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Impact of digital marketing and E-Payments on Saudi online startup consumers

أثر التسويق الرقمي والمدفوعات الإلكترونية على مستهلكي الشركات الناشئة عبر الإنترنت في السعودية

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Abstract

This study explores the impact of digital marketing and payment systems on consumer behavior in Saudi Arabia's online startups. A sample of 291 participants was selected from Hail's region, in Saudi Arabia. The research employs a mixed-method approach, using SPSS version 2025 for descriptive statistical analysis and Structural Equation Modeling with Partial Least Squares (SEM-PLS) to examine the relationships between the key constructs and their effects on online purchase outcomes (OP). The study tests nine hypotheses, revealing that Perceived Innovation (PI) has a weak positive effect on OP, but this relationship is not statistically significant. Similarly, Perceived Security (PS) shows a minimal impact on OP, suggesting that these factors may not be as influential in the context of digital payment adoption as initially expected. The model's high R-square values for intention to purchase online (IPO) (0.654) and OP (0.594) indicate that it successfully explains a substantial portion of the variance in these outcomes. These findings offer valuable insights into the factors driving digital payment adoption and online purchasing behavior in Saudi Arabia. The study underscores the need for businesses to consider regional and cultural contexts when developing digital marketing strategies for effectively promoting digital commerce in diverse markets.

Keywords: Digital Payment Adoption, Digital Marketing Strategies, Consumer Behavior, Online Startups, Saudi Arabia.

List of abbreviations

Factor loadings (FL), Cronbach's alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE), Perceived Innovation (PI), Perceived Security (PS), Perceived Ease of Use (PEU), Attitude Towards Using (ATU), Intention to Purchase Online (IPO), Online Purchase (OP).

خلاصة

تستكشف هذه الدراسة تأثير التسويق الرقمي وأنظمة الدفع على سلوك المستهلك في الشركات الناشئة عبر الإنترنت في المملكة العربية السعودية. تم اختيار عينة من 291 مشاركًا من منطقة حائل، المعروفة بخصائصها الثقافية والاقتصادية المميزة التي قد تؤثر على سلوك المستهلك. تستخدم الدراسة منهجًا مختلطًا، حيث يتم استخدام برنامج SPSS الإصدار 2025 للتحليل الإحصائي الوصفي ونمذجة المعادلات الهيكلية باستخدام المربعات الصغرى الجزئية (SEM-PLS) لفحص العلاقات بين البنى الرئيسية وتأثيراتها على نتائج الشراء عبر الإنترنت. تختبر الدراسة تسع فرضيات، كاشفة أن الابتكار المدرك (PI) له تأثير إيجابي ضعيف على الأداء التشغيلي (OP)، لكن هذه العلاقة ليست ذات دلالة إحصائية. وبالمثل، يُظهر الأمن المدرك (PS) تأثيرًا ضئيلًا على الأداء التشغيلي (OP)، مما يشير إلى أن هذه العوامل قد لا تكون مؤثرة كما كان متوقعًا في سياق اعتماد الدفع الرقمي. تشير القيم العالية لمربع R للنموذج (IPO) (0.654) و OP (0.594) لنية الشراء عبر الإنترنت إلى أنه يفسر بنجاح جزءًا كبيرًا من التباين في هذه النتائج. تقدم هذه النتائج رؤى قيمة حول العوامل التي تدفع تبني الدفع الرقمي وسلوك الشراء عبر الإنترنت في المملكة العربية السعودية، مما يبرز أهمية فهم تفضيلات واتجاهات المستهلكين المحلية في بيئة رقمية تتطور بسرعة. تؤكد الدراسة على ضرورة أن تأخذ الشركات في الاعتبار السياقات الإقليمية والثقافية عند تطوير استراتيجيات التسويق الرقمي، حيث أن هذه العناصر ضرورية للتفاعل الفعال مع المستهلكين وتعزيز التجارة الرقمية في الأسواق المتنوعة.

الكلمات المفتاحية: اعتماد الدفع الرقمي، استراتيجيات التسويق الرقمي، سلوك المستهلك، الشركات الناشئة عبر الإنترنت، المملكة العربية السعودية.

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Introduction

The rapid expansion of digital technologies has significantly transformed consumer behavior, particularly in emerging markets like Saudi Arabia. As online startups in Saudi Arabia increasingly adopt digital marketing strategies to engage a tech-savvy population, there remains a notable gap in empirical research on how these strategies affect consumer buying behavior in this specific market. This is due to the fact that the market in Saudi which consists of tech-savvy consumers facilitates online startups to thrive (Al Hamli & Sobaih, 2023). So, revenues from e-Commerce in Saudi Arabia stood approximately at 10.44 billion USD in 2022; and it has been forecasted that the figure will surpass 23.46 billion USD by the end of 2027 (Statista, 2022a). In the same vein, the consumers in the KSA who engaged in online transactions were estimated at 25.6 million in 2020, and the figure is projected to be more than 34.5 million users with 92.5% user penetration by 2025 (Statista, 2022b). In addition, it was reported that 93% of online shoppers use their smart phones for online transactions in Saudi Arabia (Bahaddad et al., 2018). To this end, the combination of the Technology Acceptance Model (TAM) and the Chip and Pin Theory offers a structured approach to understanding these impacts, making it crucial for startups aiming to optimize their marketing strategies and achieve growth in the competitive digital landscape (Davis, 1989a)

Furthermore, the government of Saudi Arabia is highly dedicated in enhancing and further developing the entrepreneurship and the startups. Therefore, the government of the KSA budgeted US $19.2 billion to empower the private sector, and greater percentage was meant to support the SMEs (Alferaih, 2022). Thus, under its Vision 2030 blueprint, the government has pledged to raise the contribution of SMEs to GDP from 20% to 35% by 2030 in an attempt to diversify the economy away from the oil dependent (Ashri, 2019; Khoirunnisa & Nurhaliza 2024).

The problem is that despite the substantial investment in digital marketing by online startups, many still face challenges in effectively reaching and engaging consumers. This issue stems from a limited understanding of how factors such as perceived innovation, attitude, ease of use, and perceived security influence consumer decisions in the Saudi Arabian context. By combining TAM and the Chip and Pin Theory, the research aims to address the identified gap by providing a comprehensive analysis of how digital marketing impacts consumer behavior, thus offering actionable insights for improving marketing effectiveness and startup success (Venkatesh & Davis, 2000). Accordingly, there is a lack of concrete evidence regarding the level of innovative technology adoption among startup founders and co-founders, making it difficult to draw definitive conclusions. The outcomes of such adoption efforts tend to vary significantly depending on the research context, leading to inconsistent findings. This variation suggests that external factors and regional influences may play a critical role in shaping these results. Consequently, generalizing the level of innovation adoption across different settings remains challenging (Giuggioli & Pellegrini, 2023). Thus, research is needed to explore these inconsistencies and identify potential patterns. Furthermore, the adoption of the new technology by startups is beyond just technical issues but also involve behavioural tendencies of the key stake holders (Alateeg et al., 2024). To this end, the interplay of technology, innovation, and human dynamics, enables proper understanding of the intricacies behind startup decisions to adopt the new technology such as digital marketing (Dwivedi et al., 2021; Lévesque et al., 2022)

Justifications for this research are grounded in the increasing emphasis on digital marketing within Saudi Arabia's growing digital economy. With substantial investments in digital infrastructure and technology, it is imperative to understand how digital marketing strategies impact consumer preferences and behaviors. Such research can guide startups in developing more effective marketing strategies, ultimately supporting their success and contributing to the broader economic development of the region (Alanmi & Alharthi, 2023).

