

Research Article

Holistic and Adaptive Online Customer Experience (HAOCX) Model: A Bibliometric and TCCM-Based Analysis (2006–2025)

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Abstract: This study aims to unify the evolving paradigm of customer experience (CX) in the context of online shopping by synthesising the fragmented research fields and proposing a comprehensive model integrating the technological, psychological, social, and experiential factors to explain the customers' behavioural intention and long-term relational outcomes in the digital commerce environment. 194 core articles from the Web of Science (WoS) database are filtered following the SPAR-4-SLR protocol. These Articles are analysed using a dual methodological approach. Initially, a bibliometric analysis provides a strong quantitative base by statistically mapping the productivity, trend, impact, and thematic structure of the research field using the tools of VOSviewer and R Studio Biblioshiny. Subsequently, the Theory-Context-Characteristics-Methodology (TCCM) framework offers analytical depth through structured qualitative evaluation of the existing literature. It reveals a prominent research gap underpinning the transition from traditional desktop e-commerce to an experiential and technology-immersive retail environment. The findings of the study propose a Holistic and Adaptive Online Customer Experience (HAOCX) model and offer a prediction using the simultaneous linear equations, ensuring that sustainable business success is the ultimate resultant outcome of holistic and adaptive CX that fosters customers' trust, loyalty, and long-term brand advocacy. The valuable insights of the study suggest that digital marketers and e-commerce firms should move beyond merely facilitating commercial transactions and enhance CX by integrating advanced technologies with customers' emotional, social, and trust-building mechanisms for creating a personalised, engaging, and relationship-oriented digital environment.

Keywords: Customer Experience, Online Shopping, Bibliometric Analysis, TCCM Framework, HAOCX model.

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INTRODUCTION

Nowadays, online shopping is a part and parcel of our routine life. The rapid expansion of advanced digital technologies in e-commerce has penetrated every sphere of tech-savvy customers (Pires *et al.*, 2025). This transformation creates immense opportunities for customers to explore and shop a wide variety of products and services through online platforms and reduces their exclusive reliance on physical stores. In such a digital environment, the way customers perceive and experience the online shopping process has become highly significant (Yi *et al.*, 2024; Pandey *et al.*, 2025; Wattoo *et al.*, 2025). Online customer experience (CX), also referred to as online shopping experience, is expressed as the subjective response of the manifestation of the psychological state of the customers that they perceive when interacting with the shopping platforms digitally. A good CX not only encourages repeat purchases and enhances customer satisfaction (Lemon & Verhoef, 2016; Becker & Jaakkola, 2020; Saha *et al.*, 2023; Soeharso, 2024), but also helps the businesses in maintaining a competitive edge by offering numerous alternatives and making a personalised and seamless shopping experience essential for business success (Verhoef *et al.*, 2009; Gao & Jiang, 2024; Mutambik, 2024; Teng *et al.*, 2024; Huang & Rust, 2024; Dwivedi *et al.*, 2021). Therefore, businesses are no longer limiting their focus to whether customers are satisfied or intended to make a purchase. Instead, the entire customer journey beginning from the initial stage when customers consider buying a product, continuing through the purchase process, and extending to the post-purchase experience are highly emphasised (Grewal &

Roggeveen, 2020). The recent pandemic has acted as a catalyst, accelerating the shift toward online shopping and fundamentally transforming consumer purchasing behaviour (Sheth, 2020; Gupta & Mukherjee, 2022; Tripathi et al., 2024). Businesses are increasingly adopting AI and machine learning to deliver personalised recommendations and create a more engaging shopping experience (Saxena & Muneeb, 2024; Yan et al., 2026). Additionally, a notable emerging trend of livestream commerce integrates shopping with live entertainment and real-time interaction, offering a novel and immersive online buying experience (Sun et al., 2019; Wang et al., 2023; Luo et al., 2024; Paul et al., 2024; Luo et al., 2024; Zeng et al., 2025; Peltier et al., 2026). At present, this digital pavilion blurs the border of online and offline purchasing mechanisms by providing all sorts of facilities, starting from finding a product online to picking it up at the online store and finally delivering the product to the customers (Zhou et al., 2024).

The growing importance of CX has intensified the research effort by generating a substantial volume of research across diverse disciplines, including marketing, technology, psychology, and related fields. However, the research on this topic remains highly fragmented and dispersed across multiple domains and perspectives. Such fragmented existing literature over the past two decades has examined only the isolated dimensions of CX. Moreover, very few studies have attempted to quantitatively map the entire research landscape (Ashraf & Iqbal, 2021). Thus, the researchers and the practitioners require a holistic understanding of CX in the context of online shopping.

The present study attempts to bridge this research gap by systematically consolidating the fragmented literature to yield a comprehensive framework. It extensively determines how the complex interplay of emerging technologies in the post-pandemic transformation brings forth multi-faceted customer expectations and experiences in the online shopping environment. As such, the study uses two sophisticated analytical mechanisms: firstly, to employ bibliometric analysis to visually map the descriptive insight of the domain of customer experience in online shopping, covering the period from 2006 to 2025. Secondly, to integrate the TCCM (Theory–Context–Characteristics–Methodology) framework, offering the analytical depth of the study towards developing a comprehensive research model and directing future research avenues. For achieving these, we have formulated the following research objectives (RO).

- RO1: To evaluate the performance and growth trajectory of the research field.
- RO2: To identify the most influential contributors to the field.
- RO3: To map the intellectual structure and foundational works of the research.
- RO4: To uncover the primary thematic clusters and current research fronts.
- RO5: To identify the research gaps based on the Theory-Context-Characteristics-Methods (TCCM) framework and to propose a model to fill those research gaps.

