

# Decoding the Role of Online Shopping Behaviour in Driving Digital Payment Adoption in Kerala

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## Abstract

This study investigated the impact of online shopping behaviour on the adoption of digital payment systems, focusing on its effects on behavioural intention and actual usage. The analysis was based on the Technology Acceptance Model (TAM) framework, which examined the relationships between online shopping behaviour, perceived usefulness, perceived ease of use, behavioural intention, and actual usage. Data were collected through an online questionnaire distributed to more than 500 digital payment users in Kerala, resulting in 399 valid responses. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used for the analysis due to the non-normal distribution of the data. The results showed that online shopping behaviour has a significant positive influence on both behavioural intention and actual usage. Perceived usefulness and perceived ease of use were also found to have a positive impact on user attitudes. Furthermore, behavioural intention was identified as a mediator between attitudes and actual usage, highlighting its critical role in adoption decisions. The study emphasised the importance of creating user-friendly and secure environments for online shopping platforms and digital payment providers to promote adoption, offering valuable insights for businesses aiming to align with consumer preferences.

**Keywords:** Mobile Payment, Technology Adoption, Digital Payment, TAM, UTAUT

## Introduction

Digital payment systems have revolutionised financial transactions, offering users greater convenience, faster processing, and improved efficiency (Gomber et al., 2018). The rapid advancement of technology and widespread internet accessibility have made digital payments a vital component of the global economy (Au & Kauffman, 2008). These systems have gained prominence not only as tools for financial inclusion but also as enablers of e-commerce and digital transformation (Gabor & Brooks, 2017; Santos et al., 2017). Developed economies have well-established digital payment ecosystems,

whereas emerging markets like India are witnessing rapid and significant growth in their adoption (Singh et al., 2023). Integrating digital payments with e-commerce platforms has been instrumental in encouraging users to adopt this technology (Nguyen & Huynh 2017; Santos et al., 2017). Online shopping has emerged as a crucial channel for digital payment adoption, where seamless payment methods enhance user experience and simplify transactions (Hussain et al., 2024; Putrevu & Mertzanis, 2023). Although digital payments are becoming increasingly popular, the specific factors influencing their adoption in the context of online shopping remain

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insufficiently explored.

Existing research has extensively examined factors influencing digital payment adoption, focusing on constructs such as perceived usefulness (Liébana-Cabanillas et al., 2014), perceived ease of use (Yan & Yang, 2014), security (Barkhordari et al., 2017), trust (Zhou, 2011), and risk (Johnson et al., 2017). These studies frequently utilise well-established theoretical frameworks, such as the Technology Acceptance Model (TAM), to analyse user behaviour and adoption decisions. For instance, TAM-based studies (Patil et al., 2017; Sarmah et al., 2021) emphasise the significance of user perceptions regarding the usefulness and simplicity of digital payment systems in driving adoption. Furthermore, constructs such as security and trust have been identified as pivotal in overcoming user resistance to digital payments.

However, while these studies provide valuable insights into general digital payment adoption, they often overlook the specific role of online shopping behaviour in influencing adoption. Although some research has examined the relationship between e-commerce and digital payment usage, the scope has been limited, frequently failing to address how frequent online shopping behaviour impacts both behavioural intention and actual use of digital payments. This gap underscores the need for research that incorporates online shopping behaviour within the framework of digital payment adoption to offer a more detailed understanding of these interdependencies. To address this gap, the present study investigates the influence of online shopping behaviour on behavioural intention and actual use of digital payment systems. Specifically, it examines how online shopping behaviour interacts with constructs such as perceived usefulness, perceived ease of use, and attitudes to drive digital payment adoption. By extending the Technology Acceptance Model (TAM), the study integrates online shopping behaviour as a key construct to assess its direct and indirect effects on adoption decisions.

This research makes a novel contribution to the literature by providing a unique perspective on digital payment adoption in the e-commerce context, delivering both theoretical and practical implications. The study's significance lies in its ability to provide actionable insights for e-commerce platforms and digital payment providers, enabling them to better align their strategies with user behaviour. Additionally, the study addresses the growing demand for region-specific insights by focusing on digital payment adoption in Kerala, a region undergoing rapid digital transformation. By doing so, this research not only bridges the identified gap but also enhances understanding of how online shopping behaviour influences digital payment adoption in emerging markets.

## **Review of Literature and Hypothesis Development**

### ***Growth of Digital Payment***

The growth of digital payment systems has seen remarkable momentum globally (Shalini & Sabitha, 2024), with India emerging as a significant player in this transformation (Rani, 2023; Jerath, 2022). Several studies underscore the factors contributing to this growth and its implications. Digital payments in India, supported by the Digital India initiative, have experienced a steady increase in transaction volume and value, with innovations like the Unified Payments Interface (UPI) playing a pivotal role (Kuriakose et al., 2022; Mahesh & Bhat, 2021). Furthermore, the Reserve Bank of India's Digital Payment Index highlights deepening digital payment adoption (Jerath, 2022). Demonetization in 2016 provided a significant boost to digital payments, driving adoption across urban and rural areas (Bhavsar & Samanta, 2021). Initiatives like UPI have revolutionized the retail payment sector by offering faster, cost-effective solutions (Mahesh & Bhat, 2021). The COVID-19 pandemic further accelerated this shift, with digital payment methods gaining traction for safer, contactless transactions (Jakhiya et al., 2020). While India has made significant progress, global comparisons reveal that the

country still lags in metrics like per capita transactions (Bhavsar & Samanta, 2021). However, digital payments have positively impacted economic growth and financial inclusion, particularly in connecting unbanked populations (Jaiswal & Singh, 2023). India's digital payment landscape reflects a dynamic convergence of technological innovation, governmental support, and user adoption.

