BABEȘ-BOLYAI UNIVERSITY

Faculty of Economics and Business Administration

PhD School of Economics and Business Administration

Mapping the Customer Journey: Developing a Holistic Model for Customer Experience in Mobile Commerce Applications

SUMMARY of the DOCTORAL THESIS

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Abbreviations

Abbreviation	Definition
APP_DSGN	Application design
AR	Augmented reality
ASEC	App security
ASO	App store optimization
AUF	App usage frequency
AVE	Average variance extracted
CHBT	Chatbot

CONV	Convenience
CR	Composite reliability
ENJ	Enjoyment
EWOM	Electronic word-of-mouth
FF	Fast fashion
HABT	Habit
HTMT	Heterotrait-Monotrait
INNO	Innovative features
LOY	Loyalty
MGA	Multi-group analysis
MV	Manifest variable
NEG.EMO	Negative emotions
NFI	Normed Fit Index
ONEX	Onboarding experience
PERS	Personalization
POS.EMO	Positive emotions
POST_CX	Post-purchase experience
POST_EMO	Post-purchase emotions
PRE_ACX	Pre-purchase affective experience
PRE_ATT	Pre-purchase attitude
PRE_CCX	Pre-purchase cognitive experience
PRE_CX	Pre-purchase experience
PRE_EMO	Pre-purchase emotions
EOU	Ease of use
RSK	Perceived risk
PROD_CHAR	Product characteristics
PUR_ACX	Purchase affective experience
PUR_ATT	Purchase attitude
PUR_CCX	Purchase cognitive experience
PUR_CX	Purchase experience
PUR_EMO	Purchase emotions
SAT	Satisfaction
SEM	Structural equation modeling
SOCI	Social influence
S-O-R	Stimulus-Organism-Response
SRMRM	Square root mean square residual
TAM	Technology Acceptance Model
TRST	Trust perception
USF	Usefulness
VIF	Variance inflation factor
WOM	Word-of-mouth
WOS	Web of science

Abstract

This thesis aims to thoroughly investigate the formation of customer experience throughout the entirety of the mobile commerce application customer journey, encompassing the pre-purchase, purchase, and post-purchase stages. Additionally, it strives to embrace a holistic perspective by scrutinizing the relation among these stages of customer experience. The analysis further involves the evaluation of external variables discerned from an extensive literature review. Furthermore, the study delves into the moderating role of variables such as gender and the type of shopping app, offering insights into their influence on the proposed relationships. The study leveraged a sample of 971 young Romanian consumers and employed the SmartPLS software to assess the reflective-formative higher-order and the reflective measurement models. The empirical findings validate the formulation of customer experience based on the proposed lower-order constructs, which include cognitive and affective experiences. The study also identifies the mediating role of customer experience, examines how external variables impact the various stages of the customer journey, and elucidates the moderating influence of shopping app type and gender. It has created a heat map for managers and marketers, highlighting pivotal attributes significantly affecting customer experience. Moreover, a customer journey map has been developed, emphasizing crucial touchpoints and actions. The study further provides tailored recommendations for each stage of the journey. The study's uniqueness lies in its comprehensive exploration of each journey phase, contributing to a holistic understanding of customer experience within shopping apps.

Keywords: customer experience; customer journey; affective experience; cognitive experience; holistic approach; shopping apps; m-commerce; higher-order model.

1. Introduction

The proliferation of smartphones has led to a revolutionary shift in consumer behavior, giving rise to mobile commerce (m-commerce), which involves financial transactions through mobile networks. M-commerce's growth is attributed to its unique attributes, such as ubiquity, localization, personalization, and convenience, resulting in a rapid "on-the-go" buying behavior faster than physical stores (Liftoff & Adjust, 2020). By 2023, m-commerce constituted 60% of e-commerce sales, projected to reach 62% by 2027 (Statista, 2023a). Global mobile app revenue, including shopping apps, was predicted to hit $541 billion in 2023 and rise to $753 billion by 2027 (Statista, 2023b). However, user retention remains challenging; the first-day retention rate for shopping apps was 19% in 2022, dropping to 5% after 30 days (Adjust, 2023). These shopping apps enable customers to purchase via mobile devices, transcending time and location constraints. While mobile applications are pivotal in m-commerce, a comprehensive understanding of factors influencing the customer experience across the journey needs to be improved. The customer experience encompasses all pre- and post-purchase touchpoints, creating a comprehensive and holistic concept (Lemon & Verhoef, 2016; Zhang et al., 2023).

1.1. Identified research gaps

In the course of this research, an array of significant research gaps has been brought to light through rigorous bibliometric and bibliographic analysis, as well as a meticulous systematic literature review. Within this context, two primary research gaps have been identified, calling for in-depth investigation and exploration:

1. **Customer experience is multidimensional encompassing cognitive and affective responses.**

Even though pioneering researchers such as Grewal et al. (2009), Puccinelli et al. (2009), Verhoef et al. (2009), Rose et al. (2012), and Lemon and Verhoef (2016) have consistently emphasized the multidimensional concept of customer experience, previous studies have predominantly treated it as a singular construct, using reflective measurement methods (Hubert et al., 2017; McLean et al., 2018; Thakur, 2018; Chopdar & Balakrishnan, 2020; Zaid & Patwayati, 2021). However, this approach must pay more attention to the intricate interplay between various dimensions and factors that collectively shape the customer experience (Lin & Bennett, 2014). By focusing solely on a

single construct, these studies may fail to capture the nuanced interactions between cognitive and affective elements that mold customers' perceptions and attitudes.

2. **Customer experience is a holistic approach, taking into account the various touchpoints.**

Given that customer experience encompasses all touchpoints throughout the customer journey, it is reasonable to design the customer experience across three stages (Lemon & Verhoef, 2016). However, previous studies have not consistently followed this approach (Parise et al., 2016; Hubert et al., 2017; McLean et al., 2018; Thakur, 2018; Watson et al., 2018; Thakur, 2019; Chopdar & Balakrishnan, 2020; Hamouda, 2021; Japutra et al., 2021; Zaid & Patwayati, 2021). An all-encompassing approach to measuring the customer experience is essential—one that fully embraces the multifaceted nature of the entire customer journey, comprising the formation of the customer experience and the connections between its stages. Adopting a formative measurement model offers the potential to delve deeper into the unique attributes and interactions that contribute to the formation of customer experience across different stages of the customer journey (Lin & Bennett, 2014).

The present study identified other research gaps as well. Leveraging the insights derived from the bibliometric analysis, a multitude of research gaps and unexplored avenues have been unveiled, laying the foundation for the present thesis:

- Predominant focus on customer experience outcomes.
- Limited focus on emerging countries.
- Minimal attention has been given to grocery, food delivery, and fashion mobile apps.

Despite the popularity of mobile applications, the subject of customer experience in this area has received less attention compared to other distribution channels. This finding underscores the importance and significance of investigating customer experience within the context of mobile commerce applications. The keywords analysis revealed a predominant focus on customer experience outcomes rather than its contributing factors, suggesting a potential research gap. Notably, the customer journey's pre-purchase stage seems less investigated compared to the post-purchase stage. The analysis also demonstrated the USA's substantial influence through its many published documents, citations, and international collaborations. Moreover, numerous publications originated from Europe, primarily from developed nations, with a limited focus on emerging

countries. In light of this, the thesis aims to address this disparity by conducting the study in Romania, an emerging European country. Furthermore, grocery, food delivery, and fashion mobile apps have received noticeably less attention compared to other categories, like general shopping apps. To foster a more holistic comprehension of customer experience within these specific industries, this thesis has chosen to focus on these shopping apps as the research context.