Many startups invest heavily in digital marketing but struggle to achieve their business goals due to an inadequate understanding of consumer preferences. This study aims to bridge the gap by investigating how perceived innovation, ease of use, attitude, and security impact consumers' intentions regarding their buying behavior in online startups. Addressing these factors is essential for startups to align their strategies with consumer expectations and improve their chances of success in the competitive digital market (Venkatesh et al., 2003; Alanmi & Alharthi, 2023).

A critical problem justifying this research is the high rate of failure among online startups in Saudi Arabia, which often stems from ineffective marketing strategies and a lack of understanding of consumer behavior.

Despite the substantial investment in digital marketing by these startups, many struggle to achieve significant traction or meet their business objectives. This challenge underscores the need for targeted research to identify the factors that influence consumer buying behavior in the context of Saudi Arabia's unique market dynamics. Especially now the country is implementing a significant economic transformation known as vision 2030 (Alateeg et al., 2024). Thus, huge investments are being made by the government through initiatives such as the Saudi Data & AI Authority (SDAIA) and the National Strategy for Data & AI (NSDAI) (Al Anezi, 2021).

TAM is being used in studies that have to do with new technology adoption and has been found to adequately explain such research (Davis, 1989b). So, by integrating TAM and the Chip and Pin Theory, this research aims to uncover insights into how ease of use, innovation, attitude and security impact consumer engagement with digital marketing, providing startups with evidence-based strategies to enhance their effectiveness and reduce failure rates. Understanding these dynamics is critical for startups to align their marketing efforts with consumer expectations and improve their chances of success in the competitive digital landscape.

Literature Review

In this section, literature review is conducted. This includes the conceptual, empirical and theoretical reviews were all conducted in the section. In addition, the application of the theories to the research context was done as well.

Concept of Online Purchase Behaviour

As stated by Ariff, Sylvester, Zakuan, Ismail, and Ali (2014), internet-based buying behavior is typically characterized as a process in which consumers browse websites to seek, choose, and purchase goods and services to meet their requirements and wants. Nevertheless, Li and Zhang (2002) pointed out that internet-based purchasing behavior is influenced by the psychology of the individual making the transaction. Online purchasing is a popular method of shopping in the digital world (Bourlakis, Papagiannidis, & Fox, 2008). As a result, the more variety and convenience, the easier it is for potential consumers to find what they are looking for online. Additionally, the effect of COVID-19 and the resultant consequences of social distance measures further facilitated the reliance of consumers to purchase goods and services using various online platforms (Alessa et al., 2021).

The Chip and Pin Theory and Its Application to Digital Payment Methods

The Chip and Pin Theory, or the PIN (Perceived Innovation, Convenience, and Security) model, explores how consumers' intentions to use digital payment methods are shaped by various perceived factors. This review examines the key variables of the PIN model—Perceived Innovation (PI), Perceived Security (PS), Intention to Use (ITU), and Actual Usage (AU)—and their importance in comprehending consumer behavior with regards to the online startups in Saudi Arabia.

Perceived Innovation (PI)

Perceived Innovation is an important variable with respect to new technologies, especially in the digital payment sector. It refers to the degree to which a payment method is recognized as modern, advanced, and incorporating the latest technological advancements. Based on Rogers' Diffusion of Innovations theory, innovations that are considered as novel and superior to existing alternatives tend to be adopted more rapidly by consumers (Rogers, 2003). In the current dynamic landscape of digital payments, the integration of cutting-edge technologies such as blockchain, biometric authentication, and artificial intelligence enhances the perceived innovation of these systems, making them more appealing to consumers. For instance, payment methods that utilize blockchain technology are often seen as more secure and transparent, while those incorporating biometric authentication are perceived as offering a higher level of convenience and security (Venkatesh et al., 2012). This perception can significantly influence consumer attitudes and behaviors, leading to a higher possibility of adoption.

Studies further emphasize the significance of perceived innovation in shaping consumer acceptance of digital payment technologies. Research by Behera et al., (2023), highlights that innovation plays a crucial role in consumers' positive attitudes towards adopting new payment methods. As digital payment platforms

continue to evolve, the ability to showcase innovation becomes increasingly vital in attracting and retaining users. For example, (Alateeg et al., 2024) found that in the context of startup sustainability, consumers are incline to adopt payment systems that they perceive as innovative, particularly those that offer novel features such as AI-driven fraud detection and personalized user experiences. Similarly, Harahonych et al., (2022) noted that the perception of innovation not only enhances consumer trust but also drives the overall adoption of digital payment systems, underscoring the importance of continuous innovation in this competitive market. Thus, as digital payment technologies advance, perceived innovation remains a key determinant of consumer acceptance and market success. To this end, it is hypothesized that:

H1 Perceived innovation has a significant impact on consumer purchase intention in Saudi Arabia's online startups

Perceived Security (PS)

Perceived Security is a critical factor in consumers' assessment of trustworthiness which directly determines their adoption decisions. Security concerns have long been recognized as a significant barrier to the widespread use of digital payments (Pavlou, 2003; Almaiah, 2023). Thus, consumers are more likely to adopt payment methods that they perceive as robust against such threats (Gefen et al., 2003). The presence of advanced security measures, such as encryption, multi-factor authentication, and tokenization, plays a pivotal role in mitigating these concerns and fostering trust among users.

Recent studies continue to underscore the importance of perceived security in the digital payment landscape, particularly as cyber threats evolve and become more sophisticated. Alateeg et al., (2024) highlight that in the context of startup sustainability; perceived security is vital in influencing user adoption, especially in markets like Saudi Arabia, where trust in digital platforms is still being cultivated. Effective security features not only protect consumers from potential threats but also enhance the overall user experience by providing peace of mind, which is essential for driving long-term engagement. Furthermore, research by Alzahrani, (2022). emphasizes that the integration of AI-driven security solutions, such as real-time fraud detection and predictive analytics, has become increasingly important in addressing consumer concerns and boosting confidence in digital payment systems. These advancements not only secure transactions but also contribute to a more seamless and reliable payment experience, ultimately encouraging broader adoption. As digital payment methods continue to evolve, the emphasis on perceived security remains paramount, influencing consumer behavior and the success of payment platforms in an increasingly digital world. Hence, it is proposed that:

H2 Perceived security has a significant impact on consumer purchase intention in Saudi Arabia's online startups

The Technology Acceptance Model (TAM) and Digital Marketing

The second theory utilized in this study is Davis' (1989b) Technology Acceptance Model (TAM), which offers an information systems framework to evaluate how consumers adopt and use technology. TAM has been widely researched and validated through numerous studies that explore individual technology acceptance behaviors across different information system architectures (Surendran, 2012). This model is built upon the foundations of the Theories of Reasoned Action (Fishbein & Ajzen, 1975) and Planned Behavior (Ajzen, 1991), providing a robust structure for analyzing technology usage. According to TAM, the ultimate goal is the actual system use, where individuals fully integrate technological advancements into their daily routines.

TAM is especially valuable for understanding how customers adopt new technologies, particularly in fields like digital marketing. It offers a framework for identifying key factors that influence consumer behavior when interacting with technology. Recognizing these factors, businesses can better understand the drivers behind technology adoption and use, helping them to develop strategies that enhance user experience and engagement. This makes TAM an important tool for examining the intersection of technology and consumer behavior in the rapidly evolving digital landscape.

