

Bridging logistics and payment to build trust in African E-Retail: The role of logistics service quality, payment drivers, and cultural influences

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ABSTRACT

E-commerce adoption in Africa is shaped by distinct logistical and payment challenges, requiring a nuanced understanding of logistics service quality (LSQ), payment drivers (PDs), and cultural influences. This study develops an integrative framework to examine how LSQ and PDs influence e-customer satisfaction, trust, and purchase intention within the African e-retail sector, using Morocco as a case study. Findings reveal that timeliness and shipping conditions significantly impact e-customer satisfaction, whereas product availability has a negligible effect, reflecting the persistence of traditional retail alternatives. Furthermore, ease of payment emerges as the strongest determinant of e-customer trust, surpassing payment security, and emphasizing the need for seamless payment experiences.

This study extends Transactional Trust Theory by demonstrating that cash on delivery (COD) serves as a trust-enhancing mechanism in low-trust, high-uncertainty environments, thereby mitigating perceived risk through physical verification before payment. The results also highlight the moderating role of COD, strengthening the effect of timeliness on satisfaction while weakening concerns over shipping conditions, and attenuating the impact of payment security on trust. Additionally, cultural dimensions—uncertainty avoidance and short-term orientation—influence social influence, shaping e-payment adoption.

By bridging logistics efficiency, payment trust mechanisms, and cultural moderating effects, this study offers theoretical contributions to e-commerce trust formation and practical insights for e-retailers and policymakers. The findings advocate for localized strategies, including hybrid payment models that balance digital integration with consumer trust preferences, fostering a smoother transition toward digital financial inclusion in emerging markets.

1. Introduction

In emerging markets, numerous challenges hinder e-commerce growth, including inadequate infrastructure, unreliable logistics networks, internet connectivity issues, and concerns regarding payment security (Murthy et al., 2021; Sila, 2019). These environments affect delivery times and shipping conditions, thereby impacting the overall effectiveness of online order fulfillment (Jain et al., 2021). Concurrently, the payment landscape in these regions is distinct from that of developed markets, with cash on delivery (COD) being a notable payment method (Hamed and El-Deeb, 2020). COD makes up for 74 % of transactions in Morocco, 60 % in Egypt, and 40 % in Kenya, where debit card penetration remains limited to just 10 % of the population (Statista, 2022a). This reliance on COD in Africa highlights the need to understand local

payment drivers (PDs)—the mechanisms that influence or determine how payments are made, structured, and processed in e-commerce. The selection of PDs influences online purchasing behavior and highlights cultural differences and trust dynamics, both of which shape the overall e-commerce experience (Anjum and Chai, 2020).

In light of these challenges, this study aims to examine the interplay between logistics service quality (LSQ), PDs, and cultural factors in shaping online consumer satisfaction and trust in Africa. LSQ serves as a key differentiator for e-retailers (Cotarelo et al., 2021) and is critical for fostering e-customer satisfaction (Sorkun et al., 2020). This interaction cannot be fully understood without considering the cultural context in which e-commerce operates. Cultural dimensions, particularly uncertainty avoidance (UA) and long-term orientation (LTO), as defined by Hofstede (Hofstede, 1984; Hofstede et al., 2005), offer a valuable

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framework for interpreting these dynamics. These two key dimensions are particularly relevant to this study because they directly shape consumers' attitudes toward trust, risk perception, and consumer decision-making behavior. UA delineates the degree to which individuals are comfortable with uncertainty and ambiguity (Hofstede et al., 2005), while LTO describes the extent to which individuals prioritize long-term planning over immediate gratification (Hofstede et al., 2005). In high-UA and low-LTO cultures, such as those prevalent in Africa, social influence significantly shapes online purchasing behavior (Karahanna et al., 1999; Thakur, 2013), contrasting with the more autonomous, data-driven decisions seen in low-UA, high-LTO cultures typical of developed regions (Al-Okaily et al., 2020).

Recent trends underscore Africa's rapid e-commerce penetration, fueled by increasing mobile internet usage and government support for digital transformation (International Trade Administration, 2024a). While this growth is promising, many countries in Africa face common challenges (Kuteyi and Winkler, 2022). These include persistent logistical inefficiencies, limited consumer trust in online transactions, and the widespread reliance on cash-on-delivery (COD) systems. Such barriers not only reduce customer satisfaction but also shape trust-building processes and influence payment preferences. The choice of payment method is often socially constructed, influenced by shared cultural values that guide consumer behavior (Alrawad et al., 2023; Zhao and Pan, 2023). In this context, the dominance of COD in Africa offers valuable insight into the mechanisms of e-commerce adoption, which may differ significantly from those observed in developed countries. To explore these mechanisms more deeply, this study focuses on the interplay of these factors within the African context—specifically using Morocco as a case study. Morocco's burgeoning e-commerce market, supported by progressive government policies and a rapidly digitizing economy, provides a compelling lens through which to analyze these dynamics and draw meaningful international comparisons.

To address these issues and provide both region-specific insights and globally relevant implications, this study investigates the following research questions:

1. To explore the impact of LSQ on e-customer satisfaction in Africa.
2. To examine the role of PDs in fostering e-customer trust in Africa and discuss its implications for global e-commerce markets.
3. To analyze the interaction between African cultural dimensions and social influence.
4. To evaluate the moderating role of COD and its relevance for e-commerce in emerging and developed markets.

By situating this study within both an African and international context, it offers several important contributions to the e-commerce literature. First, it advances understanding of how LSQ, PDs, and cultural dimensions interact to influence e-customer satisfaction and trust in emerging markets—an area that remains significantly underrepresented in current research. Second, by focusing on UA and LTO, the study provides cultural insights that explain consumer reliance on COD, highlighting the socio-psychological underpinnings of payment behavior. Third, through a country-specific analysis of Morocco, the research generates empirical evidence that serves as a foundation for broader comparative studies across Africa and other developing regions. Lastly, the study offers practical implications for policymakers and e-retailers seeking to enhance logistics infrastructure, build consumer trust, and adapt payment systems to align with regional cultural preferences.

2. Literature review

This section outlines the constructs of the existing research models, reviews the theories that support the proposed arguments, and presents the hypotheses.

2.1. Research gaps

Physical distribution service quality (PDSQ) comprises product availability, timeliness, and shipping conditions (Mentzer et al., 1989). Product availability signifies the presence of an in-stock item when a customer places an order (Cotarelo et al., 2021), while timeliness denotes whether products or services are delivered at the promised time (Prassida and Hsu, 2022). Shipping conditions measure order quality (Al-Adwan et al., 2022). Extensive research has established that LSQ (including product availability, timeliness, and shipping conditions) positively affects e-customer satisfaction (Al-Adwan et al., 2022; Cotarelo et al., 2021; Jain et al., 2021; Zhang et al., 2024).

The concept of PDs often refers to fundamental factors that influence how and why payments are made in research fields of financial, banking, and payment systems (Boel, 2019; Bogaard et al., 2024). With the advent of new payment tools such as mobile payments, PDs are still the central topic of research fields in retail industries (Ajao et al., 2023; Ali et al., 2024). In e-commerce, PDs are pivotal in shaping customer trust and influencing purchasing decisions, with payment security (PS) and ease of payment (EOP) being the most crucial factors. EOP measures the convenience of payment, whereas PS refers to the level of protection of customer data from any fraud during financial transactions. Despite its importance, few studies have investigated how PDs influence e-customer trust (Chellappa and Pavlou, 2002; Chen and He, 2013; Kousaridas et al., 2008; Li and Yeh, 2010; Zhou, 2011).

Table 1 indicates that LSQ studies are limited to countries in all regions except Africa. Moreover, research investigating the effect of COD use and the influence of cultural dimensions through social influence on PDs in the African region is scarce. As both PDs and LSQ are crucial in behavioral aspects, this study develops a holistic model, including LSQ and PDs, to bridge the gaps in e-customer behavior literature.

2.2. Theoretical backgrounds

To investigate consumer behavior and payment preferences in African e-commerce environments, this study draws on six interrelated theoretical frameworks. While these theories were developed in broader service, psychology, economics, and information systems contexts, each offers relevant explanatory power for Africa's emerging, culturally diverse, and trust-challenged digital markets. Their adaptation sheds light on how consumers evaluate service, form trust, respond to social cues, and act under culturally embedded preferences.

Initially developed by Parasuraman et al. (1988), SERVQUAL was designed to assess service quality by comparing expected versus perceived performance. With the digitization of commerce, the model evolved into e-SERVQUAL (Zeithaml et al., 2000), now widely applied in assessing LSQ within e-commerce within e-commerce (Lin et al., 2023; Uvet et al., 2024).

In African markets, where logistical inefficiencies, last-mile delivery challenges, and limited fulfillment infrastructure persist, evaluating LSQ is crucial for understanding customer satisfaction in e-commerce. As demonstrated by Cotarelo et al. (2021), LSQ—comprising dimensions such as timeliness, product availability, condition, and ease of return—has a significant impact on customer satisfaction and loyalty across different omnichannel purchasing scenarios. In contexts with infrastructural limitations, such as those prevalent in many African regions, these logistics dimensions become even more critical. For instance, delayed deliveries or lack of clear return options may not only reduce satisfaction but deter future purchases. Therefore, e-SERVQUAL provides a valuable theoretical lens to examine how perceived logistics performance affects customer experiences and retention under such constraints.

2.2.1. Expectation-confirmation theory (ECT)

ECT, introduced by Oliver, 1980 and extended by Bhattacharjee (2001) into post-adoption behavior, posits that satisfaction is driven by

Table 1
Existing literature on LSQ and PD.

Author(s) (year)	Logistics service quality			Payment drivers		Country
	Product availability	Timeliness	Shipping conditions	Ease of payment	Payment Security	
Soh et al. (2015)		✓	✓			Malaysia
Saura et al. (2008)		✓				Spain
Cotarelo et al. (2021)	✓	✓	✓			Vietnam
Al-Adwan et al. (2022)	✓	✓	✓			Jordan
Politis et al. (2014)	✓	✓	✓			Greece
Jain et al. (2021)	✓	✓	✓			India
Murfield et al. (2017)	✓	✓	✓			USA
Li and Yeh (2010)				✓		USA/China
Chellappa and Pavlou (2002)					✓	USA
Zhou (2011)				✓	✓	China
Kousaridas et al. (2008)					✓	–
Chen and He (2013)					✓	USA

the confirmation or disconfirmation of expectations. This model is particularly salient in the African e-commerce context, where consumer expectations are often shaped by informal channels, inconsistent service records, and fragmented platforms (International Trade Administration, 2024b).

In markets like Morocco, where customers may have limited digital transaction history (International Trade Administration, 2024c), satisfaction is heavily influenced by the gap between expected delivery/payment experience and actual performance. ECT thus explains how successful service execution—when it defies low expectations—can generate disproportionately positive reactions and future purchase intentions.

2.2.2. Trust theory

Trust has long been regarded as a critical determinant of consumer behavior in online environments, with foundational contributions by McKnight et al. (1998) and Gefen et al. (2003) establishing its importance in mitigating uncertainty. Building on this foundation, Li et al. (2012) propose a holistic trust framework that identifies two primary pathways through which trust is formed in online transactions: (a) PDs directly influencing customer trust, and (b) customer satisfaction acting as a mediating construct that subsequently enhances trust.

PDs, particularly payment security and ease of payment, are central antecedents of trust in Li's model. Payment security, which refers to the perceived safety of financial and personal data during transactions, reinforces *institution-based trust* by providing structural assurances. This is especially salient in African markets where weak regulatory frameworks and low institutional confidence heighten consumer sensitivity to transactional risks. Secure interfaces, encrypted gateways, and third-party verification mechanisms help establish a baseline level of trust in such environments. In tandem, ease of payment—defined as the simplicity and convenience of the payment process—enhances *cognition-based trust*, particularly when users interact with intuitive platforms offering local, familiar options without cognitive load and transaction anxiety. Infrastructural limitations and digital access gaps common in many African regions make ease of payment not merely a convenience, but a necessity for trust formation.