The literature review on customer experience encompasses three key areas. The first one delves into the different measurement methods used in prior studies. The second area systematically examines the variables influencing customer experiences and their resulting outcomes. Lastly, the third part focuses on the various stages of the customer journey to understand the nuances of each phase. All these topics have guided the author in identifying significant research gaps:

- Affective and cognitive dimension are the best suitable measurement approach for customer experience.
- Conceptual delimitation between customer experience and satisfaction is needed.
- Underexplored utilitarian variables related to shopping apps.
- Lack of research exploring the mediating role of customer experience.
- Excessive concentration on diverse touchpoints throughout the stages of the customer journey.

A significant void highlighted within the literature pertains to the prevalent emphasis on recognizing the precursors and consequences of customer experience, with a notable scarcity of studies that directly delve into the evaluation of the experience itself (Hubert et al., 2017; McLean et al., 2018; Thakur, 2018; Chopdar & Balakrishnan, 2020; Zaid & Patwayati, 2021). This void underscores the limited research dedicated to comprehensively investigating the factors that actively contribute to the formation of customer experience. Upon reviewing the diverse measurement approaches for customer experience across offline, online, omnichannel, and mobile app contexts, it becomes apparent that the most appropriate approach for measuring customer experience in the shopping app domain involves employing the affective and cognitive dimensions (Rose et al., 2012; Martin et al., 2015; Izogo & Jayawardhena, 2018; Bhattacharya et al., 2019; Hamouda, 2021; Molinillo et al., 2020; Zaid & Patwayati, 2021). Consequently, this thesis adopts the affective and cognitive dimensions as the measurement framework for customer experience in the pre-purchase and purchase stages.

Moreover, it holds significance to draw a clear distinction between satisfaction and customer experience, despite these terms often being used interchangeably in the customer experience literature (Jain et al., 2017; Bueno et al., 2019). Although they are closely related, they possess distinct meanings. As outlined by Lemon and Verhoef (2016), customer satisfaction is considered one of the components of the broader customer experience, focusing primarily on the cognitive evaluation of the overall experience. Customer satisfaction can be conceived as a response linked explicitly to a particular facet, namely the consumption experience, occurring at a precise juncture, post-purchase (Giese & Cote, 2002; Hoyer et al., 2020). Conversely, customer experience encompasses the entirety of impressions during the decision-making process, embracing emotions, behaviors, and cognitive rationales (Lemon & Verhoef, 2016). This delineation underscores that customer experience extends beyond mere customer satisfaction; instead, customer satisfaction hinges on a positive experience. On the other hand, satisfaction can be regarded as an outcome or result of a favorable experience (Jain et al., 2017; Hoyer et al., 2020). Therefore, the present study measures customers' satisfaction solely in the post-purchase stage of the customer journey.

After conducting a thorough and systematic examination of the factors influencing customer experience in various contexts, including offline, online, omnichannel, and shopping apps, numerous gaps have become apparent in the customer experience literature pertaining to shopping apps. As regards technological characteristics of the app, it is evident that the Chatbot function still needs to be explored, alongside other utilitarian characteristics (Kasilingam, 2020; Chen et al., 2021). In light of this discernible gap, the present study takes deliberate measures to bridge this gap by incorporating the Chatbot variable into the conceptual model. Notably, app design attributes have not been subjected to exhaustive scrutiny by preceding researchers in the same measure as other prominent app features such as utility and user-friendliness (Stocchi et al., 2019; Gupta et al., 2021; Wut et al., 2021; Gil-Cordero et al., 2023). Paradoxically, existing studies underscore the considerable impact of ambiance and design attributes on customer experience across diverse distribution channels (online, offline, omnichannel). Against this backdrop, the present thesis incorporates this variable into the conceptual model, acknowledging the pivotal role of app design characteristics in shaping customer experience.

Even though the S-O-R model is one of the most frequently used theoretical frameworks, a notable gap in the literature is the need for more research on the internal process as a mediator in the context of shopping apps (Shukla & Sharma, 2018; Kasilingam, 2020; Saleem et al., 2021; Pop et al., 2023). This suggests that there needs to be more understanding of how the stages of the customer journey and customer experiences are connected in the shopping app context. This gap presents an opportunity for this study to explore the role of customer experience and attitude as mediators. Based on the body of literature concerning customer experience within the shopping app context, a parallel pattern emerges, consistent with findings across other distribution channels (online, offline, omnichannel). Notably, the prevalent approach in measuring customer experience remains reflective, despite the construct of customer experience exhibiting a more compatible alignment with formative measurement techniques (Lin & Bennett, 2014). Moreover, researchers who delve into measuring customer experience do not explore the relation between the formatively measured customer experience and other predictors and/or outcomes (McLean et al., 2020; Al Amin et al., 2021; Anshu et al., 2022). This oversight inadvertently ignores the potential roles that mediating or moderating variables might play in shaping these relationships (Bagdare & Jain, 2013; Lin & Bennett, 2014).

1.2. Formation of research questions and objectives

Based on the identified research gaps, this study formulates two research questions, along with their corresponding objectives and sub-objectives. The first research question, denoted as RQ1, aims to explore the factors contributing to the formation of pre-purchase, purchase, and post-purchase experiences (**Figure 1**). In this regard, the objective is to identify and analyze the factors influencing customer experience across distinct phases of the customer journey, namely the pre-purchase, purchase, and post-purchase stages, which collectively constitute Model 1. This analysis is conducted through the adoption of a reflective-formative higher-order approach. Therefore, within the pre-purchase and purchase stages, the evaluation of customer experience is grounded in cognitive and affective dimensions, as these stages can be best evaluated through this approach (Rose et al., 2012; Martin et al., 2015; Izogo & Jayawardhena, 2018; Bhattacharya et al., 2019; Hamouda, 2021; Molinillo et al., 2020; Zaid & Patwayati, 2021). The assessment of the affective dimension encompasses the critical variable of emotions, including both positive and negative

emotions. Simultaneously, the cognitive dimension is gauged through important utilitarian attributes of the mobile application. Furthermore, the post-purchase experience is evaluated by examining levels of customer satisfaction concerning various aspects, including delivery, product quality, return and exchange policies, and customer support. This approach addresses the limitations of prior research that predominantly emphasized app related utilitarian factors in the post-purchase stage, thereby neglecting consumption-related elements (Kumar & Anjaly, 2017; Cao et al., 2018; Gârdan et al., 2021; Ma et al., 2022).

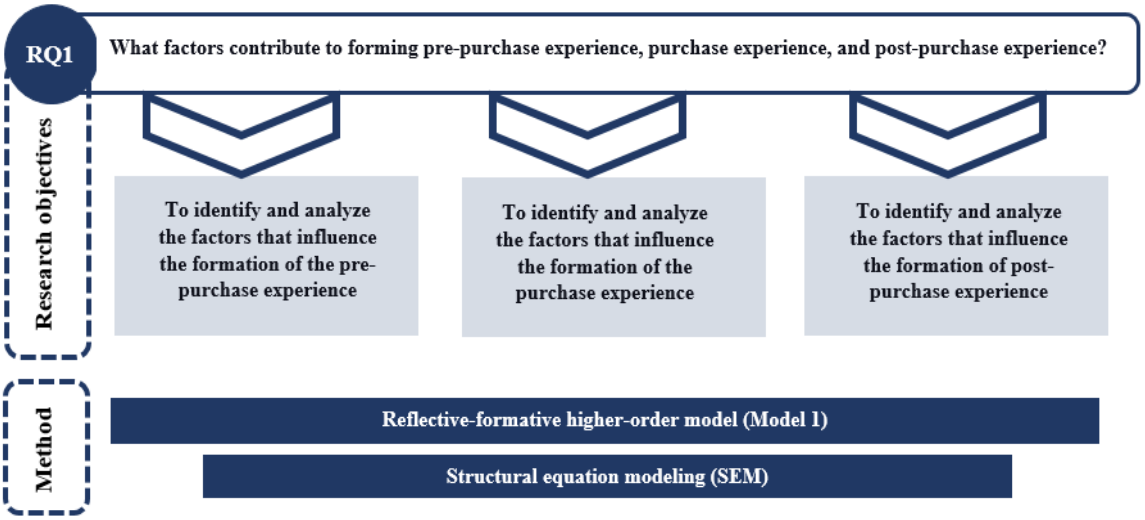

Figure 1. Objectives and methods: Model 1
Source: Elaborated by the author

The second research question, denoted as RQ2, delves into the relation of customer journey stages and investigates the external variables that influence them (**Figure 2**). To address this question, the study has developed multiple objectives and sub-objectives. Consequently, this study purposes to analyze the relationships among distinct stages within the customer journey, encompassing pre-purchase, purchase, and post-purchase experiences, focusing on potential mediating effects, constituting Model 2.

