

Customer Retention in Digital Commerce: A Systematic Review of Frameworks, Methods, and Engineering Design Implications

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Abstract

This study presents a systematic literature review of the conceptual, methodological, and managerial toolset used to study and improve customer retention in digital commerce environments. Using a PRISMA-guided review of 44 engineering-oriented studies published between 2016 and 2026, the review synthesises how retention is defined, theorised, and empirically analysed across e-commerce, mobile commerce, social commerce, digital commerce, and on-demand service platforms. The findings indicate that retention is predominantly operationalised as loyalty, repurchase intention, or continuance intention and is primarily explained using technology acceptance and service quality frameworks. Methodologically, the field is dominated by cross-sectional survey designs analysed using Structural Equation Modelling, with limited use of behavioural or operational datasets. From an engineering perspective, the review demonstrates that customer retention is not a uniform construct but a system-level outcome contingent upon commerce architecture, trust locus, and dominant risk exposure. Retention mechanisms differ structurally across B2C platforms, social commerce, resource-constrained digital commerce, and on-demand service ecosystems. The study highlights the need for architecture-specific, analytics-driven, and intervention-oriented approaches that move beyond perception-based modelling toward optimisable retention systems.

Keywords

Customer retention; e-commerce; digital commerce; systematic literature review; framework; engineering design.

1. Introduction

Customer retention is defined in the literature as the intensity of a customer's intention to continue using or repurchasing a product or service after initially receiving it (Li et al., 2024; Mofokeng, 2025; Zhang & Kim, 2021). It represents the extent to which customers demonstrate commitment and loyalty by continually choosing the same retailer rather than switching to a competitor (Li et al., 2024; Shang & Wu, 2017).

From an economic perspective, customer retention is known to be cheaper than acquisition, lifetime value drives profitability, and customer churn destabilises demand forecasting and capacity planning. In an apparel retail e-commerce study, it was found that increasing retention rates by even 5% can boost profits by 25% to 95% (Bansal & Sharma, 2024). For innovation, retained customers provide usage data and regular feedback, and support product ecosystems. Similarly, from an engineering perspective, retention influences demand variability, resource utilisation, service levels, queue lengths and system robustness.

Although customer retention has been widely studied in marketing and information systems, existing research remains fragmented across theories, methods, and platform contexts. Most studies explain retention using perceptual or behavioural constructs (Asante et al., 2019; Kabir & Kang, 2025; Netshirando et al., 2021; Prasetyo & Wahab, 2022), yet offer limited guidance on how retention can be engineered through system design, operational reliability, or analytics-

driven interventions. As a result, retention is predominantly treated as an outcome to be measured rather than a system-level phenomenon that can be explicitly designed and controlled. This gap limits organisations' ability to translate behavioural insights into actionable system architectures and decision-support mechanisms. Accordingly, a systematic synthesis is required to integrate existing knowledge and reposition customer retention as a designable and controllable system outcome from an engineering perspective.

1.1 Objectives

This study addresses this gap through a systematic literature review structured around four research objectives:

1. Conceptualise how customer retention is defined and operationalised across digital commerce settings.
2. Identify and classify the theoretical frameworks used to explain retention behaviour.
3. Examine the dominant research designs and analytical approaches applied in retention studies.
4. Synthesise actionable system, process, and managerial mechanisms to engineer retention.

Collectively, these objectives contribute by systematically classifying retention frameworks, identifying dominant methodological approaches, and translating these into engineering-oriented design implications for digital commerce systems.

The structure of the remainder of this article is as follows: Section 2 presents the method used to conduct the systematic review. Section 3 provides a descriptive and analytical synthesis of the findings and addresses the research objectives. Finally, Section 4 reflects on the theoretical, methodological, and engineering implications of the reviewed studies, articulates the contributions to the fields of digital commerce and engineering management, and proposes directions for future research.

2. Methods

A systematic literature review (SLR) was conducted to identify, classify, and synthesise the conceptual, methodological, and engineering-oriented approaches used to study customer retention in digital commerce environments. The review was designed to align directly with the four research objectives of this study, ensuring a structured and transparent approach to evidence identification, selection, and synthesis (McClelland et al., 2020).

The review employed a multi-database search strategy to ensure broad, multidisciplinary coverage of the relevant literature. Two databases were selected, namely Elsevier's abstract and citation database Scopus (Elsevier, 2026) and SpringerLink (Springer Nature, 2026), due to their extensive indexing of peer-reviewed research across engineering, information systems, and management domains. The search terms were structured around the core theme of *customer retention*, the *e-commerce setting*, and the lens of conceptual and analytical *frameworks*. These themes were operationalised into a structured Boolean search string applied across the title, abstract, and keyword fields. The full set of search terms is presented in Table 1.

Table 1. Search terms

Theme	Search terms
Core	"customer retention" OR "customer loyalty" OR "customer churn" OR "customer attrition" OR "customer switching" OR "repeat purchase" OR "repurchase intention" OR "customer continuance" OR "customer persistence" OR "repeat buying" OR "repurchase behaviour" OR "repeat buying" OR "repurchase behaviour" OR "continuance intention"
e-commerce	"e-commerce" OR ecommerce OR "online shopping" OR "online retail" OR "online purchase" OR "digital commerce" OR "electronic commerce" OR "online platform" OR marketplace OR "mobile commerce" OR m-commerce OR website OR online OR app OR "digital platform" OR omnichannel
Frameworks	Framework OR model OR theory OR "conceptual model" OR "theoretical framework" OR antecedent* OR determinant* OR driver* OR mechanism* OR factor*

The search was conducted on 7 February 2026. To ensure relevance to contemporary digital commerce environments, particularly in light of the increasing integration of advanced analytics and AI-driven systems, the review focused on recent literature. During search refinement, the term "buyer" was excluded due to its association with a broader consumer psychology literature that yielded a high proportion of irrelevant results. While this exclusion may have reduced coverage

of certain business-to-business contexts, the limitation was mitigated during the screening phase by including a sufficiently large initial number of papers.

