

Online Customer Engagement: A Systematic Literature Review using PRISMA protocol.

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Abstract:

Customer engagement (CE) is a crucial marketing concept whose relevance has been further enhanced by the growth of social media and digital marketing. While the significance of CE is widely recognized, the research in this domain is notably fragmented, characterized by diverse definitions and conceptualizations found in the literature. This fragmentation raises concerns, as the absence of standardization may result in misunderstanding and contribute to increased divergence in future research. This paper presents a systematic review of customer engagement using PRISMA protocol by delivering its antecedents, outputs, and influencing factors. We focus on three main features: the relationship quality (i.e., trust, satisfaction, and commitment), the channel integration quality, and digital transparency. As a result, we provide hypotheses of a micro-level conceptual model for customer engagement. We also highlight the adoption of technological innovation (e.g., Artificial Intelligence, Machine Learning, GhatGPT) to foster online customer engagement.

Keywords: Customer engagement, relationship quality, channel integration quality, transparency.

1. Introduction

In recent marketing literature, customer engagement has received increasing and sustained academic interest. It is a branding paradigm that lies at the crossroads of relationship marketing and value co-creation framework. The evolution of this phenomenon is strongly influenced by the spread of social media and mobile technologies based on user-generated content and ubiquitous, continuous interactions between brands and consumers. The communication and marketing process between brands and consumers has changed drastically, moving from a company-centric approach to a customer-centric marketing approach.

Customer engagement is the means by which a company builds a relationship with its customer and tenant database to drive brand retention and loyalty. It can be accomplished through marketing campaigns by creating new content, publishing it on websites, and reaching out via social media as well as mobile and wearable devices. Nowadays, Covid-19 has taken the world by storm. It has enveloped our nation, crippled expansive swaths of the economy, and conveyed entire industries to a standstill. The rules of the game change, but the game is still being played. It is up to the brand to adapt to these rapid changes and respond intelligently and thoughtfully, showing that it is both confident and responsive to the market. With the tremendous growth of technology, brands are investing in artificial intelligence, omnichannel retailing, machine learning, and big data as tools to enhance customer engagement and customer experience.

Over the past few years, digital marketing has experienced a considerable transformation. Indeed, companies are now approaching marketing through the medium of social media. It represents a golden opportunity for personalized and conversational marketing. Now, brand awareness is becoming a greater focus. Companies have to adapt to the emergence of new media and new communication trends.

The upgrade of new media channels in the last few years has transformed how customers communicate and exchange information. Managing customer relationships via social media is increasingly becoming essential for the success of digital marketing strategies. Therefore, Online Customer Engagement (OCE) has received

considerable attention in the business community. Engaging customers on social media can significantly affect brand reputation, customer retention, and overall success. With the growing prevalence of social media, businesses have more chances than ever to connect with their customers and foster loyalty. The primary question is how companies can successfully engage their customers. In the following, we will present the methodology adopted to carry out a meta-analysis of the various papers dealing with customer engagement. We will present a systematic review of OCE using PRISMA by analyzing its antecedents and enablers.

This paper is organized as follows. Section II provides the theoretical background of customer engagement and also presents the CE definitions and their types. Section III presents our research model based on PRISMA protocol. Section VI presents the results of our systematic review by highlighting the key factors influencing online customer engagement. By the end, section V provides a synthesis of our work, insights, and a conclusion.

2. Background of CE

Customer engagement strategy is a partnership between consumers and organizations through diverse communication efforts embedded by the organization. Customer engagement is crucial for business survival in today's technology-connected society. Companies must engage customers with the brand to increase loyalty through offline and online strategies. The concept of customer engagement still needs to be sufficiently clear on a theoretical level. Despite the fact that practitioners often try to embrace it as one of the central layers of marketing strategies, the academic debate is still developing serious thoughts and empirical studies on this topic. The following is a summary review of CE and OCE literature.

2.1. Definition of Customer Engagement

The concept of OCE was not recognized until 2010, although it has been involved in academic literature since 2006. To this day, CE has been defined from many perspectives (e.g., behavioral, psychological, emotional, etc.), but there is no clear definition. This section presents the most comprehensive definitions of CE that were offered by well-known scholars.

Customer engagement has been studied primarily from a relationship marketing perspective [1] that is aligned with the principles of Social Exchange Theory (SET). This perspective considers that customers make proactive efforts towards their relationships with companies rather than simply receiving benefits [2]. Marketers engage consumers to facilitate relational exchanges to shape customer behavior. Customers expend personal resources (e.g., cognitive, emotional, and physical resources) depending on the benefits they receive from their interactions with companies [3]. Therefore, SET, which emphasizes the principles of fairness and reciprocity, is an excellent theoretical framework for exploring customer engagement. It has also been extensively adopted in prior research on customer engagement [4]-[5].

SET has been the basis for previous studies examining the relationships between organizations and consumers in offline contexts [6]. The theory holds that in a social relational setting when exchange takes place, individuals rely on a relative analysis of the benefits and costs that can be economic, social, or a mix of both. Customers get favors in the form of quality of service, prompt handling of requests, and customer-focused interactions, and other programs strive to engage customers at each possible point of contact and provide unique brand experiences [7].

In the literature to date, CE is defined as a composite of cognitive, behavioral, and emotional dimensions. Based on the studied papers, there are two main perspectives to define the concept of customer engagement: the behavioral and psychological perspectives. In the following, we present insightful definitions of CE based on systematic analysis (i.e., more cited, h-index, etc.).

- **Van Doorn et al. (2010)** [8] address the concept of customer engagement from a behavioral perspective. They define it as the behavioral reactions of customers beyond the purchase of a brand or company triggered by motivational factors. Customer Engagement Behavior (CEB) comprises various behaviors, such as recommendations, blogs, text reviews, word of mouth, sales and transaction metrics, etc. The authors propose a conceptual model of CEB, including antecedents and consequences, by considering three types of factors (i.e., customer-based, firm-based, and context-based). Companies can manage CEB by adopting more inclusive and comprehensive approaches,

recognizing their expansion and impact over time.