Beyond these immediate drivers, trust also develops over time through repeated satisfactory experiences, particularly with respect to LSQ. According to Li et al. (2012), this form of *knowledge-based trust* emerges as customers build confidence through consistent and positive interactions with the platform. In the African context—where delivery delays, stockouts, and return complications are prevalent—LSQ dimensions such as timeliness, product availability, and the condition of delivered goods significantly influence overall satisfaction. When these logistics-related expectations are met reliably, customers accumulate experiential knowledge that reinforces trust in both the vendor and the platform. Over time, this experiential learning serves as a foundation for stronger and more resilient trust relationships, reducing perceived risk

in future transactions.

In sum, trust in African e-commerce is shaped by both transactional immediacy (via secure and convenient payment mechanisms) and experiential continuity (via repeated satisfaction with logistics performance). Applying Li et al. (2012)'s framework in this context underscores the importance of aligning both technical systems and service reliability to foster trust in environments characterized by infrastructural and institutional limitations.

2.2.3. Game Theory (stackelberg model)

Game Theory (Von Neumann and Morgenstern, 1944), and particularly the Stackelberg model (Von Stackelberg, 1935), offers a powerful tool for modeling hierarchical decision-making between e-commerce actors. It frames platforms as leaders that set logistics structures and payment rules, while consumers and sellers act as followers, optimizing their responses based on perceived value and trust. This lens aligns with the behavioral mechanism where customer trust enhances purchase intention (Gefen et al., 2003; Pavlou, 2003), and is particularly suited to understanding platform strategy in emerging e-commerce markets.

Yu et al. (2023) develop a Stackelberg model focusing on the platform–seller dynamic, showing how commission rates and service differentiation influence sellers' choice between self-operated and third-party logistics. Zhang et al. (2025) shift the attention to platform–consumer interaction, demonstrating that innovations disregarding user familiarity or cognitive burden can erode trust and lower adoption. Yu et al. (2024) extend the Stackelberg framework to a multi-agent setting, modeling how platform decisions affect the strategic alignment of both upstream (sellers/logistics) and downstream (consumers) actors.

Applied to African e-commerce, where trust in institutions and payment infrastructure is limited, the Stackelberg model reveals the platform's critical role as a strategic trust-builder. When platforms introduce prepayment or app-based wallets without localized safeguards—such as refund guarantees, clear service signals, or mobile-friendly design—consumer purchase intention may decline. Game theory offers not only a way to describe this asymmetry, but also a tool to anticipate and correct misaligned strategies, making it especially valuable in low-trust, high-friction markets.

2.2.4. Social Influence Theory

Social Influence Theory introduced by Deutsch and Gerard (1955) explains how individuals are affected by the behaviors and opinions of others—particularly through peer influence, word-of-mouth, and online reviews. In Africa, where formal marketing may be less persuasive than community validation, social endorsement plays an outsized role in online adoption.

For instance, in contexts of digital unfamiliarity, a friend or relative's positive experience with a payment platform or delivery service can override skepticism. Studies (Park et al., 2019) have shown how social

cues compensate for institutional uncertainty, making this theory essential to understanding payment adoption in regions where formal consumer protections are weak or inconsistently enforced.

2.2.5. Cultural Dimension Theory

Hofstede's Cultural Dimension Theory (Hofstede, 1984, 1986) provides a framework for understanding how national cultural traits—such as uncertainty avoidance, collectivism, and long-term orientation—shape consumer behavior. African markets are not culturally monolithic, but many regions exhibit traits such as risk aversion, group-based decision-making, and strong interpersonal networks, all of which influence online shopping habits.

For example, in cultures with high uncertainty avoidance, COD is preferred because it feels safer and more controllable, even if less efficient. Similarly, collectivist tendencies may reinforce the effect of social influence, as group norms shape trust more than institutional assurances. Cultural dimensions thus help contextualize both payment preferences and social learning dynamics in the African e-commerce landscape.

2.2.6. Synthesis

These six theories—though developed in various disciplines—converge in their ability to explain key behavioral mechanisms relevant to African e-commerce: satisfaction under service uncertainty, trust in low-institutional-trust settings, strategic decision-making in platform design, peer-based adoption, and culturally driven preferences. Together, they form the theoretical foundation for this study's empirical model and the development of its hypotheses. Table 2 summarizes the research model constructs with their respective descriptions, while Fig. 1 depicts the hypothetical framework of the

Table 2
Constructs of the theoretical framework.

Theory	Description	Model	Seminal Literature
e-SERVQUAL Theory	Shows how online service quality affects customer satisfaction in e-commerce.	Logistics service quality → (+) Customer satisfaction	Parasuraman et al. (1988), Zeithaml et al. (2000)
Expectation-Confirmation Theory	Explains how meeting or missing customer expectations shapes satisfaction and future purchase intent.	Customer satisfaction → (+) Purchase intention	Oliver, 1980, Bhattacharjee (2001)
Trust Theory	Trust in online shopping comes from personal traits, platform security ^a , seller credibility, emotions ^b , and past experiences ^b .	Payment drivers ^a → (+) Customer trust Customer satisfaction ^b → (+) Customer trust	McKnight et al. (1998), Gefen et al. (2003)
Game Theory (Stackelberg Model)	Describes how platforms and sellers make decisions first, and consumers react based on trust and options.	Customer trust → (+) Purchase intention	Von Stackelberg (1935), Von Neumann and Morgenstern (1944)
Social Influence Theory	Shows how people are influenced by others' opinions and behaviors when deciding to shop online.	Social influence → (+) Payment drivers	Deutsch and Gerard (1955)
Cultural Dimension Theory	Explains how cultural values affect online shopping behavior	Cultural dimension → (+) Behavioral intentions (Social influence)	Hofstede (1984, 1986)

constructs discussed in Table 2.

2.3. Hypotheses development

2.3.1. Logistics service quality

LSQ encompasses a set of performance indicators measuring the capability to meet customer needs and standards (Gupta et al., 2023). Product availability, timeliness, and shipping conditions are considered the crucial dimensions of PDSQ.

Product availability entails demand management by providing substitute products for stockouts (Xing et al., 2010). Rao et al. (2011) demonstrated that product availability positively affects e-customer satisfaction. Timeliness is paramount as it determines the reliability of the service provider, with any delay potentially causing customer dissatisfaction (Murfield et al., 2017). Griffiths et al. (2012) found that timeliness is a major dimension leading to e-customer satisfaction. According to Rashid and Rasheed (2024), shipping conditions are a dimension of the outcome quality that significantly influences e-customer satisfaction. Shipping conditions have been manifested to impact e-customer satisfaction positively (Jain et al., 2021; Ngo et al., 2025; Rao et al., 2011).

However, it has not been fully investigated whether high-level LSQ also positively affects e-satisfaction in African countries, where the expectation level of LSQ might differ from other developed nations. Consequently, this study proposes the following hypotheses:

H1a. Product availability positively affects e-customer satisfaction.

H2a. Timeliness positively affects e-customer satisfaction.

H3a. Shipping conditions positively affect e-customer satisfaction.

2.3.2. Social influence

Social influence elucidates “how interactions among individuals in a social network have an influence” (Rice and Aydin, 1991, p.222) and relates to pressure from the social community to adopt innovations (Venkatesh and Brown, 2001). According to Karahanna et al. (1999), customers interact with others to reduce their anxiety or uncertainty regarding adopting and using new technologies.

This research explores the link between cultural dimensions (UA and STO) and social influence. Several studies have used cultural dimensions as moderators between social influence and technology use; however, few examine how culture directly affects social influence (Straub et al., 1997).

Culture refers to “a set of social influences on behavior” (Brons, 2006, p.549). This study adopted two of Hofstede's cultural dimensions (UA and STO) to explore African culture. UA describes the extent to which individuals feel threatened by ambiguous and uncertain situations (Hofstede, 1986). Low-UA cultures have a positive attitude toward change and new opportunities, while high-UA cultures prefer a consistent and structured routine (Darley and Blankson, 2008). STO describes the extent to which individuals are future-oriented (Hofstede et al., 2005). STO cultures require deeper levels of trust (Hallikainen and Laukkanen, 2018). However, short-term orientation cultures foster virtues related to the past and present and immediate need gratification (Hofstede et al., 2005; Hofstede and Minkov, 2010).

Individuals with high UA are posited to rely more on opinions from social networks to reduce their feelings of uncertainty or anxiety. In such cultures, individuals are less likely to change their beliefs and behaviors; therefore, any conformity from peers and family can reduce their resistance to new changes. In STO cultures, individuals are expected to respect social codes and be sensitive to social trends in consumption (Hofstede and Minkov, 2010). Thus, the following hypotheses are suggested:

H4. UA positively influences social influence.

H5. STO positively influences social influence.

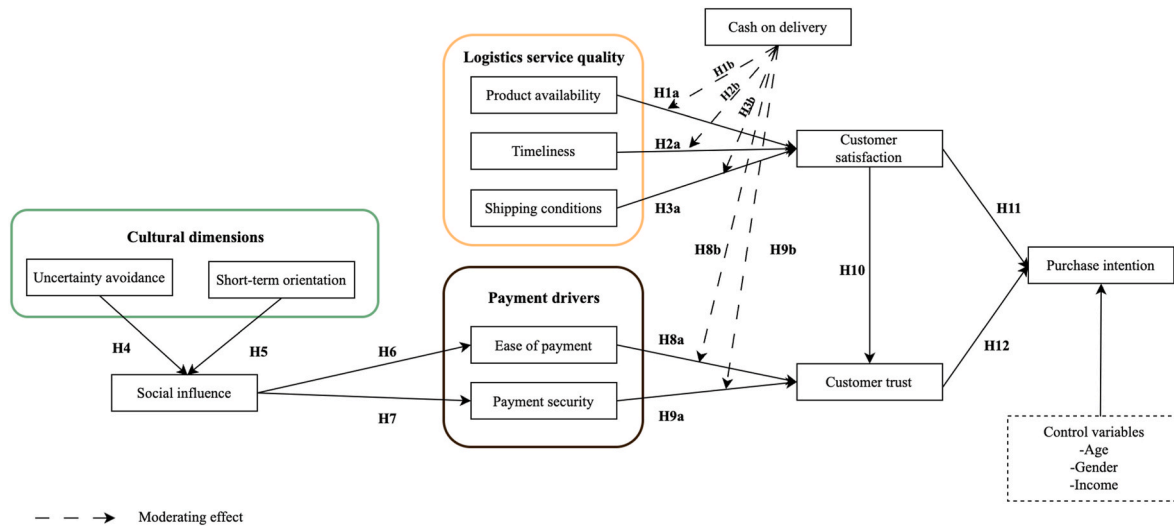


Fig. 1. Conceptual framework.

Several studies have reported a relationship between social influence and ease of use (Liébana-Cabanillas et al., 2014, 2017). Chang et al. (2009) identify ease of payment, convenience, and security as key PDs. Shin (2010) demonstrates that social influence can both reduce perceived risk because many payment methods are intangible, and increase perceived risk because customers are highly uncertain about their financial losses and privacy matters. Once a payment method is accepted as a social norm, peer pressure encourages individuals to use it, making them perceive the method as convenient and secure (ElSayad, 2024). Park et al. (2019) also state that social influence has a strong and positive influence on ease of payment and payment security. Despite the importance of social influence on EOP and PS, evidence for the relationship between the two constructs remains scarce. Thus, these arguments are hypothesized:

H6. Social influence positively affects EOP.

H7. Social influence positively affects PS.