### ***Factors Influencing Digital Payment Adoption***

The adoption of digital payment systems has significantly transformed economies worldwide, including both developed and developing regions. Constructs from the Technology Acceptance Model (TAM), such as perceived usefulness and perceived ease of use, have consistently been identified as critical determinants of adoption (Yen et al., 2010; Hong et al., 2006; Abdullah et al., 2016). Patil et al. (2017) highlighted that these factors strongly influence consumers' behavioural intentions to adopt mobile payment platforms, a trend widely supported by TAM-based studies across various contexts. Trust also plays a vital role in adoption, particularly in developing economies, where concerns over security can hinder uptake. For example, Al-Khowaiter (2020) emphasised that perceived security and trust are crucial for digital payment acceptance in Gulf Cooperation Council (GCC) countries. Similarly, risk perception has emerged as a significant barrier to adoption. Lakhaiyar and Mani (2022) identified risks such as fraud and data breaches as major concerns during the COVID-19 pandemic in India. Alrawad et al. (2023) also underscored the importance of addressing perceived risks to enhance user confidence in electronic payment systems. Social influence is another key driver of technology adoption. Najdawi et al. (2021) demonstrated that social networks and peer recommendations significantly contribute to the adoption of e-payment systems in smart cities like Dubai. Similarly, Widayat et al. (2020) found that social factors, alongside ease of use, play a crucial role in promoting the adoption of

e-money systems in Indonesia. Organizational readiness and infrastructure availability have also been identified as critical enablers of digital payment adoption. For instance, Sahu and Singh (2018) noted their importance in facilitating adoption within Indian banks. Compatibility with users' existing habits and routines is another significant determinant, as demonstrated by Tang et al. (2021) in their study on WeChat payment adoption in China. Effort expectancy, a construct from the Unified Theory of Acceptance and Use of Technology (UTAUT), has been shown to significantly affect user adoption. Febrianto et al. (2023) highlighted the importance of user convenience and minimal cognitive effort in influencing small and medium-sized enterprises (SMEs) to adopt digital payments in emerging economies. Additionally, demographic factors such as age and income have been found to moderate adoption behaviours, as evidenced by Chawla and Joshi (2018).

### ***Online Shopping Behaviour and Digital Payment Adoption***

The rapid adoption of digital payments has profoundly transformed online shopping behaviour, driven by various interconnected factors. Convenience and ease of use stand out as pivotal drivers, as highlighted by Rathore (2016), who noted that digital wallets enhance customer satisfaction and loyalty by streamlining the shopping experience. The adoption of online shopping is significantly influenced by trust, perceived risk, and user perceptions of ease and usefulness. Gefen et al. (2003) identified trust as a crucial complement to the Technology Acceptance Model (TAM), helping to reduce uncertainties associated with transactions. Ha (2020) combined TAM with the Theory of Planned Behaviour (TPB), highlighting the negative effect of perceived risk on shopping intentions. Similarly, Lim and Ting (2012) reinforced TAM's relevance by demonstrating that user-friendly interfaces lead to higher adoption rates. Ofori and Appiah-Nimo (2019) extended TAM by incorporating trust and demographic factors, showing that trust and perceived usefulness are

key determinants of adoption among Ghanaian students. Collectively, these studies emphasise the interconnected roles of trust, risk, and usability in shaping e-shopping behaviour.

Susanto et al. (2022) identified trust and security as fundamental factors influencing adoption, while Kanojia and Lal (2020) emphasized the critical role of trust in transitioning users to cashless payment methods, particularly in regions like India. Social influences and effort expectancy also play a significant role, with Widayat et al. (2020) demonstrating that peer recommendations and straightforward processes encourage e-money adoption. Furthermore, Wu et al. (2018) showed that user-friendly platforms and promotional strategies accelerate mobile payment adoption, particularly in competitive online shopping environments like China. For consumers hesitant about digital payments, Nordin et al. (2023) highlighted that addressing security concerns and ensuring system reliability are key to fostering trust and usage. However, Ligon et al. (2019) found that demand-side barriers, such as limited customer preferences and concerns about tax liabilities, can inhibit merchant adoption of digital payments. Teng and Khong (2021) revealed that loyalty rewards and promotional campaigns effectively attract e-wallet users, showcasing the importance of understanding consumer motivations. Finally, Patil et al. (2020) extended the UTAUT model, reaffirming that performance expectancy, trust, and grievance redressal are pivotal in shaping positive consumer attitudes toward digital payment systems. Collectively, these studies illustrate the multi-faceted factors driving digital payment adoption, emphasizing the importance of trust, ease of use, and strategic incentives in transforming online shopping behaviour.

H1: Online shopping behaviour positively influences behavioural intention to use digital payments.

H2: Online shopping behaviour positively influences the actual use of digital payments.

### *Theories Connected with Technology Adoption*

The Technology Acceptance Model (TAM), introduced by Davis in 1989, identifies perceived usefulness (PU) and perceived ease of use (PEOU) as key determinants of technology adoption. Numerous studies have validated and extended TAM across diverse contexts. For instance, Aguagallo and Chicaiza (2022) applied TAM to examine fintech payment acceptance in Ecuador's retail businesses, finding that PU and PEOU significantly influence adoption, with system use, administrative support, and system quality playing critical roles (Aguagallo & Chicaiza, 2022). Similarly, Patil et al. (2020) confirmed the relevance of PU and PEOU in shaping user attitudes toward adopting online payment systems in the financial sector. In addition, Najib and Fahma (2020) extended TAM by incorporating trust, demonstrating its critical influence on digital payment adoption among Indonesian SMEs. Further, Plouffe et al. (2001) suggested that while TAM provides an effective framework, its applicability could be enhanced by introducing additional antecedents to address broader adoption scenarios. These studies collectively highlight TAM's adaptability and the importance of extending its constructs to suit specific contexts.