- **Bijmolt et al. (2010)** [9] state that the manifestations of customer engagement include word of mouth, customer cocreation, and complaint behavior. Their paper provides a brief outline of "traditional" models addressing customer transactions and further discusses how the critical behavioral manifestations of customer engagement (e, g., WOM, co-creation, and complaint behavior) can be incorporated into these models. The authors identify three phases: customer acquisition, development, and retention. They also address several organizational challenges related to customer engagement analysis that present roadblocks to the introduction of customer engagement analysis.
- **Jaakola et al. (2014)** [10] provide the initial attempt to conceptualize the role of CEB in value co-creation within a multi-stakeholder service system. They identify four types of CEB: augmenting, co-developing, influencing, and mobilizing behavior and investigate the value outputs that were experienced by the different stakeholders. This paper suggests that CEB influences value co-creation under the various resource contributions of customers toward the focal firm and other stakeholders that change and/or increase the offering and/or impact the perceptions, predilections, expectations, or actions of other stakeholders towards the firm or its offering. The authors study the case of a public transportation service system involving consumers, communities, businesses, and government organizations. They provide nine propositions related to the four types of CEB, which explain the links between CEB and value co-creation by core customers, the core business, and other stakeholders.
- **Kumar et al. (2016)** [11] define customer engagement as "dynamic interactions of a consumer with a company, with prospects and with other shoppers, whether they are transactional or non-transactional in nature." The authors show that CE would positively affect the firm's performance. These favorable performance results are due to improved transactional customer engagement behavior rather than non-transactional behavior.
- **Mollen and Wilson (2010)** [12] consider online brand engagement as a multi-dimensional concept including cognitive treatment, experiential value (i.e., emotional congruence), and instrumental value (i.e., purpose and relevance) dimensions. The authors also clearly differentiate the concept from that of "involvement." It is argued that CE goes beyond involvement as it includes a proactive and interactive customer relationship with a specific brand. As a result, the authors assert that CE goes beyond the simple exercise of cognition. Unlike involvement, CE requires the satisfaction of instrumental value as well as experiential value. This approach is coherent with the vision of CE within the transcending relationship theory in the service-dominant logic, which emphasizes interactivity and customer experience [13]. CE is the customer's cognitive and affective commitment to an active relationship with the brand as personified by the website or other computer-mediated entities designed to communicate brand value.
- **Brodie et al. (2011)** [14] define the CE from psychological perspective. CE is a cognitive process based on interactive and co-creative customer experiences with a brand in targeted service relationships. It emerges under a specific set of contextual conditions leading to different levels of CE. It is considered as a dynamic and iterative process in service relationships that yields value co-creation. CE plays a vital role in a nomological network controlling service relationships where other relational items (e.g., involvement, commitment, loyalty) are antecedents and/or consequences in the iterative processes of CE. It is a multi-dimensional concept that depends on a context-specific and/or stakeholder-specific expression of the relevant cognitive, emotional, and/or behavioral dimensions. Similarly, Brodie et al. (2013) [15] adopt an ethnographic method to examine the nature and breadth of customer engagement in a digital brand community environment. From their conceptual model, CE leads to connection and emotional bonding, customer empowerment, customer loyalty, satisfaction, trust, and commitment.
- **Sashi et al. (2012)** [16] consider customer engagement as satisfying customers by providing superior value over the competition in order to build long-term trust and commitment. The online customer is engaged with the company through word of mouth, such as product reviews on websites, blog communities, and social networks.

- **Rodrigo Guesalaga (2016)** [17] define customer engagement in social media as "the extent to which the organization's important customers are active in using social media tools." Harmeling et al. (2017) [18] found that the different measurements of customer engagement can be divided into four main perspectives: intrinsic motivations, psychological mind states, customer activities, and contributions to firms. The authors propose that Customer engagement marketing is a firm's deliberate effort to motivate, empower, and measure a customer's voluntary contribution to the firm's marketing functions beyond the core economic transaction.

2.2. Perspectives of CE

From the definitions provided in the previous subsection, we identified two perspectives of customer engagement (i.e., psychological and behavioral). These perspectives provide insight into how customers interact with a brand or business on both a mental and physical level.

2.2.1. Psychological Perspective of Customer Engagement

This perspective focuses on the emotional and cognitive aspects of CE. It delves into the customer's mindset, feelings, and perceptions when interacting with a brand [14]-[18]. The key components of the psychological perspective include:

- **Emotional Attachment:** Customers may develop emotional connections to a brand or product. Positive emotions such as trust, loyalty, love, and satisfaction can drive engagement. For example, a customer who feels emotionally attached to a brand is more likely to recommend it to others.
- **Cognitive Engagement:** This refers to the mental processes involved in customer engagement. It includes aspects like awareness, attention, interest, and understanding. Customers must first be aware of a brand before engaging with it on a deeper level.
- **Brand Perception:** How customers perceive a brand's values, reputation, and image influences their engagement. Brands that align with customers' values and beliefs tend to foster stronger psychological engagement.
- **Trust and Loyalty:** Trust is a critical psychological element in customer engagement. When clients trust a trademark, they are more likely to engage with it and remain loyal over time.

2.2.2. Behavioral Perspective of Customer Engagement

The behavioral perspective of CE focuses on observable actions and interactions between customers and the brand. It emphasizes the actions that customers take as a result of their engagement [8]-[11]. The key components of the behavioral perspective include:

- **Purchase Behavior:** Customer engagement often leads to actual purchases. Monitoring buying patterns and conversion rates can provide insights into the effectiveness of engagement strategies.
- **Repeat Business:** Engaged customers are more likely to return and make repeat purchases. High customer retention rates are indicative of successful behavioral engagement.
- **Social Interactions:** Engagement can manifest through customer interactions on social media, reviews, comments, and other online platforms. Positive social engagement can amplify a brand's reach and influence.
- **Feedback and Advocacy:** Engaged customers are more likely to provide feedback, participate in surveys, and act as advocates for the brand. Their word-of-mouth recommendations can significantly impact the business.
- **Referral Behavior:** Customers who are highly engaged may refer friends, family, or colleagues to the brand, contributing to customer acquisition.

Consequently, both the psychological and behavioral perspectives of customer engagement are interconnected. Customers having positive psychological experiences with a brand are more likely to exhibit desirable behavioral patterns, such as making purchases, staying loyal, and advocating for the brand. Effective customer engagement strategies often aim to create a harmonious balance between these two

perspectives to build long-term, mutually beneficial customer relationships. Figure 1 provides a global view of these two perspectives.