2.3.3. Payment drivers

As e-commerce has rapidly expanded worldwide, various payment options like mobile payments and credit cards are utilized for online purchases. E-payments facilitate the instant transfer of money to retailers (Anjum and Chai, 2020). However, payment security is considered a concerning factor in online shopping (Hossain et al., 2024). Low-security payments prevent customers from purchasing online because paying online entails sharing information related to credit cards. As transaction security influences customer attitudes toward online shopping (Lin, 2007; Vijayasathy, 2004), e-retailers establish security parameters as a higher level of security is linked to e-customer satisfaction (Madinios and Theodoridis, 2010), impacting customers' trust. In e-commerce, authentication is associated with the security of payment, influencing customers' trust (Chen and He, 2013; Kousaridas et al., 2008).

Contrary to the perception that ease of payment contradicts high-security payment, recent technological advancements in FinTech (i.e., Google Pay, Amazon Pay, X-Pay) evidence that ease of payment can align with payment security. Several studies find that EOP positively affects trust (Li and Yeh, 2010; Zhou, 2011). Customers' perspectives regarding the convenience of a payment method influence their trust in e-retailers (El Aissoug et al., 2024). Quan et al. (2023) find that both EOP and PS influence customer trust.

Therefore, this study posits a positive correlation between these PDs (EOP and PS) and the level of customer trust. It hypothesizes as follows:

H8a. Ease of payment positively affects e-customer trust.

H9a. Payment security positively affects e-customer trust.

E-customer satisfaction, e-customer trust, and e-purchase intention.

Customer satisfaction is generally understood as the customer's post-purchase comparison of pre-purchase expectations and the received performance (Al-Adwan et al., 2022). Satisfaction is typically cumulative and related to the overall assessment of customers' experiences (Sharma and Singh, 2023; H. Zhang et al., 2025). E-customer satisfaction indicates contentment with a past purchasing experience from an online retailer (Sann et al., 2024).

Several researchers demonstrate the relationship between e-customer satisfaction and e-customer trust (Javed and Wu, 2020; Kim and Yum, 2024; Meilatinova, 2021). Customers who experience high satisfaction become loyal to the same service provider, which enhances e-customer trust (Cotarelo et al., 2021; Tran and Strutton, 2020; Zhang et al., 2023). Thus, this paper proposes the following hypothesis:

H10. E-customer satisfaction positively affects e-customer trust.

Customer satisfaction results from customers' purchase experiences, which drive their future purchase intentions (Meilatinova, 2021). Purchase intention refers to a customer's decision concerning a purchase (Dhingra et al., 2020) and is an aspect of behavioral intention (Zeithaml et al., 1996). Dhingra et al. (2020) suggested that customer satisfaction positively affects purchase intention. Hence, the next hypothesis is posited:

H11. E-customer satisfaction positively impacts e-purchase intention.

E-customer trust describes the degree of belief in an entity's reliability (Chaihanchai et al., 2024). It is based on customers' expectations about the seller's behavior (Hride et al., 2022). To recommend an e-retailer, customers must first trust the information provided (Al-Adwan et al., 2022).

For online shoppers, trust is significant because they do not visit the store to physically check their desired products (Rasty et al., 2021). Thus, trust helps in eliminating risks and unpredictability (Al-Adwan et al., 2022). Numerous studies show that e-customer trust influences e-purchase intentions (Meilatinova, 2021; Rita et al., 2019). Therefore, the following hypothesis is proposed:

H12. E-customer trust positively affects e-purchase intention.

2.3.4. Cash on delivery

The COD payment method allows customers to pay the purchasing

price in cash once their order is delivered (Tandon et al., 2018). COD requires integrated cooperation between e-retailers and e-logistics service providers in the cash collection process. Owing to COD, sellers require extra resources to handle payments and deliveries. However, it remains the most frequently used payment method in Africa due to (1) customers' lack of trust in logistics service providers, (2) low card penetration, and (3) the absence of secure online payment systems (El Aissoug et al., 2024). Despite practical issues with COD, there have been few empirical investigations.

While risk-related service attributes such as shipping conditions and payment security (PS) are essential in shaping positive customer responses in e-commerce, their relative influence is contingent on the payment method chosen by the customer. In non-COD transactions, where payment is made before product receipt, customers experience heightened vulnerability to transactional risks, making them more sensitive to the physical condition of delivered goods and the security of the payment process (Bhatnagar et al., 2000; Gefen et al., 2003). These elements serve as safeguards against potential loss, fraud, or dissatisfaction. In contrast, COD shifts the temporal structure of risk by deferring payment until the point of delivery, which naturally reduces the customer's pre-transactional anxiety (Jain et al., 2021). As a result, attention is redirected away from risk-mitigation features and toward aspects that directly determine whether the transaction will be completed successfully. According to attention resource allocation theory (Janiszewski, 1998; Kahneman, 1973; Ocasio, 1997), individuals facing cognitive constraints allocate attention to the most salient and relevant cues. In the COD context, where the payment depends on fulfillment, customers are less likely to dwell on shipping conditions or payment security, since the COD mechanism itself effectively buffers these risks. This suggests a weakened impact of risk-related factors on customer outcomes under COD, leading to the following hypotheses:

H3b. COD moderates the relationship between shipping conditions and e-customer satisfaction, such that the degree of the relationship is higher for shoppers using a non-COD payment option.

H9b. COD moderates the relationship between PS and e-customer trust, such that the degree of the relationship is higher for shoppers using a non-COD payment option.

In contrast, performance-related logistics attributes such as product availability, delivery timeliness, and ease of payment become more prominent under COD arrangements, as these factors directly govern the success of the transaction. Under COD, the perceived importance of these attributes intensifies, as customers only pay upon successful delivery, making the fulfillment process a critical point of evaluation. This aligns with expectation-confirmation theory (Oliver, 1980), which suggests that satisfaction arises when core service expectations are met or exceeded, particularly in high-stakes or outcome-contingent situations such as COD. At the same time, ease of payment, often tied to customer trust (Gefen et al., 2003; Pavlou, 2003), also gains salience in COD transactions due to the physical nature of the payment exchange. A seamless and low-effort payment experience at the moment of delivery strengthens the perception of competence and credibility, reinforcing trust in the seller. The real-time, interpersonal nature of COD enhances the relevance of these performance dimensions. Based on these theoretical insights, the following moderation effects are proposed:

H1b. COD moderates the relationship between product availability and e-customer satisfaction, such that the degree of the relationship is higher for shoppers using a COD payment option.

H2b. COD moderates the relationship between timeliness and e-customer satisfaction, such that the degree of the relationship is higher for shoppers using a COD payment option.

H8b. COD moderates the relationship between EOP and e-customer trust, such that the degree of the relationship is higher for shoppers using a COD payment option.

3. Methodology

3.1. Survey design and data collection

Paid survey research firms (Schoenherr et al., 2015) were hired to administer the survey through their online panels. A mix of participant panels from different partners was used to diversify the sample and support randomization. Initially, the survey was soft-launched with a small sample ($n = 53$) to test its clarity and structure. Based on the preliminary responses, minor modifications were made to improve the questionnaire before the official launch. The final questionnaire consisted of three sections. The first section explained the research objectives and included confidentiality and consent statements. The second section collected information on demographic characteristics. In the third section, respondents rated a series of statements using a 7-point Likert scale, where 1 = "strongly disagree" and 7 = "strongly agree" (See Appendix A).

To ensure accessibility and inclusivity, the survey was administered in both French and Arabic. The back-translation method recommended by Sperber et al. (1994) was utilized to maintain conceptual equivalence between the translated versions. The target population consisted of individuals living in Morocco. Participants were selected through random sampling, with the following criteria: (1) aged 18 or older and (2) active users of e-commerce platforms. A total of 1854 panelists responded to the survey invitation, of which 859 valid responses were retained for analysis. The remainder were excluded either due to screening criteria or failure to pass attention checks embedded in the survey, or displaying poor data quality—such as straight-lining, where the same response pattern was repeated across items.

To assess the temporal robustness of the findings (Hulland et al., 2018), a two-wave repeated cross-sectional survey was conducted. The first wave took place in August 2023, followed by the second in April 2025. Each wave involved a distinct sample of respondents, recruited independently but following the same sampling procedure. Although the interval between waves may constrain the ability to capture short-term changes, it offers a basis for evaluating the stability of observed patterns over time. The survey also employed a nationwide sampling strategy across Morocco, minimizing potential regional biases and enhancing the generalizability of the results. To ensure the reliability of the findings across both waves, robustness checks were performed by controlling for regional differences and reanalyzing key relationships within the Casa-blanca subsample. The consistency of results supports the temporal and contextual validity of the study.

Table 3 summarizes the demographic characteristics of the sample and assesses their representativeness in comparison to national population statistics. The statistical data from the study indicate that 62.4 % of the respondents are male, and 37.7 % have an income ranging from 200 to 500 USD. This aligns with Morocco's national statistics, where males comprise around 50.3 % of the population, and the average monthly income is 385 USD (Rahhou, 2022). Respondents aged over 41 represent 38 % of the total sample, which is somewhat comparable to the national statistic, where this age group comprises approximately 44.1 % of the population (Population of Morocco, 2017). The use of COD for online shopping represents 56 %, aligning with the proportion in Morocco (Statista, 2022b). These consistent comparisons with national statistics suggest that the study's sample is representative.

3.2. Bias examination and normality assessment

Common method bias (CMB) arises when the estimates of the link between two or more constructs are assessed using the same approach (Podsakoff and Organ, 1986). To check the bias, Harman's single-factor test was conducted. First, the findings reveal that only one factor explains 29.04 % variance, which is still under the threshold of 50 % (Podsakoff et al., 2003). Second, the model fit is examined when all indicators are loaded onto one factor. The resulting fit indices are as

Table 3
Respondents' demographic characteristics.

Characteristics	Sample		National Statistics	
	Frequency (n = 859)	Proportion (%)	Proportion (%)	Median
Gender				
Male	536	62.4	50.3 ^a	
Female	323	37.6	49.7 ^a	
Age (in years)			29.3 ^b	
18–24	140	16.3	23.3 ^c	
25–30	196	22.8	11.5 ^c	
31–35	107	12.4	11.0 ^c	
36–40	90	10.5	10.1 ^c	
41–45	156	18.2	9.0 ^c	
>46	170	19.8	35.1 ^c	
Income (in USD)			358 ^d	
0–200	120	14.0		
200–500	324	37.7		
500–800	248	28.9		
Above 800	167	19.4		
Preferred payment method				
E-payments	378	44.0		
COD	481	56.0		

^a The World Bank (2022)

^b Worldometers (2023).

^c Population of Morocco (2017)

^d Rahhou (2022).

follows: $\chi^2/df = 14.45$, CFI = 0.51, TLI = 0.48, RMSEA = 0.12, SRMR = 0.11. As such, the single-factor model suggested a worse fit than the original model. Hence, Harman's single-factor test is validated, indicating the absence of CMB.

Normality assessment is a statistical process often used to determine whether study data has a normal distribution. Kurtosis and skewness tests were conducted to measure the normality of the collected data. The values are considered acceptable if they fall between -2 and $+2$ and between -7 and $+7$, respectively (Byrne, 2013). The obtained values fall within the acceptable ranges, indicating a normal distribution.

4. Results and discussion

4.1. Measurement model

A confirmatory factor analysis (CFA) was conducted using a statistical software package (IBM SPSS AMOS 28) to test the measurement items. The results indicate that the model fit indices satisfy all the recommended values by Hu and Bentler (1999), indicating an overall good model fit: $\chi^2/df = 2.50$; CFI = 0.95, TLI = 0.95, RMSEA = 0.04, and SRMR = 0.05. In addition, both composite reliability (CR) and Cronbach's alpha for all latent constructs exceed the threshold of 0.70,

Table 4
Measurement model and discriminant validity.