The Unified Theory of Acceptance and Use of Technology (UTAUT), introduced by Venkatesh et al. (2003), builds upon TAM by incorporating constructs such as social influence, facilitating conditions, and effort expectancy. Phan et al. (2020) applied UTAUT to examine third-party payment adoption, identifying social influence as a key determinant in decision-making. Similarly, Othman et al. (2024) enhanced UTAUT by integrating affective factors, showcasing the model's strong predictive capacity for e-wallet adoption intentions. In the context of contactless payment adoption in India, Tamilmani et al. (2020) extended UTAUT, reaffirming the importance of perceived usefulness and ease of use in influencing user

acceptance.

The Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), developed by Fishbein and Ajzen, focus on attitudes, subjective norms, and perceived behavioural control as determinants of behavioural intentions. Ozturk et al. (2016) examined these theories within the hospitality sector, demonstrating that self-efficacy and perceived risk significantly affect digital payment acceptance. For Bitcoin adoption, Folkinshteyn and Lennon (2016) utilised TPB to reveal the crucial role of perceived behavioural control in shaping user intentions. Additionally, Sutarso (2021) highlighted perceived enjoyment and satisfaction as critical factors under TPB for sustaining e-payment usage.

Roger's (1962) Diffusion of Innovations (DOI) theory explains technology adoption through attributes such as relative advantage, compatibility, and complexity. Di Pietro et al. (2015) integrated DOI with TAM to analyse mobile payment adoption, revealing that compatibility and relative advantage are significant determinants. Similarly, Goeke and Pousttchi (2010) identified compatibility with existing user habits as a major factor influencing mobile payment adoption. Furthermore, Senali et al. (2022) confirmed the critical role of innovation compatibility in driving e-wallet adoption.

In conclusion, technology adoption is primarily driven by trust, ease of use, and usefulness, while risk remains a significant deterrent. Li et al. (2016) and Yadav et al. (2015) emphasised trust as a critical factor, with perceived risk acting as a barrier to adoption. Yen et al. (2010) and Abdullah et al. (2016) underscored the importance of task-technology fit and self-efficacy in facilitating adoption, while Thakur (2013) reinforced TAM's relevance across digital platforms.

While several studies have explored the relationship between e-commerce and digital payment usage, they often overlook the role of frequent online shopping behaviour in

shaping both the intention to use and the actual adoption of digital payment systems. This gap underscores the need for research that incorporates online shopping behaviour to gain a more comprehensive understanding of its influence on digital payment adoption.

### **Objectives of the Study**

To examine the influence of online shopping behaviour on the behavioural intention to use digital payments.

To analyse the impact of online shopping behaviour on the actual use of digital payments.

### **Research Hypotheses**

H1: Online shopping behaviour positively influences behavioural intention to use digital payments.

H2: Online shopping behaviour positively influences the actual use of digital payments.

### **Research Methodology**

Drawing from the existing literature, this study formulated a research framework to investigate the structural relationships among critical constructs that affect the acceptance and adoption of digital payment systems within the context of online shopping behaviour. Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied, as the collected data exhibited non-normal distribution (Hair et al., 2018). The analysis was performed using SmartPLS 4, building upon the Technology Acceptance Model (TAM) developed by Davis (1989).

### **Data Collection**

Data were gathered through an online questionnaire distributed to over 500 users of digital payment platforms, resulting in 399 valid responses after a thorough screening process. This sample size satisfies the '10-times rule' for PLS-SEM analysis, as outlined by Peng and Lai (2012). The study targeted individuals across Kerala who are using both online shopping and digital payment usage. The constructs and variables derived from a comprehensive literature review are detailed in Table 1.

**Table 1**  
*Constructs, Variable Names, and Code Assigned from the Literature Review*

Construct	Variable Name	Code	Theory Support
Attitude Toward Using (ATU)	Favourable Attitude	ATU 1	(Li et al., 2016; Yen et al., 2010)
	Positive Attitude	ATU 2	
Actual Use (AU)	Online Use	AU 1	(Thakur, 2013; Abdullah et al., 2016)
	Bill payment Use	AU 2	
	Peer to Peer	AU 3	
Behavioural Intention to Use (BI)	Future Intention	BI 1	(Yen et al., 2010; Yadav et al., 2015)
	Intention to Try Daily	BI 2	
	Intention to increase usage	BI 3	
Online Shopping Behaviour (OSB)	Online Shopping Frequency	OSB 1	(Gefen et al., 2003; Ha, 2020; Lim & Ting, 2012; Ofori & Appiah-Nimo, 2019)
	Online Shopping Range	OSB 2	
	Online Shopping Easiness	OSB 3	
	Online Shopping Trust	OSB 4	
	Online Shopping Convenience	OSB 5	
	Online Shopping Preference	OSB 6	
	Social influence on Online Shopping	OSB 7	
	Discounts in Online shopping	OSB 8	
Perceived Ease of Use (PEU)	Ease to Learn	PEU 1	(Yen et al., 2010; Hong et al., 2006)
	Clear and Understandable	PEU 2	
	Flexible	PEU 3	
	Ease to Use	PEU 4	
Perceived Risk (PR)	Risk of Security	PR 1	(Lee, 2009; Giovanis et al., 2012)
	Risk of Privacy	PR 2	
	Risk of Fraud	PR 3	
Perceived Usefulness (PU)	Usefulness regarding Productivity	PU 1	(Abdullah et al., 2016; Yen et al., 2010)
	Effectiveness	PU 2	
	Usefulness in Managing Finance	PU 3	
	Usefulness Daily payments	PU 4	

*Note.* All constructs, variable names, and assigned codes in the table originate from the cited academic literature.