The rest of the paper is structured as follows. Section 2 focuses on synthesising the existing literature on online customer experience and developing a core theoretical foundation of the study. Section 3 outlines the research methodology used for the study. Section 4 presents the bibliometric analysis and the supported TCCM (Theory–Context–Characteristics–Methodology) framework to identify major research gaps and the proposed research model. Section 5 offers a discussion on how the proposed model addresses the research gaps and explains the conceptual relationships through simultaneous linear equations. Finally, Sections 6, 7, and 8 highlight the future research direction, managerial implications, and conclusion of the study.

LITERATURE REVIEW

According to the Digital Economy Report 2024, UNCTAD, the adoption of digital technologies results in a revolution of commercial transactions globally that brings forth the concept of e-commerce. The topic of research on CX in online shopping gained significant momentum after the pivotal work by Rose et al. (2012). They developed a foundational model based on website antecedents, such as design and usability, which foster loyalty through the mechanism of building trust. The researchers also explored how the verbal and visual dimensions of unique online website design elements create effective online CX (Bleier et al., 2019). Bilgihan (2016) developed an integrated model for Millennial consumers, which addressed a major limitation of applying advanced technological innovations to the customer experience in the context of online shopping. A study by Klaus and Maklan (2013) conceptualised the online purchase process into functional and psychological dimensions that integrate advanced technological innovations into customer experience. However, the significance of these dimensions varies across different stages of the customers' journey (Kuppelwieser & Klaus, 2021; Panesar et al., 2026).

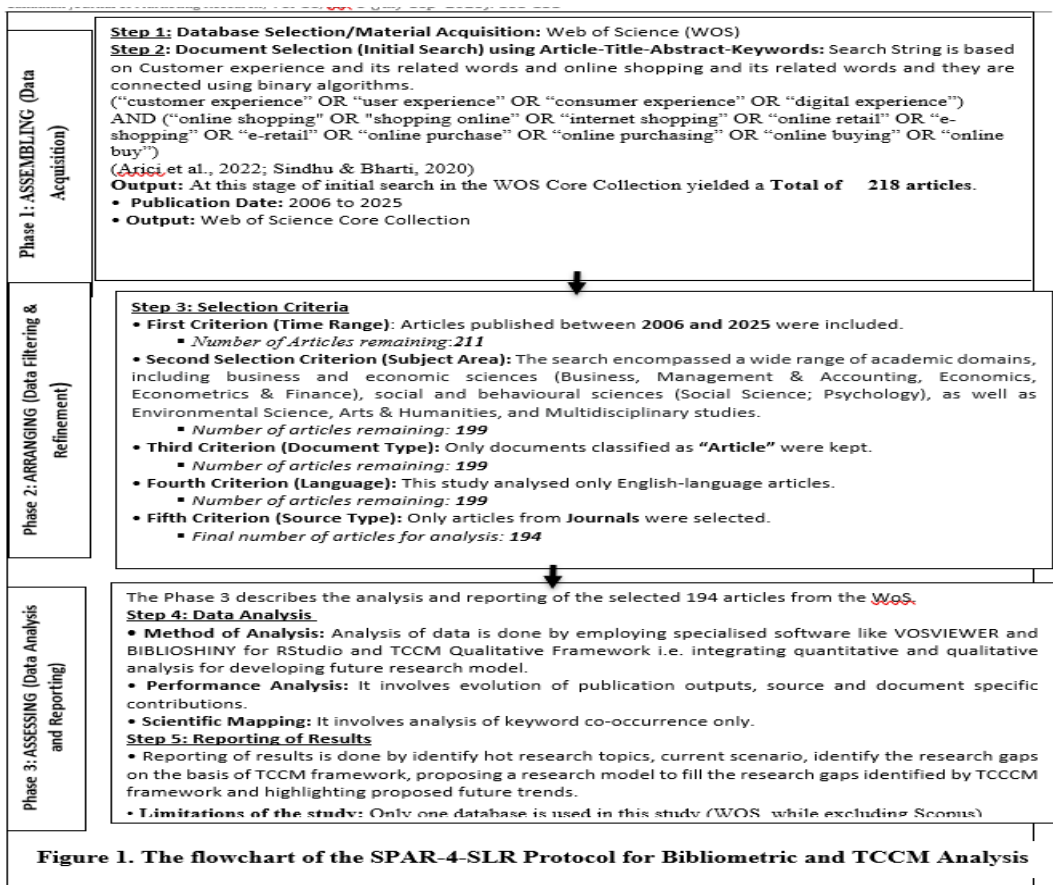
In response to this remarkable growth, there is a paramount shift in customers' online shopping behaviour due to the inherent features of accessibility, timeliness, boundlessness, conveniences, greater interaction, immediate response, and the like, that are imperative to this digital landscape (Shankar et al., 2022; Kawaf & Tagg, 2017; Kannan, 2017). It is also evidenced that by navigating the interconnected digital touch points, the customers can effortlessly develop their cognitive thinking as well as greater online shopping intention once they are exposed to the external stimuli like optimum product variety, best quality, competitive pricing, personalised services, alternative payment gateways, easy delivery or reverse logistic (return), if required (Oliver, 1997; Venkatesh et al., 2003). Thus, the decision-making process of the customers becomes highly experiential, focusing on the dynamic interaction of their affection, cognition, and behaviour in this digital setting (Schmitt,