Variables	AVE	CR	1	2	3	4	5	6	7	8	9	10	11
1. Product availability	0.65	0.88	0.80^a										
2. Timeliness	0.55	0.79	0.26 ^b	0.74									
3. E-customer satisfaction	0.58	0.80	0.27	0.60	0.76								
4. Shipping conditions	0.59	0.74	0.33	0.58	0.67	0.77							
5. Ease of payment	0.73	0.93	0.43	0.48	0.59	0.63	0.85						
6. Uncertainty avoidance	0.60	0.82	0.24	0.35	0.26	0.25	0.47	0.78					
7. Short-term orientation	0.61	0.82	0.02	0.15	0.11	0.04	0.18	0.40	0.78				
8. Social influence	0.58	0.80	−0.15	0.11	0.14	0.04	0.14	0.32	0.37	0.76			
9. Payment security	0.59	0.85	0.30	0.40	0.48	0.47	0.54	0.34	0.19	0.14	0.76		
10. E-customer trust	0.52	0.77	0.28	0.49	0.69	0.75	0.64	0.23	0.10	0.16	0.50	0.72	
11. E-Purchase intention	0.54	0.78	0.44	0.40	0.62	0.67	0.71	0.40	0.17	0.10	0.52	0.62	0.73

Notes: AVE: Average variance explained, CR: Composite reliability.

^a The diagonal values with bold are the square root of AVEs.

^b The values below the bold diagonal values are the correlations between the constructs.

thereby establishing construct reliability (Hair et al., 2010).

The study assessed convergent validity using AVE, which exceeded the threshold value of 0.50 for all constructs. Discriminant validity was confirmed since the square root of the AVE of each construct exceeds its correlation with the other examined latent constructs (Fornell and Larcker, 1981). Table 4 presents the result of the measurement model and discriminant validity test.

4.2. Structural equation path analysis

Structural equation analysis was conducted to evaluate the study's conceptual framework. The fit indices indicate an acceptable model fit: $\chi^2/df = 3.65$, CFI = 0.90; TLI = 0.90; RMSEA = 0.06; SRMR = 0.07. According to Marsh and Hocevar (1985), a normed chi-square value between 2 and 5 is considered acceptable, as it reflects a balance between model fit with complexity. This range acknowledges that the chi-square statistics tend to increase with more complex models. Furthermore, a good model fit is supported when the RMSEA and SRMR values are below the threshold of 0.08 (MacCallum et al., 1996), and when CFI and TLI values are 0.90 or higher (Bentler and Bonett, 1980).

Results in Table 5 indicate that all hypotheses are accepted, except hypothesis H1a. Product availability does not affect e-customer satisfaction ($\beta = 0.03$, $P > 0.05$); therefore, H1a is rejected. Timeliness ($\beta = 0.29$, $P < 0.001$) and shipping conditions ($\beta = 0.54$, $P < 0.001$) positively affect e-customer satisfaction; hence, H2a and H3a are accepted. UA ($\beta = 0.30$, $P < 0.001$) and STO ($\beta = 0.19$, $P < 0.001$) positively influence SI. Also, SI positively affects EOP ($\beta = 0.29$, $P < 0.001$) and PS (β

Table 5
Results of hypothesis testing.

Hypothesis	Path	Coefficients	P-values	Results
H1a	PA→CS	0.03	ns	Rejected
H2a	TL→CS	0.29	***	Accepted
H3a	SC→CS	0.54	***	Accepted
H4	UA→SI	0.30	***	Accepted
H5	STO→SI	0.19	***	Accepted
H6	SI→EOP	0.29	***	Accepted
H7	SI→PS	0.26	***	Accepted
H8a	EOP→CT	0.45	***	Accepted
H9a	PS→CT	0.15	***	Accepted
H10	CS→CT	0.55	***	Accepted
H11	CS→IT	0.23	***	Accepted
H12	CT→IT	0.51	***	Accepted
	Age→IT	0.13	***	
	Income→IT	−0.01	ns	
	Gender→IT	0.05	ns	

Model fit indices: $\chi^2/df = 3.65$, CFI = 0.90, TLI = 0.90, RMSEA = 0.06; SRMR = 0.07.

*** $P < 0.001$, ns $P > 0.05$ (ns: non-significant).

= 0.26, $P < 0.001$). Therefore, H4, H5, H6, and H7 are accepted. The findings validate EOP as the strongest determinant of e-customer trust compared with PS (EOP: $\beta = 0.45$, $P < 0.001$; PS: $\beta = 0.15$, $P < 0.001$). Thus, H8 and H9 are accepted.

Further, e-customer satisfaction ($\beta = 0.55$, $P < 0.001$) positively affects e-customer trust. Therefore, H10 is accepted. Furthermore, e-customer satisfaction ($\beta = 0.23$, $P < 0.001$) and e-customer trust ($\beta = 0.51$, $P < 0.001$) positively affect e-purchase intention. Therefore, H11 and H12 are accepted. Our model includes three control variables (age, income, and gender) to examine their effects on e-purchase intention. The results indicate that only age has a significant effect on the overall e-purchase intention. This implies that changes in age are associated with changes in individuals' likelihood or willingness to make online purchases, particularly in emerging markets. This is consistent with prior research, which highlights the significant role of age in shaping online shopping behavior. For example, Rybaczewska and Sparks (2022) emphasized that age significantly impacts e-commerce activities. In our context, the positive association indicates that older consumers may perceive greater utility or convenience in e-commerce as platforms become more accessible and trustworthy. Conversely, income and gender did not yield significant effects, suggesting that online shopping behaviors in Morocco may be less influenced by these factors than by age-related attitudes toward technology, trust, and convenience.

4.3. Moderation effect analysis

A two-group analysis was conducted to assess the moderating effect of the payment method. The study sample was divided into two groups based on the respondents' chosen payment method. Group 1 consisted of individuals who used COD ($n = 481$), while Group 2 included those who did not use COD ($n = 378$). The significance of the differences between these groups was evaluated using multigroup analysis, thereby validating the moderating role of the payment method.

Concerning the LSQ dimensions, the findings presented in Table 6 indicate that COD has no moderating effect on the relationship between product availability and e-customer satisfaction ($\beta = 0.11$, $P > 0.05$). Consequently, H1b is not supported. However, COD significantly moderates the relationship between timeliness and e-customer satisfaction ($\beta = 0.22$, $P < 0.05$), suggesting that COD strengthens the positive link between those two variables. Hence, H2b is supported. Moreover, COD was found to moderate the relationship between shipping conditions and e-customer satisfaction ($\beta = -0.28$, $P < 0.01$), indicating an attenuating effect. This finding supports hypothesis H3b.

Regarding the PDs, the results reveal that COD does not moderate the relationship between EOP and e-customer trust ($\beta = 0.01$, $P > 0.05$), leading to no support for hypothesis H8b. Conversely, COD was found to significantly attenuate the path between PS and e-customer trust ($\beta = -0.25$, $P < 0.05$), providing support for hypothesis H9b.

To better visualize the moderating effects of the supported hypotheses, three interaction plots were constructed. The mean score of the moderator plus/minus one standard deviation was used as a reference. In line with the test results, Fig. 2 revealed an enhancing interaction between timeliness and customer satisfaction, but an attenuating interaction between shipping conditions and customer satisfaction

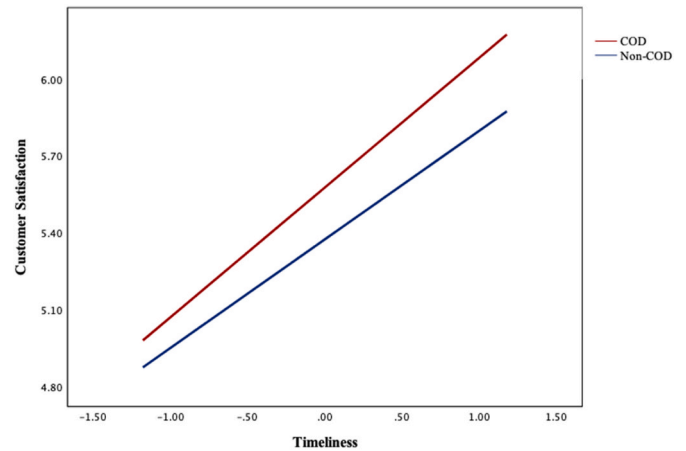


Fig. 2. Interaction plot (TL-CS).

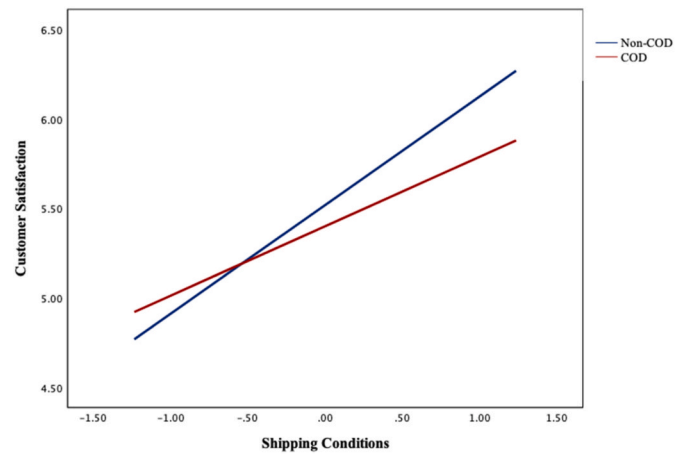


Fig. 3. Interaction plot (SC-CS).

(Fig. 3). On the other hand, it was found that the slope of customer trust over payment security is significantly steeper for non-COD users (Fig. 4), indicating that the impact of payment security on customer trust is stronger for non-COD users than for COD users.

4.4. Discussion

This research employed quantitative analysis to elucidate the factors influencing customers' online shopping experiences. The findings provide insights into the interplay between LSQ, PDs, cultural dimensions, and customer behavior.

Among the LSQ dimensions, timeliness and shipping conditions positively affect e-customer satisfaction, supporting prior research (Al-Adwan et al., 2022; Cotarello et al., 2021; Jain et al., 2021). Conversely, product availability has no relationship with e-customer

Table 6
Moderation effect analysis.

Hypothesis	Path	COD	Non-COD ^b	Difference	Moderating effect	Results
H1b	PA→CS	-0.04 ^a	0.07 ^a	0.11 ^a	No difference	Not Supported
H2b	TL→CS	0.35***	0.13	0.22*	Enhanced	Supported
H3b	SC→CS	0.44***	0.72***	-0.28**	Attenuated	Supported
H8b	EOP→CT	0.43***	0.42***	0.01 ^a	No difference	Not Supported
H9b	PS→CT	0.08 ^a	0.33***	-0.25*	Attenuated	Supported

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

^a $P > 0.05$ (ns: non-significant).

^b Non-COD stands for e-payments.

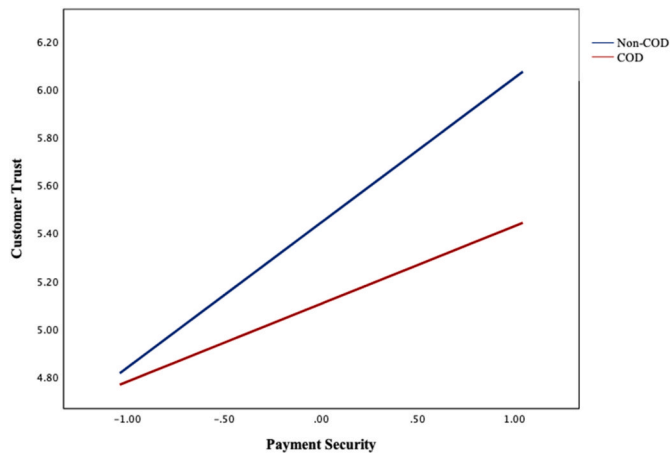


Fig. 4. Interaction plot (PS-CT).

satisfaction. This deviation may be attributed to Morocco's hybrid retail landscape, where traditional markets coexist with e-commerce, and consumers may not fully rely on online channels for product availability. Shipping conditions emerged as the strongest predictor of e-customer satisfaction (Jain et al., 2021), emphasizing the concerns about product integrity upon delivery—a salient issue in regions with underdeveloped logistics networks. In contrast, customers in developed markets often prioritize tracking transparency or delivery speed due to greater infrastructural reliability.