**Methods**

We employed Partial Least Squares Structural Equation Modelling (PLS-SEM) because of its capability to estimate multiple relationships concurrently, addressing both formative and reflective measurement models

(Hair et al., 2011; Hair et al., 2013; Alkhwaldi et al., 2023; Mamun et al., 2023). This technique enabled an examination of direct effects among factors influencing digital payment adoption, alongside their interactions. PLS-SEM offers insights into structural pathways

and relationships within the model, ensuring reliability even with smaller sample sizes and non-normal data distributions.

Partial Least Squares Structural Equation Modelling (PLS-SEM) is a robust analytical tool designed for examining complex connections between latent variables and their observed indicators (Sarstedt et al., 2021). It is especially suitable for predictive modelling

and situations where data fail to meet the stringent criteria of covariance-based SEM, such as multivariate normality or large sample size requirements. Its capacity to handle intricate models with numerous constructs and pathways made it the optimal choice for this study, which explores the impact of online shopping behaviour on digital payment adoption through extended TAM constructs.

**Results- Model Estimation**

**Table 2**

*Reliability and Validity Assessment of Constructs in the Measurement Model*

	Cronbach’s alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ATU	0.923	0.937	0.963	0.928
AU	0.752	0.813	0.856	0.668
BI	0.77	0.816	0.867	0.687
OSB	0.937	0.941	0.948	0.693
PEU	0.761	0.805	0.847	0.586
PR	0.844	0.936	0.903	0.756
PU	0.86	0.861	0.905	0.704

*Note.* A Cronbach’s alpha and composite reliability (rho\_c) above 0.7 and an AVE above 0.5 indicate good reliability and convergent validity (Hair et al., 2018).

The reliability and validity assessment in Table 2 indicates strong internal consistency and convergent validity for all constructs in the model. Attitude Toward Using demonstrated the highest reliability and validity across all metrics, while Perceived Ease of Use achieved

acceptable levels despite having the lowest Average Variance Extracted. This shows that the measurement items are consistently reliable and effectively capture the intended constructs.

**Table 3**

*Discriminant Validity – Heterotrait Monotrait Ratio (HTMT)*

Constructs	ATU	AU	BI	OSB	PEU	PR	PU
ATU							
AU	0.539						
BI	0.75	0.62					
OSB	0.354	0.461	0.47				
PEU	0.7	0.65	0.8	0.45			
PR	0.039	0.098	0.025	0.167	0.064		
PU	0.78	0.64	0.81	0.44	0.75	0.044	-

*Note.* HTMT values below 0.90 confirm acceptable discriminant validity (Hair et al., 2018).

As presented in Table 3, the HTMT results indicate acceptable discriminant validity, with all values remaining below the recommended threshold. The highest correlation was identified between Perceived Ease of Use and Perceived Usefulness, reflecting their conceptual alignment while preserving their

distinctiveness. Perceived Risk exhibited minimal overlap with other constructs, underscoring its unique contribution to the model. These findings confirm that the constructs are well-differentiated and conceptually meaningful.

**Table 4**  
*Indicator Reliability- Outer Loadings*

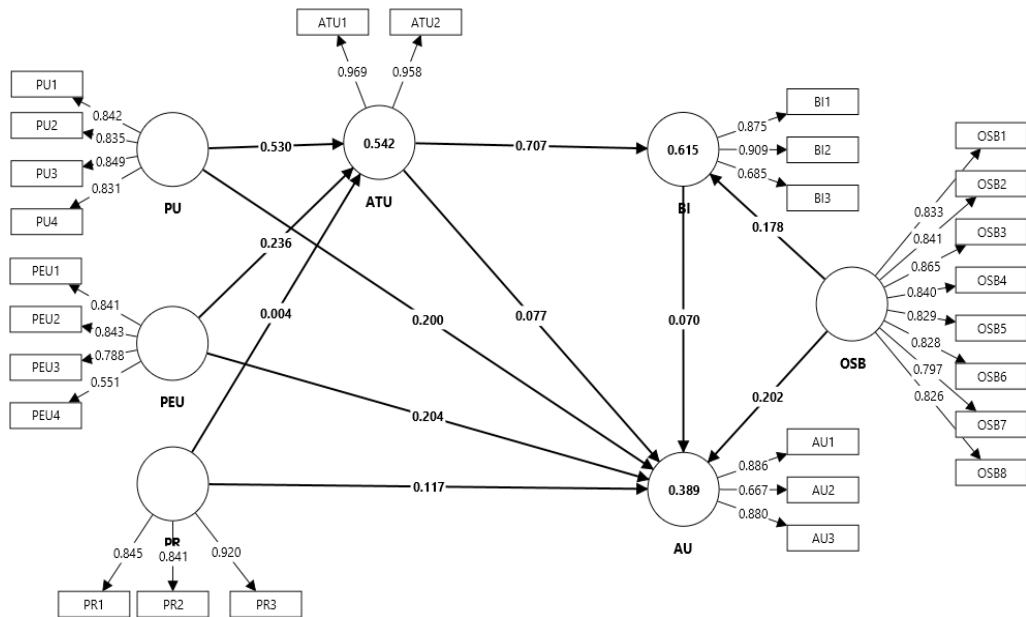
	ATU	AU	BI	OSB	PEU	PR	PU
ATU1	0.969						
ATU2	0.958						
AU1		0.886					
AU2		0.667					
AU3		0.88					
BI1			0.875				
BI2			0.909				
BI3			0.685				
OSB1				0.833			
OSB2				0.841			
OSB3				0.865			
OSB4				0.84			
OSB5				0.829			
OSB6				0.828			
OSB7				0.797			
OSB8				0.826			
PEU1					0.841		
PEU2					0.843		
PEU3					0.788		
PEU4					0.551		
PR1						0.845	
PR2						0.841	
PR3						0.92	
PU1							0.842
PU2							0.835
PU3							0.849
PU4							0.831

*Note.* Indicator reliability is achieved when outer loadings exceed 0.7, though values between 0.5 and 0.7 can be retained if the indicators are theoretically significant (Hair et al., 2018).