Inclusion and exclusion criteria were defined to ensure consistency, relevance, and quality of the reviewed literature. The review included peer-reviewed journal articles and conference papers published in English between 2016 and 2026 that addressed customer retention in digital commerce contexts and were situated in engineering or closely related domains. To ensure a baseline level of scholarly engagement, a minimum threshold of one citation was applied. While this criterion may exclude very recent publications, it supports the inclusion of studies that have undergone initial academic scrutiny and contribute to the established body of knowledge. Studies were excluded if they were not written in English, were not relevant to customer retention in digital commerce, fell outside the defined subject domain, had no citations, or were published prior to 2016.

To ensure transparency and reproducibility, the study selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2010). The screening process was conducted in two stages. First, titles and abstracts of all retrieved records were assessed for relevance based on the defined inclusion criteria. Second, full-text articles were reviewed to confirm their conceptual and methodological alignment with the study's objectives.

The initial search yielded 772 records. Following title and abstract screening, 403 records were excluded due to a lack of relevance. A total of 369 full-text articles were assessed for eligibility, of which 63 were excluded due to irrelevance or unavailability. This resulted in a final sample of 44 studies included in the review, as illustrated in Figure 1. The size and composition of the final sample reflect both the breadth of customer retention research across digital commerce contexts and the relatively limited number of studies adopting an explicitly engineering-oriented perspective. This observation further supports the need for a systematic synthesis that bridges behavioural, analytical, and system-level approaches to retention.

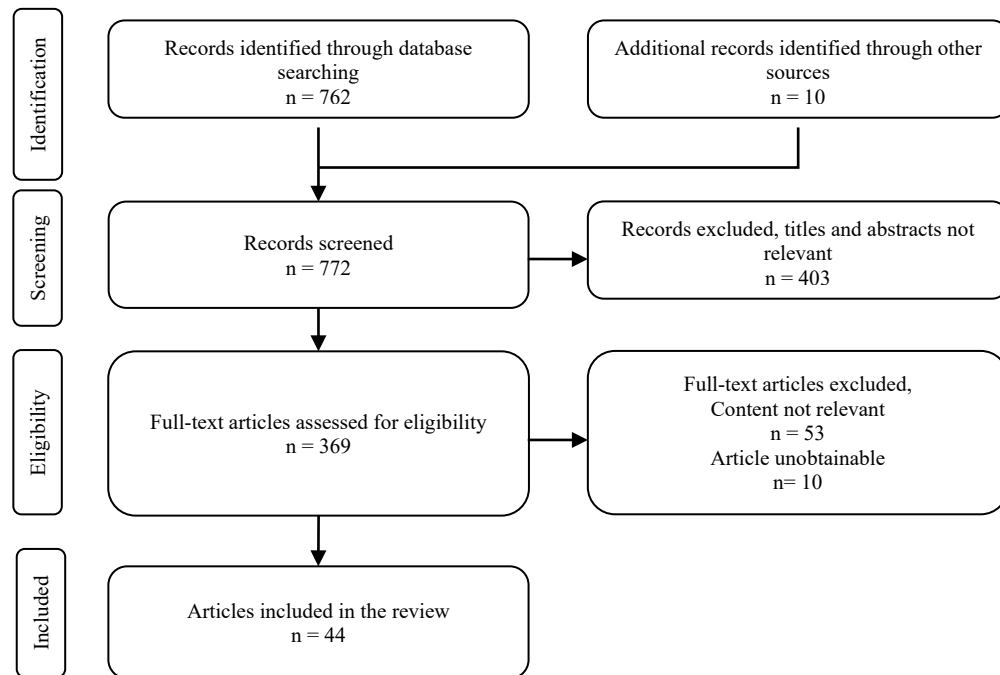


Figure 1. Study selection via the PRISMA flow diagram

A structured data extraction protocol was developed to ensure consistency and transparency. Following eligibility screening, all included studies were systematically coded using a predefined extraction template. The extracted data are presented in Table 2. For each study, key attributes were recorded and organised, including bibliographic information, research context, theoretical framework, key constructs, research method, sample characteristics, retention measures, and reported managerial or design implications.

An inductive–deductive coding approach was applied. Deductive coding aligned extracted data with the research objectives, while inductive coding identified emergent themes and patterns across studies. The coding process was iterative, with categories refined to ensure consistency and enable consolidation of conceptually similar constructs. The extracted data were analysed using a structured thematic synthesis approach. Study findings were examined at the construct level and grouped into higher-order categories through cross-study comparison. This process enabled the identification of dominant theoretical perspectives, methodological approaches, and retention measures, as well as the classification of retention mechanisms based on system characteristics such as platform architecture, trust locus, and risk exposure.

From an engineering perspective, the analysis interprets customer retention as a system-level outcome. By integrating findings across studies, the review highlights how retention mechanisms vary across digital commerce contexts and identifies opportunities to design retention as a controllable and optimisable system outcome. The synthesis directly informs the structure of the results section.

3. Results and Discussion

The results are organised according to the study objectives. First, retention is conceptualised across commerce contexts and operational definitions to address Objective 1. Next, the theoretical frameworks explaining retention behaviour are synthesised to address Objective 2. Third, dominant research designs and analytical methods are examined to characterise how retention has been empirically studied to fulfil Objective 3. Finally, engineering and managerial implications are consolidated to identify actionable mechanisms for designing retention systems and fulfilling Objective 4.