The findings suggest that both **uncertainty avoidance** and **short-term orientation** significantly shape behavioral responses. The results show that high UA and STO levels amplify **social influence**, suggesting that Moroccan consumers—when uncertain about transaction outcomes—are more likely to rely on peer behavior and normative cues to reduce perceived risk. This aligns with cultural psychology frameworks (Triandis, 1989), asserting that individuals in collectivist, risk-averse environments tend to conform to socially accepted behaviors to gain cognitive assurance.

Furthermore, the results indicate that social influence significantly impacts both ease of payment and payment security. This extends previous findings (Flavián et al., 2020), suggesting that in high-UA cultures, peer acceptance of a particular payment method not only enhances its perceived convenience but also bolsters its perceived safety. When a payment option such as COD becomes a normative standard, its widespread use provides vicarious assurance, leading consumers to trust in its effectiveness and security.

Concerning PDs, both ease of payment and payment security positively influence e-customer trust, with EOP exerting a stronger impact. This underscores the importance of intuitive, low-friction payment experiences in building trust—an effect observed across both developed and emerging markets. Nonetheless, the continued preference for COD in Morocco reflects a cultural and infrastructural context in which physicality, immediacy, and transparency of payment are deeply valued.

Following Al-Adwan et al. (2022) and Cotarelo et al. (2021), we observe that e-customer satisfaction positively impacts e-customer trust. Satisfied customers are more likely to have positive expectations about future experiences, in turn, creating the basis for e-customer trust. When customers trust an e-retailer, they become loyal brand advocates, and their willingness to buy online increases. The current research confirms that customers with high levels of trust tend to have a high intention to purchase online (Meilatinova, 2021; Trivedi and Yadav, 2020).

The results of this study provide nuanced insights into how COD moderates the relationship between key LSQ dimensions and customers' behavioral aspects in a developing country context. Notably, H2b was supported, confirming a strengthened relationship between timeliness and customer satisfaction under COD. In contrast, H3b and H9b were

also supported, but in the opposite direction—indicating that COD attenuates the effects of shipping conditions on satisfaction and payment security on trust. Meanwhile, H1b and H8b were not supported, suggesting that COD's moderating role is not uniformly significant across all dimensions.

The support for H2b reflects the fact that, in developing countries where delivery delays are common, on-time delivery carries heightened importance for COD users, as the transaction is only finalized upon successful receipt. This aligns with expectation-disconfirmation theory (Oliver, 1980), as timely delivery becomes a critical signal of performance that directly influences satisfaction when payment is conditional on it. COD consumers in such contexts are more likely to monitor and value punctuality, making timeliness a central evaluative cue under deferred payment conditions.

In contrast, H3b and H9b reveal that COD weakens the influence of shipping conditions and payment security on customer outcomes. This can be explained by the risk-buffering nature of COD. Since consumers do not pay until the product is delivered, the need to preemptively evaluate packaging quality or worry about online fraud is reduced. According to attention resource allocation studies (Janiszewski, 1998; Kahneman, 1973; Ocasio, 1997), consumers direct less cognitive attention to these risk-related factors under COD, as the transaction structure itself mitigates those risks. As such, even if a package is less well-protected or the payment process lacks perceived technical security, the ability to inspect the product and pay only upon satisfaction reduces the psychological weight of these concerns—thus attenuating their effect on satisfaction and trust, respectively.

The lack of support for H1b (product availability to satisfaction under COD) may be due to low baseline expectations around inventory accuracy and fulfillment consistency in developing markets. Customers might be accustomed to order cancellations or stock discrepancies, and therefore may focus more on whether the product ultimately arrives than on whether it was initially shown as “available.” Similarly, H8b (ease of payment to trust under COD) may not be significant in these contexts because manual or cash-based payment interactions are still common and expected. Consumers may not see frictionless payment as a trust signal, since they do not rely on advanced digital systems that would otherwise highlight smoothness as a marker of competence.

In sum, the results suggest that COD moderates service evaluation in asymmetric ways, amplifying the role of delivery performance (e.g., timeliness), while dampening the relevance of risk mitigation attributes (e.g., shipping conditions, payment security), and having limited impact on factors with low salience or expectation (e.g., product availability, ease of payment) in the given economic context.

5. Conclusion

5.1. Theoretical implications

This study develops an integrative theoretical framework that examines the interplay between LSQ and PDs in shaping e-purchase intentions. Unlike prior research that isolates these dimensions, our model provides a holistic perspective, revealing their interdependent effects on e-customer satisfaction and trust. By demonstrating that LSQ and PDs exert complementary influences, this study advances a theoretical understanding of how operational and transactional factors jointly drive e-commerce adoption.

Furthermore, this study extends the Transactional Trust Theory (Pavlou and Gefen, 2004) by contextualizing trust mechanisms in emerging markets. While prior research emphasizes institution-based trust in digital transactions, our findings show that COD itself functions as an alternative institutional trust mechanism, mitigating perceived risk by allowing physical verification before payment. Specifically, we find that for COD users, timeliness has a stronger impact on satisfaction, whereas concerns about shipping conditions are reduced, underscoring how payment structures shape trust formation in low-trust

environments.

Additionally, this study integrates cultural dimensions—uncertainty avoidance and short-term orientation—into e-commerce trust formation. We demonstrate that in high uncertainty avoidance cultures, COD plays a dual role in reducing financial risk and reinforcing transactional trust, offering insights into how cultural variability influences payment preferences and risk perceptions. This study makes three key contributions to Transactional Trust Theory and the broader e-commerce literature:

(1) Contextualizing Trust Mechanisms in Emerging Markets

Prior research on transactional trust has predominantly focused on institutional mechanisms found in developed markets, such as secure digital payments, platform-based buyer protection, and brand reputation. Our findings extend this understanding by demonstrating that in cash-dependent economies, COD itself serves as a trust-enhancing mechanism, offering a practical and culturally embedded alternative to digital assurances. This contribution is particularly relevant for researchers studying trust formation in digital markets characterized by low institutional trust and high uncertainty avoidance.

(2) Expanding the Role of Payment Methods in Trust Development

While Pavlou and Gefen (2004) emphasize institution-based trust through digital safeguards, this study highlights that payment flexibility (ease of payment) is also a critical factor in transactional trust. By showing that COD moderates the relationship between LSQ, PDs, and trust formation, our findings suggest that transactional trust is dynamic and shaped by local payment behaviors rather than being solely reliant on institutional structures. This insight encourages future research to explore alternative trust-building mechanisms beyond traditional digital security measures, particularly in markets where digital payment adoption remains limited.

(3) Bridging Transactional Trust with Cultural Dimensions

This study integrates cultural dimensions (UA and STO) with Transactional Trust Theory, offering a novel perspective on how social and cultural factors mediate consumer trust in e-commerce transactions. Our results show that in high uncertainty avoidance markets, where digital payment hesitancy is prevalent, COD plays a dual role in reducing financial risk and reinforcing transactional trust. These findings highlight the interplay between cultural expectations and trust formation, providing a theoretical foundation for future studies examining how cultural variables interact with e-commerce trust-building mechanisms.

By broadening Transactional Trust Theory beyond developed economies, this study lays the groundwork for future research on payment flexibility, risk perceptions, and culturally adaptive trust mechanisms in digital commerce.

5.2. Practical implications

This research provides valuable, actionable insights for e-retailers and policymakers seeking to enhance LSQ and drive digital payment adoption in developing markets. A deep understanding of cultural influence factors—including trust in traditional payment methods, social norms, and consumer risk perception—is essential for crafting effective e-commerce strategies.

(1) Leveraging Technology to Enhance Logistics Efficiency and Trust

To improve LSQ and enhance e-customer satisfaction, African e-commerce platforms must invest in IoT-enabled real-time tracking systems and develop localized last-mile delivery hubs to enhance transparency, reliability, and control over order fulfillment. These

technologies not only improve delivery speed but also ensure that shipping conditions—such as product handling, temperature control, and package integrity—are closely monitored throughout the supply chain. For instance, smart packaging and condition-monitoring sensors can detect and report shocks, humidity, or temperature deviations in real time, helping maintain product quality and triggering immediate corrective actions if needed. In addition, the use of advanced data analytics and machine learning can optimize route planning and inventory placement, reduce delays, and minimize excessive handling. Combined with interactive tools like real-time delivery notifications and AI-driven customer support, these innovations address both the speed and quality of delivery, directly impacting customers' perceptions of shipping conditions and overall satisfaction. Finally, to bridge infrastructural gaps, partnerships with informal delivery networks—such as motorbike couriers and community agents—can be digitally integrated through mobile apps that include protocols for safe handling and feedback loops. Digitally integrating these actors through mobile applications can standardize service quality, enable customer feedback, and enhance accountability, even in regions with limited logistics infrastructure.

(2) Designing Hybrid Payment Models for Cultural Alignment

E-retailers should develop adaptive payment platforms that enable consumers to seamlessly switch between cash-on-delivery and digital payments within the same transaction journey, reflecting varying trust levels and payment preferences. For example, “phased payments” — where an initial partial payment is made digitally to secure the order, followed by COD upon delivery — can blend risk reduction with convenience, easing consumers into digital adoption. Integrating widely trusted localized mobile money services like M-Pesa alongside traditional COD further leverages existing financial habits and supports gradual digital payment acceptance.

Behavioral data and AI-driven customer segmentation can customize payment offerings based on demographic and psychographic factors, acknowledging the diversity in uncertainty avoidance across African markets. For instance, offering incentives or installment plans to younger, tech-savvy consumers while maintaining COD options for more risk-averse groups balances inclusivity and innovation, optimizing customer satisfaction and trust. To overcome persistent trust deficits, financial literacy campaigns should be embedded within payment interfaces. Interactive mobile platforms in local languages, supported by in-app prompts and tutorials, can guide users through digital transactions in an intuitive manner. Moreover, e-retailers should leverage social influencers, mobile money agents, and community leaders to promote peer-based learning and normalize the use of secure digital payments. These efforts are vital in environments where fraud concerns and limited digital experience remain key barriers to adoption.

(3) Integrating Parcel Lockers in Africa

The introduction of Parcel lockers (PLs) equipped with payment terminals (Appendix B) offers a promising solution to persistent last-mile delivery challenges common in many African countries, including unreliable door-to-door delivery, customer unavailability, and security issues. These centralized pickup points provide customers with flexible, secure parcel retrieval options, reducing logistical inefficiencies and operational costs. Countries like Morocco (e.g., Express Relais), Nigeria (e.g., GIGL), and South Africa (e.g., Pargo and DSV Locker) have begun piloting parcel locker systems in urban centers, demonstrating practical benefits such as mitigating failed deliveries and supporting digital payment integration within locker systems. However, infrastructure constraints—including power outages and limited urban planning—necessitate adaptive designs, such as solar-powered lockers and offline capabilities, with initial deployment focusing on major cities with sufficient infrastructure. Moreover, parcel lockers can also accelerate the shift from COD to digital payments by integrating payment

terminals, offering a controlled environment for secure transactions. Coupled with ongoing financial literacy and consumer education initiatives, parcel lockers can help build trust and facilitate the gradual adoption of e-payments, addressing cultural and infrastructural barriers.

5.3. Limitations and recommendations for future research

First, the study focused solely on Moroccan consumers, which restricts the generalizability of the findings across Africa. Future studies should adopt a multi-country design to assess whether consumer behavior patterns related to LSQ, PDs, and trust hold across diverse cultural and infrastructural settings within the continent. In addition, this study relied on cross-sectional data, which limits causal inference. To address this, future research should incorporate longitudinal or experimental designs to examine how changes in LSQ and payment methods causally affect e-customer satisfaction and trust over time.