This study specifically examines four core components of TAM: perceived ease of use (PEU), attitude toward using (ATU), intention to use (ITU), and actual usage (AU). Each of these factors plays a critical role in shaping consumer interactions with technology, especially in the context of digital marketing tools

used by startups. Focusing on these dimensions, the study seeks to determine how they collectively influence consumer behavior and decision-making processes, offering valuable insights into how businesses can improve technology adoption rates.

In the context of Saudi Arabian startups, the study explores how these TAM factors affect consumer behavior in digital marketing. With the rapid digital transformation in the region, understanding how consumers perceive and engage with technology is crucial for businesses aiming to thrive in a competitive market. This research provides a comprehensive analysis of the technological adoption process, with a specific focus on digital marketing for startups in Saudi Arabia, helping to identify the key drivers of success in this dynamic field.

Perceived Ease of Use (PEU)

Perceived Ease of Use (PEU) reflects how effortless a consumer believes it will be to use a particular technology, such as digital marketing tools. Davis (1989a) identified PEU as a critical factor influencing technology adoption, emphasizing that technologies perceived as easy to use are more likely to be embraced by consumers. In the realm of digital marketing, platforms that are user-friendly require minimal training, and offer intuitive interfaces tend to facilitate higher adoption rates. Thus ease of use not only reduces the learning curve for new users but also facilitates the overall user experience, making it more likely for businesses to integrate these tools into their marketing strategies (Venkatesh et al., 2012).

Recent research underscores the importance of PEU in shaping the intentions towards using digital marketing. Consumers are more inclined to adopt digital marketing platforms that streamline processes and reduce complexity. Alateeg et al., (2024) further support this notion, noting that digital marketing tools that offer seamless integration and straightforward usability contribute to more favorable attitudes and higher usage rates. Moreover, Yakaitis et al., (2023). highlight that user-friendly platform, which minimize operational barriers and enhance efficiency, are crucial in maintaining sustained engagement and maximizing the effectiveness of digital marketing efforts. As digital marketing technologies continue to evolve, ensuring their ease of use will remain essential for fostering widespread adoption and optimizing user satisfaction. Based on the forgoing therefore it is proposed that:

H3 Perceived ease of use has a significant impact on consumer purchase intention in Saudi Arabia’s online startups

Attitude towards Usage (ATU)

Attitude towards Usage (ATU) represents a consumer's overall evaluation and sentiment towards digital marketing. This attitude is significantly influenced by two: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). According to Ajzen and Fishbein (1980), consumers who perceive digital marketing as user-friendly are more likely to develop a positive attitude towards its use. When digital marketing tools are seen as enhancing performance or outcomes and are easy to operate, consumers are inclined to view them favorably.

A favorable ATU serves as a strong predictor of both the intention and the actual usage of digital marketing tools. Davis (1989a) asserts that positive attitudes towards a technology directly impact users' intentions to adopt and integrate it into their practices. Recent studies reinforce this view, showing that when businesses perceive digital marketing tools as both useful and easy to use; their attitudes towards these tools become more positive, leading to higher adoption rates and consistent usage (Alateeg et al., 2024). Furthermore, Yang et al., (2017) highlight that a positive attitude towards digital marketing not only drives the initial intention to use but also sustains engagement over time. As digital marketing technologies evolve, fostering a favorable attitude among users will be essential for driving continued adoption and maximizing the impact of these tools. Hence, it is presumed that:

H4 Attitude towards usage/purchase has a significant impact on consumer purchase intention in Saudi Arabia’s online startups

Intention to Use (ITU)

Intention to Use (ITU) represents the likelihood that a consumer will engage with digital marketing tools and technologies. ITU is considered a precursor to actual usage, as it encapsulates the consumer's readiness and motivation to adopt and regularly use digital marketing methods.

Research consistently shows a strong correlation between ITU and actual usage, highlighting ITU as a critical measure for predicting consumer behavior. Taylor and Todd (1995) found that a higher intention to use digital marketing tools is closely associated with greater actual usage, making ITU a valuable predictor of how likely consumers are to engage with these tools. Recent studies, for instance, Kim et al., (2013) stress that intention to use not only predicts initial engagement but also plays a significant role in long-term usage patterns, emphasizing the need for businesses to foster strong intentions through effective communication and demonstration of the benefits and ease of their digital marketing offerings.

H5 Intention to use/purchase has a significant impact on consumer purchase in Saudi Arabia's online startups
H6 Intention to use/purchase significantly mediate the impact of perceived innovation on consumer purchase in Saudi Arabia's online startups
H7 Intention to use/purchase significantly mediate the impact of perceived security on consumer purchase in Saudi Arabia's online startups
H8 Intention to use/purchase significantly mediate the impact of perceived ease of use on consumer purchase in Saudi Arabia's online startups
H9 Intention to use/purchase significantly mediate the impact of Attititude on consumer purchase in Saudi Arabia's online startups

Actual Usage (AU)

Actual Usage (AU) denotes the extent to which consumers actively engage with digital marketing tools. As the final outcome of the Technology Acceptance Model (TAM), AU represents the practical application of Intention to Use (ITU) and reflects how theoretical intentions translate into real-world behavior (Davis, 1989). High levels of intention to use digital marketing tools generally correlate with increased actual usage, indicating that consumers who are motivated and ready to adopt these tools are more likely to use them regularly.

However, the relationship between ITU and AU is not always straightforward, as actual usage can be influenced by various external factors. Research by Venkatesh et al. (2003) highlights that while strong intentions predict higher usage rates, other variables like personal preferences can also impact how frequently and effectively digital marketing tools are utilized. Recent investigations like that of Alateeg et al., (2024) further emphasize that real-world application of digital marketing is subject to external influences beyond mere intention, underscoring the importance of adapting strategies to address these variables and ensure sustained engagement with digital marketing technologies.

Integrating TAM and the Chip and Pin Theory

Combining two theories of Technology Acceptance Model (TAM) and that of Chip and Pin is crucial for understanding the impact of digital marketing and payment systems on consumer behavior in Saudi Arabia's online startups. TAM as propounded by Davis (1989b), emphasizes the roles of perceived usefulness, ease of use, and attitude towards using technology in influencing consumer behavior. On the other hand, the Chip and Pin Theory, articulated by Shaw, (2015), focuses on perceived innovation, convenience, and security. Combining these theoretical frameworks facilitates a proper understanding how digital marketing affects consumer actions regarding online startups.

The integration of TAM and the Chip and Pin Theory allows for a nuanced exploration of the cognitive and affective dimensions of consumer responses to digital marketing. The variables in TAM affects consumer attitudes toward technology and these attitudes, consequently, influence their intention to adopt and use digital marketing strategies. Meanwhile, the Chip and Pin Theory provides additional insights into how perceptions of innovation, convenience, and security impact these intentions and actual usage of digital payment methods.

For instance, perceived usefulness (TAM) and perceived innovation (Chip & Pin Theory) can collectively shape consumer attitudes towards digital marketing by highlighting its value and novelty. Similarly, perceived ease of use (TAM) and perceived convenience (Chip and Pin Theory) can affect users' willingness to engage with digital marketing tools. By integrating these perspectives, researchers can better understand the interplay between cognitive perceptions of utility and ease, and affective responses related to innovation and convenience.