1999; Lemon & Verhoef, 2016; Hoyer & van, 2022). Thus, online CX is rooted in the active but virtual interactions between customers and e-retail platforms. However, the customers are still reluctant to engage in digital shopping due to the inherent existence of anonymity, information asymmetry or inability to verify the products physically (Pavlou, 2003). This necessitates considering major psychological constructs like risk, trust, perceived value, perceived enjoyment, etc. (Ariff et al., 2014; Shahzad et al., 2024), which play critical roles in elevating the CX as a strategic differentiator influencing consumer behaviour (Gefen et al., 2003; McKnight et al., 2002; Izogo & Jayawardhena, 2018). Furthermore, the scholarly landscape increasingly emphasises the multi-dimensional perspective of CX in online settings (Kranzbühler et al., 2018), predominantly encompassing perceived value, emotional responses, and satisfaction (Ahmad et al., 2024; Mamakou et al., 2024; Ahmad et al., 2025), which ultimately drive behavioural outcomes like loyalty, engagement, advocacy, and impulsive buying (Verhoef et al., 2009; Homburg et al., 2017; Hassan, 2024).

Acknowledging the conceptual and analytical perspective of several prior studies, the present study uses a comprehensive evaluation by adopting bibliometric analysis and a supported TCCM framework to capture a deeper understanding of CX in the complex digital shopping marketplace.

METHODOLOGY

This study employed mixed methods, i.e., quantitative bibliometric analysis combined with qualitative evaluation using the TCCM (Theory-Context-Characteristics-Methodology) framework to decode the intellectual DNA of the topic customer experience in online shopping. The Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol, proposed by Paul et al. (2021), is strictly followed in our study. As shown in Figure 1, the SPAR-4-SLR protocol consisted of three phases: (1) Data Collection, i.e., assembling; (2) Filtering of data, i.e., arranging; and (3) Analysis and Reporting of data, i.e., assessing. The data is sourced from the WoS database, which follows strict indexing standards and includes high-quality peer-reviewed articles from all the major academic disciplines (Serenko, A., 2021). To find the right articles, we have searched for specific keywords in the main parts of academic papers—the title, abstract, and keywords. We have retrieved the studies encompassing both customer experience and online shopping; therefore, the terms are combined using the Boolean operator AND. The search string is shown in a flowchart (Figure 1). After narrowing down the results, we had our final collection of 194 articles for doing the necessary analysis.



The analysis was performed using VOSviewer for its powerful network visualisation features and the Biblioshiny package in R Studio for its comprehensive statistical and performance analysis capabilities.

The final phase is assessing, i.e., Analysis and Reporting of data, which is designed to better understand the objectives of the TCCM framework through performance analysis and scientific mapping. Finally, the findings of these analyses are integrated to address the study’s TCCM-oriented objectives, identify key trends, and suggest ideas for future research.

ANALYSIS AND FINDINGS

Bibliometric analysis: Presenting Descriptive Statistics

A detailed analysis is conducted in this section based on 194 articles obtained through a filtering process described in the methodology section.

Evolution and trajectory of the research field

Figure 2 shows a clear trend of research on the growth and development of customer experience in the context of online shopping from 2006 to 2025. It tracks two key indicators: the number of articles published each year on the topic, represented by green bars, and the cumulative citations for articles from each year, shown by the blue line. The consistent growth of published documents is visualized since 2017. Additionally, during the period 2008 and 2012, the accumulated citations are showing more than 900 each, indicating highly influential foundational works. The dramatic change is observed from 2022, after the outbreak of COVID-19 in 2020, due to the global spread of advanced digital technologies to cope with issues like social distancing. Ultimately, the annual publication output reached its highest point in 2025 with 44 articles. The observed exponential growth, supported by a strong R2 value of 0.95, indicates consistency in research development within this field.

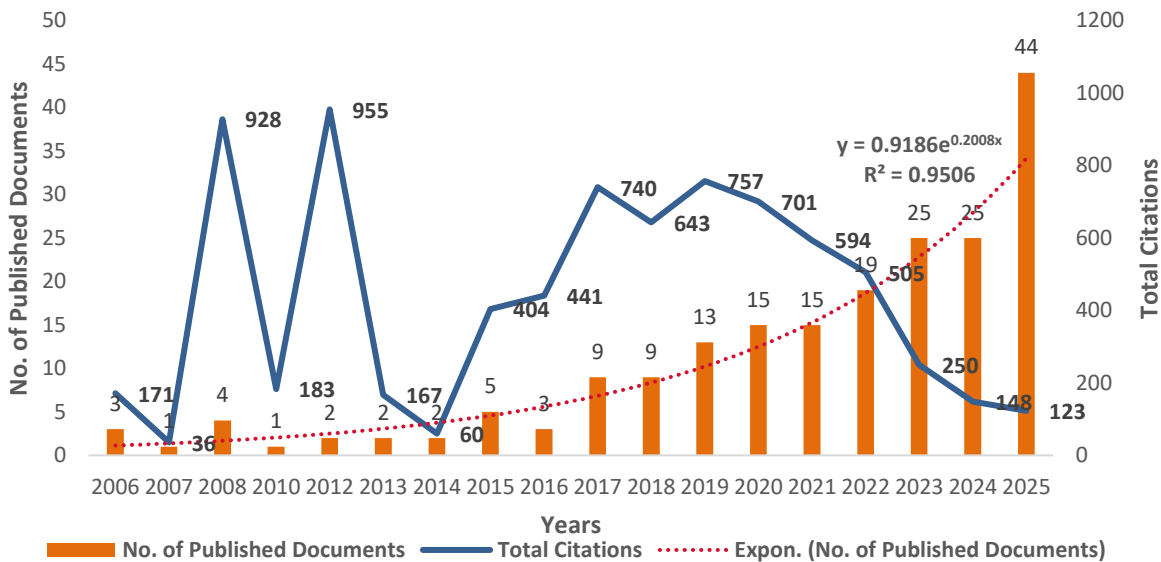


Figure 2. Annual Scientific Production and Citation Impact (2006–2025)