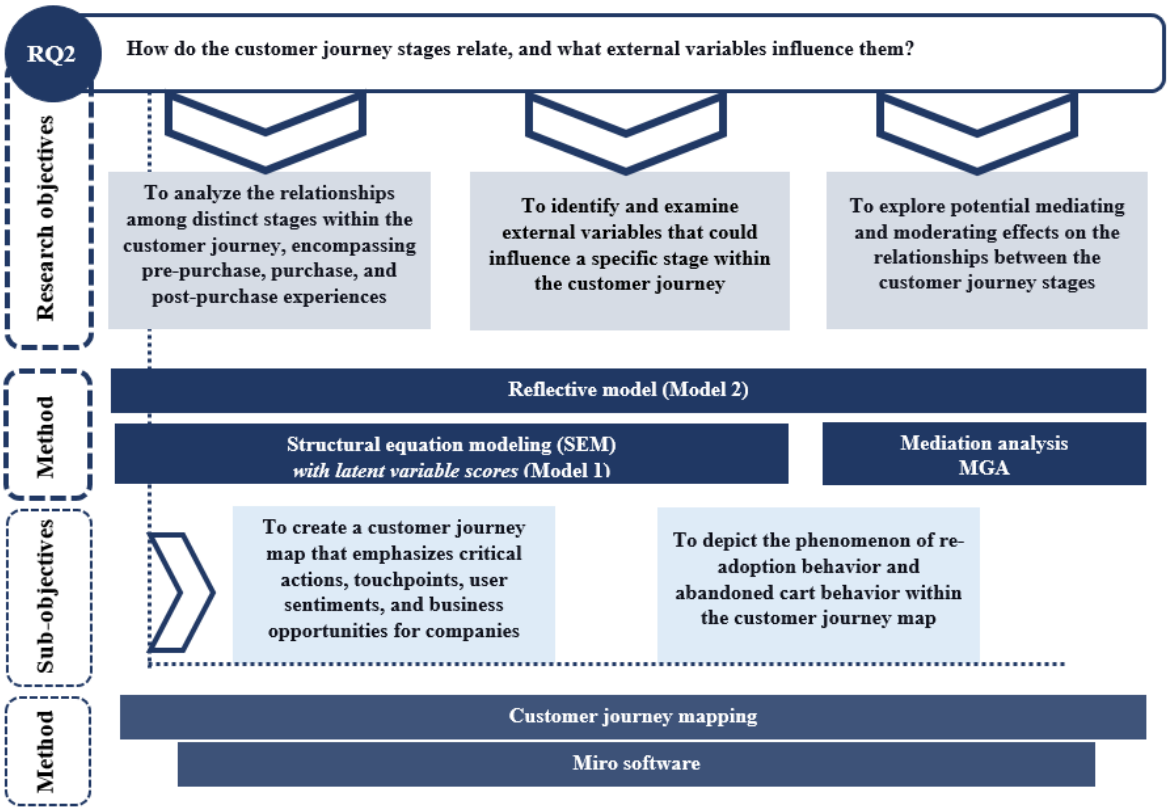

Figure 2. Objectives and methods: Model 2
Source: Elaborated by the author

This emphasis arises from the dearth of investigations into the interplay between these stages in existing literature (Kim & Baek, 2018; Fernandes & Barfknecht, 2020; Ahn & Kwon, 2021; Barta et al., 2021; Rodrigues et al., 2021; Saprikis et al., 2021). Furthermore, this research identifies and scrutinizes external variables uncovered in an extensive literature review. These variables encompass aspects such as the onboarding experience, trust, social influence, habit, personalization, and convenience. It is worth noting that two constructs, app security (ASE) and innovative features (INNO) were initially conceptualized as contributors to the formation of customer experience in Model 1. However, the statistical analyses did not validate this assumption. Nevertheless, the present study still regards these variables as crucial predictors in shaping the customer experience. Consequently, these two variables have been incorporated into Model 2 as external factors. These external factors are examined for their potential influence on specific stages within the customer journey. Additionally, the study explores the moderating role of variables such as gender and shopping app type, as revealed in the literature concerning the proposed relationships.

Lastly, from a practical standpoint, this research strives to create a customer journey map that accounts for users' actions, emotions, and challenges. By incorporating these elements, the study aims to offer valuable practical insights for businesses, enhancing their comprehension of the customer experience. As regards the originality of the research, to the best of the researcher's knowledge, this study marks a pioneering endeavor in the field of customer experience literature, especially within the context of shopping apps. Its primary aim is to conceptualize the customer experience construct in accordance with the established theoretical foundations of leading scholars in this area. As such, it defines customer experience as a multidimensional concept that encompasses both the cognitive and affective responses of customers. Furthermore, it adopts a holistic approach, advocating for the evaluation of customer experience at every stage of the customer journey, while also considering the impact of touchpoints. Moreover, this thesis stands as one of the initial studies to investigate the mediating role of each customer experience stage – specifically, the pre-purchase, purchase, and post-purchase stages – within the context of shopping apps. This exploration aims to elucidate the underlying processes that connect the customer experience stages with other independent variables. Additionally, this study examines the moderating effects of gender and shopping app type, shedding light on intriguing insights within different sub-groups.

This thesis is organized into eight chapters. **Chapter 2** introduces the conceptual boundaries of customer experience and mobile shopping applications, offering a foundational understanding of these concepts to facilitate comprehension of subsequent chapters. **Chapter 3** conducts a bibliometric analysis to quantitatively and qualitatively explore existing research on customer experience, establishing the research context. **Chapter 4** examines the customer experience literature across various distribution channels, encompassing offline, online, omnichannel, and mobile apps. Initially, a systematic literature review is conducted to gain a comprehensive understanding of customer experience in these channels. Additionally, this chapter highlights three significant themes in the customer experience literature: measurement approaches used in previous studies, an exploration of variables influencing customer experience and its outcomes, and a focus on the stages of the customer journey within shopping apps. It also includes the development of conceptual models and hypotheses. **Chapter 5** outlines the research methodology, providing insights into the techniques and processes employed for data collection and analysis. **Chapter 6**

presents the study's results, involving the validation and evaluation of the two models. **Chapter 7** offers a comprehensive discussion of the findings, providing interpretations and insights derived from the results. **Chapter 8** concludes the research, discussing the theoretical contributions made by the study, managerial implications, and acknowledging the study's limitations while suggesting potential directions for future research.

2. Conceptual delimitations and classifications of customer experience in mobile commerce applications

Mobile applications, operating on smart devices and offering advanced computing capabilities and diverse functions through embedded software (Hew et al., 2023), are considered pivotal components of mobile commerce. Amidst various classifications in the literature, this thesis centers on a specific category: mobile commerce applications, commonly known as shopping apps. These apps empower users to seamlessly buy and sell goods and services, transcending temporal and spatial constraints (Stocchi et al., 2022). Given this technological landscape, the concept of customer experience takes center stage, encompassing a spectrum of cognitive, affective, emotional, social, and physical customer reactions. This comprehensive perspective involves interactions that span various touchpoints in the customer's journey, thereby encapsulating the engagements between companies and customers (Lemon & Verhoef, 2016; Gahler et al., 2023). This journey unfolds across three stages: pre-purchase, purchase, and post-purchase.