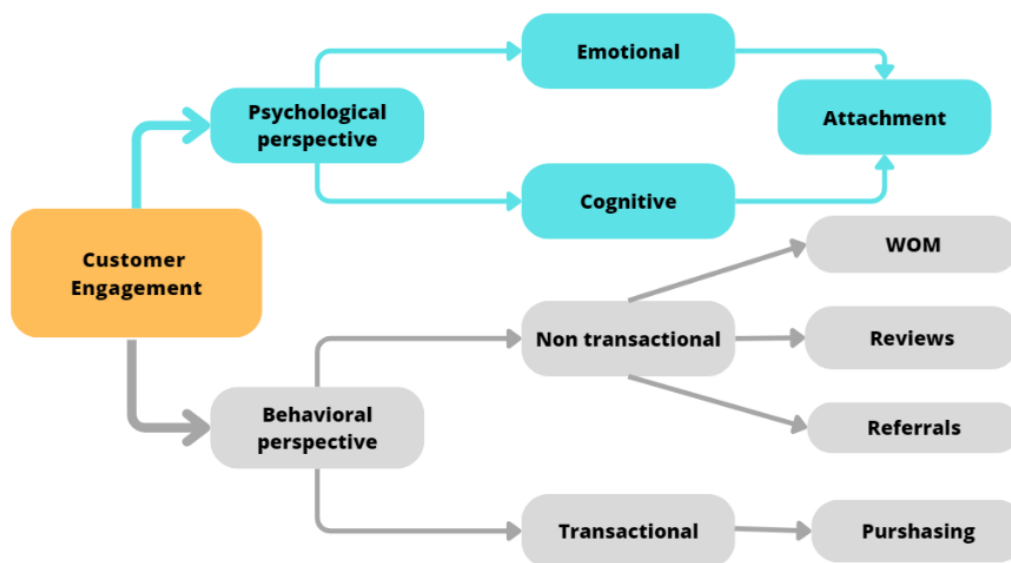


Figure 1: customer engagement perspectives.

3. Research Method

Our review follows the framework proposed by Kitchenham [19]-[20] related to systematic literature reviews and meta-analyses named PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). This method applies a highly structured approach to identify, select, critically evaluate, and synthesize relevant studies on online customer engagement. According to Mengist et al. [21], the PRISMA method involves selecting the literature in four stages: identification, selection, eligibility, and inclusion.

3.1 Research Questions

The primary goal of this review is to search for the online customer engagement concept or related concepts in recent works in the literature, reviewing (1) OCE definitions and its components, (2) conceptual models, and (3) factors influencing OCE. Following a systematic review of the literature, this paper will address the following research questions:

- RQ1: What are the antecedents and enablers of OCE?
- RQ2: What are the factors that influence OCE?
- RQ3: What is the relationship between all components?

3.2 Identification

In this literature review, we have only included studies from the last decade (from 2010 to 2024), which were published in various databases with the largest compilation of studies about management, relationship quality, digital transparency, and channel integration quality, among other topics, associated with OCE: Scopus, Web of Science, Science Direct, ACM Digital Library, Taylor & Francis, Emerald Insight. These databases are recognized as significant reliable sources of high-quality publications from computer science and engineering areas. In our study, we use the same filtering parameters in all databases. The searching terms were: (1) "Customer engagement" and "social media", (2) "online customer engagement", (3) "consumer engagement" and "social media", and (4) "Customer brand engagement". We checked the "title of the article" option in "advanced search" in order to produce finer-grained search results. The keywords were consistent in both American and British English, and thus, alternative spellings were not considered. Moreover, the decision to use only four combinations of keywords for the search (i.e., one combination for one search) is in line with the recommendation of a recent systematic review by Lim et al. [22]. This reflects the appropriateness, relevance, and logic of using few but meaningful keyword combinations. The retrieved papers were imported to Mendeley using the BibTex format. This permitted us to erase the duplicated

papers, adjust them, and export them to a spreadsheet. As an initial result, table I shows the number of works matching our search terms in each database.

Table 1: Search results in databases using our search terms.

<i>Database</i>	<i>Number of studies</i>	<i>% of studies</i>
Scopus	775	50%
Springer Link	140	10%
Web of science	56	3,6%
ACM Digital Library	10	0,6%
Taylor & Francis Online	113	7,3%
Emerald Insight	242	15,6%
SAGE Journals	169	11%
Jstor	25	1,6%
IEEE	12	0,7%
Total	1542	

3.3 Screening

We carry out a selection of the works related to the OCE concept. For this selection process, we define three inclusion criteria and six exclusion criteria:

- **IC1:** Articles published between 2010 and 2024.
- **IC2:** Research Article or Proceedings / Conference Article.
- **IC3:** Articles referring to research questions.
- **EX1:** The duplicated papers.
- **EX2:** Study is not written in English.
- **EX3:** The paper is not available.
- **EX4:** The paper is not indexed.
- **EX5:** Short papers less than five pages.
- **EX6:** Not conceptual and not empirical.

It is worth noticing that the exclusion criteria were designed to be incremental. For example, if the article was rejected by the exclusion criteria 1, the article is automatically excluded, and no further verification of additional exclusion criteria is done. To limit our scope, we considered only works published in indexed journals and conferences with high-impact factors and citations. Also, short papers (i.e., research articles with less than five pages) were removed from the selected literature. Table II provides the top twenty h-index papers in our systematic review.

3.4 Eligibility

In the eligibility stage, we assessed the full text of 436 articles for article type and source quality. In particular, we considered conceptual and empirical articles only as they typically serve as the foundation of knowledge. Editorials were excluded as they might not engage in knowledge-building as extensively and rigorously as conceptual and empirical articles.