3.1 Descriptive overview of papers

The included papers were first screened for their e-commerce contexts, as presented in Figure 2. It was found that 52% of the papers focused on e-commerce, while 25% focussed on mobile commerce (shopping via mobile apps), 7% on customer-to-customer marketplaces and on-demand service commerce, and 2% on digital or d-commerce and social commerce. The majority of the papers focused on customer retention under the broad umbrella of e-commerce and shopping via mobile apps, with only a limited number of studies focusing on digital, social, and on-demand or service commerce platforms.

These studies were conducted across multiple geographical contexts. Using the World Bank's (2025) regional classification, it was found that 50% of these studies were conducted in East Asia and the Pacific, with 11% focusing on Europe and Central Asia and adopting a global or multi-country perspective. Furthermore, 9% of studies were conducted in South Asia and Sub-Saharan Africa, with 7% in the Middle East and North Africa and 2% in emerging markets. It thus highlights that further research opportunities exist for emerging markets, South Asia, Sub-Saharan Africa and the Middle East and North Africa.

Next, the papers were categorised according to their primary theoretical lens or conceptual model for explaining retention behaviour. It was found that 18% of papers used the Technology Acceptance Model (TAM) as their foundation, 9% the Service Quality model and 7% the Unified Theory of Acceptance and Use of Technology (UTAUT) model.

Furthermore, the papers were examined to identify their research designs and analytical approaches. Figure 3 shows that most studies (47%) rely on cross-sectional surveys analysed using PLS-SEM, suggesting a strong reliance on perception-based modelling, while fewer (31%) employ covariance-based SEM for confirmatory testing.

Figure 2. The e-commerce type identified in which the studies was conducted Figure 3. Research design and analysis approach.

When the main independent, mediating, and explanatory variables were examined, it was found that the most frequently studied constructs are satisfaction (78%), trust (65%), and service quality (61%), while fewer studies examine behavioural or system-level variables such as logistics quality or servitization.

Finally, it was also found that retention is most commonly operationalised as loyalty (34%), followed by repurchase intention (30%) and continuance intention (18%). Four individual studies were found to focus on Engagement, satisfaction, customer retention, loyalty and repeat purchase behaviour, respectively. Three studies are conceptual and do not empirically measure retention.

3.2 Defining e-commerce retention

The literature indicates that customer retention in digital commerce is conceptualised differently across platform types, reflecting variations in system architecture, risk exposure, and trust structures. Across the reviewed literature, retention mechanisms cluster around distinct commerce architectures, including traditional e-commerce, mobile commerce, social commerce, digital commerce in emerging contexts, and on-demand service platforms (see Figure 2).

- E-Commerce

In traditional e-commerce environments, retention is primarily driven by system performance, where firms retain direct control over service quality, fulfilment, and customer interaction. Electronic commerce (e-commerce) refers to the buying and selling of products and services through Internet-based digital channels and is commonly structured as a business-to-customer (B2C) model in which a single firm sells directly to consumers (Mehedintu & Soava, 2022; Mofokeng, 2025). In this architecture, the firm controls product and service quality, fulfilment processes, and customer interactions, and customers primarily place their trust in the brand or firm rather than in individual sellers. Consequently, the main risks perceived by customers relate to service reliability and user experience quality. Retention is therefore typically conceptualised as repeat purchase or continued usage intention (Rachbini et al., 2019; Zhang & Kim, 2021), reflecting the likelihood that post-purchase evaluations motivate customers to return to the same platform (Mofokeng, 2025). Empirical studies consistently show that retention is system-performance-driven, with service quality, fulfilment reliability, usability, and price or value as the key mechanisms (Asante et al., 2019; Ilieva et al., 2022; Matthew et al., 2021; Tandon et al., 2020). From an engineering and managerial perspective, improving operational reliability and optimising the user experience are therefore central levers for sustaining customer retention.

- Mobile Shoppers

In mobile commerce environments, retention is primarily driven by convenience, accessibility, and user experience continuity, with customers valuing seamless, on-the-go interactions. Mobile commerce (m-commerce) refers to the use of portable wireless devices, primarily smartphones and tablets, to conduct commercial transactions while on the move (Arumugam & Wing, 2020; Mehedintu & Soava, 2022; Morsi, 2023). Mobile shoppers are consumers who download and use dedicated applications or mobile internet features to simplify and access these shopping services (Kim et al., 2021; Morsi, 2023). Retention for mobile shoppers is often defined as continuance intention, which refers to the user's specific intention to continue using related application services and their willingness to pay for them (Shang & Wu, 2017).

It also includes repurchase intention, which indicates a customer's willingness to make another purchase from the same m-commerce application based on the quality of their previous experience (Mehedintu & Soava, 2022).

- ***Social Commerce***

In social commerce environments, retention is predominantly engagement-driven, shaped by peer influence, community interaction, and user-generated content rather than firm-controlled service delivery. Social commerce (s-commerce) is a subset of e-commerce that leverages social networking platforms and online communities to facilitate buying and selling activities. Unlike traditional B2C models, s-commerce environments typically involve multiple independent sellers or brands operating within a shared social platform where content creation, peer interaction, and community participation shape purchasing behaviour (Wirapraja & Subriadi, 2019). In this architecture, product and service quality are influenced not only by sellers but also by social signals such as reviews, ratings, recommendations, and user-generated content. Consequently, customers place greater trust in peers, influencers, and community opinions than in the firm alone (Wu et al., 2021). The primary risks, therefore, relate less to service reliability and more to misinformation, social pressure, or biased influence. Retention is commonly defined through repurchase intention and continued engagement with vendors or platforms, often conceptualised as progressing customers along a 'ladder of loyalty' or 'ladder of engagement' (Hosseini & Rezvani, 2021). Empirical studies show that retention in s-commerce is predominantly engagement-driven, with social proof, recommendations, sharing behaviours, parasocial relationships, and content interaction stimulating repeat use and purchasing (Bao et al., 2016; Rachbini et al., 2019). From an engineering and managerial perspective, sustaining retention requires designing interaction-rich and community-oriented features, such as reviews, messaging, sharing tools, and influencer integration, rather than relying solely on service quality or operational improvements.