Furthermore, this combined framework is vital in identifying the factors that drive or impede the adoption of digital marketing within Saudi Arabia's online startup ecosystem. Insights derived from analyzing the relationships between PU, PEU, innovation, convenience, and security can help online startups develop targeted digital marketing strategies that resonate with Saudi consumers (Alanmi, & Alharthi, 2023). Understanding these dynamics enables startups to customize marketing approaches to address the unique preferences of the Saudi market, thereby enhancing their competitiveness and success.

The integration of TAM and the Chip and Pin Theory provides a holistic understanding of consumer behavior towards digital marketing in Saudi Arabia. It does not only elucidates the factors influencing adoption and usage but also offers actionable insights for online startups aiming to effectively engage with Saudi consumers. This comprehensive approach is vital for driving growth and achieving success in the region's burgeoning digital economy.

Finally, it should be noted that some of the variables in the two theories used in this study overlapped to a greater extent. For instance, perceived convenience and PEOU; attitude to usage versus attitude towards payment; intention to use in TAM versus intention to use in Chip and Pin theories; and finally actual usage in TAM versus actual usage in the Chip and Pin theories. Based on this therefore, two variables that do not seem to overlap were used from each of the theories.

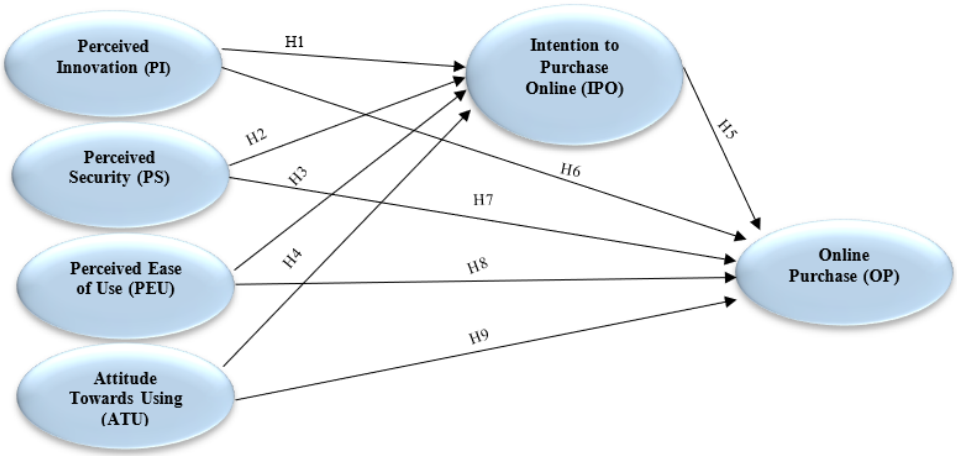

Figure 1. Conceptual Framework

Methodology

The study employs a dual approach to analyze the data collected on the consumer behavior with regards to digital marketing for online startups in Saudi Arabia. SPSS version 2025 was utilized to run the basic descriptive statistics and preliminary checks, including reliability analysis and exploratory factor analysis (EFA). SPSS is selected due to its robust capabilities for handling initial data validation and summarization tasks (Pallant, 2020). It helps in ensuring data quality and preparing the dataset for more complex analyses.

In order to delve deeper into the relationships between variables and test the hypothesized models, this study employs Structural Equation Modeling with Partial Least Squares (SEM-PLS). SEM-PLS is selected because it can handle complex models involving multiple constructs and their interrelationships, especially in exploratory research where theoretical frameworks are still evolving (Hair et al., 2021). Unlike traditional covariance-based SEM, SEM-PLS does not require large sample sizes and is well-suited for scenarios with non-normal data distributions and small to medium-sized samples (Sarstedt et al., 2021). This methodological choice would enable a thorough analysis of the structural paths and the measurement model. Again, it would provide insights into the variables affecting digital payment and marketing strategies.

The study focuses on the Hail region in Saudi Arabia, with a sample size of 291 participants drawn from this area. Hail is selected due to its strategic importance in the region and its unique cultural and economic characteristics, which may provide distinct insights into consumer behavior (Albaqawy et al., 2023). Focusing on this specific region, the study aims to capture localized trends and preferences that might differ from other parts of Saudi Arabia, thereby offering more nuanced findings. This regional focus is justified as it allows for a detailed examination of factors affecting digital payment and marketing adoption in a context that is representative of a growing, yet under-researched, area within the country.

Data analysis and results

This section presents data analysis and results presentation. Thus, descriptive statistics, inferential statistics as well as hypotheses testing are conducted in this section.

Gender Distribution

Table 1 indicates that 73.2% of the participants in the study are male, while 26.8% are female. This significant gender imbalance suggests that the study primarily reflects male perspectives on digital payment adoption and marketing strategies. In Saudi Arabia, societal norms and gender roles have traditionally been more rigid, such a skewed gender representation could lead to findings that do not fully capture the experiences and preferences of female users (Alotaibi, 2023). As women are increasingly becoming active participants in the workforce and digital economy in Saudi Arabia, their perspectives are crucial to understanding digital payment adoption fully (Al-Saggaf & Simmons, 2015). Therefore, the results might not be entirely generalizable across different gender demographics, as the insights are predominantly influenced by the male population's behaviors and attitudes toward digital payments.

Age Breakdown

The age distribution of participants shows that 35.7% are aged between 18-24 years, while 27.1% are 55 years and older. The concentration of younger respondents suggests a demography that is conversant with digital technologies and thus, more likely to embrace digital payment methods. This age dynamic is particularly relevant in Saudi Arabia, where a significant proportion of the population is young, and digital literacy is relatively high among this group (Alnafaiy et al., 2024). Younger individuals often drive technological adoption trends, and their active participation in the digital economy could mean that the study's findings predominantly reflect innovative practices and preferences that resonate with a tech-savvy audience. However, this focus may overlook the adoption barriers faced by older or less tech-oriented demographics, who may have different attitudes towards technology use (Ramírez-Correa et al., 2023).

Table 1.
Demographic data

S/n	Variables	Scale	Frequency	Percent
1	Gender	Male	213	73.2
		Female	78	26.8
		Total	291	100
2	Age	18-24 years	104	35.7
		25-34 years	55	18.9
		35-44 years	26	8.9
		45-54 years	27	9.3
		55+ years	79	27.1
		Total	291	100
3	Education Level	Secondary School and below	63	21.6
		Certificate/ Diploma/ Advanced Diploma	35	12
		Bachelor's Degree	105	36.1
		Postgraduate or higher Degree	88	30.2
		Total	291	100
4	Income Level:	less than 5,000 SAR	111	38.1
		5,000-10,000 SAR	57	19.6
		10,001-15,000 SAR	58	19.9
		15,001-20,000 SAR	22	7.6
		20,001+ SAR	43	14.8
		Total	291	100

Educational Attainment

Regarding educational background, 36.1% of participants hold a Bachelor's degree, and 30.2% possess a postgraduate or higher degree. This high level of educational attainment implies that the respondents are likely well-informed and capable of understanding complex digital payment systems and marketing strategies. In Saudi Arabia, higher education levels correlate with increased digital literacy and a propensity to engage with advanced technologies (Al-Somali et al., 2009). Therefore, the study may reflect insights from a population that is more likely to adopt digital technologies, possibly skewing the findings towards those with a higher educational background. This is particularly important as Saudi Arabia continues to invest in education and digital infrastructure under Vision 2030, aiming to create a knowledge-based economy (Vision 2030, 2016).