Table 2: Top Twenty h-index papers

<i>Journal/Conference paper</i>	<i>h-index</i>	<i>Reference</i>	<i>Publisher</i>
Communications of the ACM	22,7	[23]	ACM
International Journal of Information Management	18,99	[24]	Elsevier
Journal of the Academy of Marketing Science	18,5	[25], [18], [26],[27], [28],[29]	Springer
Journal of Marketing	15,36	[30], [31],[32]	SAGE

			journals
Journal of service research	13,9	[13], [33], [9],[10], [14],[42], [43],[44]	SAGE journals
Journal of Management	13,9	[35]	SAGE journals
Tourism Management	12,87	[36]	Elsevier
Journal of Retailing and Consumer Service	12,4	[37], [38], [39],[40], [41],[42], [43],[44]	Elsevier
Journal of service research	12,4	[34], [45],[46]	SAGE journals
Journal of Retailing	11,19	[47], [48],[49]	Elsevier
Journal of Business Research	10,969	[50], [4], [15],[12], [51],[52]	Elsevier
International Journal of Hospitality Management	10,42	[53]	Elsevier
International Journal of Service Industry Management	9,45	[54]	Emerald publishing
Journal of Service Management	9,45	[55]	Emerald publishing
The service Industries Journal	9,4	[56]	Taylor & Francis
Industrial Marketing Management	8,89	[57], [58],[59]	Elsevier
Journal of Marketing Research	8,4	[60], [61]	Elsevier
Decision Support Systems	6,69	[62]	Elsevier
Journal of Advertising	6,528	[63], [64]	Taylor & Francis
Journal of Business Ethics	6,33	[65], [66]	Springer

3.5 Inclusion

In the inclusion stage, using content analysis, we reviewed 178 conceptual and empirical articles that were published in highly indexed journals. In particular, we extracted key information concerning the antecedents, decisions, and outputs, as well as the factors that influence the topic. In this regard, we adopted the integrated ADO (Antecedents, Decisions, and Outcomes) [67] framework for systematic review. The flow of this process is presented in Figure 2.

4. Data Analysis

Despite the growing interest in CE among academics and marketing professionals, no study to date has provided an exhaustive overview of OCE based on content. Instead, previous studies on CE are often limited to conceptual (e.g., construction) or contextual (e.g., hospitality and tourism) overviews obtained using conventional (e.g., descriptive) research methods, providing a limited understanding of the field as a whole. Some recent reviews [68] handle only the collection methodology of CE papers in the past, present, and future, but they don't highlight the antecedents, components, and drivers of CE. Our literature review will include both empirical and conceptual frameworks by providing all the theoretical foundations linked to OCE, and describing its antecedents and outcomes. Antecedents are the direct precursors of decisions and indirect precursors of outcomes; they directly explain why a decision is made or not made, and indirectly explain why an outcome avails or does not avail. In the present review, three categories of antecedents were uncovered, relationship quality (i.e., trust, commitment, and satisfaction), channel integration quality, and digital transparency, with a total of 11 items. These items will be analyzed in depth in the next section.

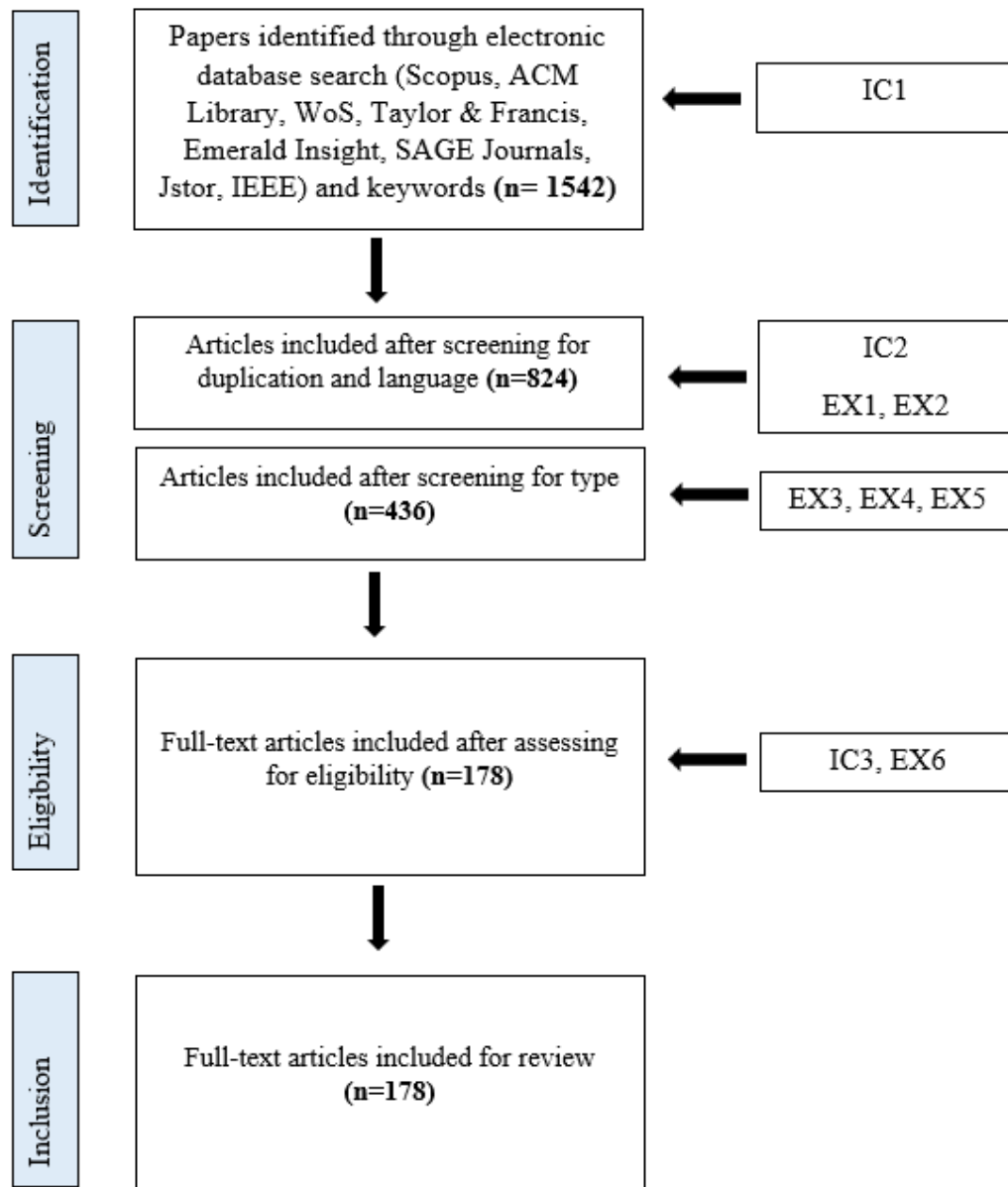


Figure 2. Flow diagram of the paper selection process based on the PRISMA protocol.