- ***Digital commerce***

Digital commerce (d-commerce) is defined by Netshirando et al. (2021) as the electronic exchange of information, products, services, and payments across multiple digital channels between customers and businesses. While it overlaps with traditional e-commerce, d-commerce is typically framed within emerging, resource-constrained environments where digital channels serve as enabling infrastructure for broader economic participation. In these contexts, firms may not fully control service or logistics performance due to infrastructural limitations, and customers place trust not only in vendors but also in the reliability of the surrounding socio-technical system. Consequently, the primary risks relate less to service quality alone and more to access barriers such as unreliable logistics, high connectivity costs, and limited digital capability. Retention is commonly operationalised through repeat purchase behaviour or continued use of digital channels. Unlike mature e-commerce settings, where experience optimisation dominates, retention in d-commerce is largely driven by facilitating conditions, affordability, perceived usefulness, and system simplicity, with customers continuing to use platforms when they are accessible, understandable, and cost-effective. From an engineering and managerial perspective, improving connectivity, usability, trust, and logistical reliability constitutes the primary levers for sustaining retention (Netshirando et al., 2021).

- ***On-demand/service commerce***

On-demand or service commerce represents a specialised form of e-commerce in which digital platforms coordinate real-time service fulfilment rather than traditional inventory-based retail (Zhang & Kim, 2021). Food delivery applications exemplify this model, connecting customers, restaurants, and delivery providers through a platform that orchestrates ordering, preparation, and last-mile logistics (Kim et al., 2021; Yeo et al., 2021). In contrast to conventional B2C e-commerce, where retention is primarily influenced by interface quality or brand trust, service quality in this context is largely operational and experience-based. Customers evaluate the platform based on delivery speed, order accuracy, food condition, and service reliability, making fulfilment performance the central determinant of continued usage (Dsouza & Sharma, 2021; Yeo et al., 2021). Retention is therefore typically measured through repurchase or reuse intention and is driven by perceived value, time savings, and consistent service outcomes. While incentives such as loyalty points or cashback may support engagement, sustained retention depends predominantly on reliable operations rather than promotional mechanisms (Yeo et al., 2021). From an engineering and managerial perspective, designing robust logistics systems, ensuring accurate and timely delivery, and maintaining high service standards are the primary levers for retention in on-demand commerce.

These distinctions highlight that retention is not a uniform construct but varies systematically across platform designs and interaction logics (Table 2). From an engineering viewpoint, customer retention is not a psychological constant. It is a system-level outcome determined by the dominant risk and trust structure embedded in each commerce architecture. The findings indicate that customer retention cannot be treated as a uniform construct across digital commerce environments. Rather, retention mechanisms are structurally contingent upon the underlying commerce architecture, dominant risk

exposure, and trust locus embedded within each system. In B2C settings, retention is primarily driven by service reliability and user experience optimisation. In social commerce, engagement and peer influence mechanisms dominate. In resource-constrained digital commerce contexts, facilitating conditions and infrastructural reliability become critical. On-demand service platforms: operational execution and logistics performance are central. These distinctions suggest that retention should be engineered as a context-specific system outcome rather than addressed through generic loyalty or UX strategies. Consequently, one-size-fits-all retention interventions under the umbrella term “e-commerce” are unlikely to succeed without careful consideration of industry structure, geographic context, and economic conditions. Retention is thus not a universal behavioural response; it is an emergent property of the dominant technical, operational, and social constraints embedded within each digital commerce system.

Table 2. Architecture-Driven Customer Retention Framework in Digital Commerce

Platform Type	Trust Locus	Dominant Risk	Retention Mechanism	Design Implication
E-commerce (B2C)	Firm / Brand	Service reliability	Service quality, UX, fulfilment	Optimise operations and UX
Mobile commerce	Platform / App	Usability and continuity	Convenience, ease-of-use	Seamless mobile UX
Social commerce	Peers / Community	Misinformation, bias	Engagement, social proof	Interaction and community features
Digital commerce (emerging)	System / Infrastructure	Access, affordability	Facilitating conditions	Simplicity and accessibility
On-demand/service	Platform orchestration	Delivery failure	Operational performance	Logistics optimisation

3.3 E-commerce frameworks for customer retention

Customer retention is explained through a diverse set of theoretical perspectives that cluster into four dominant framework families: (1) technology acceptance and continuance models, (2) service quality and satisfaction models, (3) behavioural and cognitive process theories, and (4) emerging systems- and intervention-oriented approaches. While these families share the objective of explaining repeat purchase or continued usage behaviour, they differ substantially in their explanatory focus, unit of analysis, and degree of managerial actionability.

