variables that allow us to better define intention to use financial technologies. Future research could incorporate additional variables, such as hedonic motivation, price value, and perceived

risk, and examine the moderating effects of demographic factors, which have not yet been thoroughly investigated and can provide significant insights.

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Abbreviations

The following abbreviations are used in this manuscript:

AVE	Average Variance Extracted
DW	Digital Wallet
EE	Estonia
FCs	Facilitating Conditions
HTMT	Heterotrait-Monotrait Ratio of Correlations
IU	Intention to Use
LT	Lithuania
LV	Latvia
PE	Perceived Ease of Use
PT	Perceived Trust
PU	Perceived Usefulness
SI	Social Influence
SLR	Systematic Literature Review
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

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