Journal-level Influence

Table 1 shows that the J. of Retailing and Consumer Services is the leading journal in this research field, having a total production of 12 articles and a strong impact of 786 total citations and the highest h-index (10). In contrast, the journal Sustainability has published 8 articles, but the citation per publication (CPP) is very low, indicating that it focuses only on volume and not on individual impact. Other journals like Interacting with Computers and the Journal of Services Marketing also publish work with a high impact.

Table 1: Most Influential Journals by Productivity and Impact Metrics							
Sources/ Journals	Total Production (TP)	Percentage obtained (%)	Total citation s (TC)	Citations per publication (CPP)	h_i nde x	g_in dex	m_i ndex
J. of Retailing and Consumer Services	12	6.18%	786	65.5	10	12	0.909
Sustainability	8	4.12%	103	12.88	5	8	0.833
Int. J. of Retailing	7	3.61%	278	39.71	7	7	0.70

& Distribution Management							0
Frontiers in Psychology	7	3.61%	70	10	5	7	0.556
J. of Theo. and Applied Electronic Commerce Research	7	3.61%	51	7.28	3	7	0.600
IEEE Access	5	2.58%	72	14.4	4	5	0.667
Interacting with computers	4	2.06%	283	70.75	4	4	0.200
J. of Services Marketing	4	2.06%	250	62.5	4	4	0.308
Asia pacific J. of Marketing and Logistics	4	2.06%	45	11.25	3	4	0.333
Computers in Human Behaviour	4	2.06%	440	110	3	4	0.300

Most cited documents

Table 2 highlights the most influential studies in online CX research based on citation impact. Global citations indicate a paper's overall influence across all disciplines, while local citations reflect its importance within this specific research field (Bakır & Sak, 2025). Rose et al. (2012) lead in global citations, while recent studies like Gulfranz et al. (2022) show high normalized impact. The LC/GC ratio reflects local relevance, indicating how strongly these works shape the specific research domain.

Table 2: Top 10 Highly Cited Documents						
Document	Year	Local Citations	Global Citations	LC/GC Ratio (%)	Normalized Local Citations	Normalized Global Citations
Rose S, 2012, https://doi.org/10.1016/j.jretai.2012.03.001	2012	31	644	4.81	2.00	1.35
Klaus P, 2013 https://doi.org/10.1108/JSM-02-2012-0030	2013	11	140	7.86	2.00	1.68
Martin J, 2015, https://doi.org/10.1016/j.jretconser.2015.03.008	2015	10	201	4.98	3.57	2.49
Pandey S, 2018, https://doi.org/10.1108/IJRDM-01-2017-0005	2018	9	81	11.11	3.24	1.13
Bleier A, 2019 https://doi.org/10.1177/0022242918809930	2019	9	253	3.56	6.88	4.34
Kawaf F, 2017, https://doi.org/10.1016/j.chb.2017.02.055	2017	8	57	14.04	6.00	0.69
Bilgihan A, 2016, https://doi.org/10.1016/j.chb.2016.03.014	2016	7	300	2.33	2.10	2.04
Gulfranz MB, 2022, https://doi.org/10.1016/j.jretconser.2022.103000	2022	5	98	5.10	10.42	4.85

Bilgihan A, 2015, https://doi.org/10.1016/j.im.2015.05.005	20 15	4	109	3.67	1.43	1.35
Izogo EE, 2018, https://doi.org/10.1108/JRIM-02-2017-0015	20 18	4	75	5.33	1.44	1.05

Strategic Diagnosis of the Research Landscape: A Thematic Map Analysis

- To identify and plot the core research themes in the collected literature, we have conducted a keyword co-occurrence analysis. The process started by selecting all keywords as the unit of analysis and full counting as the measurement method. The WoS database produced 1136 unique keywords, which shows the wide coverage and variety of the database.
- To focus on the most relevant keywords, we have considered those keywords that occur at least 10 times. As a result, we have removed 97% of the keywords (1133 out of 1168), leaving only 35 keywords of the original 1168 for focused analysis. This approach makes sure that the network map of Figure 3 clearly highlights major themes, avoiding crowding with unnecessary keywords.