- *Technology acceptance and continuance models*

Technology acceptance-based frameworks constitute the dominant approach (27% of the included papers). Models grounded in the Technology Acceptance Model (TAM), Expectation Confirmation Model (ECM), Expectation Confirmation Theory (ECT), and Unified Theory of Acceptance and Use of Technology (UTAUT) and UTUAT2 conceptualise retention primarily as a post-adoption continuance decision driven by perceived usefulness, ease of use, confirmation, and satisfaction (Murillo-Zegarra et al., 2020; Netshirando et al., 2021; Tseng & Lee, 2018; Wang et al., 2020; Zhang & Kim, 2021). Within these models, customers remain loyal when digital platforms reduce effort and deliver functional value. Despite their strong predictive power, these frameworks remain primarily explanatory and provide limited guidance on how specific system or operational changes should be implemented to improve retention outcomes. As a result, their contributions are largely explanatory rather than prescriptive.

- *Service quality and satisfaction models*

The second dominant family frames retention as a consequence of service and experience quality. Drawing on SERVQUAL, E-S-QUAL, and the Information Systems Success Model, these studies link improvements in information quality, reliability, fulfilment, responsiveness, and trust to customer satisfaction, which, in turn, drives loyalty or repurchase intention (Ahmed et al., 2021; Ariesty & Sari, 2021; Dsouza & Sharma, 2021; Kim et al., 2021; Lin et al., 2016; Morsi, 2023; Rachbini et al., 2019; Yeo et al., 2021). Compared to acceptance-based models, service quality frameworks more explicitly incorporate operational variables, such as logistics performance or service reliability, thereby offering clearer connections between process design and retention outcomes. From an engineering perspective, this family provides more actionable levers, as improvements in measurable service processes can directly influence satisfaction and loyalty.

- *Behavioural and cognitive process theories*

A smaller but conceptually rich group of studies (23% of papers) adopts behavioural or cognitive theories, including stimulus–organism–response (SOR), protection motivation theory (PMT), self-regulation processes, and trust- or

relationship-based perspectives. These approaches model retention as an outcome of emotional, motivational, or social mechanisms triggered by environmental stimuli (Ariesty & Sari, 2021; Asante et al., 2019; Bao et al., 2016; Kabir & Kang, 2025; Kharisma et al., 2024; Netshirando et al., 2021). While such theories provide deeper insight into psychological processes underlying loyalty, they often abstract away from system-level variables and operational design considerations. Consequently, their practical value for engineering decision-making may be limited unless combined with measurable service or technological constructs.

- ***Systems and intervention-oriented approaches***

Only a limited subset of studies treats retention as a system- or managerial-design problem rather than solely as a behavioural response. These works employ analytics-driven or operational approaches such as clickstream analysis (Bharathi et al., 2018), artificial neural networks (Mehedintu & Soava, 2022), loyalty programme design (Kushnarevych, 2024), gamification (Bayır & Akel, 2024; Hosseini & Rezvani, 2021), or AI-enabled personalisation (Panya et al., 2025) to identify and prioritise actionable retention levers. Unlike perception-based frameworks, these approaches view retention as a controllable outcome that can be optimised through process improvements, targeted incentives, or decision-support tools. Despite their practical relevance, such intervention-oriented frameworks remain underrepresented in the literature.

Across these frameworks, a clear distinction emerges between models that explain retention and those that enable its design. Taken together, the findings indicate a strong theoretical emphasis on perception- and intention-based explanations of retention, with most studies modelling satisfaction, trust, or usefulness as mediating constructs. While these frameworks effectively explain *why* customers stay, comparatively fewer studies address *how* retention can be systematically engineered through operational reliability, analytics, or system design. This imbalance highlights an opportunity for future research to integrate behavioural theory with engineering and managerial mechanisms, enabling retention to be treated not only as a psychological construct but also as a designable and optimisable system outcome.

3.4 Dominant research designs and analytical approaches applied in retention studies

Customer retention research is dominated by quantitative, survey-based methodologies designed, as shown in Figure 3, to explain continuance behaviour in digital environments (Arumugam & Wing, 2020; Dsouza & Sharma, 2021; Mehedintu & Soava, 2022; Netshirando et al., 2021).

This methodological dominance reflects a broader orientation toward perception-based explanation rather than behavioural prediction or system optimisation. This reinforces a research paradigm focused on explaining behaviour rather than actively managing or optimising retention outcomes. The majority of studies (90%) employ cross-sectional survey designs, collecting data at a single point in time through online questionnaires to capture consumer perceptions of usefulness, satisfaction, trust, and intention. Retention is typically operationalised as continuance intention or repurchase intention, reflecting psychological commitment rather than observed behaviour.

Structural Equation Modelling (SEM) is the dominant analytical approach. Approximately 47% of studies apply Partial Least Squares SEM (PLS-SEM) (Ilieva et al., 2022; Li et al., 2024; Panya et al., 2025; Shang & Wu, 2017; Zhang & Kim, 2021), while 31% employ covariance-based SEM for confirmatory testing (Kharisma et al., 2024; Mehedintu & Soava, 2022; Yang et al., 2017). This distribution suggests that retention research is largely prediction-oriented and perception-driven, with emphasis on explaining variance in behavioural intention rather than establishing causal relationships. Standard reliability and validity assessments (e.g., internal consistency, convergent and discriminant validity) are commonly reported to ensure measurement robustness.

Despite the proliferation of conceptual models, several methodological limitations emerge. First, the heavy reliance on cross-sectional survey data limits causal inference and the ability to examine behavioural change over time. Second, relatively few studies incorporate behavioural or operational datasets, such as transaction logs, churn histories, or clickstream data, thereby constraining predictive validity. Third, most analytical frameworks prioritise perceptual constructs over system-level performance variables, reducing direct applicability for operational decision-making. These trends indicate that retention research remains predominantly explanatory. This highlights a critical need for engineering-oriented approaches that integrate behavioural theory with longitudinal data, analytics, and system-level design.