The indicator reliability assessment shows that most outer loadings exceed the recommended threshold of 0.7, confirming strong individual indicator reliability for the majority of items in the measurement model. This indicates that the observed variables effectively represent their respective constructs, ensuring measurement accuracy.

A few indicators have outer loadings below the threshold of 0.7 but were retained due to their theoretical significance and relevance to the constructs they represent. These indicators provide critical insights into specific dimensions of the constructs and contribute to the theoretical foundation of the study.

**Figure 1**  
 PLS-SEM Estimated Model



*Note.* The values presented in Figure 1 represent path coefficients, which indicate the strength and direction of the relationships between the constructs.

Figures 1 and 2 depict the structural model's relationships, illustrating how online shopping behaviour and other constructs influence behavioural intention and the actual use of digital payments. The model highlights that online shopping behaviour has a significant positive effect on both behavioural intention and actual use. Frequent online shopping enhances users' familiarity with digital payment systems, strongly influencing their intention to adopt these systems. However, adoption is not solely driven by online shopping behaviour; other constructs, such as perceived usefulness and perceived ease of use, play critical roles

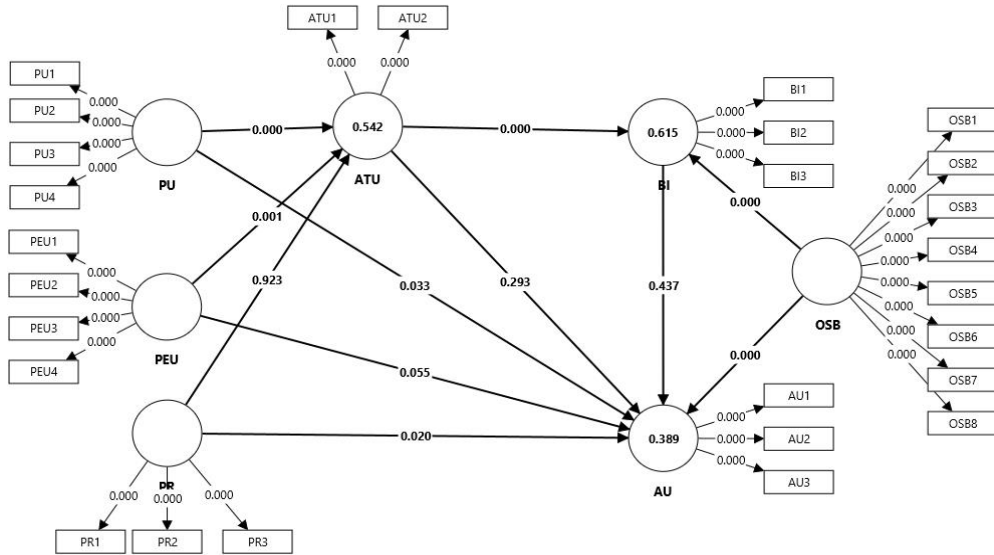
in shaping users' attitudes toward digital payment systems, which subsequently affect behavioural intention. This underscores the multifaceted nature of the adoption process, driven by interconnected factors.

Behavioural intention emerged as a crucial mediator, linking attitudes toward use with actual usage. This finding highlights its importance in translating positive attitudes into actionable behaviour. Among the constructs, perceived usefulness exhibited the strongest direct impact on attitudes, indicating that users are more inclined to adopt digital payments

when these systems are perceived to enhance transaction efficiency and effectiveness. Similarly, perceived ease of use positively influenced attitudes, suggesting that systems

that are intuitive and easy to interact with foster positive perceptions and increase the likelihood of adoption.

**Figure 2**  
*Bootstrap Analysis of the PLS-SEM Model*



*Note:* The values shown in Figure 2 represent the p-values, indicating the statistical significance of the relationships. Lower p-values provide stronger evidence in support of the hypothesised paths.

The results validate the hypothesised relationships in the study, with the statistical significance of the path coefficients confirming the influence of the key constructs. Online shopping behaviour significantly impacts both behavioural intention and actual use, supporting Hypotheses 1 and 2. Perceived usefulness and perceived ease of use were found to have significant effects on attitudes toward digital payment systems, which, in turn, strongly influenced behavioural intention. While perceived risk had minimal impact on attitudes and usage, its inclusion provides deeper insights into potential barriers to adoption.

shopping behaviour positively impacts actual use, was also supported, demonstrating its significant role in influencing adoption decisions.

Table 5 shows the relationships between key constructs in the structural model, including their path coefficients, statistical significance, effect sizes, and variance inflation factors (VIF). Attitude toward using digital payments strongly influences behavioural intention, confirming its role as a central mediator in the adoption process. Online shopping behaviour significantly affects both behavioural intention and actual use, indicating that frequent online shopping enhances familiarity and trust in digital payment systems. Perceived usefulness and perceived ease of use also play important roles in shaping attitudes toward using digital payments, contributing to the overall adoption process.