All the factors analyzed in the studies were examined, that is, the independent and dependent variables. Furthermore, all the studies investigated more than one factor, for example, trust and satisfaction were the most common ones presented in 67% of studied papers. Table III summarizes the factors identified by percentage in the selected articles. Our paper is the first to present a content review, including relationship quality, channel integration quality, and transparency. The other related papers ([26], [31], [69], [70]) present the CE components but without taking into account transparency and channel integration quality. Some recent systematic reviews related to OCE ([71], [22]) were limited to bibliometric analysis. Another recent systematic review presented by Saikia et al. [72] focuses on theories, context, characteristics, and methods. However, our review will handle content review to identify the factors that influence customer engagement in social media.

Many parameters may influence OCE, including trust, credibility, involvement, satisfaction, etc. From the literature review, some concepts are considered as antecedents or outcomes of CE (e.g., trust and satisfaction) depending on the customer's previous experience with the focal object. In the following, we will discuss the different concepts and their impact on online customer engagement based on the decision results of the PRISMA approach.

Table 3: Factors influencing OCE

<i>Factor</i>	<i>% of studies</i>
Trust	67%
Satisfaction	65%
Commitment	25%
Channel Service Configuration	16%
Integrated Interactions	13%
Digital Transparency	5%
Involvement	8%
Clarity	3%
Objectivity	6%
Openness	7%
Responsibility	4%

5. The factors influencing online customer engagement

5.1 Trust

Trust is the faith a customer has in a firm. It reflects confidence in a company's commitment to fulfill its promises and make the convenient feature for the customer. Trust implies a willingness to rely on exchange partners [76]. This definition covers the two general approaches of trust in the literature. First, numerous marketing studies view trust as a belief, assurance, or anticipation about the trustworthiness of an exchange partner that arises from that partner's expertise, dependability, or intentionality [77]. Second, trust has been considered a behavioral intention or behavior that reflects dependence on a partner and implies vulnerability and uncertainty on behalf of the trustor [78]. Similarly, Rousseau et al. [35] define trust as a psychological state that encompasses the willingness to admit vulnerability based on positive expectations of another's intentions or behavior. In the same context, Robinson et al. [79] define trust as a person's "expectations, assumptions or beliefs about the likelihood that another's future actions will be beneficial, favorable or at least not detrimental". Accordingly, trust allows customers to share personal information with the belief that this information will remain confidential, to purchase goods and services, and to take action based on the advice they receive [106].

5.1.1 Trust & OCE

Based on the literature, there is a kind of discrepancy in the current studies regarding the relationship between trust and CE. Some researchers have suggested that trust is an antecedent of customer engagement ([14], [10], [8]), [80]. In contrast, other researchers have proposed that trust is a consequence of customer engagement ([81], [7], [1]). Customers with high trust are expected to be more engaged, especially in social media, where online communities form a sense of group belonging, which then increases their trust in the community [7]. According to [82] and [26], trust could be a key enabler of customer engagement and loyalty, and CE is positively related to an individual's trust in the organization associated with their focus of engagement [1]. Customer engagement is based primarily on trust and commitment that then generate satisfaction and positive emotions [27]. Similarly, authors in [80] examine the mediating role of customer trust between customer experience of products and services and customer engagement. From the obtained results, the emotional, physical-sensorial, and social components had a significant positive effect on customer engagement through customer trust, but the cognitive experience did not have a substantial impact on customer engagement.

H1: Trust can positively affect customer engagement.

5.1.2 Trust & commitment

The theory of commitment and trust [32] has pioneered relationship marketing. Based on this theory, the primary goal of companies is to build positive relationships with customers by developing commitment and

trust. Commitment has been defined by Moorman et al. as "an enduring desire to maintain a valued relationship" [60]. Trust is expected to reduce perceived risk and thus increase the customer's commitment to the service provider. Customers are convinced that problems will be solved in time, which then decreases the transaction cost incurred [56]. Previous research recognizes trust in the brand as a prerequisite state for advancing affective commitment and a condition for building valuable relationships with customers [32]. Similarly, authors in [83] make an empirical study from 200 online retail bank customers; they find that trust mediates the influence of engagement and personalization on affective commitment. Customers with a higher degree of commitment and who have developed lasting relationships with a company are likely to perceive stronger associations between themselves and the company's offerings/brand.

H2: Trust has a positive impact on commitment.

5.1.3 Trust & transparency

In a digital environment, as the adopted technologies overcome customer understanding (i.e., low digital literacy), consumers rely on brand trust. They require more transparency from companies regarding their digital practices and content (i.e., personal data management, digital communication, and open interaction with customers) [63]. Transparency means honesty and integrity in all kinds of communications. Therefore, it is difficult to sustain customer trust and engagement without transparency ([84], [85]). Transparency is a multidimensional concept that includes clarity, disclosure, accuracy, objectivity, openness, and responsibility. The question that arises is how the dimensions of transparency relate to stakeholder trust in the company or organization. The development of effective, reciprocal communication between sellers and customers is useful for maintaining consumer confidence. The clarity with which companies disclose information reinforces trust [86]. Consumers boycott companies that fail to meet their standards of clarity and transparency. Companies that lack transparency and whose objectives and practices are unclear are perceived as unreliable.

In a digital environment, customer trust can be enhanced through web interaction that guarantees the security of personal data and user validity. In e-commerce environments, trust is a directional relationship between two parties who can be referred to as the trust giver and the trust receiver [87]. Web interactions should also provide detailed information about the transaction process, so that users do not get confused, such as warranty information, and the validity of the seller's address, indeed the company must guarantee the clarity of the information. E-commerce-related web interactions should also facilitate rapid response, ease of search, and feedback from other buyers to inspire confidence in potential customers (Syuhada & Gambett, 2013 [88]). *The perception of clarity positively influences the perception of trust.*

Eisend's 2006 study proved that companies, that present positive and negative reviews of a product or service and highlight their credibility, have a positive impact on brand attitudes, advertising, and purchase intentions [89]. In this way, the company's objectivity generates favorable attitudes and behaviors on the part of consumers, notably the perception of credibility. In the context of online business objectivity, favorable and unfavorable reviews are highlighted. Customers who intuitively share experiences with similar customers can easily establish correlations and trust. Trust is the acceptance of risk-taking, the willingness of one party to be vulnerable to another based on the assurance that the latter is competent, reliable, honest, and willing (Tschannen-Moran & Hoy, 2000 [90]). Thus, the perception of transparency on the part of the consumer comes to reduce the feeling of risk and vulnerability and to emphasize its credibility and objectivity for ease of choice on the part of the consumer. *The perception of objectivity positively influences the perception of trust.*

Mohammed Ibrahim and Pitter Ribbers [91] distinguish between trust that comes from openness, known as openness trust, and trust that comes from competence. Trust through openness is based on the perception that the partner is willing to share information and acts honestly in business transactions. Partners do not achieve such trust by offering abundant information about transactions and context, as it leads to information overload. Openness involves honest incentives to share accurate, complete, and timely information that considers the partner's needs and benefits. Woolthuis et al. [92], and Sharratt et al. [93] argue that effective

information exchange occurs when each party provides and absorbs information. Trust through openness is also expected to influence human knowledge. Consumers are expected to evaluate information received from partners and use it effectively [94]. The link between openness and trust is reciprocal, and Thomas W. Lauer's work [95] has shown that trust is, in turn, linked to customer openness, which can manifest itself in more frequent purchases, an openness to try new products, and a willingness to participate in programs using additional personal information [96]. Customers are more inclined to trust societies that are honest and transparent about their business methods, policies, and strategies [97].