4. Conclusion

This systematic literature review synthesised 44 studies published between 2016 and 2026 to examine how customer retention is defined, theorised, and empirically studied in digital commerce environments. The findings reveal that retention is predominantly operationalised as loyalty, repurchase intention, or continuance intention and is primarily explained through technology acceptance and service quality frameworks. Methodologically, the field is dominated by cross-sectional survey designs analysed using SEM, with limited incorporation of behavioural or operational data.

From an engineering perspective, the review demonstrates that customer retention is not a uniform psychological construct but a system-level outcome contingent upon the underlying commerce architecture, dominant risk exposure, and trust locus. In B2C e-commerce, retention is primarily performance-driven; in social commerce, engagement and peer influence dominate; in digital commerce within resource-constrained contexts, facilitating conditions and infrastructure reliability are critical; and in on-demand service platforms, logistics and fulfilment execution are central. These structural differences indicate that generic retention strategies under the umbrella term “e-commerce” are unlikely to be effective without contextual adaptation.

This study contributes an architecture-driven customer retention framework that reconceptualises retention as a system-level outcome. It shows how digital commerce platforms shape trust structures and risk exposure, which determine dominant retention mechanisms. By linking these mechanisms to design levers, the framework enables retention to be actively designed and optimised within digital commerce systems.

The review also highlights a theoretical imbalance in the literature, with strong emphasis on perceptual and intention-based explanations and comparatively limited attention to analytics-driven, operational, and intervention-oriented approaches. Future research should therefore integrate behavioural theory with longitudinal datasets, operational metrics, optimisation techniques, and decision-support systems to position customer retention as a controllable and designable system outcome.

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Biography

Michelle Smit (PhD) earned her PhD in Innovation and Technology Management from Stellenbosch University, South Africa, in 2023. She completed her BEng (Industrial Engineering) at Stellenbosch University in 2019 and is currently a lecturer in the Department of Industrial Engineering at the same institution, as well as a Candidate Engineer registered with the Engineering Council of South Africa. Her research focuses on product development, technology adoption, and customer retention within engineering and service-based industries, with particular emphasis on how innovations progress through multiple “Valleys of Death.” More recently, her work explores the role of artificial intelligence in supporting product development processes and engineering customer journeys, including how multidisciplinary teams can leverage AI to improve decision-making, system performance, and customer outcomes. She has co-authored several peer-reviewed journal articles and international conference papers in the fields of engineering management and innovation.

Appendix

Table 3 presents the data extraction table of the study.

Table 3. List of studies with data extraction

Paper	Authors	Context	Framework / Theory	Method	Key constructs	Retention measure
A Hybrid SEM–Neural Network Modeling of Quality of M-Commerce Services under the Impact of the COVID-19 Pandemic	(Mehedintu & Soava, 2022)	Mobile commerce – Romania – COVID-19 users	Hybrid modelling (SEM–ANN)	Survey; Hybrid modelling (SEM + ANN)	Service quality; Satisfaction; Loyalty	Loyalty
A Study on the Factors Affecting Satisfaction and Reuse Intention among Customers Using O2O Delivery Platform in China	(Zhang & Kim, 2021)	Online-to-Offline delivery platform – China	TAM + ECM	Survey; Regression	Service quality; Usefulness; Ease of use; Satisfaction	Continuance intention
AI-Powered Personalization in Online Shopping: Key Factors Influencing Customer Retention	(Panya et al., 2025)	E-commerce marketplace – Thailand – AI personalisation	Consumer behaviour model	Survey; SEM	Trust; Ease of use; Technology readiness; Personalisation; Social norms; Consumer purchase behaviour	Loyalty
An Interaction–Engagement–Intention Model: How AI and AR Transform the User–Platform Interaction Paradigm	(Kabir & Kang, 2025)	Mobile commerce - Australia - AI and AR - IKEA	SOR	Survey; PLS-SEM	Norms; Interactivity; AI recommendation; Reviews; Presence; Attitude; Trust; Product fit	Continuance intention
Antecedents of M-Commerce User Experience from a Millennials Perspective in a South African Fashion Retail Context	(Arumugam & Wing, 2020)	Mobile fashion retail – South Africa – Millennials	UX/Customer experience model	Survey; PLS-SEM	User experience; Behavioural intention	Continuance intention
Building Loyalty Programs with AI-Powered Online Tools	(Kushnarevych, 2024)	Loyalty programme platforms – SMEs – Global	Conceptual (no explicit theory)	Content analysis	Rewards; Loyalty programme design; Analytics; Segmentation	Conceptual
Click Stream Analysis in E-commerce Websites – a Framework	(Bharathi et al., 2018)	E-commerce – General	Cognitive architecture	Behavioural data analytics	Navigation behaviour; Clickstream patterns; Cognitive styles	Conceptual
Consumers’ Role in the Survival of E-commerce in Sub-Saharan Africa: Consequences of E-Service Quality on Engagement Formation	(Asante et al., 2019)	E-commerce - Sub-Saharan Africa	SOR	Survey; PLS-SEM	Service quality; Engagement	Engagement
Customer Satisfaction in e-Commerce during the COVID-19 Pandemic	(Ilieva et al., 2022)	E-commerce – Bulgaria – COVID-19 shoppers	Satisfaction-based behavioural model	Survey; SEM + clusteringtext analytics	Security; Information availability; Shipping; Quality; Price; Time saved; Satisfaction	Satisfaction
Determinants of digital commerce repeat-purchase behaviour in South Africa: A rural citizen perspective	(Netshirando et al., 2021)	Digital commerce – Rural consumers – South Africa	UTAUT2 + PMT	Survey; SEM	Trust; Facilitating conditions; Privacy; Security; Value for money; Purchase behaviour	Repeat purchase behaviour
Determinants of Trust and Customer Loyalty on C2C E-Marketplace in Indonesia	(Rachbini et al., 2019)	C2C marketplace (groceries) – Indonesia	Customer Equity theory	Survey; SEM	Brand equity; Value equity; Relationship equity; Trust; Loyalty	Loyalty
Digital Marketing, Brand Awareness and Customer Relationship Management on Repurchase Intention in E-commerce Marketplace	(Kharisma et al., 2024)	E-commerce marketplace – Indonesia – Gen-Z	Trust-based / Relationship quality	Survey; PLS-SEM	Digital marketing; Brand awareness; CRM; Trust; Repurchase intention	Repurchase intention
Do information and service quality affect perceived privacy protection, satisfaction, and loyalty? Evidence from a Chinese O2O-based mobile shopping application	(Kim et al., 2021)	O2O mobile shopping – China	IS Success model	Survey; PLS-SEM	Information quality; Service quality; Privacy protection; Satisfaction; Loyalty	Loyalty
E-Banking Customer Satisfaction and Loyalty: Evidence from Serial Mediation through Modified E-S-QUAL Model and Second-Order PLS-SEM	(Ahmed et al., 2021)	E-banking – Pakistan	Service quality (E-S-QUAL)	Survey; PLS-SEM	Service quality; Trust; Satisfaction; Loyalty	Loyalty