**Table 5**  
*Path Coefficients, Significance Levels, Effect Sizes, and VIF*

Construct Path	Path Coefficients	P-value	f-square	VIF
ATU → AU	0.077	0.29	0.004	2.73
ATU → BI	0.707***	<0.01	1.154	1.125
BI → AU	0.07	0.437	<0.01	2.368
OSB → AU	0.202***	<0.01	0.352	1.283
OSB → BI	0.178***	<0.01	0.373	1.125
PEU → ATU	0.236***	0.01	0.04	2.036
PEU → AU	0.204**	0.05	0.021	3.262
PR → ATU	0.004	0.92	<0.01	1.002
PR → AU	0.117**	0.02	0.022	1.022
PU → ATU	0.530***	<0.01	0.202	3.033
PU → AU	0.200**	0.03	0.016	3.133

*Note.* Significance levels are indicated as \*\*\* for  $p \leq 0.01$ , \*\* for  $p \leq 0.05$ , and \* for  $p \leq 0.10$  and threshold for VIF (Hair et al., 2018).

The relationships in Table 5 also highlight the direct effects on the actual use of digital payments. Perceived ease of use and perceived usefulness not only influence attitude but also have direct impacts on actual use, emphasizing their practical importance. Behavioural intention shows a weaker direct influence on actual use compared to other constructs,

suggesting that other factors may play more dominant roles in certain scenarios. Effect sizes indicate that online shopping behaviour and perceived usefulness have the strongest impact on adoption, while the VIF values less than 5 (Kock & Lynn, 2012) confirm that multicollinearity is within acceptable limits, ensuring the reliability of the results.

**Table 6**  
*Model Fit Indices for Structural Equation Model*

Fit Index	Saturated Model	Estimated Model
SRMR	0.056	0.064
Chi-square	1100	1150
NFI	0.987	0.995

*Note.* SRMR values below 0.08 indicate a good model fit, while lower chi-square values and NFI values nearing 1 reflect a stronger model fit (Hair et al., 2018).

The model exhibits a strong fit, as evidenced by the fit indices presented in Table 6. The SRMR values for both the saturated and estimated models lie within the acceptable range, suggesting minimal discrepancies between the observed and expected data. The relatively low chi-square values further support the model’s goodness of fit, though

it is acknowledged that chi-square values can be sensitive to sample size. Additionally, the NFI values, which are near 1, confirm a high degree of alignment between the proposed model and the observed data. These results indicate that the structural equation model effectively captures the relationships among the constructs.

**Table 7**  
*R-Square and Adjusted R-Square for Endogenous Constructs*

	R-square	R-square adjusted
ATU	0.542	0.538
AU	0.389	0.379
BI	0.615	0.613

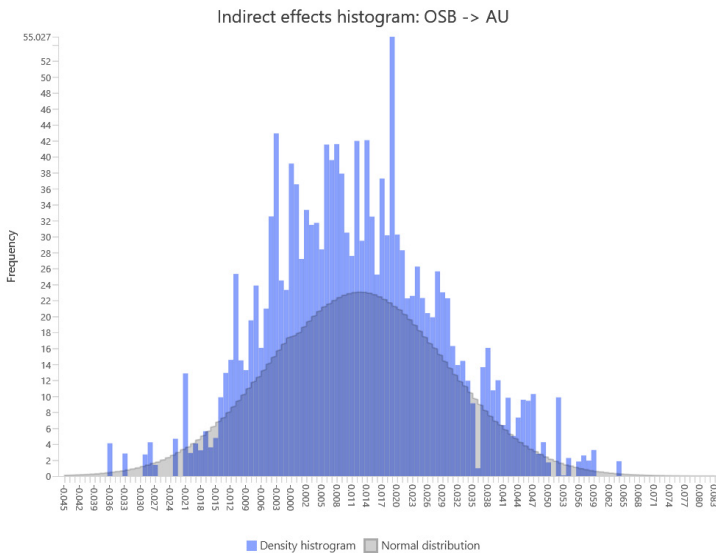
*Note:* R-square and adjusted R-square values show variance explained for ATU, AU, and BI.

The R-square values presented in Table 7 highlight the model’s explanatory power for the endogenous constructs. Behavioural intention has the highest R-square value, demonstrating that the model accounts for a significant portion of its variance, making it the most well-predicted construct in the framework. Attitude toward using displays

a moderate level of explanatory power, indicating a notable influence from its predictors. In contrast, actual use exhibits a lower R-square value, suggesting that other factors outside the model may contribute to its variance. The adjusted R-square values, though slightly lower, remain consistent, reaffirming the reliability and stability of the findings.

**Figure 3**

*Indirect Effects Histogram: Online Shopping Behaviour (OSB) to Actual Use (AU)*



*Note.* The histogram represents the distribution of bootstrapped indirect effects for the relationship between online shopping behaviour and actual use of digital payments.

Figure 3 illustrates the distribution of indirect effects from online shopping behaviour to the actual use of digital payments. The density histogram reveals that the indirect effects follow a symmetrical pattern, with most values clustering near the mean, indicating consistency in the mediation effects through