The perception of openness has a positive influence on trust. Overall, we posit that *“The perception of transparency has a positive influence on trust”*.

5.1.4 Trust & Satisfaction

Customer satisfaction is how a customer is pleased with the supplied product/service. It is closely related to interpersonal trust [98]. The literature demonstrates a bidirectional relationship between satisfaction and trust. On the one hand, Geyskens et al. [61] consider satisfaction an antecedent to trust. Their model posits a sequential one-way causal flow from non-economic satisfaction to trust to commitment. The meta-analysis proves that trust is strongly correlated with non-economic satisfaction. Selnes et al. [99] discuss the complementary role of satisfaction and trust in sustaining and improving the relationship between a supplier and a buyer. They find that satisfaction breeds trust, manifesting the other party's ability to meet relational norms. On the other hand, many studies have identified that trust is a decisive factor in predicting loyalty, and if consumer trust is established, consumers will be satisfied [100]. According to Berry [28], trust is crucial for satisfaction. A consumer who trusts the brand will be satisfied and more willing to commit to the brand. Crosby et al. [75] found that trust positively and immediately affects satisfaction. However, our study considers trust as the predictor of satisfaction and argues that if the customers trust the product then eventually they will be satisfied. Therefore, the subsequent hypothesis is:

H3: Trust has a positive effect on satisfaction.

5.1.5 Trust & Channel integration quality

Few studies have investigated the impact of channel integration quality on customer perception of trust and satisfaction. For example, Hanna et al. [101] confirm by their empirical study that positive evaluation of perceived channel integration has a positive effect on customer trust toward the retailer. In their conceptual model, they consider customer trust within a multichannel system as a mediating variable between channel evaluation, perceived channel integration grade, and customer loyalty. Using the stimulus-organism-response (SOR) framework, Zhang et al. [102] propose that channel integration enhances consumer empowerment, resulting in increased trust, satisfaction, and better consumer purchase intention. Similarly, authors in [103] consider customer empowerment as a mediating variable between channel integration and customer trust. Furthermore, assurance quality is a new dimension of omnichannel integration quality suggested by Hossain et al. [40]. Assurance quality refers to the reliability of several channel attributes and customer trust, including the confidentiality and trustworthiness of customers' personal information across channels, as well as the availability of service retrieval [57]. More dimensions related to channel integration quality are provided in the following subsection.

The channel integration has the potential to get customer loyalty and trust through both online and offline channels.

5.2 Customer satisfaction

Customer satisfaction is determined by comparing a customer's expectations with their actual experience with a service interaction. It is a metric used to measure the level of happiness a customer feels with a product, service, or experience. Customer satisfaction is an indicator of a customer's overall feeling toward a specific brand. It is the perception of how well a product or service fulfills their expectations and needs based on their evaluation [104]. If a customer is satisfied with a product or service, he might make another purchase. Besides, when customers are actively involved with a company, they extend their involvement beyond mere transactions. This behavior can include referring others, discussing the brand on social media,

and offering valuable feedback to the company, all of which contribute to what is known as CE.

5.2.1 Customer satisfaction & OCE

Satisfaction depends on customer's expectations. Thus, when a customer's expectations are met, the customer becomes satisfied with the brand over time. Therefore, satisfaction depends on the link between the expected value and the perceived value; the reason why companies sometimes focus on user centered design to improve their brand image [105]. Emotional brand image is the customers' perception of the brand that is registered in their memory. This perception plays a vital role in shaping customer loyalty. Emotional experiences through a brand's products or services can establish a successful relationship between the customer and the brand, contributing to a stronger sense of engagement.

H4: Satisfaction has a positive effect on customer engagement.

5.3 Commitment

Commitment is the depth of attitude toward a brand, which is part of customer engagement in the form of increased expenditure of resources (time and money). Commitment refers to the loyalty and dedication of consumers toward a brand. It measures the willingness of customers to engage with a brand. High levels of commitment translate into increased customer lifetime and brand affinity.

5.3.1 Commitment & CE

Commitment and customer engagement are closely related concepts in the context of business and marketing. They play important roles in building and maintaining a strong relationship between a company and its customers. Commitment drives customer engagement: When customers are committed to a brand, they are more likely to actively engage with the company. Their commitment motivates them to seek out interactions, participate in loyalty programs, provide feedback, and contribute to the brand's community [106]. According to the literature on customer engagement, such as [12],[1], the customer engagement process creates an emotional relationship between the customer and the service provider, leading to an increased level of commitment between them.

H5: Commitment has a positive impact on customer engagement.

5.4 Channel integration quality

The channel integration quality refers to an omnichannel retailer's ability to provide customers with a seamless shopping experience across all channels [33]. Cao and Li [107] define the CIQ as the degree to which a company aligns the goals, structure, and deployment of its channels to generate synergies for the company and provide specific benefits to its customers. These advantages include growth in cross-channel sales and an increase in consumer experiences [49]. Channel integration quality refers to the effectiveness of combining multiple marketing channels in a way that leads to a seamless and consistent experience for customers. It involves the process of integrating various marketing media, such as social media, email, mobile marketing, offline advertising, and search engine marketing, to create a cohesive and consistent customer experience. The quality of channel integration can impact a business's ability to effectively reach its target audience, increase brand awareness, and drive sales. Effective channel integration requires careful planning, execution, and evaluation to ensure that each channel complements the others and helps to achieve the overall marketing objectives.