3. Bibliometric analysis of customer experience in the retail industry

Utilizing VOS viewer software, a bibliometric analysis was performed to cluster publications on customer experience in retail from the Web of Science (WoS) Core Collection database. This visual analysis represented aggregated scientific research. Notably, research on customer experience in retail showed a rising trend from 2008 to mid-2023. Among the key findings, the seminal work by Verhoef et al. (2009) on customer experience stood as the most cited article. Customer experience is prominently linked to keywords like satisfaction and loyalty. Besides, a research gap was evident in connecting customer experience with mobile apps. The Journal of Retailing emerged as the most influential journal, with the USA standing out as a dominant force in terms of citation impact. Publications were predominantly led by Europe, mainly developed nations, indicating the necessity

for increased focus on emerging economies such as Romania. Despite the advantages of bibliometric analysis and VOS viewer, a systematic literature review was used to ensure high-quality inclusion.

4. Hypotheses and conceptual model development

Based on the systematic review, out of 506 articles, 191 were analyzed comprehensively, examining journals and their publication frequency, the applied methodologies and techniques, sample sizes, industry contexts, and theoretical underpinnings. The review was a foundation for recommending appropriate theoretical frameworks and methodological approaches. Furthermore, the analysis of the articles revealed two significant themes: (1) approaches for measuring customer experience and (2) the systematic exploration of variables that influence customer experience and its subsequent outcomes.

4.1. Measurement approaches in customer experience research: a comprehensive review

Research commonly evaluates customer experience by exploring cognitive and affective dimensions. The cognitive aspect examines utilitarian attributes' impact, while the affective facet encompasses emotions, moods, and feelings (Foroudi et al., 2016; Alnawas & Hemsley-Brown, 2018; Izogo & Jayawardhena, 2018; Bhattacharya et al., 2019; Micu et al., 2019; Barari et al., 2020; Hamouda, 2021; Molinillo et al., 2020; Tyrväinen et al., 2020; Zaid & Patwayati, 2021). Most studies typically focus on interpreting customer experience within a single buying stage, sidelining the holistic journey across pre-purchase, purchase, and post-purchase phases. This limitation can hinder a complete understanding of customer experience and behavior. At each stage, a comprehensive customer experience evaluation is crucial for nurturing a holistic perspective of the shopping app customer journey.

4.2. Factors influencing customer experience in retail: a systematization approach

This study explores customer experience in retail through a systematic analysis of independent, mediating, and dependent variables across offline, online, omnichannel, and mobile app distribution channels. Utilizing the S-O-R (Stimulus-Organism-Response) and cognitive-affective

models, the approach categorizes variables to comprehend the multifaceted nature of customer experience. Variables are classified into external (interaction, ambiance, technological, and product-related) and internal (attitudinal) categories, enhancing the understanding of factors shaping customer experience across different distribution channels. This systematization led the researcher to explore essential variables in shaping customer experience that have yet to be studied in the context of shopping apps. For instance, aesthetics, design, and atmosphere were found to be influential factors in shaping customer experience in the offline, online, and omnichannel context (Lucia-Palacios et al., 2016; Stein & Ramaseshan, 2016; Mohd-Ramly & Omar, 2017; Lee & Lim, 2017; Terblanche, 2018; Hsieh et al., 2021). However, the current body of research on shopping apps still needs to be improved in examining the role of app design as a determinant of customer experience. Also, product characteristics have been comparatively neglected across all four distribution channels, despite their crucial role in shaping customer experience during purchase (Trivedi & Trivedi, 2018; Tarhini et al., 2019; Liang & Liu, 2019; Chiu et al., 2021; Tseng et al., 2022). Within the mobile app domain, the Chatbot function emerges as a pivotal area for investigation. Surprisingly, emotions still need to be studied despite their significant impact on shaping customer experience.

4.3. The conceptual model

Expanding on the preceding discussions, the core objective of this thesis is to investigate the factors that influence the formation of pre-purchase, purchase, and post-purchase experiences through the adoption of a reflective-formative higher-order approach (*Model 1*). In alignment with this goal, assessing customer experience formation in the pre-purchase and purchase stages leverages the affective and cognitive dimensions. The affective experience hinges on customer emotions, while the cognitive experience centers on fundamental attributes of the shopping app. Based on the comprehensive literature review, in the pre-purchase stage, two critical variables were identified in shaping cognitive experience, namely, ease of use and privacy risk, while in the purchase experience stage, the following variables were identified as substantial factors in contributing to the cognitive experience: ease of use, app security, product characteristics, usefulness, app design, innovative features, chatbot, enjoyment. Subsequently, the evaluation of the post-purchase experience is predicated on customer emotions and their satisfaction levels with the post-purchase services. The second objective of this study is to explore the connections between the pre-purchase,

purchase, and post-purchase experiences while also investigating the influence of external variables on one of the stages of the customer journey using a reflective model approach. Drawing upon the comprehensive literature review, the following external variables were identified: onboarding experience, social influence, trust, convenience, personalization, and habit. The study also incorporated the role of attitude in shaping customer experience and conceptualized the primary outcomes associated with a positive customer experience, including customer loyalty and usage frequency. Moreover, the moderating role of shopping app type and gender is also explored on the proposed relationships (**Figure 3**).