Income Levels

The income distribution among participants reveals that 38.1% earn less than 5,000 SAR, while 14.8% earn over 20,000 SAR. This variation in income levels indicates a diverse economic background, which could influence spending habits and the willingness to adopt digital payment methods. In Saudi Arabia, income levels are a significant determinant of consumer behavior, particularly in adopting new technologies (Alalwan et al., 2018). Participants with lower incomes may exhibit caution in adopting digital payments due to financial constraints and concerns about transaction costs. In contrast, higher-income individuals may be more open to utilizing these technologies, seeing them as convenient and secure options for managing finances. This diversity in income levels suggests that income play a vital role in influencing digital payment adoption and marketing strategies, reflecting broader trends in Saudi Arabia's digital transformation (Al-Ghaith et al., 2010).

Assessment of Measurement Model on Construct Validity

The reliability and validity of constructs are assessed when evaluating a measurement model. Construct validity is an essential factor, ensuring that the conceptual construct is accurately measured by observable variables or indicators (Hair et al., 2020). This assessment includes both convergent and discriminant validity. Convergent validity refers to the degree to which indicators of a construct are related, demonstrating that they measure the same underlying concept Fornell & Larcker, (1981). It confirms that multiple items are indeed capturing the same theoretical notion, providing consistency across the measurement. Discriminant validity, on the other hand, ensures that the construct being measured is distinct from others. This type of validity confirms that the measures of different constructs are not excessively correlated, thereby establishing the uniqueness of each construct in the model (Henseler et al., 2015). Both convergent and discriminant validity are crucial for confirming the overall accuracy and reliability of a measurement model, ensuring that it effectively captures the intended constructs while maintaining distinctiveness from others.

To evaluate convergent validity, several criteria are commonly used, as in Table 2, such as factor loadings, Cronbach's alpha, composite reliability (rho_c), and average variance extracted (AVE). Factor loadings should ideally be 0.70 or higher; all the factor loadings in Table 2 have exceeded the minimum threshold, with the lowest loading indicating that the indicators have a strong relationship with their underlying construct (Hair et al., 2020). The Cronbach's alpha, which is also used for testing of internal consistency, assesses the reliability of a set of indicators; a value of 0.70 or above is generally considered acceptable (Cronbach, 1951). However, composite reliability (rho_c) is preferred over Cronbach's alpha in structural equation modeling (SEM) as it accounts for the different loadings of indicators, providing a more accurate reliability assessment. A rho_c value of 0.70 or higher indicates strong internal consistency, suggesting that the items within the construct are reliably measuring the same concept (Bagozzi & Yi, 1988). The Average Variance Extracted (AVE) assesses the proportion of variance captured by the construct relative to the variance caused by measurement error. An AVE value of 0.50 or higher shows that the construct accounts for more than fifty percent of the variance in its indicators, ensuring a sufficient level of validity (Fornell & Larcker, 1981).

Table 2.
Reliability and validity

S/n	Variables	ITEMS	FL	CA	CR	AVE
1	Perceived Innovation (PI)	PI1	0.8007	0.8976	0.9193	0.6196
		PI2	0.7786			
		PI3	0.7760			
		PI4	0.7453			
		PI5	0.8006			
		PI6	0.8168			
		PI7	0.7900			
2	Perceived Security (PS)	PS1	0.7832	0.885	0.9104	0.5922
		PS2	0.7544			
		PS3	0.7868			
		PS4	0.7504			
		PS5	0.7837			
		PS6	0.7471			
		PS7	0.7802			
3	Perceived Ease of Use (PEU)	PEU1	0.7737	0.8831	0.9089	0.5880
		PEU2	0.7749			
		PEU3	0.7966			
		PEU4	0.7366			
		PEU5	0.7778			
		PEU6	0.7594			
		PEU7	0.7472			
4	Attitude Towards Using (ATU)	ATU1	0.7765	0.896264	0.9182	0.6162
		ATU2	0.7935			
		ATU3	0.7859			
		ATU4	0.7974			
		ATU5	0.7744			
		ATU6	0.7765			
		ATU7	0.7903			
5	Intention to Purchase Online (IPO)	IPO1	**Deleted**	0.8252	0.8774	0.5889
		IPO2	0.7578			
		IPO3	0.7369			
		IPO4	0.7826			
		IPO5	**Deleted**			
		IPO6	0.7574			
		IPO7	0.8005			
6	Online Purchase (OP)	OP1	0.7266	0.8857	0.9108	0.5935
		OP2	0.7727			
		OP3	0.7827			
		OP4	0.7825			
		OP5	0.7901			
		OP6	0.7686			
		OP7	0.7678			

A number of methods exist for assessing discriminant validity, among which are the Fornell-Larcker criterion as well as the heterotrait-monotrait (HTMT) ratio. The Fornell-Larcker criterion asserts that the square root of a construct's AVE is required to be greater than its highest correlation between any other construct, demonstrating distinctive characteristics (Fornell & Larcker, 1981). Meanwhile, the HTMT ratio is considered a more stringent assessment of discriminant validity; a value below 0.85 is generally indicative of adequate discriminant validity (Henseler et al., 2015). Together, the assessments in table 3, ensure that the measurement model has good construct validity, thereby confirming the model's suitability for further analysis and interpretation of structural relationships.

Table 3.
Discriminant validity (Heterotrait-Monotrait (HTMT) ratio)

	ATU	IPO	OP	PEU	PI
IPO	0.8231				
OP	0.7999	0.821			
PEU	0.7214	0.8412	0.7898		
PI	0.7207	0.6491	0.6295	0.7628	
PS	0.8582	0.7960	0.7244	0.8088	0.8763

The following table 3 illustrates the heterotrait-monotrait (HTMT) values for the variables that were studied in the study. All HTMT values fell below the minimum threshold of 0.85, exhibiting good discriminant validity. Thus, each construct is sufficiently distinct and not overly linked with any additional construct in the conceptual framework. Such a finding is crucial because it confirms that the measurement model successfully differentiates between the unique dimensions of the theoretical framework, rather than conflating them.

The importance of achieving discriminant validity in the study lies in its impact on the model's reliability and validity. When constructs are clearly distinct, it strengthens the model's ability to accurately reflect the different aspects of digital payment adoption and marketing strategies. This distinction is essential for ensuring that each construct uniquely contributes to the understanding of the theoretical framework without overlapping with others. As a result, the model is more robust and credible, providing a reliable basis for analyzing relationships between different constructs.

Furthermore, the demonstrated discriminant validity enhances the model's capacity to offer precise insights into the dynamics of digital payment adoption and marketing strategies. This clarity allows researchers to draw more accurate conclusions about how various factors influence digital payment behaviors and preferences. Consequently, the findings are more likely to reflect true associations rather than spurious correlations caused by overlapping constructs. Ultimately, these results have significant practical implications. With a measurement model that accurately distinguishes between constructs, researchers and practitioners can develop more effective decision-making processes and targeted strategies in the digital marketplace. By understanding the distinct factors that drive digital payment adoption and marketing effectiveness, organizations could customize their approaches so as to better satisfy different customer segments, leading to more successful outcomes in the digital economy.