E-customer loyalty in gamified trusted store platforms: a case study analysis in Iran	(Hosseini & Rezvani, 2021)	Online retail – Iran	Trust– Satisfaction– Loyalty framework	Survey; PLS-SEM	Content and Product quality; Price; Trust; Convenience; Security; Delivery; Satisfaction; Loyalty	Loyalty
Effectiveness of Social Commerce in Influencing Repurchase Intention: A Systematic Literature Review	(Wirapraja & Subriadi, 2019)	Social commerce – Multi-context	Systematic literature review	Systematic review	Repurchase intention antecedents (multiple)	Repurchase intention
Evaluation of E-service Quality and its impact on Customer Satisfaction for Mobile Commerce Applications in Egypt	(Morsi, 2023)	Mobile commerce – Egypt	Service Quality (SERVQUAL / e-SERVQ)	Survey; PLS-SEM	Information quality; Usability; Service quality; Satisfaction	Loyalty
Exploring the service quality in the E-commerce context: a triadic view	(Lin et al., 2016)	E-commerce - China	Service Quality (E-service + Logistics)	Survey; SEM	e-service quality; logistics service quality; satisfaction loyalty	Loyalty
Facilitation of consumer loyalty toward branded applications: The dual-route perspective	(Tseng & Lee, 2018)	Branded mobile apps – Retail – Multi-context	TAM + Parasocial interaction	Survey; PLS-SEM	Brand benefits; Parasocial interaction; Usefulness System and Information quality;	Continuance intention
Factor Analysis of Customer Satisfaction Towards Repurchase Intentions in Online Shopping for Daily Necessities on E-commerce Sites	(Natasha et al., 2023)	Online grocery retail – Indonesia	Satisfaction– Repurchase framework	Survey; SEM	Customer service; Price; Product and Delivery experience; Satisfaction; Repurchase intention	Repurchase intention
Factors Affecting Online Repurchase Intention on E-commerce Website	(Nand & Bhatt, 2022)	E-commerce – Emerging markets	TAM	Conceptual (framework development)	Usefulness; Ease of use; Security; Trust; Risk; Loyalty; Service quality	Conceptual
Gamification in mobile shopping applications: A review in terms of technology acceptance model	(Bayır & Akel, 2024)	Mobile shopping apps – Turkey	TAM	Survey; SEM	Gamification; Ease of use; Usefulness; Attitude; Intention	Continuance intention
Impact of EWOM, website quality, and product satisfaction on customer satisfaction and repurchase intention: moderating role of shipping and handling	(Tandon et al., 2020)	E-commerce – India	IS Success model + eWOM	Survey; PLS-SEM	Website quality; eWOM; Product satisfaction; Shipping; Satisfaction; Repurchase intention	Repurchase intention
Impact of EWOM, website quality, and product satisfaction on customer satisfaction and repurchase intention: moderating role of shipping and handling	(Tandon et al., 2020)	E-commerce – Logistics/fulfilment focus – India	SOR	Survey; PLS-SEM	eWOM; Website quality; Product satisfaction; Satisfaction; Repurchase intention	Repurchase intention
Investigating the Impact of System and Service Qualities on Customer Loyalty in Acceptance of E-Marketplace	(Prasetya et al., 2020)	E-marketplace – Acceptance/loyalty focus – Indonesia	IS Success model	Survey; PLS-SEM	System quality; Service quality; Usefulness; Satisfaction; Acceptance; Loyalty	Loyalty
Mechanisms of building customer loyalty: Mediation of customer satisfaction with online retailing in South Africa	(Mofokeng, 2025)	Online retail – South Africa	UTAUT2 + ECT + Commitment– Trust	Survey; SEM	UTAUT2 constructs; Satisfaction; Trust; Loyalty	Loyalty
Online food delivery portals during COVID-19 times: an analysis of changing consumer behavior and expectations	(Dsouza & Sharma, 2021)	Food delivery platforms – COVID-19 context	Service Quality (Quality– Satisfaction– Loyalty)	Survey; Regression	Servitization; Experience; Engagement; Repurchase intention	Repurchase intention
Post-purchase online customer experience with apparel retailing: a structural equation modelling approach	(Bansal & Sharma, 2024)	Online apparel retail – India	Online Customer Experience	Survey; SEM	Post-purchase experience; Satisfaction; Repurchase intention	Repurchase intention