Second, while this study used COD as a moderator, it did not fully explore how cultural dimensions interact with payment mechanisms. Specifically, researchers could test whether these cultural dimensions moderate the relationships between LSQ and customer satisfaction, or between PDs and trust. Future studies could use moderated mediation models to test if cultural alignment with COD or digital payments influences the strength of LSQ on satisfaction or PDs on trust, generating specific, testable hypotheses.

Finally, incorporating game-theoretic modelling into future studies could offer predictive insights into strategic behavior among e-retailers,

logistics providers, and consumers. For example, delivery model decisions (self-logistics vs. third-party) or hybrid payment designs (phased payments, mobile money integration) can be framed as strategic games where players maximize utility based on trust, cost, and infrastructure. Simulations of such interactions under different

Cultural and economic scenarios would yield more nuanced, operationally relevant recommendations.

CRedit authorship contribution statement

Chaimaa El Aissoug: Writing – original draft, Visualization, Software, Methodology, Investigation, Data curation. **Thai Young Kim:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Xueqin Wang:** Writing – review & editing, Validation, Supervision, Investigation.

Declaration of competing interest

The authors have declared no conflict of interest.

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Appendix A

Measurement items per research constructs	Mean	S.D.
Product availability		
PA1: "Online shopping website confirms the availability of the product" (Xing et al., 2010)	4.08	2.15
PA2: "I can track my order through the online shopping website." (Murfield et al., 2017)	4.30	2.23
PA3: "Online shopping website offers me an alternative product" (Murfield et al., 2017)	3.75	2.08
PA4: "Waiting time for out-of-stock items is short" (Cotarelo et al., 2021)	3.90	1.95
Timeliness (Cotarelo et al., 2021)		
TL1: "Product is delivered on the promised date"	5.48	1.31
TL2: "Online shopping website provides information about a delivery timeslot"	5.43	1.47
TL3: "Order arrives on time"	5.39	1.45
Shipping conditions		
SC1: "Product is in good condition upon delivery" (Xing et al., 2010)	5.51	1.42
SC2: "Delivery order is accurate (the right items with the correct quantity)" (Cotarelo et al., 2021)	5.54	1.35
e-customer satisfaction		
CS1: "I am satisfied with the service of the online shopping experience" (Cotarelo et al., 2021)	5.44	1.36
CS2: "Online shopping experience always meets my needs" (Cotarelo et al., 2021)	5.37	1.35
CS3: "I am satisfied with the online purchase experience (e.g., ordering and payment procedures)" (Rose et al., 2012)	5.62	1.36
e-customer trust (Rose et al., 2012)		
CT1: "I can rely on online shopping websites as they deliver as promised."	5.35	1.43
CT2: "Online shopping is a trustworthy experience."	5.32	1.41
CT3: "Online shopping is reliable."	5.10	1.52
Ease of payment		
EOP1: "My preferred payment method is easy to use" (Venkatesh et al., 2003)	5.37	1.28
EOP2: "It is easy for me to get what I need using my preferred payment method" (Abu-Shanab, 2014)	5.42	1.23
EOP3: "Ease of use of my preferred payment method enhances my intention to buy online" (Anjum and Chai, 2020)	5.47	1.22
EOP4: "I can skillfully use my preferred payment method to complete shopping" (Yang et al., 2015)	5.45	1.20
EOP5: "I find it easy to use my preferred payment method" (Yuen et al., 2023)	5.44	1.25
Social influence		
SI1: "Friends and family influence my decision to use my preferred payment method" (Chong et al., 2012)	4.51	1.77
SI2: "People who are important to me think that I should use my preferred payment method" (Venkatesh et al., 2012)	5.17	1.39
SI3: "People who influence my behavior think that I should use my preferred payment method." (Venkatesh et al., 2012)	5.05	1.52
Payment security		
PS1: "My preferred payment method gives me confidence for future purchases of products." (Hamed and El-Deeb, 2020)	5.58	1.26
PS2: "I prefer to buy using my preferred payment method." (Hamed and El-Deeb, 2020)	5.65	1.20
PS3: "I think my preferred payment method is a reliable mode of payment." (Hamed and El-Deeb, 2020)	5.66	1.22
PS4: "My preferred payment method is safe to use when making online purchases." (Kwon and Lee, 2003)	5.53	1.31
Uncertainty avoidance		
UA1: "It is important to have instructions spelled out in detail so that I can always know what I am expected to do." (Hofstede, 1994)	5.78	1.33
UA2: "It is important to closely follow instructions and procedures." (Hofstede, 1994)	5.81	1.30
UA3: "I would not take risks when an outcome cannot be predicted." (Yang et al., 2022)	5.68	1.46
Short-term orientation		

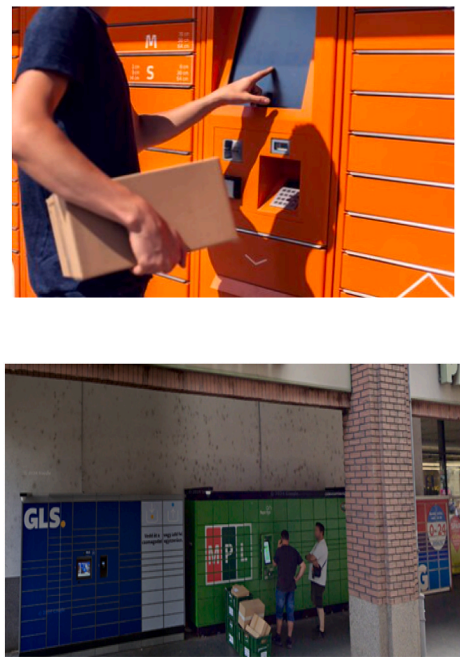
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Measurement items per research constructs	Mean	S.D.
STO1: "Respect for tradition is important to me." (Bearden et al., 2006)	5.73	1.36
STO2: "I value my past experiences." (Hassan et al., 2011)	5.91	1.32
STO3: "Traditional values are important to me." (Bearden et al., 2006)	5.67	1.50
e-Purchase intention		
IT1: "The likelihood that I would search for items to buy online is high." (Al-Adwan et al., 2022)	5.16	1.43
IT2: "I would be willing to buy items from a store online." (Hamed and El-Deeb, 2020)	5.53	1.21
IT3: "Given a chance, I intend to use this online shopping website." (Al-Adwan et al., 2022)	5.21	1.42

Appendix B

Parcel Locker systems equipped with a Payment Terminal in e-commerce.



Data availability

Data will be made available on request.

References

Abu-Shanab, E., 2014. Antecedents of trust in e-government services: an empirical test in Jordan. *Transforming Gov. People, Process Policy* 8, 480–499. <https://doi.org/10.1108/TG-08-2013-0027>.

Ajao, Q.M., Oludamilare, O., Sadeeq, L., 2023. Drivers of Mobile payment acceptance: the impact of network externalities in Nigeria. *Oalib* 10, 1–19. <https://doi.org/10.4236/oalib.1110240>.

Al-Adwan, A.S., Al-Debei, M.M., Dwivedi, Y.K., 2022. E-commerce in high uncertainty avoidance cultures: the driving forces of repurchase and word-of-mouth intentions. *Technol. Soc.* 71, 102083. <https://doi.org/10.1016/j.techsoc.2022.102083>.

Ali, M., Raza, S.A., Hakim, F., Puah, C.H., Chaw, L.Y., 2024. An integrated framework for mobile payment in Pakistan: drivers, barriers, and facilitators of usage behavior. *J. Financ. Serv. Market.* 29, 257–275. <https://doi.org/10.1057/s41264-022-00199-0>.

Al-Okaily, M., Lutfi, A., Alsaad, A., Taamneh, A., Alsyoud, A., 2020. The determinants of digital payment systems' acceptance under cultural orientation differences: the case of uncertainty avoidance. *Technol. Soc.* 63, 101367. <https://doi.org/10.1016/j.techsoc.2020.101367>.

Alrawad, M., Lutfi, A., Almaiah, M.A., Elshaer, I.A., 2023. Examining the influence of trust and perceived risk on customers intention to use NFC mobile payment system. *J Open Innov. Technol. Mark. Complex.* 9, 100070.

Anjum, S., Chai, J., 2020. Drivers of cash-on-delivery method of payment in E-Commerce shopping: evidence from Pakistan. *Sage Open* 10, 215824402091739. <https://doi.org/10.1177/2158244020917392>.

Bearden, W.O., Money, R.B., Nevins, J.L., 2006. A measure of long-term orientation: development and validation. *J. Acad. Market. Sci.* 34, 456–467. <https://doi.org/10.1177/0092070306286706>.

Bentler, P.M., Bonett, D.G., 1980. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol. Bull.* 88, 588–606. <https://doi.org/10.1037/0033-2909.88.3.588>.

Bhatnagar, A., Misra, S., Rao, H.R., 2000. On risk, convenience, and internet shopping behavior. *Commun. ACM* 43, 98–105.

Bhattacharjee, A., 2001. Understanding information systems continuance: an expectation-confirmation model, source. *MIS Q.*

Boel, P., 2019. *Payment Systems – History and Challenges*. Stockholm.

Bogaard, H., Doerr, S., Jonker, N., Kiefer, H., Koltukcu, O., Lopez, C., Ornelas, J.R.H., Rambharat, R., Röhrs, S., Teppa, F., Van Bruggen, F., Vansteenberghe, E., 2024. *Literature Review on Financial Technology and Competition for Banking Services*.

Brons, L.L., 2006. Indirect measurement of regional culture in the Netherlands. *Tijdschr. Econ. Soc. Geogr.* 97, 547–566. <https://doi.org/10.1111/j.1467-9663.2006.00363.x>.

Byrne, B.M., 2013. *Structural Equation Modeling with AMOS*. Routledge. <https://doi.org/10.4324/9780203805534>.

Chaihanchanchai, P., Anantachart, S., Ruangthanakorn, N., 2024. Unlocking the persuasive power of virtual influencer on brand trust and purchase intention: a parallel mediation of source credibility. *J. Market. Commun.* 1–23. <https://doi.org/10.1080/13527266.2023.2301390>.

Chang, Y.F., Chen, C.S., Zhou, H., 2009. Smart phone for mobile commerce. *Comput. Stand. Interfac.* 31, 740–747. <https://doi.org/10.1016/j.csi.2008.09.016>.

Chellappa, R.K., Pavlou, P.A., 2002. Perceived information security, financial liability and consumer trust in electronic commerce transactions. *Logist. Inf. Manag.* 15, 358–368. <https://doi.org/10.1108/09576050210447046>.

Chen, Y., He, W., 2013. Security risks and protection in online learning: a survey. *Int. Rev. Res. Open Dist. Learn.* 14. <https://doi.org/10.19173/irrodl.v14i5.1632>.