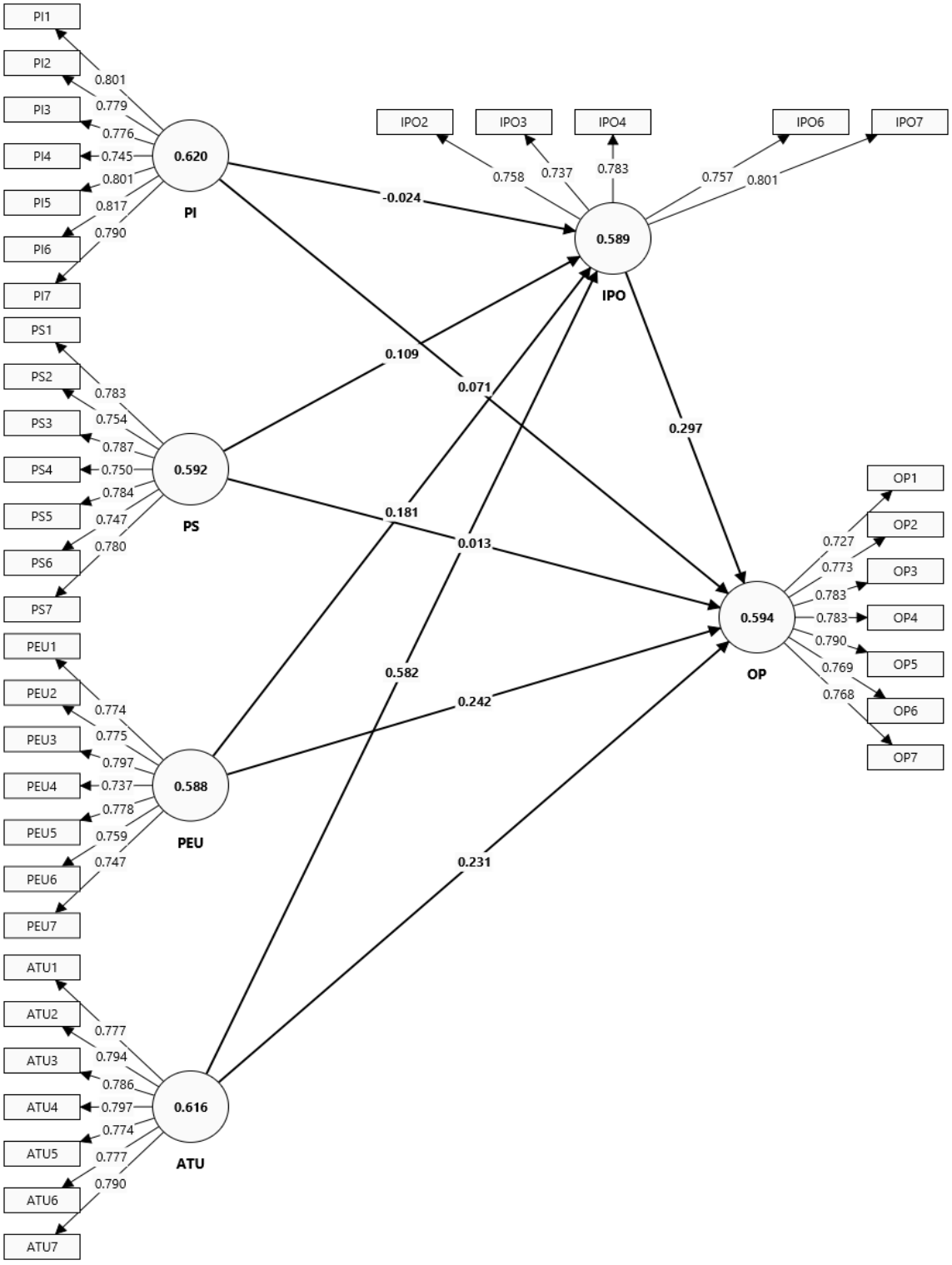

Figure 2. Structural model

Figure 2 presents the structural model, showing the hypothesized relationships among the constructs in the study, while Table 4 summarizes the model fit statistics. The fit indicators, such as the Standardized Root Mean Square Residual (SRMR) of 0.0526, d_ULS of 2.2704, d_G of 1.0307, and Chi-square value of 1627.4752, suggest that the model fits the data well. Specifically, the SRMR value is below the acceptable threshold of 0.08, indicating a minimal discrepancy between the observed and predicted correlations, which supports the model's validity.

Table 4.
Model fit summary

Model fit	Saturated model	Estimated model
SRMR	0.052619184	0.052619184
d_ULS	2.270398388	2.270398388
d_G	1.030689295	1.030689295
Chi-square	1627.475209	1627.475209
NFI	0.797923266	0.797923266

However, the overall model fit, as indicated by the Normed Fit Index (NFI) value of 0.7979, shows that while the model provides a reasonable fit, there is still some room for improvement. This indicates that further refinement of the model could enhance its ability to explain the structural relationships depicted in Figure 2, potentially leading to a more robust understanding of the constructs and their interactions within the context of the study.

Table 5.
Variance explain in the endogenous latent variable

	R-square	R-square adjusted
IPO	0.654052	0.649280273
OP	0.593554	0.586521945

Table 5 illustrates the R-square and adjusted R-square values for the two endogenous latent variables, namely Intention to Purchase Online (IPO) and Online Purchase (OP). The coefficient of correlation (R-square) for purchase intention represents 0.6541, which means that the independent variables that make up the model explain approximately 65.4% of the variance in PI. Similarly, the coefficient R-squared of 0.5936 for OP suggests that the model explains about 59.4% of the variation in online purchasing behavioral intention.

These high R-square values suggest that the model is effective in capturing a significant portion of the variability in these outcomes. This implies that the constructs used in the study are highly relevant for understanding the factors influencing digital payment adoption and online purchasing behavior, thereby providing valuable insights into consumer behavior in the digital marketplace.