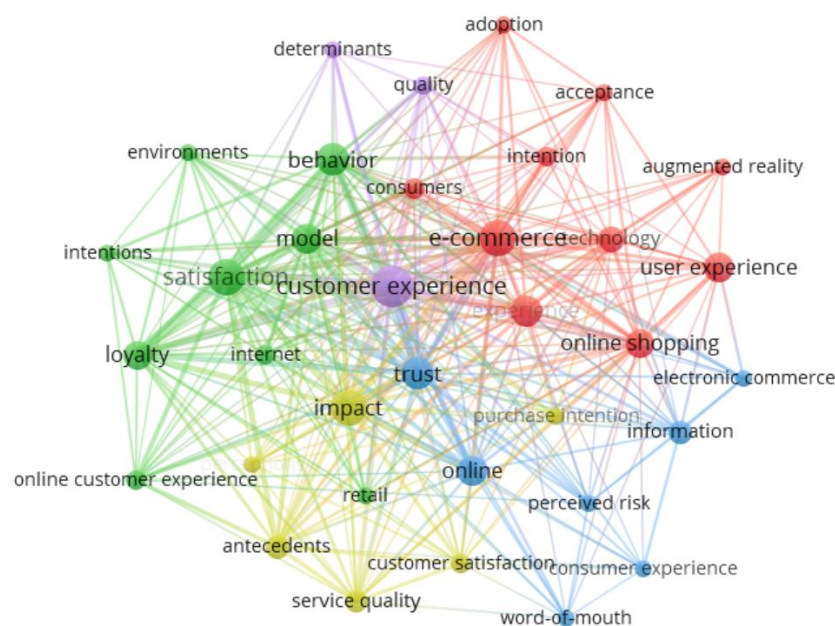


Figure 3. Clustered Keyword Network Representation.

The network map of Figure 3 shows connections among these 35 important keywords, grouping them into five clear clusters based on their co-occurrence frequency. Each colour-coded cluster represented a distinct theme within the keyword network. Keywords with higher occurrence will appear larger, and the lines joining them indicate the strength of the connection between them. The name of the cluster, main keywords, and thematic focus of each cluster is shown in Table 3.

Table 3: Composition and Thematic Interpretation of Keyword Clusters

Custer No.	Name of the Cluster	Main Keywords	Thematic Focus
Cluster 1 (Red): 10 Keywords	Technology adoption and E-commerce Experience	E-commerce, Technology, User experience, Adoption, Acceptance, Intention, Augmented reality, Online shopping.	Indicating how advanced technologies influences behavioural intention in online shopping environments.
Cluster 2 (Green): 8 Keywords	Behavioural Outcomes and Loyalty	Satisfaction, loyalty, Behaviour, Model, Intentions, Online customer experience, Environments.	Reflecting behavioural responses within online environments

Cluster 3 (Blue): 6 Keywords	Consumer Decision-Making and Risk	Online shopping, Trust, Perceived risk, Consumer experience, Information, Word-of-mouth, Electronic commerce.	Representing the critical role of trust formation and perceived risk in shaping online purchase decisions.
Cluster 4 (Yellow): 8 Keywords	Service quality and Customer satisfaction	Impact, Service quality, Antecedents, Customer satisfaction, Retail, Perceptions.	Focusing on service quality and its impact on customer satisfaction.
Cluster 5 (Purple): 3 Keywords	Core Determinants of Quality	Customer experience, Determinants, Quality.	Conceptualisation of customer experience by connecting its determinants, quality perceptions, and multidimensional nature across digital commerce contexts.

TCCM framework: Presenting qualitative evaluation and research gap

Apart from the bibliometric method, this paper also employs a qualitative framework known as TCCM for exploring the research on customer experience in online shopping. This framework provides an overview of the current status of the research and the latest developments in the field. Table 4 summarises the main theories that have influenced the research on customer experience in online shopping for the period 2006 to 2025:

Table 4: Principal Theories shaping online CX: A TCCM Perspective (2006- 2025)	
Years	Theories/Models Applied
2006–2010	Technology Acceptance Model (TAM) (Davis, 1989), Expectancy-Disconfirmation Theory (EDT) (Bhattacharjee, 2001)
2010–2014	Cognitive-Affective-Behavioural Frameworks (Rose et al., 2012), Flow Theory (Novak et al., 2000)
2014–2016	Multi-Attribute Utility Theory (MAUT), Stimulus-Organism-Response (SOR) (Jacoby, 2002), Attitude-Behaviour-Context (ABC) Theory (Stern, 2000)
2016–2020	Co-Creation Theory (Service-Dominant Logic), Value Creation Theories (Vargo & Lusch, 2008), Trust-Transfer Theory (Stewart, 2003), Social Exchange Theory (Blau, 1964)
2020–2025	Social Identity Theory, Information Integration Theory, Regulatory Focus Theory, Consumer Culture Theory, Assemblage Theory, Trust Transfer Theory (Guo et al., 2021), Commitment-trust theory of relationship marketing (Youssef et al., 2018), Social Exchange Theory (SET) (Xuan et al., 2023), Social Network Theory, Information Systems Success Model (ISSM) (Roh et al., 2024), Cognitive-Experiential Theory and Cognitive Appraisal Theory (Dos et al., 2021)

The context dimensions of the TCCM framework for the period 2006 to 2025 in CX research on online shopping are discussed in Table 5. It is clear from the table that the research context shifted from a narrowly focused technological and geographic perspective to a more diverse, global, and technologically advanced environment, reflecting changes in consumer behaviour, digital platforms, and industry practices.

Table 5: Context(C) Dimensions of TCCM framework	
Period	Dominant Research Contexts
2006–2010	Developed markets (US, Europe), desktop e-commerce. (Gefen et al., 2003; Pavlou, 2003).
2010–2014	Expansion to emerging markets (Asia, Latin America); rise of mobile shopping. (Cyr et al., 2006; Zhang et al., 2012).
2014–2016	Social media and peer influence platforms, research on online reviews, social proof, and digital communities (Hajli, 2015; Kim & Johnson, 2016); B2B (Youssef et al., 2018) and B2C e-commerce retail landscape (Miao et al., 2022).