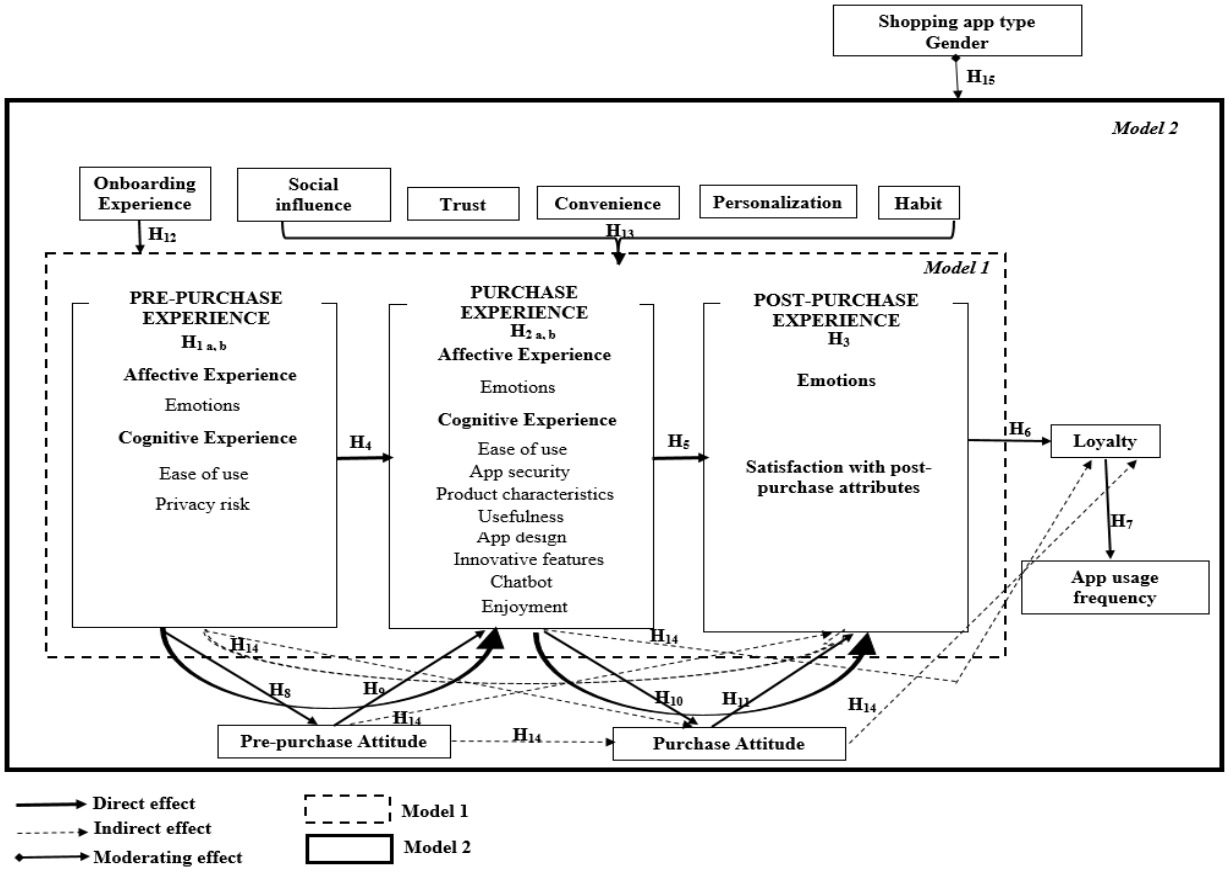

Figure 3. Conceptual Model

5. Research methodology

The study delves into three categories of shopping applications: fast fashion (FF), grocery, and food delivery. These specific app genres were chosen due to their remarkable growth in both revenue and downloads, alongside the identified research gap in comprehending the customer experience within these unique contexts (Statista, 2023a). The decision to investigate these applications in Romania is anchored in the country's emerging innovative status, particularly in digitalization (European Commission, 2022). With high smartphone usage and widespread internet penetration, Romania provides an insightful environment for exploring the customer journey in mobile shopping (Statista, 2022b; Economica.net, 2022). The prevalence of these app types in Romania further substantiates their suitability for this study (Statista, 2023c, 2023d). The study narrows its focus to Millennials (Generation Y) and Generation Z, acknowledged as enthusiastic users of mobile shopping apps (Statista, 2023e). Generation Z, with 32% engaging in daily online shopping, substantially influences shopping app usage (The Current, 2023). The determination of the sample size employed three distinct methods: population proportion-based calculation, Structural Equation Modeling (SEM) calculation, and the utilization of the "10 to 1 rule." These methods collectively recommended a sample size ranging from 385 to 2528. Employing a quantitative survey approach, this research utilized a self-administered questionnaire as the primary tool for data collection. The online survey platform LimeSurvey was employed for conducting data collection. To refine the clarity and effectiveness of the survey instrument, a pilot test involving 53 respondents was conducted. Ultimately, the data collection process resulted in 1201 responses (comprising 873 complete responses and 328 partial responses). Following the implementation of data cleansing procedures, 971 responses were retained from the initial 1201. Participants were screened based on having a minimum of six months of app usage and completed purchases. Questionnaire items were fine-tuned based on relevant literature, and participants' responses were evaluated using a 5-point Likert scale.

The study deconstructed the proposed conceptual model into two components for evaluation: a reflective-formative higher-order model (referred to as Model 1) emphasizing the formation of customer experience and a reflective model (referred to as Model 2) scrutinizing relationships within the framework. SmartPLS 4.0, a software specializing in structural equation modeling

(SEM), was used for analysis. Missing values were treated using mean replacement. Furthermore, model constructs and indicators were deliberately aligned, mitigating biases and ensuring a well-balanced measurement approach (Sarstedt et al., 2019).

6. Results

6.1. Model 1: Testing the formation of the customer experience in the pre-purchase, purchase, and post-purchase stages

The analysis commenced with validating the first-order measurement model using the PLS consistent algorithm. The reliability and validity of the first-order constructs were assessed through factor loadings, Cronbach's α, Composite Reliability (CR), average variance extracted (AVE), and discriminant validity. Indicators not meeting the criteria were removed, excluding three constructs from the assessment: innovative features and app security from the purchase experience and positive emotions from the pre-purchase experience. The remaining indicators had loadings exceeding 0.70, indicating satisfactory convergent validity (Hair et al., 2018). Cronbach's α, CR, AVE, and HTMT values surpassed thresholds, indicating first-order model reliability and validity (Hair et al., 2018). The subsequent stage involves the examination of the second- and third-order formative construct to establish their composite relationships with their respective first-order indicators. (Sarstedt et al., 2019). In this phase, the second-order construct is treated as a lower-order formative construct and particular attention is given to investigating multicollinearity and outer weights within its measurement model (Becker et al., 2012). The variance inflation factor (VIF) values were used to assess the indicator collinearity, as recommended by Hair et al. (2018). All outer VIF values in this analysis were below five, except for the chatbot (CHTB) indicators, which exhibited collinearity concerns. However, within the inner model, all VIF values were below three, indicating the absence of collinearity issues. Indicator weights' significance and relevance were also assessed. Notably, substantial contributions were observed from first- to second-order and second- to third-order constructs in the pre-purchase, purchase, and post-purchase stages ($p < 0.05$; t-value > 1.96) (**Figure 3**). **Table 1** showcases robust higher-order model support with significant t-statistics and p-values under 0.001.

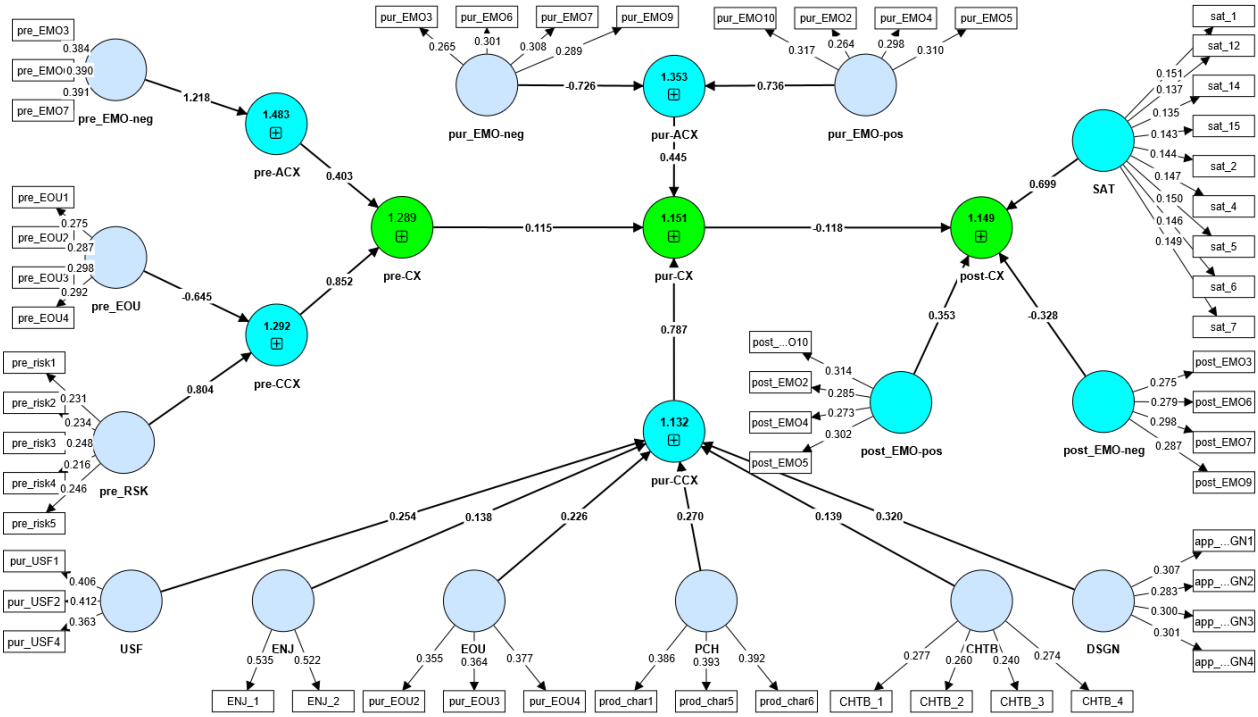

Figure 4. Higher-Order Measurement Model Illustrating the Formation of Customer Experience

Table 1. Impact of Lower Order Constructs on Higher Order Constructs: Formation of Customer Experience