- Chong, A.Y.L., Chan, F.T.S., Ooi, K.B., 2012. Predicting consumer decisions to adopt mobile commerce: cross country empirical examination between China and Malaysia. *Decis. Support Syst.* 53, 34–43. <https://doi.org/10.1016/j.dss.2011.12.001>.
- Cotarello, M., Calderón, H., Fayos, T., 2021. A further approach in omnichannel LSQ, satisfaction and customer loyalty. *Int. J. Retail Distrib. Manag.* 49, 1133–1153. <https://doi.org/10.1108/IJRD-01-2020-0013>.
- Darley, W.K., Blankson, C., 2008. African culture and business markets: implications for marketing practices. *J. Bus. Ind. Market.* 23, 374–383. <https://doi.org/10.1108/08858620810894427>.
- Deutsch, M., Gerard, H.B., 1955. A study of normative and informational social influences upon individual judgment. *J. Abnorm. Soc. Psychol.* 51, 629.
- Dhingra, S., Gupta, S., Bhatt, R., 2020. A study of relationship among service quality of E-Commerce websites, customer satisfaction, and purchase intention. *Int. J. E Bus. Res.* 16, 42–59. <https://doi.org/10.4018/IJEBR.2020070103>.
- El Aissoug, C., Kim, T.-Y., Choi, D.-H., 2024. Cross-cultural exploration of determinants of e-commerce adoption: perspectives from logistics service quality and payment driver. *J. Retailing Consum. Serv.* 81, 104033. <https://doi.org/10.1016/j.jretconser.2024.104033>.
- ElSayed, G., 2024. Online customers' attitudes and intentions towards e-payment usage in Egypt during the COVID-19 pandemic: the serial mediation roles of perceived usefulness, perceived trust, and attitude. *J. Sci. Technol. Policy Manag.* <https://doi.org/10.1108/JSTPM-02-2023-0024>.
- Flavián, C., Guinali, M., Lu, Y., 2020. Mobile payments adoption – introducing mindfulness to better understand consumer behavior. *Int. J. Bank Market.* 38, 1575–1599. <https://doi.org/10.1108/IJBM-01-2020-0039>.
- Fornell, C., Larcker, D.F., 1981. Structural equation models with unobservable variables and measurement error: algebra and statistics. *J. Mark. Res.* 18, 382. <https://doi.org/10.2307/3150980>.
- Gefen, D., Karahanna, E., Straub, D.W., 2003. Trust and TAM in online shopping: an integrated model. *MIS Q.* 51–90.
- Griffis, S.E., Rao, S., Goldsby, T.J., Niranjan, T.T., 2012. The customer consequences of returns in online retailing: an empirical analysis. *J. Oper. Manag.* 30, 282–294. <https://doi.org/10.1016/j.jom.2012.02.002>.
- Gupta, A., Singh, R.K., Mathiyazhagan, K., Suri, P.K., Dwivedi, Y.K., 2023. Exploring relationships between service quality dimensions and customers satisfaction: empirical study in context to Indian logistics service providers. *Int. J. Logist. Manag.* 34, 1858–1889. <https://doi.org/10.1108/IJLM-02-2022-0084>.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2010. *Multivariate Data Analysis*, seventh ed. Pearson, New York.
- Hallikainen, H., Laukkanen, T., 2018. National culture and consumer trust in e-commerce. *Int. J. Inf. Manag.* 38, 97–106. <https://doi.org/10.1016/j.jinfomgt.2017.07.002>.
- Hamed, S., El-Deeb, S., 2020. Cash on delivery as a determinant of E-Commerce growth in emerging markets. *J. Global Market.* 33, 242–265. <https://doi.org/10.1080/08911762.2020.1738002>.
- Hassan, L.M., Shiu, E., Walsh, G., 2011. A multi-country assessment of the long-term orientation scale. *Int. Mark. Rev.* 28, 81–101. <https://doi.org/10.1108/0265133111107116>.
- Hofstede, G., 1994. Management scientists are human. *Manag. Sci.* 40, 4–13. <https://doi.org/10.1287/mnsc.40.1.4>.
- Hofstede, G., 1986. Cultural differences in teaching and learning. *Int. J. Intercult. Relat.* 10, 301–320. [https://doi.org/10.1016/0147-1767\(86\)90015-5](https://doi.org/10.1016/0147-1767(86)90015-5).
- Hofstede, G., 1984. *Culture's Consequences: International Differences in work-related Values*. sage.
- Hofstede, G., Hofstede, G.J., Minkov, M., 2005. *Cultures and Organizations : Software of the Mind : Intercultural Cooperation and Its Importance for Survival*, Rev. and Exp. third ed. McGraw Hill Professional, New York.
- Hofstede, G., Minkov, M., 2010. Long- versus short-term orientation: new perspectives. *Asia Pac. Bus. Rev.* 16, 493–504. <https://doi.org/10.1080/13602381003637609>.
- Hossain, M.A., Islam, S., Rahman, M.M., Arif, N.U.M., 2024. Impact of online payment systems on customer trust and loyalty in E-commerce analyzing security and convenience. *Acad. J. Sci., Technol., Eng., math. edu*, 4, 1–15. <https://doi.org/10.69593/ajsteme.v4i03.85>.
- Hride, F.T., Ferdousi, F., Jasimuddin, S.M., 2022. Linking perceived price fairness, customer satisfaction, trust, and loyalty: a structural equation modeling of facebook-based e-commerce in Bangladesh. *Global Bus. Organ. Excel.* 41, 41–54. <https://doi.org/10.1002/joe.22146>.
- Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55. <https://doi.org/10.1080/10705519909540118>.
- Hulland, J., Baumgartner, H., Smith, K.M., 2018. Marketing survey research best practices: evidence and recommendations from a review of JAMS articles. *J. Acad. Market. Sci.* 46, 92–108.
- International Trade Administration, 2024a. The Rise of eCommerce in Africa [WWW Document]. The international trade administration. URL <https://www.trade.gov/rise-e-commerce-africa>, 10.9.24.
- International Trade Administration, 2024b. Morocco - Digital Economy [WWW Document]. URL <https://www.trade.gov/country-commercial-guides/morocco-digital-economy>, 7.3.25.
- International Trade Administration, 2024c. Morocco - eCommerce. URL <https://www.trade.gov/country-commercial-guides/morocco-e-commerce>, 7.3.25.
- Jain, N.K., Gajjar, H., Shah, B.J., 2021. Electronic logistics service quality and repurchase intention in e-tailing: catalytic role of shopping satisfaction, payment options, gender and returning experience. *J. Retailing Consum. Serv.* 59, 102360. <https://doi.org/10.1016/j.jretconser.2020.102360>.
- Janiszewski, C., 1998. The influence of display characteristics on visual exploratory search behavior. *J. Consum. Res.* 25, 290–301.
- Javed, M.K., Wu, M., 2020. Effects of online retailer after delivery services on repurchase intention: an empirical analysis of customers' past experience and future confidence with the retailer. *J. Retailing Consum. Serv.* 54, 101942. <https://doi.org/10.1016/j.jretconser.2019.101942>.
- Kahneman, D., 1973. *Attention and Effort*. Citeaser.
- Karahanna, E., Straub, D.W., Chervany, N.L., 1999. Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Q.* 23, 183. <https://doi.org/10.2307/249751>.
- Kim, J., Yum, K., 2024. Enhancing continuous usage intention in E-Commerce marketplace platforms: the effects of service quality, customer satisfaction, and trust. *Appl. Sci.* 14, 7617. <https://doi.org/10.3390/app14177617>.
- Kousaridas, A., Parissis, G., Apostolopoulos, T., 2008. An open financial services architecture based on the use of intelligent mobile devices. *Electron. Commer. Res. Appl.* 7, 232–246. <https://doi.org/10.1016/j.elerap.2007.04.003>.
- Kuteyi, D., Winkler, H., 2022. Logistics challenges in Sub-Saharan Africa and opportunities for digitalization. *Sustainability* 14. <https://doi.org/10.3390/su14042399>.
- Kwon, K.-N., Lee, J., 2003. Concerns about payment security of internet purchases: a perspective on Current On-Line shoppers. *Cloth. Text. Res. J.* 21, 174–184. <https://doi.org/10.1177/0887302X0402100404>.
- Li, F., Pienkowski, D., Van Moorsel, A., Smith, C., 2012. A holistic framework for trust in online transactions. *Int. J. Manag. Rev.* <https://doi.org/10.1111/j.1468-2370.2011.00311.x>.
- Li, Y.M., Yeh, Y.S., 2010. Increasing trust in mobile commerce through design aesthetics. *Comput. Hum. Behav.* 26, 673–684. <https://doi.org/10.1016/j.chb.2010.01.004>.
- Liébana-Cabanillas, F., Marinković, V., Kalinić, Z., 2017. A SEM-neural network approach for predicting antecedents of m-commerce acceptance. *Int. J. Inf. Manag.* 37, 14–24. <https://doi.org/10.1016/j.ijinfomgt.2016.10.008>.
- Liébana-Cabanillas, F., Sánchez-Fernández, J., Muñoz-Leiva, F., 2014. Antecedents of the adoption of the new mobile payment systems: the moderating effect of age. *Comput. Hum. Behav.* 35, 464–478. <https://doi.org/10.1016/j.chb.2014.03.022>.
- Lin, H.-F., 2007. The impact of website quality dimensions on customer satisfaction in the B2C E-commerce context. *Total Qual. Manag. Bus. Excel.* 18, 363–378. <https://doi.org/10.1080/14783360701231302>.
- Lin, X., Mamun, A. Al, Yang, Q., Masukujjaman, M., 2023. Examining the effect of logistics service quality on customer satisfaction and re-use intention. *PLoS One* 18, e0286382.
- MacCallum, R.C., Browne, M.W., Sugawara, H.M., 1996. Power analysis and determination of sample size for covariance structure modeling. *Psychol. Methods* 1, 130–149. <https://doi.org/10.1037/1082-989X.1.2.130>.
- Maditinos, D.I., Theodoridis, K., 2010. Satisfaction determinants in the Greek online shopping context. *Inf. Technol. People* 23, 312–329. <https://doi.org/10.1108/09593841011087789>.
- Marsh, H.W., Hocevar, D., 1985. Application of confirmatory factor analysis to the study of self-concept: first- and higher order factor models and their invariance across groups. *Psychol. Bull.* 97, 562–582. <https://doi.org/10.1037/0033-2909.97.3.562>.
- McKnight, D.H., Cummings, L.L., Chervany, N.L., 1998. Initial trust formation in new organizational relationships. *Acad. Manag. Rev.* 23, 473–490.
- Meilatinova, N., 2021. Social commerce: factors affecting customer repurchase and word-of-mouth intentions. *Int. J. Inf. Manag.* 57, 102300. <https://doi.org/10.1016/j.jinfomgt.2020.102300>.
- Mentzer, J.T., Gomes, R., Krapfel, R.E., 1989. *Physical Distribution Service: a Fundamental Marketing Concept?*.
- Murfield, M., Boone, C.A., Rutner, P., Thomas, R., 2017. Investigating logistics service quality in omni-channel retailing. *Int. J. Phys. Distrib. Logist. Manag.* 47, 263–296. <https://doi.org/10.1108/IJPDLM-06-2016-0161>.
- Murthy, K.V.B., Kalsie, A., Shankar, R., 2021. Digital economy in a global perspective: is there a digital divide? *Transnatl. Corp. Rev.* 13, 1–15. <https://doi.org/10.1080/19186444.2020.1871257>.
- Ngo, T.T.A., An, G.K., Dao, D.K., Nguyen, N.Q.N., Nguyen, N.Y.V., Phong, B.H., 2025. Roles of logistics service quality in shaping generation Z customers' repurchase intention and electronic word of mouth in E-commerce industry. *PLoS One* 20, e0323962. <https://doi.org/10.1371/journal.pone.0323962>.
- Ocasio, W., 1997. Towards an attention-based view of the firm. *Strateg. Manag. J.* 18, 187–206.
- Oliver, R.L., 1980. A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of marketing research* 17, 460–469.
- Parasuraman, A.P., Zeithaml, V.A., Berry, L.L., 1988. SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *J. Retailing* 64, 12–37.
- Park, J., Ahn, J., Thavisay, T., Ren, T., 2019. Examining the role of anxiety and social influence in multi-benefits of mobile payment service. *J. Retailing Consum. Serv.* 47, 140–149. <https://doi.org/10.1016/j.jretconser.2018.11.015>.
- Pavlou, P.A., 2003. Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. *Int. J. Electron. Commer.* 7, 101–134.
- Pavlou, P.A., Gefen, D., 2004. Building effective online marketplaces with institution-based trust. *Inf. Syst. Res.* 15. <https://doi.org/10.1287/isre.1040.0015>.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y., Podsakoff, N.P., 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>.
- Podsakoff, P.M., Organ, D.W., 1986. Self-reports in organizational research: problems and prospects. *J. Manag.* 12, 531–544. <https://doi.org/10.1177/014920638601200408>.