Predicting E-commerce Consumers' Loyalty Through the Lens of Protection Motivation Theory	(Prasetyo & Wahab, 2022)	E-commerce – Security/privacy focus – Indonesia	PMT	Survey; Regression	Perceived severity; Self-efficacy; Safety behaviour; Vulnerability; Cost	Loyalty
Repurchase intention in the Chinese e-marketplace: Roles of interactivity, trust and perceived effectiveness of e-commerce institutional mechanisms	(Bao et al., 2016)	C2C marketplace (Taobao) – China	Trust theory	Survey; PLS-SEM	Trust; Interactivity; Communication tools; Institutional mechanisms	Repurchase intention
Role of channel integration on the service quality, satisfaction, and repurchase intention in a multichannel (online-cum-mobile) retail environment	(Yang et al., 2017)	Multichannel retail (online + mobile) – China	Self-regulation theory	Survey; SEM	Channel integration; Service quality; Satisfaction	Repurchase intention
Self-service technology (web interface): Bagozzi's self-regulation processes framework to measure Indian customer loyalty	(Paul & Jacob, 2019)	E-commerce -India - web self-service technology	Bagozzi's Self-Regulation Processes	Survey; PLS-SEM	Service quality; value, familiarity; satisfaction; trust; loyalty	Loyalty and eWOM
Technology affordance, national polycontextuality, and customer loyalty in the cross-border e-commerce platform: A comparative study between China and South Korea	(Li et al., 2024)	E-commerce platforms - China vs South Korea - Cross-border	TAM	Survey; SEM	CBEC affordances; ease of use; social comparison; perceived value	Loyalty
The Effect of Information Quality, Trust and Satisfaction to E-commerce Customer Loyalty in Sharing Economy Activities	(Ariesty & Sari, 2021)	E-commerce - Indonesia	Information quality–Trust–Satisfaction framework	Survey; PLS-SEM	Information quality; Trust; Satisfaction; Loyalty	Loyalty
The Effect of Monthly Promotion, Gamification, User Interface Usability & Attractiveness on the Marketplace Repurchase Intention	(Matthew et al., 2021)	E-commerce marketplace – Indonesia	Promotion/UX behavioural model	Survey; Regression	Promotion; Gamification; UI usability; UI attractiveness	Repurchase intention
<i>The Effects of Corporate Social Responsibility (CSR) on Consumer Behaviour in Online Commerce: The Case of Cosmetics during the COVID-19 Pandemics</i>	(Popa et al., 2022)	Online cosmetics retail – COVID-19	Stakeholder/CSR theory	Survey; PLS-SEM	CSR; Trust; Competitive advantage; Buying intention; Loyalty	Loyalty
<i>The Effects of Corporate Social Responsibility (CSR) on Consumer Behaviour in Online Commerce: The Case of Cosmetics during the COVID-19 Pandemics</i>	(Popa et al., 2022)	e-commerce – Romania – COVID-19 period - cosmetics	Stakeholder Theory; CSR behavioural model	Survey; PLS-SEM	CSR dimensions; brand trust; loyalty; competitive advantage; buying intention; customer	Loyalty and Continuance intention
<i>The Effects of Mobile Advertising Alerts and Perceived Value on Continuance Intention for Branded Mobile Apps</i>	(Murillo-Zegarra et al., 2020)	Branded mobile app – Fashion retail – Spain	TAM + Advertising value models	Survey; SEM	Informativeness; Control; Credibility; Usefulness; Personalisation; Irritation; Perceived value; Ease of use; Repurchase intention	Continuance intention
<i>The Effects of the Social Influence Approach on Swift Guanxi, Trust and Repurchase Intention When Considering Buyer Dependence</i>	(Wu et al., 2021)	C2C marketplace – Taiwan	Social influence theory	Survey; PLS-SEM	Buyer dependence; Social influence; Trust; Guanxi; Repurchase intention	Repurchase intention
The Impact of Perceived Interactivity and Intrinsic Value on Users' Continuance Intention in Using Mobile Augmented Reality Virtual Shoe-Try-On Function	(Jiang et al., 2022)	Mobile AR retail (virtual try-on) – China	Interactivity–Value–Attitude model	Survey; SEM	Interactivity; Intrinsic value; Attitude; Continuance intention	Continuance intention
The Implementation of UTAUT-2 in Cashback Program on E-commerce Platform	(Ikhsan et al., 2022)	E-commerce – Cashback/loyalty programme – Indonesia	UTAUT2	Survey; PLS-SEM	Performance and effort expectancy; Use behaviour Intention; Social influence; Facilitating conditions	Continuance intention

The leniency of return policy and consumers' repurchase intention in online retailing	(Wang et al., 2020)	Online retail – Returns management	ECT	Survey; SEM	Return policy leniency; Fairness; Service quality; Repurchase intention	Repurchase intention
The role of food apps servitization on repurchase intention: A study of FoodPanda	(Yeo et al., 2021)	Food delivery apps – Malaysia	Platform or Servitization framework	Survey; PLS-SEM	Usefulness; Risk; Social influence; Trust; Effort expectancy; Information quality	Repurchase intention
Understanding mobile shopping consumers' continuance intention	(Shang & Wu, 2017)	Mobile shopping – China – Continuance behaviour	TAM + ECM	Survey; PLS-SEM	Perceived value; Satisfaction; Ease of use; Usefulness	Continuance intention
Understanding the Effects of Social Media Marketing on Customers' Bank Loyalty: A SEM Approach	(Elareshi et al., 2023)	Online banking - Jordan	TAM + Social media marketing	Survey; SEM	Usefulness; Ease of use; eWOM; Informativeness; Social media features; Loyalty	Loyalty