HOC	LOC	R^2	Original Beta	Mean	STDEV	T-statistic	P-value	LOC	R^2	Original Beta	Mean	STDEV	T-statistic	P-value
Pre-CX	*ACX*	28.16%	0.403	0.403	0.015	26.572	0.000***	**Neg. EMO**	NR	1.218	1.218	0.023	52.804	0.000***
	CCX	71.91%	0.852	0.851	0.012	70.105	0.000***	**RSK**	58.93%	0.804	0.804	0.027	29.938	0.000***
								EOU	41.08%	-0.645	-0.632	0.128	5.045	0.000***
Pur-CX	*ACX*	36.26%	0.445	0.446	0.015	29.142	0.000***	**Pos. EMO**	50.53%	0.736	0.736	0.027	27.375	0.000***
								Neg. EMO	49.41%	-0.726	-0.708	0.160	4.541	0.000***
	CCX	70.90%	0.787	0.786	0.014	55.172	0.000***	**DSGN**	26.09%	0.320	0.320	0.009	37.127	0.000***
								CHTB	4.32%	0.139	0.138	0.020	6.797	0.000***
								ENJ	9.64%	0.138	0.137	0.007	21.101	0.000***
								EOU	17.70%	0.226	0.225	0.009	26.276	0.000***
								PCH	22.20%	0.270	0.271	0.009	28.847	0.000***
								USF	20.01%	0.254	0.255	0.010	26.067	0.000***
Post-CX	*SAT*	61.62%	0.699	0.698	0.015	47.135	0.000***							
	Pos.EMO	26.72%	0.353	0.352	0.012	29.908	0.000***							
	Neg.EMO	19.86%	-0.328	-0.319	0.076	4.306	0.000***							

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; NR=not relevant; Neg.EMO=negative emotion; RSK=risk; EOU=ease of use; Pos.EMO=positive emotion; DSGN=app design; CHBT=chatbot; EJ=enjoyment; PCH=product characteristics; USF=usefulness; ACX=affective experience; CCX=cognitive experience; SAT=satisfaction; pre-CX=pre-purchase experience; Pur-CX=purchase experience; Post-CX=post-purchase experience.

6.2. Model 2: Testing the holistic customer experience model for mobile shopping apps

After rigorously validating and interpreting the results of the higher-order model, the process continues with the computation of latent variable scores (Sarstedt et al., 2019). The resulting scores play a pivotal role in generating a new data file, creating new variables corresponding to each latent factor identified in the model. These variables serve as fundamental components for the comprehensive analysis of the holistic customer experience model. This model assesses connections across customer journey stages and external variables' influence. The path model was developed using SmartPLS 4.0, with all reflective constructs. Despite app security (ASE) and innovative features (INNO) were not validated as a construct that contributes to the formation of customer experience, the present study still considers these variables as essential predictors in driving the customer experience. Thus, these two variables were included in Model 2 as external variables. Multiple tests were performed to determine exogenous variables impacting endogenous variables, leading to the final reflective model in **Figure 5**.

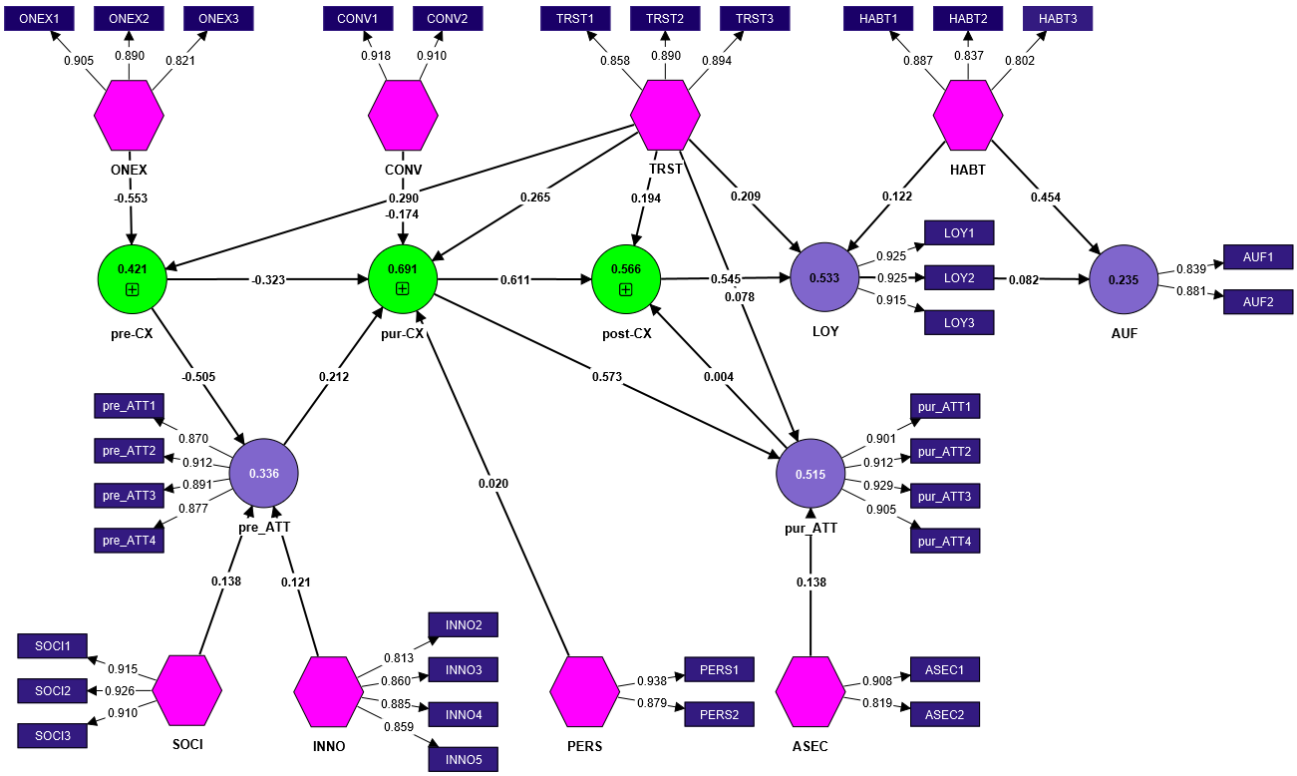

Figure 5. Structural Model

Reliability and validity were assessed through factor loadings, Cronbach's α, Composite reliability (CR), average variance extracted (AVE), and discriminant validity (Hair et al., 2018).

Table 2. Construct performance in predicting R^2 and Q^2

	R^2	Q^2
Pre-purchase experience (pre_CX)	0.421	0.417
Purchase experience (pur_CX_	0.691	0.615
Post-purchase experience (post_CX)	0.566	0.433
Pre-purchase attitude (pre_ATT)	0.336	0.375
Purchase attitude (pur_ATT)	0.515	0.409
Loyalty (LOY)	0.533	0.376
App usage frequency (AUF)	0.235	0.227

Both the outer and inner models exhibited VIF values, indicating the absence of multicollinearity issues. The model fit assessment showed an SRMR of 0.047, below the recommended threshold, while the NFI slightly fell short of the desired level. **Table 2** presents the explained variances and Q^2 statistics. The results of the structural model are outlined in **Table 3**.