2016–2020	Omnichannel retailing (Xuan et al., 2023), sector-specific studies like fashion, groceries, electronics, hospitality (Kandampully et al., 2015), hospital, omnichannel banking (Xuan, et al., 2023) and fintech services (Roh et al., 2024), fashion industry (Chakraborty & Zhang 2025), book market (Klaus, 2013), travel industry, mobile banking (Yasin et al., 2020), omnichannel banking (Xuan, et al., 2023). The researchers also conducted research in the context of social networking sites like Facebook (Pongpaew et al., 2017) as well as live streaming commerce (Yan et al., 2023).
2020-2025	Post-pandemic global shift, hybrid “phygital” experiences, new tech adoption (Sheth, 2020; Luo et al., 2024; Zhou et al., 2024).

The evolving characteristics and methods employed in online customer experience research through the TCCM framework for the period 2006 to 2025 are summarised in Table 6. This table shows that previously, CX had a static and single-dimensional view, which has now been changed towards nuanced, multi-touchpoint, and dynamic understandings, with advances in methodology that provide a deeper, more contextually rich insight.

Table 6: Characteristics and Methodologies of Online CX Research Evolution		
Period	Key Characteristics	Methods Employed
2006–2010	Focus on basic website usability, functionality, security, and reliability (Gefen et al., 2003; Wolfinbarger & Gilly, 2003).	Quantitative surveys, satisfaction/service quality scales, factor analysis.
2010–2014	A growing number of studies have recognised perceived usefulness, perceived ease of use, perceived compatibility, attitude as the antecedents or determinants of online behavioural intention (Rodriguez & Crespo, 2011; Pavlou, 2003; Kim et al., 2008).	Structural equation modelling, customer journey mapping, user interviews.
2014–2016	Emphasis on emotional engagement, community trust, and growing customisation (Hajli, 2015; Rose et al., 2012).	Mixed methods (surveys + qualitative), experimental designs, analysis of online reviews.
2016–2020	Integration of co-creation (user participation), social proof, advanced personalisation (Pralhad & Ramaswamy, 2004; Lemon & Verhoef, 2016; Verhoef et al., 2015).	Netnography, thematic analysis, sentiment analysis of UGC, longitudinal studies.
2020–2025	Phygital (online-offline) integration, real-time personalisation, context-sensitive/dynamic CX, long-term outcomes (trust, advocacy). The researchers have also expanded by exploring the key dimensions of perceived risk, including seller risk, financial risk, product risk, privacy risk, and social risk ((Pantano et al., 2022; Roh et al., 2024; Li et al., 2025). In this cutting-edge of digital technology, contemporary researches have entrusted to the characteristics such as perceived security, usability, and service quality (Roh et al., 2024), perceived social presence (Pongpaew W et al., 2017) and social media engagement, imperative towards achieving several behavioural outcomes in the form of Repurchase intention, prior online experiences, customer relationship (Miao, M. et al., 2022), impulsive purchases (Gulfraz, et al., 2022), customer engagement, brand awareness, trust.	Big-data analytics, behavioural tracking (clickstreams), machine learning, bibliometric mapping, diary and ethnographic studies.

Prominent methodologies in CX research in online shopping, as structured by the TCCM framework from 2006 to 2025, have evolved in sophistication alongside technological and contextual changes. The transformation in CX research methodologies from 2006 to 2025 is outlined in Table 7.

Table 7: Research Methods for Online Shopping Customer Experience

Period	Methodological Approaches
2006-2010	Quantitative Surveys, Factor Analysis Regression (Gefen et al., 2003; Wolfinbarger & Gilly, 2003).
2010-2014	Structural Equation Modeling (SEM) (Rodriguez et al., 2011), Customer Journey Mapping.
2014–2016	Qualitative Interviews, Focus Groups, Mixed Methods and some of the past research used a review-based methodology (Kandampully, J et al., 2015) that synthesises existing literature.
2016-2020	Netnography, Social Listening, Sentiment Analysis, Longitudinal Studies, fuzzy-set qualitative comparative analysis (fsQCA) (Pappas, 2018).
2020–2025	Big Data Analytics, Machine Learning, Clickstream & Behavioural Tracking, Bibliometric Mapping, Experiments, logistic regression (Li et al., 2025).

The research gaps identified based on the TCCM framework in online customer experience research are:

Theoretical Gaps:

Most of the theories, such as TAM, EDT, Flow, S-O-R, Trust Transfer, Social Exchange, etc., can be applied within a definite time frame. Therefore, considering the rapid technological upliftment and shifting consumer behaviour, a more comprehensive and integrated theoretical model is required that can holistically capture the complex, dynamic, and multi-faceted nature of modern online CX (Becker & Jaakkola, 2020; Bleier et al., 2019; Kranzbühler et al., 2018; Pires et al., 2025).

Contextual Gaps:

Research on CX so far has been conducted in some sector-specific studies like fashion, groceries, hospitality, and banking; but still, there is a lack of dedicated studies for other sectors such as education, healthcare, professional services (Ahmad et al., 2024; Wattoo et al., 2025), specialised retail engaged with online CX. Comparative studies that focus on the unique cultures, local infrastructure, and economic contexts across different parts of these diverse markets are also very limited (Zhou et al., 2024; Tripathi et al., 2024). Additionally, future research needs to find out its impact on CX in the context of various industries and diverse groups of customers.

Characteristics Gaps:

CX in online shopping is dynamic and continuously evolving (Homburg et al., 2017). To capture these dynamic changes, future research should explore how different perceived risks interact across digital platforms and how CX influences loyalty, emotional attachment, and post-purchase engagement (Li et al., 2025). Further studies should also examine the combined influence of usability, security, social connection, and personalisation on overall CX.