The dimensions of CIQ differ from one author to another. For example, Shi et al. [24] propose five dimensions of omnichannel experience (i.e., connectivity, integration, consistency, flexibility, and personalization). Besides, Lee et al. [58], and Sousa et al. [33] provide two groups of dimensions: channel service configuration and integrated interactions. The channel service configuration group contains two sub-dimensions: the breadth of channel service choice and transparency of channel service configuration. On the other hand, the integrated interaction group includes content consistency and process consistency. Therefore, in this paper, we will follow the same approach as Sousa and Voss, which has been widely adopted in the literature.

5.4.1 Channel service configuration & CE

The channel service configuration refers to the combination of the breadth of channel choice and the transparency of channel service configuration.

5.4.1.1 Channel choice breadth

The channel choice breadth is defined as the ability of a customer to choose and use different channels and information independently according to their requirements and satisfactions [62] [41]. More simply put, the broader the range of channels, the more flexibility consumers have to decide on their preferred channels for making purchases. For instance, multichannel retailers that can handle different types of orders (i.e., phone, Instagram, social media, online website, etc) have better channel service configurations compared to e-commerce companies that only accept phone or online orders. Therefore, the breadth of channel choice is an influential factor in fostering consumer participation [108]. Another example, customers who can purchase iPhones either online or in physical Apple Stores will appreciate the ability to choose their favorite channel for a given purchase task and are likely to be unhappy when forced to use only one channel [109]. Hence, the combination of alternative channels enhances the customer's overall cognitive experience of the brand by freely switching between the available channels and making comparisons of the Pros and Cons of purchasing products through various channels. Therefore, the customers have positive emotions about the brand, they feel free to choose the convenient channel, and they become more engaged [110]. Consequently, we posit that **the breadth of channel choice leads to positive emotions and customer engagement**. The majority of empirical research accurately mirrors these dimensions and their subcategories. Research indicates that the arrangement of channels, precisely the breadth of channel choice, enhances the perceived smoothness of the omnichannel experience [62], as well as customer commitment [58].

5.4.1.2 Transparency of channel service configuration:

The transparency of the channel-service configuration is defined as the level of customer awareness of available channels and services, as well as the channel-related differences in the characteristics and attributes of these services. Multiple channels can complement each other in providing services so that customers are willing to use various channels in their interactions with the same company [25]. The availability of multiple channels can also enhance the benefits of convenience and consistency. For example, customers can read reviews of the company's products on social platforms and then visit a physical shop to test them out and make an online order. This will increase the time customers spend in the company and enhance their attachment to the company. The two channels complement each other and create a well-rounded end-to-end customer experience during each purchase [33]. According to SET, if customers sense the flexibility to choose a particular shopping task from alternative distribution channels, they are more likely to make reciprocal trials and engage more with omnichannel retailers [13]. *Channel-service configuration positively affects CE.*

5.4.2 Channel Service Configuration & relationship quality

With omnichannel retailing, customers can choose the most convenient channel for purchasing. This breadth of channel choice increases the online shopping experience, which positively impacts customer trust and satisfaction [111]. In this regard, authors in [112] carried out a quantitative study proving that channel service configuration positively influences the relationship quality dimensions (i.e., trust, satisfaction, and commitment) of online customers. For the same purpose, authors in [113] collect data from 736 customers and examine, using PLS-SEM, how various types of retailers impact channel integration quality as well as customer trust, satisfaction, and custom intention. As a result, *the channel service configuration is positively impacted by trust, satisfaction, and commitment.*

5.4.3 Integrated interactions & CE

To ensure effective customer engagement, businesses must create a seamless experience across all channels through which customers interact with each other. This requires channel integration where businesses create a unified approach of marketing and customer engagement that covers every touch-point with the 14 customer [114]. Otherwise, integrated interactions are defined as the consistency of interactions across channels, resulting in a uniform service experience with two other sub-dimensions: content consistency and

process consistency. In the following, we provide more details for each sub-dimension (i.e., content consistency and process consistency).

5.4.3.1 Channel Content Consistency & CE

Content consistency refers to how a company presents its brand, messaging, and tone across all platforms and channels. It is the consistency of the content provided by retailers across channels [33]. For example, if a company uses a casual tone on social media but a formal tone on its website, it can confuse the audience and impact their trust and engagement with the brand. To maintain content consistency, a company must establish guidelines for tone, style, and messaging that can be used consistently across all platforms. Consistency across channels can mitigate customer concerns about product price or quality differences and save them time and money [39]. Content consistency allows customers to receive similar replies to an inquiry filed either online or on physical channels. Retailers who supply consistent material (e.g., contents of pricing, product specs, and warrant services) across channels can give a valuable exchange to customers. Apple, for example, provides the same product descriptions in both online and physical shops, and customers receive consistent replies to their queries across channels. Consistency is crucial for developing a smooth buying experience. Customers would quickly become irritated as they moved from channel to channel without consistent content across channels. In other words, since content consistency reduces friction and shortens the transaction process, customers will value it and become more engaged.

5.4.3.2 Process consistency & CE

Process consistency is defined as the degree of consistency in the level, image, feel, and speed of service perceived by customers across channels [58]. Process consistency refers to the system used to create, schedule, and distribute content. Establishing a consistent process ensures that the workflow for creating and publishing content is streamlined and systematic. It helps to guarantee that deadlines are met, content is delivered consistently and on time, and quality is maintained. It also builds an engaged audience that views the company as a reliable source of information and can translate into increased brand awareness and, ultimately, sales. When a process is transparent, all stakeholders have complete visibility and understanding of how the process works, how decisions are made, and what actions are required from them. It reduces the chance of misunderstandings or mistakes and increases the likelihood that the process will be executed consistently, leading to better outcomes. On the other hand, inconsistency can arise when processes are opaque or when stakeholders have different interpretations or expectations about how the process should be carried out. Therefore, process transparency is a key factor in achieving process consistency. A consistent experience across a company's channels makes it easier for customers to switch channels [115]. For example, a customer with a positive experience in a physical store may expect the same level of service and quality when they visit the brand's website or social media pages. One can conclude that interaction consistency leads to satisfaction and customer engagement [58]. For example, if consumers find a product they like when shopping offline, they may share the product links with their friends straight through the company's internet channels without worrying about providing inaccurate information. Customers also want to join the brand community of companies that give consistent service. As a result, customers' perceived value of consistency in an omnichannel scenario can aid in the assessment of the whole strength of customer-company connections, enabling customers' satisfaction with relationship strategies [53]. *Integrated Interaction consistency positively affects CE. Transparency has a positive effect on content and process consistency.*

5.4.4 Integrated Interaction & relationship quality

The omnichannel customer browses different channels before making its final decision. Therefore, brands must enhance their omnichannel retailing by ensuring content consistency (e.g., prices, product availability, information, promotions, etc.) and process consistency (e.g., performance, service, etc.) [116]. Providers should maintain rigorous consistency in process and content across all channels in order to build a strong relationship quality through enhancing trust, satisfaction, and commitment [117]. By contrast, customers, who experience inconsistent content and processes, feel dissatisfaction toward the brand, which reduces trust and engagement [118]. We posit that *integrated interactions are positively impacted by relationship quality.*

Overall, we conclude the following hypotheses:

H6: The channel integration quality can positively influence customer satisfaction.