Table 3. The path coefficients of the structural equation model

Paths	Path Coefficients	Standard Deviation	T-Value	*P*-Value	Hypotheses
Pre_CX→pur_CX	-0.323	0.023	13.756	0.000***	H_4—Confirmed
Pre_ACX → pur_ACX	-0.381	0.030	12.882	0.000***	
Pre_ACX → pur_CCX	-0.186	0.028	6.699	0.000***	
Pre_CCX → pur_ACX	-0.071	0.033	2.129	0.033*	
Pre_CCX → pur_CCX	-0.084	0.029	2.933	0.003**	
Pur_CX→post_CX	0.611	0.039	15.797	0.000***	H_5—Confirmed
Pur_ACX → SAT	0.250	0.040	6.224	0.000***	
Pur_ACX → post_EMO-neg	-0.625	0.038	16.308	0.000***	
Pur_ACX → post_EMO-pos	0.475	0.039	12.148	0.000***	
Pur_CCX → SAT	0.264	0.045	5.828	0.000***	
Pur_CCX → post_EMO-neg	-0.097	0.049	1.982	0.048***	
Pur_CCX → post_EMO-pos	0.074	0.052	1.428	$0.153^{n.s.}$	
Post_CX→LOY	0.545	0.033	16.611	0.000***	H_6—Confirmed
SAT → LOY	0.313	0.043	7.308	0.000***	
Post_EMO-neg → LOY	-0.108	0.029	3.686	0.000***	
Post_EMO-pos → LOY	0.243	0.037	6.551	0.000***	
LOY→AUF	0.082	0.032	2.524	0.012*	H_7—Confirmed
Pre_CX→pre_ATT	-0.505	0.029	17.140	0.000***	H_8—Confirmed
Pre_ACX → pre_ATT	-0.168	0.037	4.578	0.000***	
Pre_CCX → pre_ATT	-0.366	0.037	9.835	0.000***	
Pre_ATT→pur_CX	0.212	0.026	8.035	0.000***	H_9— Confirmed

Pre_ATT → pur_ACX	0.122	0.030	4.065	0.000***	
Pre_ATT → pur_CCX	0.267	0.026	10.210	0.000***	
Pur_CX→pur_ATT	0.573	0.043	13.387	0.000***	H_{10}—Confirmed
Pur_ACX → pur_ATT	0.157	0.038	4.091	0.000***	
Pur_CCX → pur_ATT	0.462	0.046	10.114	0.000***	
Pur_ATT→post_CX	0.004	0.039	0.098	$0.922^{n.s.}$	H_{11}—Rejected
Pur_ATT → SAT	0.041	0.044	0.933	$0.351^{n.s.}$	
Pur_ATT → post_EMO-neg	0.035	0.042	0.834	$0.404^{n.s.}$	
Pur_ATT → post_EMO-pos	0.029	0.046	0.619	$0.536^{n.s.}$	
ONEX→pre_CX	-0.553	0.029	18.885	0.000***	H_{12}—Confirmed
ONEX → pre_ACX	-0.401	0.038	10.490	0.000***	
ONEX → pre_CCX	-0.488	0.033	14.804	0.000***	
CONV→pur_CX	0.290	0.029	10.139	0.000***	H_{13a}—Confirmed
CONV → pur_ACX	0.179	0.030	5.911	0.000***	
CONV → pur_CCX	0.304	0.030	10.087	0.000***	
PERS→pur_CX	0.020	0.024	0.844	$0.399^{n.s.}$	H_{13b}—Rejected
PERS → pur_ACX	0.027	0.029	0.934	$0.350^{n.s.}$	
PERS → pur_CCX	0.034	0.025	1.347	$0.178^{n.s.}$	
SOCI→pre_ATT	0.138	0.030	4.614	0.000***	H_{13c}— Confirmed
TRST→pre_CX	-0.174	0.032	5.436	0.000***	H_{13d}—Confirmed
TRST → pre_ACX	-0.093	0.035	2.643	0.008**	
TRST → pre_CCX	-0.173	0.035	4.982	0.000***	
TRST→pur_CX	0.265	0.026	10.086	0.000***	
TRST → pur_ACX	0.251	0.036	6.929	0.000***	
TRST→ pur_CCX	0.256	0.028	9.217	0.000***	
TRST→pur_ATT	0.078	0.038	2.066	0.039*	
TRST→post_CX	0.194	0.038	5.080	0.000***	
TRST → SAT	0.221	0.042	5.250	0.000***	
TRST → post_EMO-neg	0.024	0.037	0.645	$0.519^{n.s.}$	
TRST → post_EMO-pos	0.186	0.043	4.276	0.000***	
TRST→LOY	0.209	0.037	5.680	0.000***	
HABT→LOY	0.122	0.029	4.210	0.000***	H_{13e}—Supported
HABT→AUF	0.454	0.026	17.387	0.000***	
INNO→pre_ATT	0.121	0.029	4.211	0.000***	Tested but not hypothesized
ASEC→pur_ATT	0.138	0.035	3.890	0.000***	Tested but not hypothesized

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; ASEC=app security; AUF=app usage frequency; CONV=convenience; HABT=app habituality; INNO=innovative features; LOY=loyalty; NS=non-significant; ONEX=onboarding experience; PERS=personalization; post_CX=post-purchase experience; pre_ATT=pre-purchase attitude; pre_CX=pre-purchase experience; pur_ATT=purchase attitude; pur_CX=purchase experience; SOCI=social influence; TRST=trust perception.

6.2.3. The mediation and MGA analysis of the structural model

The mediation analysis of pre_CX, pur_CX, post_CX, pre_ATT, and pur_ATT followed Hair et al.'s (2018) approach. Key findings reveal that the pre-purchase experience exhibits partial mediation, while the purchase experience predominantly demonstrates full mediation, with some partial mediation. The post-purchase experience plays a complementary role in mediation. Pre-purchase attitude competitively mediates Pre_CX → pur_CX (β = -0.276; T-value = 10.943; $p < 0.001$), while INNO → pur_CX shows complete mediation. Other relationships lack mediation (SOCI → pur_CX, Pur_CX → post_CX, ASEC → post_CX). This study further explores distinctions in shopping app types (fast fashion, grocery, food delivery) and genders. Utilizing multi-group analysis with 5000 subsamples, significant variations emerge. Notable differences include social influence having a stronger impact on pre-purchase attitudes in fast fashion apps than in food delivery apps. Trust's influence on post-purchase experience varies between FF and grocery apps and between grocery and food delivery apps. Purchase experience's effect on post-purchase experience is more pronounced in grocery apps. The impact of pre-purchase experience on purchase experience differs between FF and grocery apps and between grocery and delivery apps. Regarding genders, innovation's impact on pre-purchase attitude is more substantial in males, whereas social influence's effect is more emphasized in females.

7. Discussion

7.1. Formation of the customer experience in the pre-purchase, purchase, and post-purchase stages

This study underscores the substantial impact of affective and cognitive experiences on shaping pre-purchase and purchase experiences within mobile shopping apps. These findings are consistent with previous research in the field (Bustamante & Rubio, 2017; Roy et al., 2017; Barari et al., 2020; Saini & Singh, 2020). During the pre-purchase phase, negative emotions—such as confusion, uncertainty, and disappointment—predominantly shape the affective experience. Interestingly, positive emotions did not meet the inclusion criteria during the validation phase, suggesting a limited impact. In contrast, the purchase and post-purchase phases blend positive and negative emotions, indicating a balanced emotional response. In the pre-purchase cognitive experience, the

pivotal roles of perceived risk and ease of use are confirmed. Heightened risk perception intensifies cognitive load, while ease of use mitigates it. This study validates the dominance of cognitive experiences over the affective dimension in shaping the pre-purchase experience, aligning with earlier findings (Barari et al., 2020; Molinillo et al., 2020). Within the purchase experience, supported hypotheses underscore the influence of both affective and cognitive experiences. Positive and negative emotions jointly contribute to the affective experience. Positive emotions elevate the emotional response during purchases, fostering optimism, confidence, assurance, and satisfaction. Conversely, negative emotions such as confusion, uncertainty, disappointment, and doubt lead to a less favorable emotional encounter, in line with previous research (Zegarra & Ruiz-Mafé, 2020; Manthiou et al., 2020). Positive emotions wield a slightly more pronounced influence (0.736) than negative emotions (-0.708) during the purchase phase. The app's design emerges as the most influential factor shaping the cognitive experience during purchases. A user-friendly, visually appealing interface with intuitive navigation positively impacts decision-making, corroborating various studies (Lee & Lim, 2017; Stocchi et al., 2019; Hsieh et al., 2021). Product characteristics also play a pivotal role, where diverse offerings and discounts enhance the cognitive experience—consistent with earlier research (Stein & Ramaseshan, 2016; Mohd-Ramly & Omar, 2017; Lee & Lim, 2017; Gao et al., 2021). App usefulness and ease of use follow, facilitating swift transactions and decision-making (Pandey & Chawla, 2018; McLean et al., 2018; Liang & Liu, 2019; Iqbal, 2020; Rodrigues et al., 2021). Chatbot interactions also exert an influence on the cognitive experience. Transparent information, context maintenance, issue resolution, and advice positively impact app-based purchase decisions (Chen et al., 2021). Additionally, the enjoyment derived from app usage further contributes to the cognitive experience, aligning with previous findings (Izogo & Jayawardhena, 2018; McLean et al., 2020). However, perceived app security and innovative features were not significant factors in shaping cognitive experience, prompting further investigation. The study emphasizes the greater influence of cognitive experience on purchase than the affective dimension. Transitioning to the post-purchase experience, this phase encompasses satisfaction derived from consumption-related attributes and emotions. The results highlight that favorable satisfaction with consumption attributes enhances the overall post-purchase experience, with higher satisfaction leading to improved experiences. These findings align with previous studies (Thakur, 2018; Zegarra & Ruiz-Mafé, 2020; Jain et al., 2022). Notably, satisfaction accounts for 61.62% of the post-purchase experience variance, with positive emotions