Methodological Gaps:

To understand the current state of CX, we need more sophisticated and robust methodology e.g., real-time predictive model that not only diagnoses current CX states but also anticipates future issues and suggests proactive steps to improve them. Although this study employs mixed methods like bibliometric and TCCM for a richer and multi-angled understanding of CX, for a deeper and fuller understanding of CX, we still need to study CX by integrating various research methods like statistics, econometrics, experimental designs, and ethnography.

Currently, the main problem with research in the domain of CX in online shopping is that there is no foolproof, complete, adaptable, and predictive CX model. That is why we are proposing the ‘Holistic and Adaptive Online CX (HAOCX)’ Model.

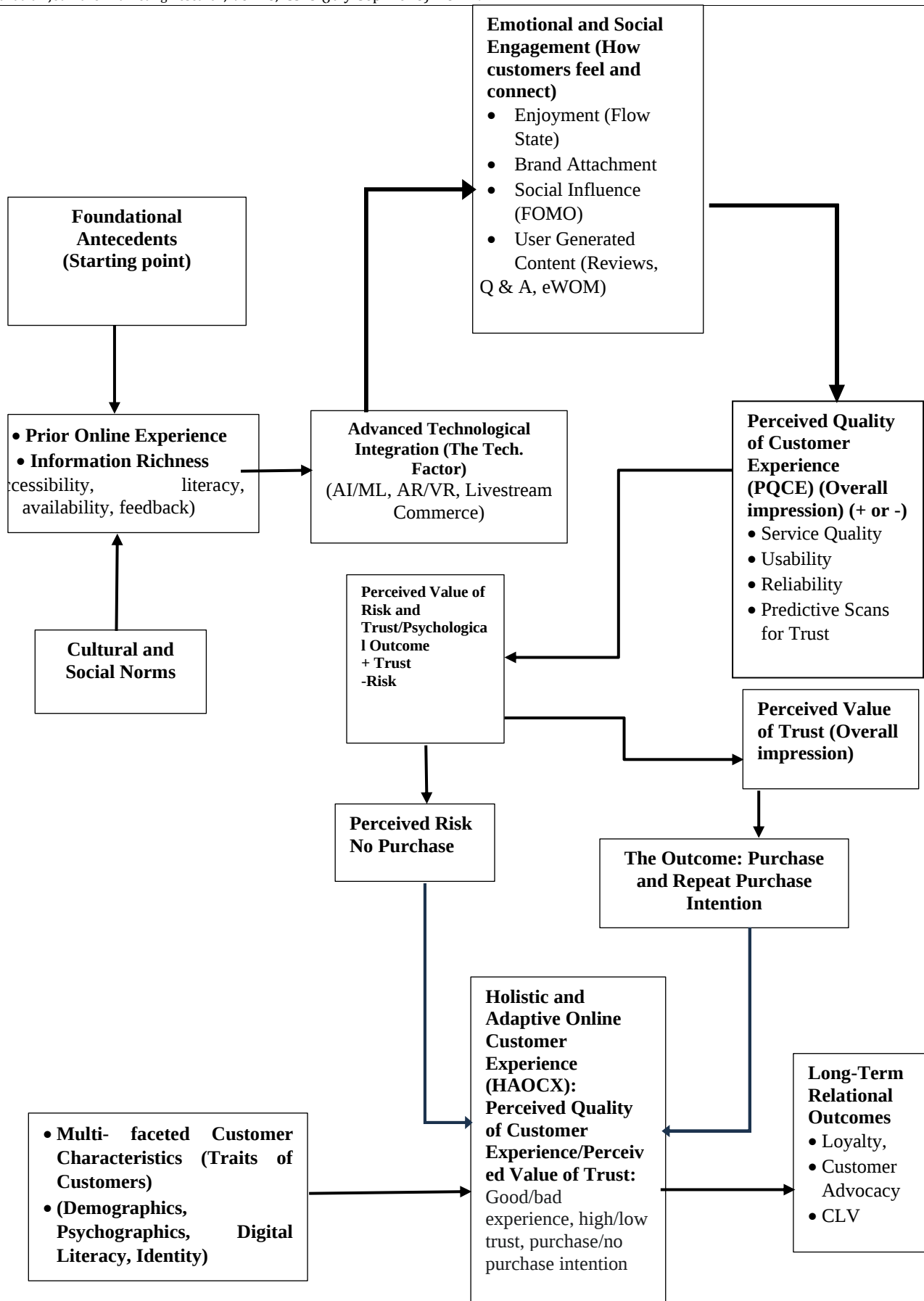


Figure 4: The ideal experience: Holistic and Adaptive Online Customer Experience (HAOCX)

DISCUSSION

How the proposed HAOCX model fills the TCCM-identified research gaps

Our introduced model integrates the fragmented elements of the CX which were unexplored earlier, into a coherent HAOCX model that addresses all gaps identified by the TCCM framework.

Filling Theoretical Gaps:

The proposed HAOCX model integrates technological, psychological, social, and behavioural dimensions of CX into a unified framework. It combines foundational antecedents, advanced technologies, emotional and social engagement (Pizzutti & Basso, 2012), perceived quality (Arici et al., 2022), trust–risk evaluation, and customer characteristics to explain purchase intention, repeat purchases (Chiu et al., 2014), and long-term relational outcomes. The model also links advanced technologies such as AI/ML, AR/VR, and livestream commerce with emotional and social engagement, making CX more holistic and adaptive.

Filling Contextual Gaps:

The HAOCX model incorporates cultural and social norms to explain how CX differs across contexts and customer groups. It also addresses emerging phygital and livestream shopping environments through advanced technological integration (Zhou et al., 2024; Alexander & Varley, 2025). Further, the model includes predictive trust mechanisms to capture privacy, ethics, and technology-related concerns, making it adaptable across industries and digital environments.