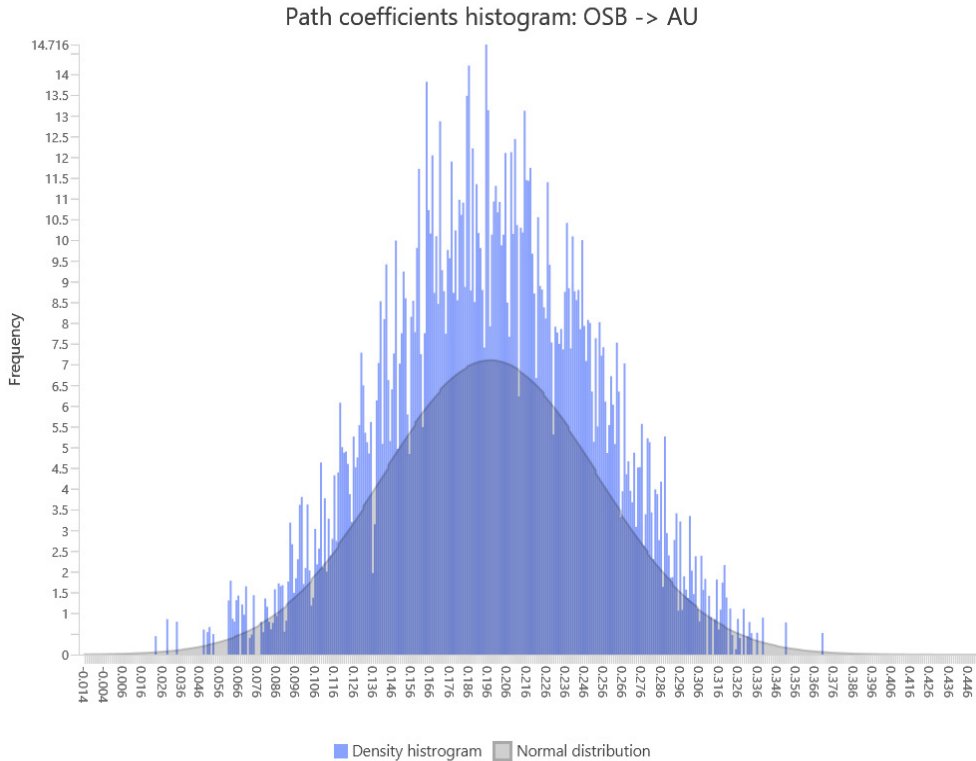
constructs such as behavioural intention. The overlaid normal distribution curve aligns well with the histogram, demonstrating that the bootstrapped indirect effects are approximately normally distributed. This pattern reinforces the reliability of the indirect relationship between online shopping behaviour and actual use.

The concentration of values around the mean suggests that behavioural intention effectively mediates this relationship, confirming the model’s robustness. The absence of significant skewness or outliers highlights that the

indirect effects are stable across the dataset, supporting the theoretical assumption that online shopping behaviour influences actual use through intermediate factors.

**Figure 4**

*Path Coefficients Histogram: Online Shopping Behaviour (OSB) to Actual Use (AU)*



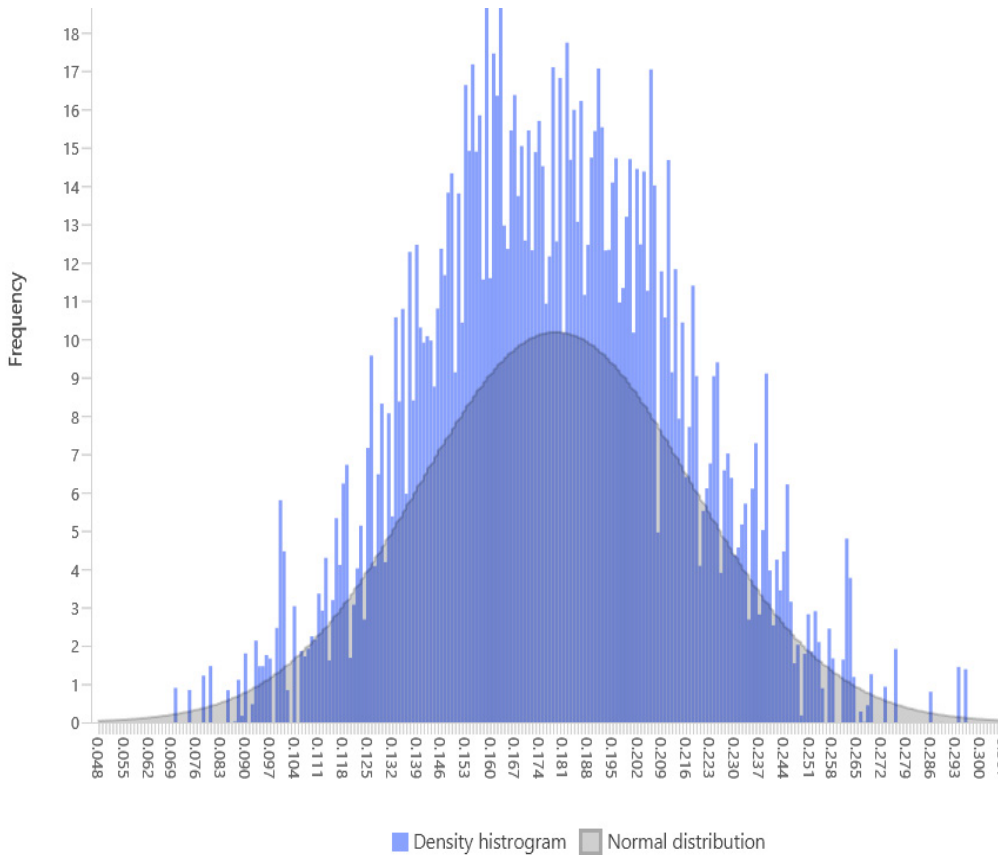
*Note.* The histogram represents the distribution of bootstrapped path coefficients for the direct relationship between online shopping behaviour and actual use of digital payments.

Figure 4 illustrates the distribution of bootstrapped path coefficients for the direct relationship between online shopping behaviour and the actual use of digital payments. The histogram shows a clear symmetrical distribution, with most coefficients clustering near the center, reflecting consistency and reliability in the direct effects. The alignment of the overlaid normal distribution curve with the histogram further indicates that the path coefficients are

normally distributed. This result highlights the stability of the direct relationship between online shopping behaviour and actual use, with no significant deviations or outliers observed. The distribution confirms that frequent online shopping behaviour has a consistent and reliable positive effect on the use of digital payments across the dataset. This supports the theoretical framework that online shopping behaviour directly influences adoption patterns in digital payment systems.