enhancing the post-purchase experience while negative emotions diminish it. Positive emotions exert a slightly more substantial influence than negative ones.

7.2. Holistic customer experience across the stages of the customer journey

The findings reveal that the pre-purchase experience negatively and significantly influences the subsequent purchase experience. This negative impact can be attributed to the specific dimensions through which pre-purchase experience was measured—the affective and cognitive dimensions. During the pre-purchase stage, if customers encounter negative emotional responses, such as feeling uncertain, confused, or hesitant while trying to register and log in to the shopping app, these emotions can carry over and affect their emotional and cognitive responses in the subsequent purchase stage. On the other hand, the purchase experience yields a robust and positive effect on the post-purchase experience. Positive emotional responses experienced by customers during the purchase stage enhance overall satisfaction, amplify positive emotions, and alleviate negative ones in the post-purchase phase. When shoppers encounter a positive cognitive experience while using the app, the design prioritizes user-friendliness, practicality, enjoyment, and efficiency. This allows them to navigate seamlessly, discover valuable deals, explore various products, and benefit from clear and appealing interfaces. The presence of a helpful Chatbot that caters to their needs adds to this positive experience. When all these aspects align, they culminate in an improved shopping journey. Thus, a positive cognitive experience enhances satisfaction in the post-purchase stage. These results align with previous studies in the field (Terblanche, 2018; Vakulenko et al., 2019). A positive post-purchase experience has the potential to significantly and positively influence customer loyalty towards the shopping app. Additionally, the link between customer loyalty and app usage frequency is strongly established, corroborating prior research (Alnawas & Hemsley-Brown, 2018; Saini & Singh, 2020). The findings underscore a robust and inverse relation between the pre-purchase experience and attitudes. This suggests that as negative emotional responses escalate during the registration and login process, customers' overall attitude towards the search, installation, registration, and login process diminishes. A similar trend is observed for cognitive experience, indicating that users' attitudes toward the entire process can decline as perceived risks increase during registration. However, the ease of registration can enhance the overall pre-purchase attitude, aligning with earlier findings (McLean et al., 2020). Furthermore, when the pre-purchase

experience does not influence pre-purchase attitudes, this can positively influence customers' purchase experience. When customers maintain a more positive attitude towards various stages of interacting with the shopping app—including searching, installing, and navigating through the registration and login processes—it improves the overall purchase experience. These findings align with similar outcomes in the field (Kasilingam, 2020). A positive purchase experience can positively influence customers' attitudes during this stage. Both cognitive and affective experiences encountered in the purchase stage positively affect purchase attitudes. This indicates that the practical (cognitive) and emotional (affective) aspects of the experience synergistically enhance users' perception and attitude toward their purchase interactions. The onboarding experience exerts a strong negative influence on the pre-purchase experience. If users find the onboarding process seamless, efficient, and comfortable, it can mitigate their negative emotional responses during this stage, in line with earlier research (Rose et al., 2012; Iqbal, 2020). Moreover, when customers perceive a shopping app as a convenient, time-saving tool that seamlessly integrates into their daily routine, it positively influences their overall purchase experience, aligning with previous findings (McLean et al., 2020; Aslam et al., 2021). The study suggests that the attitudes and behaviors of close friends, family members, and colleagues can impact users' attitudes during the pre-purchase stage of using a shopping app. When individuals perceive that those within their social circle find the app valuable and enjoyable, it positively influences their attitude toward various pre-purchase activities, such as searching, installing, registering, and logging in, confirming previous results (Nguyen & Borusiak, 2021; Saprikis et al., 2021). Innovative features were found to have no substantial role in forming the purchase experience but exert a significant impact as an external variable in the pre-purchase attitude. When users recognize that the app offers personalized elements such as avatars and individual statistics, acknowledges their accomplishments through badges, and introduces augmented reality (AR) functionalities for enriched visual displays, their overall attitude towards the initial phases of app engagement becomes more favorable, confirming previous findings (Rodrigues et al., 2021; Wut et al., 2021). In addition, when users perceive that the shopping app reliably handles payment processes and demonstrates robust security measures to protect their account information, their attitude towards using the app for purchases becomes more positive. Customers' perceptions of the trustworthiness and integrity of the app and the company's reputation can have diverse impacts on various stages of the customer journey. Notably, this perception can negatively influence the pre-purchase experience while positively affecting the

purchase experience, purchase attitude, and overall loyalty, aligning with previous findings (Tarhini et al., 2019; Kasilingam, 2020). Finally, the level of interdependency that customers feel with the shopping app plays a pivotal role in shaping their loyalty. This interdependency can manifest in various ways, such as using these apps as a habit or users feeling a sense of addiction towards them. This sense of habit strongly influences their willingness to recommend the application to others and their usage frequency, supporting previous findings (Tarhini et al., 2019). The mediation analysis reveals the mediating role of customer experience stages and attitudes, and statistically significant differences are observed among different groups based on the type of shopping app and gender concerning the proposed relationships.

8. Conclusions

This study presents original contributions to the theory of customer experience and its relevance to mobile commerce applications by empirically demonstrating the multidimensional and holistic approach of the customer experience, exploring the relationships between its various stages, and illustrating the mediating role of each stage. Additionally, the study focuses on the conceptualization of critical touchpoints in assessing cognitive experiential responses, identifies key drivers at each stage of the customer experience, demonstrates the direct impact of trust on all three stages of the customer experience, and delves into the role of situational and consumer-related moderators.

This section presents a comprehensive exploration of the managerial implications arising from the research findings. Based on prior research findings, the researcher developed a "heat-map" focus table to visually present the most impactful factors influencing the formation of customer experience in the pre-purchase, purchase, and post-purchase stages. Also, for each stage, thematic recommendations and implications are presented for businesses. As part of the managerial implications, a comprehensive customer journey map was created, covering critical stages like discovery, onboarding, pre-purchase, purchase, and post-purchase. It also sheds light on the phenomena of abandoned carts and re-adoption behavior.

While this study has yielded valuable insights into the intricate landscape of customer experiences within shopping applications, it is essential to acknowledge the inherent limitations of the present research. The study's findings are specific to the context, focusing on shopping apps and particular demographics. Caution is warranted when attempting to generalize to other app types and cultures. The study's cross-sectional design provides a snapshot, but a longitudinal approach could unveil evolving perceptions over time. The sample composition, primarily comprising Gen Z and Millennials, restricts the generalizability of findings to a broader audience. Furthermore, the use of snowball sampling raises concerns regarding representativeness. In future research, exploration of cultural variations, adoption of longitudinal designs, comparison between emerging and developed countries, and expanding variables could contribute to a more comprehensive understanding of user experiences. A closer examination of positive emotions in the pre-purchase stage could yield more profound insights.

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