- Politis, Y., Giovanis, A., Binioris, S., 2014. Logistics service quality and its effects on customer satisfaction in the manufacturing companies' supply chains. *J. Model. Manag.* 9, 215–237. <https://doi.org/10.1108/JM2-05-2012-0016>.
- Population of Morocco [WWW Document], 2017. Population pyramids of the world. URL: <https://www.populationpyramid.net/morocco/2017/>, 5.17.24.
- Prassida, G.F., Hsu, P.-Y., 2022. The harmonious role of channel integration and logistics service in omnichannel retailing: the case of IKEA. *J. Retailing Consum. Serv.* 68, 103030. <https://doi.org/10.1016/j.jretconser.2022.103030>.
- Quan, W., Moon, H., Kim, S., Sam, Han, H., 2023. Mobile, traditional, and cryptocurrency payments influence consumer trust, attitude, and destination choice: Chinese versus Koreans. *Int. J. Hospit. Manag.* 108, 103363. <https://doi.org/10.1016/j.ijhm.2022.103363>.
- Rahhou, jihane, 2022. Morocco has highest average salary in North Africa. URL: <https://www.morocoworldnews.com/2022/08/42335/morocco-has-highest-average-salary-in-north-africa/>, 7.18.25.
- Rao, S., Goldsby, T.J., Griffiths, S.E., Iyengar, D., 2011. Electronic logistics service quality (e-LSQ): its impact on the customer's purchase satisfaction and retention. *J. Bus. Logist.* 32, 167–179. <https://doi.org/10.1111/j.2158-1592.2011.01014.x>.
- Rashid, DrA., Rasheed, DrA., 2024. Logistics service quality and product satisfaction in E-Commerce. *Sage Open* 14. <https://doi.org/10.1177/21582440231224250>.
- Rasty, F., Mirghafoori, S.H., Saeida Ardekani, S., Ajdari, P., 2021. Trust barriers to online shopping: investigating and prioritizing trust barriers in an intuitionistic fuzzy environment. *Int. J. Consum. Stud.* 45, 1030–1046. <https://doi.org/10.1111/ijcs.12629>.
- Rice, R.E., Aydin, C., 1991. Attitudes toward new organizational technology: network proximity as a mechanism for social information processing. *Adm. Sci. Q.* 36, 219. <https://doi.org/10.2307/2393354>.
- Rita, P., Oliveira, T., Farisa, A., 2019. The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon* 5, e02690. <https://doi.org/10.1016/j.heliyon.2019.e02690>.
- Rose, S., Clark, M., Samouel, P., Hair, N., 2012. Online customer experience in e-Retailing: an empirical model of antecedents and outcomes. *J. Retailing* 88, 308–322. <https://doi.org/10.1016/j.jretai.2012.03.001>.
- Rybackowska, M., Sparks, L., 2022. Ageing consumers and e-commerce activities. *Ageing Soc.* 42, 1879–1898. <https://doi.org/10.1017/S0144686X20001932>.
- Sann, R., Pimpohnsakun, P., Booncharoen, P., 2024. Exploring the impact of logistics service quality on customer satisfaction, trust and loyalty in bus transport. *Int. J. Qual. Serv. Sci.* 16, 519–541. <https://doi.org/10.1108/IJQSS-07-2023-0110>.
- Saura, I.G., Francés, D.S., Contrí, G.B., Blasco, M.F., 2008. Logistics service quality: a new way to loyalty. *Ind. Manag. Data Syst.* 108, 650–668. <https://doi.org/10.1108/02635570810876778>.
- Schoenherr, T., Ellram, L.M., Tate, W.L., 2015. A note on the use of survey research firms to enable empirical data collection. *J. Bus. Logist.* 36, 288–300.
- Sharma, D.R., Singh, B., 2023. Understanding the relationship between customer satisfaction, customer engagement and repeat purchase behaviour. *Vision. J. Bus. Perspect.* 27, 449–457. <https://doi.org/10.1177/0972262921992593>.
- Shin, D.-H., 2010. Modeling the interaction of users and Mobile payment system: conceptual framework. *Int. J. Hum. Comput. Interact.* 26, 917–940. <https://doi.org/10.1080/10447318.2010.502098>.
- Sila, I., 2019. Antecedents of electronic commerce in developing economies. *J. Global Inf. Manag.* 27, 66–92. <https://doi.org/10.4018/JGIM.2019010104>.
- Soh, K.L., Chin, S.H., Wong, W.P., 2015. A theoretical model to investigate customer loyalty on logistics service providers for sustainable business performance. *Int. J. Bus. Perform. Supply Chain Model.* 7, 212. <https://doi.org/10.1504/IJBPSM.2015.071609>.
- Sorkun, M.F., Yumurtacı Hüseyinoğlu, I.Ö., Börühan, G., 2020. Omni-channel capability and customer satisfaction: mediating roles of flexibility and operational logistics service quality. *Int. J. Retail Distrib. Manag.* 48, 629–648. <https://doi.org/10.1108/IJRDM-07-2019-0235>.
- Sperber, A.D., Devellis, R.F., Boehlecke, B., 1994. Cross-cultural translation. *J. Cross Cult. Psychol.* 25, 501–524. <https://doi.org/10.1177/0022022194254006>.
- Statista, 2022a. The Rise of e-commerce Across Africa.
- Statista, 2022b. E-commerce in Morocco.
- Straub, D., Keil, M., Brenner, W., 1997. Testing the technology acceptance model across cultures: a three country study. *Inf. Manag.* 33, 1–11. [https://doi.org/10.1016/S0378-7206\(97\)00026-8](https://doi.org/10.1016/S0378-7206(97)00026-8).
- Tandon, U., Kiran, R., Sah, A.N., 2018. The influence of website functionality, drivers and perceived risk on customer satisfaction in online shopping: an emerging economy case. *Inf. Syst. E. Bus. Manag.* 16, 57–91. <https://doi.org/10.1007/s10257-017-0341-3>.
- Thakur, R., 2013. Customer adoption of Mobile payment services by professionals across two cities in India: an empirical study using modified technology acceptance model. *Bus. Perspect. Res.* 1, 17–30. <https://doi.org/10.1177/2278533720130203>.
- The World Bank, 2022. Population, total - morocco. URL: <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=MA>, 4.1.24.
- Tran, G.A., Strutton, D., 2020. Comparing email and SNS users: investigating e-servicescape, customer reviews, trust, loyalty and E-WOM. *J. Retailing Consum. Serv.* 53. <https://doi.org/10.1016/j.jretconser.2019.03.009>.
- Triandis, H.C., 1989. The self and social behavior in differing cultural contexts. *Psychol. Rev.* 96, 506–520. <https://doi.org/10.1037/0033-295X.96.3.506>.
- Trivedi, S.K., Yadav, M., 2020. Repurchase intentions in Y generation: mediation of trust and e-satisfaction. *Market. Intell. Plann.* 38, 401–415. <https://doi.org/10.1108/MIP-02-2019-0072>.
- Uvet, H., Dickens, J., Anderson, J., Glassburner, A., Boone, C.A., 2024. A hybrid e-logistics service quality approach: modeling the evolution of B2C e-commerce. *Int. J. Logist. Manag.* 35, 1303–1331.
- Venkatesh, V., Brown, S.A., 2001. A longitudinal investigation of personal computers in homes: adoption determinants and emerging challenges. *MIS Q.* 25, 71. <https://doi.org/10.2307/3250959>.
- Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D., 2003. User acceptance of information technology: toward a unified view. *MIS Q.* 27, 425–478. <https://doi.org/10.2307/30036540>.
- Venkatesh, V., Thong, J.Y.L., Xu, X., Walton, S.M., 2012. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Q.* 36, 157–178.
- Vijayarath, L.R., 2004. Predicting consumer intentions to use on-line shopping: the case for an augmented technology acceptance model. *Inf. Manag.* 41, 747–762. <https://doi.org/10.1016/j.im.2003.08.011>.
- Von Neumann, J., Morgenstern, O., 1944. *Theory of Games and Economic Behavior*. Princeton Univ. Press, Princeton.
- Von Stackelberg, H., 1935. *DER TYPISCHE FEHLSCHLUSS IN DER THEORIE DER GLEICHGEWICHTSLOSEN MARKTFORMEN: Ein Beitrag zum Seinsgebundenheitsproblem der Wissenschaft*. *J. Inst. Theor. Econ. JITE* 95, 691–708.
- Worldometers, 2023. Morocco demographics. URL: <https://www.worldometers.info/demographics/morocco-demographics/>, 4.1.24.
- Xing, Y., Grant, D.B., McKinnon, A.C., Fernie, J., 2010. Physical distribution service quality in online retailing. *Int. J. Phys. Distrib. Logist. Manag.* 40, 415–432. <https://doi.org/10.1108/09600031011052859>.
- Yang, Q., Pang, C., Liu, L., Yen, D.C., Michael Tarn, J., 2015. Exploring consumer perceived risk and trust for online payments: an empirical study in China's younger generation. *Comput. Hum. Behav.* 50, 9–24. <https://doi.org/10.1016/j.chb.2015.03.058>.
- Yang, S., Isa, S.M., Ramayah, T., 2022. Does uncertainty avoidance moderate the effect of self-congruity on revisit intention? A two-city (auckland and Glasgow) investigation. *J. Destin. Market. Manag.* 24, 100703. <https://doi.org/10.1016/j.jdmm.2022.100703>.
- Yu, J., Song, Z., Zhou, C., 2023. Self-supporting or third-party? The optimal delivery strategy selection decision for e-tailers under competition. *Kybernetes* 52, 4783–4811. <https://doi.org/10.1108/K-02-2022-0216>.
- Yu, J., Zhou, C., Leng, M., 2024. Strategic logistics service choices for online platforms: self-operated, third-party or agency logistics? *RAIRO, Oper. Res.* 58, 3923–3945. <https://doi.org/10.1051/ro/2024167>.
- Yuen, K.F., Choo, L.Q., Li, X., Wong, Y.D., Ma, F., Wang, X., 2023. A theoretical investigation of user acceptance of autonomous public transport. *Transportation* 50, 545–569. <https://doi.org/10.1007/s11116-021-10253-w>.
- Zeithaml, V.A., Berry, L.L., Parasuraman, A., 1996. The behavioral consequences of service quality. *J. Market.* 60, 31. <https://doi.org/10.2307/1251929>.
- Zeithaml, V.A., Parasuraman, A., Malhotra, A., 2000. *A Conceptual Framework for Understanding e-Service Quality: Implications for Future Research and Managerial Practice*.
- Zhang, G., Meng, X., Feng, L., Kou, Q., 2025a. Effects of the buy-online-and-assemble-in-store approach: implications for firms, consumers, and environment. *Sustain. Oper. Comput.* 6, 47–56. <https://doi.org/10.1016/j.susoc.2025.03.001>.
- Zhang, H., Deng, H., Sun, Q., Zhu, L., 2025b. Customer satisfaction in online-to-offline commerce: a fresh product perspective. *Br. Food J.* 127, 284–300. <https://doi.org/10.1108/BFJ-10-2024-1059>.
- Zhang, Q., Ariffin, S.K., Richardson, C., Wang, Y., 2023. Influencing factors of customer loyalty in mobile payment: a consumption value perspective and the role of alternative attractiveness. *J. Retailing Consum. Serv.* 73. <https://doi.org/10.1016/j.jretconser.2023.103302>.
- Zhang, Y., Yuan, Y., Su, J., 2024. Systematic investigation of the logistics service quality of cross-border e-commerce: a mixed-methods perspective. *Asia Pac. J. Mark. Logist.* 36, 549–564. <https://doi.org/10.1108/APJML-03-2023-0203>.
- Zhao, Y., Pan, Y.-H., 2023. A study of the impact of cultural characteristics on consumers' behavioral intention for mobile payments: a comparison between China and Korea. *Sustainability* 15, 6956.
- Zhou, T., 2011. The effect of initial trust on user adoption of mobile payment. *Inf. Dev.* 27, 290–300. <https://doi.org/10.1177/0266666911424075>.