**Figure 5**

*Path Coefficients Histogram: Online Shopping Behaviour (OSB) to Behavioural Intention (BI)*



*Note.* The histogram represents the distribution of bootstrapped path coefficients for the relationship between online shopping behaviour and behavioural intention to use digital payments.

Figure 5 illustrates the distribution of path coefficients for the direct relationship between online shopping behaviour and behavioural intention to use digital payments. The histogram shows a symmetrical pattern, with the majority of coefficients clustering around the central value, indicating consistent effects throughout the dataset. The alignment of the normal distribution curve with the histogram confirms that the path coefficients approximate a normal distribution. This pattern underscores the reliability of the positive relationship between online shopping behaviour and behavioural intention. It indicates that individuals who frequently engage in online shopping are consistently more inclined to

exhibit an intention to adopt digital payments. The absence of significant outliers or extreme variations in the coefficients further reinforces the robustness of this relationship within the study’s context.

**Discussion**

The findings of this study indicate that online shopping behaviour has a significant influence on both behavioural intention and actual use of digital payments, thereby directly supporting the proposed hypotheses. Frequent engagement in online shopping enhances users’ familiarity with and trust in digital payment systems, which in turn strengthens their intention to adopt these technologies.

Moreover, online shopping behaviour directly affects actual use, underscoring its dual role as both a behavioural driver and a practical enabler. Key constructs such as perceived usefulness and perceived ease of use were identified as significant predictors, shaping positive attitudes toward digital payments and reinforcing their impact on behavioural intention. In contrast, perceived risk demonstrated a minimal effect on attitudes and usage, suggesting that concerns about security and privacy are often outweighed by the perceived convenience and benefits of digital payment systems. Overall, these findings provide a holistic framework for understanding the factors that influence digital payment adoption, with online shopping behaviour serving as a pivotal element in driving both intention and actual use.

These findings align with existing research on the relationship between online shopping behaviour and digital payment adoption, while also shedding light on the specific regional dynamics of Kerala. The results indicate that frequent online shopping enhances behavioural intention by fostering trust and familiarity with digital payment systems. This is consistent with prior studies that emphasise e-commerce as a critical enabler of digital payment adoption, promoting user confidence and simplifying transactions (Gefen et al., 2003; Ha, 2020). The observed direct effect of online shopping behaviour on actual use further corroborates previous research, which highlights e-commerce as a key factor in reducing reliance on cash and facilitating the practical adoption of digital payments (Lim & Ting, 2012; Ofori & Appiah-Nimo, 2019). However, the minimal impact of perceived risk in this study contrasts with earlier findings that identify security and privacy concerns as significant barriers to adoption (Lee, 2009; Giovanis et al., 2012). This divergence may be attributed to regional differences, particularly in Kerala, where growing trust in digital infrastructure and the intuitive design of digital payment systems appear to mitigate concerns about security and privacy. These insights

underscore the importance of considering regional contexts when examining the factors influencing digital payment adoption.

The structural model highlights the crucial mediating role of behavioural intention in linking positive attitudes to actual use, reaffirming the core principles of the Technology Acceptance Model – TAM (Davis, 1989). Constructs such as perceived usefulness and perceived ease of use play a central role in shaping user attitudes, underscoring the significance of perceived value and accessibility in influencing adoption behaviour. While perceived risk plays a relatively minor role in this study, its theoretical importance remains intact. The findings suggest that in a context like Kerala, characterised by a rapidly growing digital economy and a digitally literate population, other factors may have a more pronounced impact on adoption. These results position online shopping behaviour as a key driver of digital payment adoption, reflecting its integration within the broader narrative of regional digital transformation and infrastructure development.

This study extends the Technology Acceptance Model (TAM) by integrating online shopping behaviour as a direct and indirect determinant of digital payment adoption. The findings highlight the critical role of online shopping in shaping behavioural intention and actual use, offering a nuanced perspective on the interplay between e-commerce and digital payment systems. Frequent online shoppers are more inclined to adopt digital payments, with perceived usefulness and ease of use shaping attitudes and mediating adoption. Although perceived risk plays a limited role, its inclusion enriches the model by addressing potential barriers. Focusing on Kerala, the study underscores how local infrastructure and digital literacy mitigate risk, emphasizing the contextual nature of technology adoption. These insights enhance TAM's explanatory power while providing practical recommendations for seamless integration, user-friendly interfaces, and trust-building in digital payment systems.

This study concludes that online shopping behaviour serves as a significant and consistent determinant of both behavioural intention and actual use of digital payments. This highlights the pivotal role of e-commerce behaviour in driving adoption and validates the robustness of the extended TAM framework. These findings not only contribute to the theoretical understanding of digital payment adoption but also address practical considerations for promoting integration within an increasingly digitalised economy.

### Implications of the Study

The study's findings indicate that online shopping platforms play a critical role in enhancing digital payment adoption by strengthening behavioural intention and actual use through improved user experiences. E-commerce providers should focus on seamlessly integrating digital payment systems to build trust and promote ease of use, as these factors significantly influence user attitudes and intentions. Developers of digital payment systems can apply these insights by designing features that prioritise efficiency and simplicity, appealing particularly to frequent online shoppers. Furthermore, addressing potential risks such as fraud or privacy concerns is essential for fostering user confidence and encouraging adoption. These targeted strategies, derived from the study, enable businesses to align their practices with consumer behaviours and preferences, ultimately driving higher adoption rates of digital payment systems.

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