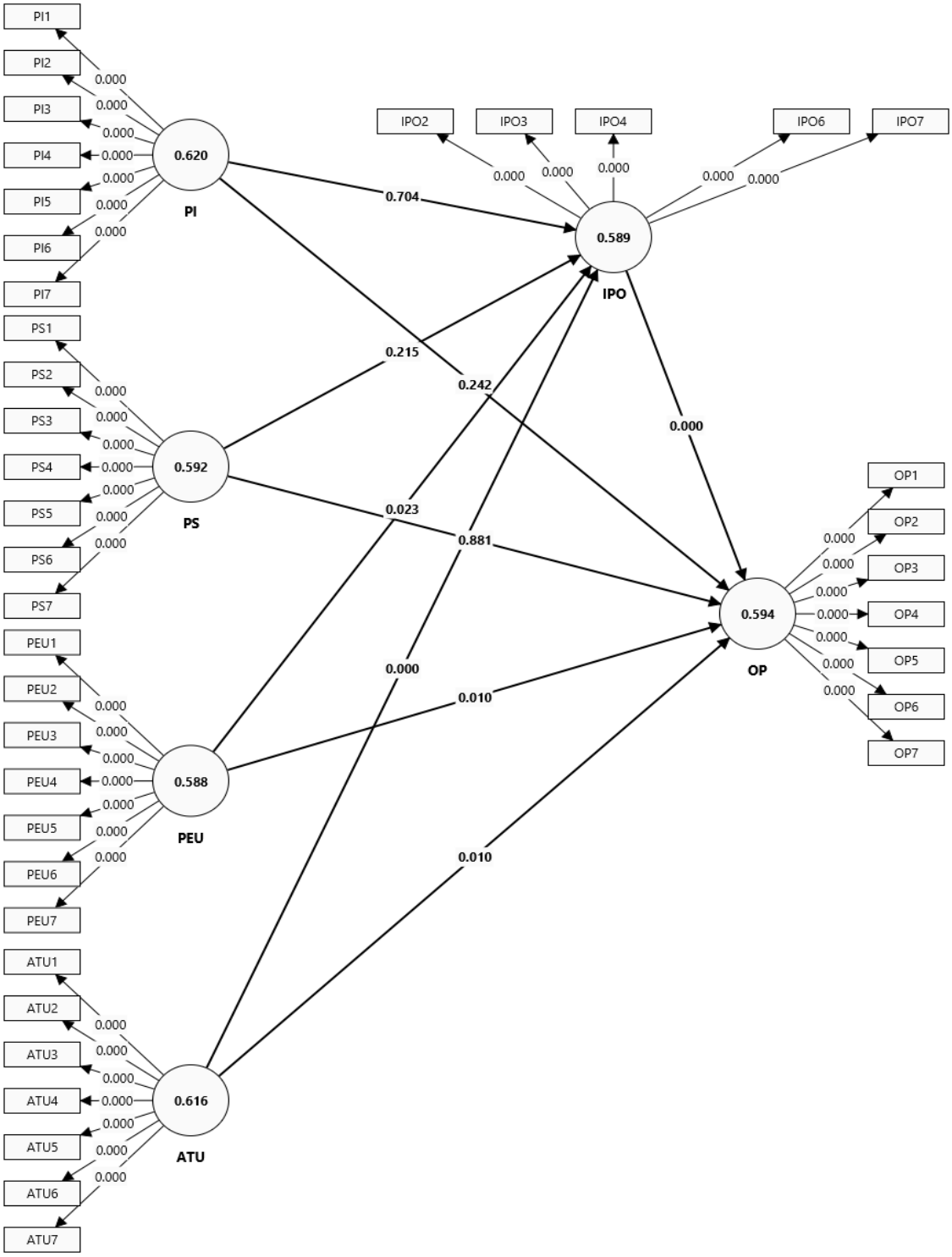

Figure 3. Bootstrapping model

The nine hypotheses in the study analyze various factors influencing online purchase outcomes (OP) and intention to purchase online (IPO) in Saudi Arabia's rapidly evolving digital marketplace. Hypotheses H1, H2, H5, and H6 focus on the direct and indirect effects of Perceived Innovation (PI) and Perceived Security (PS) on OP. The findings indicate that both PI and PS have weak and statistically insignificant direct impacts on OP, aligning with research suggesting that these factors are less critical in driving online purchases compared to other variables. This is consistent with the notion that in Saudi Arabia, consumers prioritize trust and established platforms over novelty and security concerns.

Table 6.
Hypothesis results

Hypothesis	Relationship	Std. Beta	Std. Dev	t-values)	p-values	Findings
H1	PI -> OP	0.071	0.061	1.170	0.242	Not Supported
H2	PS -> OP	0.013	0.088	0.150	0.881	Not Supported
H3	PEU -> OP	0.242	0.094	2.577	0.010	Supported
H4	ATU -> OP	0.231	0.090	2.561	0.010	Supported
H5	PI -> IPO -> OP	-0.007	0.019	0.371	0.711	Not Supported
H6	PS -> IPO -> OP	0.032	0.027	1.180	0.238	Not Supported
H7	PEU -> IPO -> OP	0.054	0.025	2.124	0.034	Supported
H8	ATU -> IPO -> OP	0.173	0.050	3.456	0.001	Supported
H9	IPO -> OP	0.297	0.063	4.756	0.000	Supported

In contrast, Hypotheses H3, H4, H7, H8, and H9 reveal more significant results. Perceived Ease of Use (PEU) and Attitude Towards Use (ATU) both have strong positive effects on OP, with PEU also significantly impacting IPO, which in turn affects OP. These results emphasize the importance of user-friendly digital platforms and positive attitudes towards online transactions in enhancing online shopping behaviors. The strong direct effect of IPO on OP further underscores that a consumer's intention to purchase online is a powerful predictor of actual online buying behavior. These insights suggest that simplifying user interfaces and fostering favorable attitudes towards digital transactions are key strategies for boosting online purchases in Saudi Arabia.

Discussions

The study's nine hypotheses look at the links between various latent factors and how they affect online purchase outcomes (OP) and intention to purchase online (IPO) in the Kingdom of Saudi Arabia. This research is critical, considering the region's rapid adoption of digital technology and growing popularity of online shopping (Al Sawy & Al-Madani, 2021).

H1 (PI -> OP) explores the correlation between perceived innovation (PI) and online purchases (OP). The beta value of 0.071 indicates a weak positive influence; however, the t-value of 1.170 and p-value of 0.242 show that this association is not statistically significant. This finding is consistent with Al Hamli & Sobaih, (2023), who discovered that while innovation is valued, it may not be the key driver of online purchase behavior in Saudi Arabia, where trust and familiarity frequently take priority above innovation.

H2 (PS->OP) investigates the effect of perceived security (PS) on OP. Considering a beta value of 0.013, a t-value of 0.150, and a p-value of 0.881, the results indicate that perceived security does not have a significant impact on online purchases. This is congruent with the results of Almarhabi et al., (2023)., who stated that while security concerns exist in Saudi Arabia, they are generally addressed by robust laws and regulations and the availability of secure, well-known platforms, minimizing the perceived risk when it comes to consumers.

H3 (PEU->OP) examines the effect of perceived ease of use (PEU) on OP and finds a beta value of 0.242, a t-value of 2.577, and a p-value of 0.010, demonstrating a significant positive effect. This confirms the hypothesis and is consistent with the findings of Al-Maghrabi and Dennis (2019), who discovered that the ease of use is a significant factor in strengthening online buying among Saudi customers, who prioritize convenience and simple access to information in digital transactions.

H4 (ATU -> OP) examines the relationship between Attitude Towards Use (ATU) and OP, with a beta value of 0.231, a t-value of 2.561, and a p-value of 0.010, indicating a significant positive effect. This supports the notion that positive attitudes toward using digital payments can significantly enhance online purchase behaviors. According to Alshehri, (2022), in Saudi Arabia, consumer attitudes are heavily influenced by social norms and perceived ease of transaction, both of which enhance positive attitudes towards digital payment systems.

H5 (PI -> IPO -> OP) considers the indirect effect of PI on OP through IPO, revealing a beta value of -0.007, a t-value of 0.371, and a p-value of 0.711, indicating no significant indirect effect. This suggests that in the Saudi context, intention to purchase online do not mediate the effect of perceived innovation on

online purchasing behavior, possibly due to the consumer preference for tried and tested methods over innovative ones (Al-Maghrabi & Dennis, 2019).

H6 (PS -> IPO -> OP) explores the indirect effect of PS on OP through IPO. The beta value of 0.032, with a t-value of 1.180 and a p-value of 0.238, shows no significant effect. This finding suggests that perceived security's indirect impact on online purchasing via intention to purchase online is not substantial. This aligns with Almarhabi et al., (2023), who argued that while security is a consideration, other factors such as perceived ease of use and social influence play more significant roles in determining online purchasing behavior in Saudi Arabia.