Filling Characteristics Gaps:

The proposed model treats CX as dynamic and interconnected rather than static. It integrates emotional engagement, trust, risk perception, usability, and customer characteristics to explain changing CX patterns. Unlike earlier studies focused mainly on purchase intention, the model extends towards loyalty, advocacy, and Customer Lifetime Value (CLV), thereby covering the complete customer journey and long-term relational outcomes (Mamakou et al., 2024).

Filling Methodological Gaps:

The HAOCX model provides a basis for applying advanced analytical approaches such as SEM and PLS-SEM to examine interrelationships among CX dimensions. In this study, simultaneous equations are used to predict CX outcomes by identifying dependent and independent variables, while future studies may empirically validate the framework using more sophisticated methodologies (Davenport et al., 2020; Paul et al., 2024).

FUTURE RESEARCH DIRECTION

Based on the above theoretical insights, the following research avenues are proposed:

Empirically validating the proposed HAOCX model across diverse technological, cultural, and socio-demographic contexts. Examining the influence of emerging technologies like Artificial Intelligence (AI), Machine Learning (ML), Augmented Reality (AR), Virtual Reality (VR), and Metaverse-based retailing on customer engagement, trust building, interpersonal excellence, risk perception, and adaptive CX in the online shopping context (Huang & Rust, 2018; Davenport et al., 2020; Gursoy, 2026).

Exploring the real-time predictive models to measure CX through big data analytics, behavioural tracking, biometric responses, and machine learning techniques.

Developing cross-cultural studies to investigate the effect of cultural values, social norms, and digital literacy on CX between developed and emerging economies.

Explaining the deeper insight of online shopping behaviour of the prospective customers, examining their emotional and cognitive perspectives by integrating the relevant theories like Flow Theory, Cognitive Appraisal Theory, Social Identity Theory, Attachment Theory, etc.

Adopting longitudinal studies evolving CX across the pre-purchase, purchase, and post-purchase stages, examining how such experiences contribute to the long-term outcomes like customer advocacy, emotional attachment, brand loyalty, and customer lifetime value (CLV).

Empirically testing the HAOCX model in diverse sectors such as healthcare, education, hospitality, banking, luxury retail, and professional services to identify industry-specific drivers of online customer experience.

Investigating the growing significance of phygital retailing, omnichannel ecosystems, livestream commerce, and social commerce in shaping customer trust, emotional involvement, and loyalty (Grewal et al., 2024; Alexander & Varley, 2025). Finally, applying several advanced quantitative, qualitative, or mixed-method experiential research designs underpins a robust and holistic understanding of CX in this virtual marketplace.

MANAGERIAL IMPLICATIONS

The proposed Holistic and Adaptive Online Customer Experience (HAOCX) model offers a practical guide for digital leaders, marketing teams, or e-commerce teams. As the digital landscape shifts from desktop-centric shopping to phygital and livestream-driven engagement, the model provides the following recommendations:

Firstly, the managers should deploy the advanced technologies such as AI, AR, and VR strategically. They should not treat them as the functional tool of basic automation, but should use them to create a state of flow and enjoyment, which the HAOCX model identifies as a core of increasing sales. Secondly, the model shows that advanced technology alone cannot ensure purchase decisions if customers perceive high levels of risk. Therefore, the managers should build trust, ensuring privacy concerns, technical security, and product authenticity. Such trust-building measures can reduce customers' perceived risk and lower the possibility of purchase avoidance. Thirdly, the managers should analyse the specific traits of customer characteristics, such as digital literacy, cultural norms, and past online behaviour, to create dynamic interfaces that adjust in real-time. For example, a tech-savvy user may prefer a fast, AI-heavy experience, while a risk-averse user may require more social proof and explicit trust signals. Fourthly, companies should arrange live-streamed retail events where shoppers can interact with real people and see reviews of genuine customers. Such a human connection increases the trust of the customers, and they become brand loyal. Finally, instead of looking at immediate repurchase intent, the HAOCX model emphasises long-term relational outcomes for sustainable growth of the business. Therefore, the managers should focus less on short-term transaction metrics and more on long-term loyalty, measuring brand advocacy, community vibes, and Customer Lifetime Value (CLV).

CONCLUSION

The study has thoroughly explored the domain of CX in the context of online shopping by retrieving the journal articles from the WoS database for the period 2006 to 2025. It has developed an integrated mechanism by blending bibliometric analysis with the TCCM framework. However, the study has certain limitations. As the study is designed by using selective scholarly literature, following some stringent inclusion-exclusion criteria, it narrows down the selection of literature for the analysis. Although the advanced tools like VOSviewer and R Studio Biblioshiny were employed, the other sophisticated machine learning tools, such as SciMat or CitNetExplorer, which could potentially offer alternative clustering approaches or more dynamic analyses, are not utilized in the research landscape. Despite the above, the study has produced a comprehensive research framework, called the HAOCX model, that has converged the theoretical, technological, and methodological components, driven by risk and trust dynamics to customer experience, engagement, loyalty, purchase intention, and other behavioural outcomes. Consequently, the study highlighted several future research directions by properly describing and interpreting its various components and predicting the CX. Thus, in this multifaceted technological landscape, the holistic framework provides a synergistic effect to the businesses for creating superior customer experiences and overcoming various challenges and barriers of the emerging economies.

Conflicts of Interest Declaration

All authors declare that they have no conflicts of interest.

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