H7 (PEU->IPO->OP) posits that perceived ease of use (PEU) has an indirect effect on online purchases (OP) by influencing the intention to purchase online. The beta value of 0.054, with a t-value of 2.124 as well as a p-value of 0.034, demonstrates that the indirect association is statistically significant, hence supporting the hypothesis. This finding is consistent with existing literature in Saudi Arabia, which highlights the importance of simplicity of use in encouraging positive online shopping behaviors (Al-Maghrabi & Dennis, 2019). In the Saudi context, where digital literacy is rapidly increasing, an intuitive and easy-to-navigate platform enhances users' intention to make purchases, which, in turn, translates to actual buying behavior (Alsulaimani, 2018). The significant impact of PEU on IPO and, consequently, on OP suggests that efforts to simplify user interfaces and streamline digital payment processes can effectively boost online shopping activities in the region.

H8 (ATU -> IPO -> OP) hypothesizes that a positive Attitude Towards Use (ATU) influences IPO, which subsequently affects OP. The results, with a beta value of 0.173, a t-value of 3.456, and a p-value of 0.001, reveal a strong and significant positive effect, thereby supporting the hypothesis. This finding is particularly relevant in the Saudi Arabian market, where consumer attitudes towards digital payment systems are shaped by cultural factors and social norms (Al Hamli & Sobaih, 2023). A favorable attitude towards using digital platforms significantly enhances the intention to purchase online, which leads to increased online transactions. Given the conservative nature of Saudi society, where trust and social approval are paramount, a positive perception of digital transactions can effectively drive online purchasing behaviors (Almarhabi et al., 2023).

H9 (IPO -> OP) examines the direct relationship between the Intention to Purchase Online (IPO) and Online Purchase (OP). The findings, with a beta value of 0.297, a t-value of 4.756, and a p-value of 0.000, indicate a strong and statistically significant positive effect, confirming the hypothesis. This relationship highlights that a stronger intention to purchase online is directly associated with an increase in actual online purchases. This is in line with previous research findings in Saudi Arabia, which shows that clear purchase intentions are a significant predictor of online shopping behavior (Anaam et al., 2021). In a market where digital adoption is rapidly growing, understanding the factors that strengthen IPO would avail insights for marketers looking to enhance online sales strategies, particularly through targeted campaigns that reinforce consumer intent.

Conclusion

Based on the statistical results above, the following major conclusions are hereby drawn: Perceived Ease of Use, Attitude towards Using and Intention to Purchase Online are found to have significant positive relationship with Online Purchase. Similarly, Intention to Purchase Online, mediate the relationship between Perceived Ease of Use and Attitude towards Using on Online purchase. On the other hand, Attitude towards Using was not found to have significant mediating effect between Perceived Innovation and Perceived Security on Online Purchase. In the same manner, Perceived Innovation and Perceived Security did not show any significant direct relationship with online purchase. The overall model was found to be significant as 59 percent of the variation in Online Purchase was explained the variables under investigation.

Implications of the Study

This study has far-reaching implications, contributing significantly towards both theoretical and practical applications in the fields of digital marketing and consumer behavior. This study establishes a strong framework for understanding the multiple aspects that influence consumer engagement with digital platforms by combining the Technology Acceptance Model (TAM) and the Chip and Pin Theory. It especially looks at how perceived usefulness, simplicity of use, innovation, and security perceptions

influence consumer interactions with digital marketing technologies. This theoretical innovation not only extends the existing body of literature but also provides a deeper awareness of the psychological and emotional processes that underpin consumer responses to digital marketing initiatives. As such, it sets a foundational basis for future studies aiming to explore these dimensions in greater detail, particularly in the rapidly evolving digital commerce landscape.

From a practical perspective, the findings underscore the critical importance of perceived ease of use and positive consumer attitudes towards digital marketing in shaping online purchase intentions. For businesses, especially startups operating in highly competitive digital environments, these insights are particularly valuable. They suggest that a strategic focus on creating user-friendly digital marketing interfaces that enhance the overall consumer experience can lead to increased engagement and higher conversion rates. Simplifying the user interface and ensuring the intuitiveness of digital marketing tools can significantly lower the barriers to consumer adoption, thereby enhancing their willingness to engage with digital content and complete online transactions. This approach not only improves user satisfaction but also strengthens the brand's position in the digital marketplace by fostering a more engaging and seamless user experience. Furthermore, the study highlights the pivotal role of perceived security in influencing consumer behavior, a factor of growing importance as online shopping becomes increasingly prevalent. Ensuring that consumers feel secure when engaging in digital transactions is paramount to maintaining their trust and encouraging continued engagement. Businesses should prioritize the implementation of robust security measures, such as advanced encryption technologies and multi-factor authentication, to safeguard customer data and protect against potential breaches. Moreover, transparently communicating these security practices to consumers can further bolster their confidence in using digital payment methods. By doing so, companies not only mitigate potential risks but also build long-term customer loyalty, as consumers are more likely to remain with a brand they perceive as trustworthy and reliable in terms of safeguarding their personal and financial information.

Lastly, the implications of this study extend to policymakers and industry stakeholders who are invested in fostering the growth of digital commerce. Understanding the key drivers of consumer acceptance of digital marketing and online purchasing behaviors can inform the development of supportive policies and industry standards that enhance the overall digital ecosystem. For instance, creating regulatory frameworks that emphasize user privacy, data protection, and cybersecurity can help build a safer digital environment that encourages consumer participation. Additionally, promoting educational initiatives that enhance digital literacy among consumers can help reduce apprehensions related to digital transactions, thereby supporting a more dynamic and inclusive digital marketplace. By addressing these areas, policymakers and industry leaders can play a crucial role in promoting the sustainable growth of digital commerce, benefiting consumers and businesses alike through a more secure and user-friendly digital economy.

Limitations and directions for future research

While offering valuable insights into digital marketing and consumer behavior, the study has several limitations that warrant consideration. Firstly, the research is geographically concentrated in the Hail region of Saudi Arabia; this could constrain the generalizability of the findings to other regions or cultural contexts. Furthermore, the specific socio-economic and cultural features of Hail may not represent those of other areas within Saudi Arabia or beyond. Consequently, future research could benefit from a broader geographical scope, incorporating diverse regions and demographic groups to evaluate the proposed model's applicability across different consumer segments and cultural backgrounds, thereby enhancing the study's external validity.

Secondly, the type of data used which is collected using self administered questionnaire presents potential biases, such as social desirability bias and recall bias, which could affect the accuracy of the findings. To address this limitation and strengthen the validity of future studies, researchers could employ mixed-method approaches that combine quantitative surveys with qualitative method. These techniques allows for a more nuanced exploration of consumer behavior, capturing the complexities of their motivations and the variables affecting their acceptance of digital marketing and payment systems.

Furthermore, the study focuses on a limited set of constructs, such as perceived ease of use, perceived security, and attitude toward use, potentially overlooking other influential factors that may impact online purchasing behavior. Other variables such as brand reputation, and broader economic situations were not included in the model and they could significantly affect consumer decisions in digital contexts. Future

research should consider integrating these additional factors to develop an all encompassing model that better captures the multidimensional nature of consumer engagement with digital marketing and online purchasing activities.

Finally, given the rapid pace of technological advancements, it is crucial for future studies to examine the effect of emerging technologies, like artificial intelligence, machine learning, mobile payment innovations and consumer behavior. Understanding how these technological trends shape perceptions of ease of use, security, and overall consumer attitudes will provide businesses with timely insights to adapt their strategies to evolving consumer expectations. Therefore, exploring these areas, researchers can offer practical guidance to marketers and policymakers on how to navigate the dynamic digital landscape and optimize consumer engagement.

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