H7: The channel integration quality can positively influence customer trust.

H8: The channel integration quality can positively influence customer commitment.

H9: Channel integration quality has a positive impact on customer engagement.

5.5 Transparency

Digital transparency is defined as the action by an organization to deliver available, easy-to-understand, and factual information in a timely manner through an interactive, accessible, and non-intrusive digital channel in order to meet stakeholder needs. In this exchange, the organization holds itself accountable for its actions and presents openness to its stakeholders. We conclude that digital transparency includes clarity, objectivity, openness/interactivity, and responsibility:

- The concept of clarity relates to how easily the information from a sender can be understood and perceived [119]. Clarity enables consumers to understand the company's actions and intentions so that they can decode and interpret perceived information [65]. According to a qualitative study by Portes et al., [120] [121], clarity is composed of three essential dimensions, namely: Intelligibility of information, visibility of information, and contextualization of information.
- Objectivity is the quality of someone, a spirit, or a group that makes judgments without involving personal preferences. According to Portes, there are three essential dimensions of the consumer's perception of online objectivity, namely: the perception of information objectivity (ease of comparison, not manipulating information), the perception of online reviews objectivity (displaying positive and negative reviews), and the perception of relationship objectivity (facilitating exchanges between customers).
- Organizational openness is the extent to which customers can monitor and influence processes by having access to information and decision-making instances. The notions of openness and transparency are often used interchangeably [122] [123] [124].
- Responsibility is the act of explaining, with honesty, one's choices and decisions even if it exposes a vulnerability [125]. In transparency, the organization is expected to be responsible and accountable to its stakeholders [66]. Both good and bad actions must be owned and communicated to stakeholders.

5.5.1 Transparency & relationship quality

Perceived transparency positively influences customer trust. Indeed, trust represents an antecedent and a consequence of transparency; without having trust in the brand, one cannot be transparent, and conversely, without transparency, it is difficult to safeguard customer trust and engagement with brands [51]. Transparency has a positive impact on overall customer trust. It builds, regains, and increases customer trust in the organization ([59], [85], [126]).

In the digital environment, consumers are worried about how companies collect their data and control everything from their news and music feeds to ads that recommend what they should buy and where. Most consumers prefer to preserve their privacy and refuse to share information with companies.

Authors in [127] investigate the impact of enhanced transparency on consumers' trust and behavior in three specific areas: (1) the criteria for and presentation features of search results; (2) the identity of contractual parties; and (3) quality controls on consumer reviews, ratings, and endorsement systems. They conducted experiments in four countries, and the results show that the high transparency in online platforms increases customer trust and, therefore, enhances product selection.

H10: The perception of digital transparency has a positive effect on customer trust.

Interactivity, openness, the communication of clear information on price, product and service quality, and the use of personal data are antecedents of customer satisfaction because consumers depend on this

information as an extrinsic signal of quality. In this context, authors in [129] revealed that information such as price and quality significantly influence customer satisfaction in service industries [128]. According to [130], when customers perceive fairness and objectivity in the information offered by a company, positive feelings will be gradually developed, and these feelings will, in turn, progress into behavioral intention. Authors in [131] reported that sharing clear, objective information and corporate openness had a positive impact on customer satisfaction and loyalty for Indian retail supermarkets. Similarly, authors in [180] demonstrated the effect of perceived transparency on customer satisfaction through case studies of companies in the telephony, banking, and supermarket markets. Indeed, companies that make efforts in the area of transparency have been recomposed by their customers in terms of satisfaction, loyalty, and commitment. On the other hand, a decrease in perceived transparency will be followed by a reduction in perceived value, which negatively influences the feeling of satisfaction.

H11: The perception of digital transparency has a positive effect on customer satisfaction.

Basically, commitment refers to the intention to maintain or continue a relationship with the other party due to various underlying reasons such as feelings and attachment, rational and economic calculations, obligation, alternatives, and habit [132] [133]. In terms of behavior, customer commitment manifests itself explicitly in continuing the relationship and associated investments in resources [134]. In our research context, customer commitment is a key relational outcome for assessing the long-term impact of a company's transparency practices. The outcomes of a study conducted by Chen et al., [135] showed that perceived transparency of a company's practices has a positive effect on customers' commitment to the 16 company, while perceived control exerts a negative effect on commitment. With increasing trust in the company, customers' relationship with the company is strengthened, and they tend to be more committed to the company and have the will to maintain a long-lasting and valuable relationship with customers. Based on this notion, we formulate the following hypothesis:

H12: The perception of digital transparency has a positive influence on customer commitment.

5.5.2 Transparency & CE

As already mentioned, transparency is related to clarity, objectivity, and openness. In the following, we will highlight the influence of each component on customer engagement. Clarity is essential in building customer engagement, as it involves communicating with customers clearly and concisely so that they understand what a company stands for, what products and services it delivers, and how it can satisfy their needs. When a company is transparent and clear in its messaging, customers feel more informed and invested in the brand, which drives higher levels of engagement [136]. Aguirre et al. [47] posit that increasing clarity with customers results in more engaged behavior. For example, a company that openly shares information about its production processes and clearly communicates the benefits of its products and services can attract customers who are environmentally conscious and value transparency in their business practices. These customers are more likely to engage with the company, share their positive experiences with others, and still loyal to the brand in the long term.

In the context of e-commerce, companies must be openminded by offering consumers the ability to communicate with them on multiple channels (social networks, website, email, phone, etc.), enabling immediate and instantaneous interactions (automatic callbacks, etc.) and permitting the participation and collaboration of its community to enhance its offer [73]. In this regard, the authors in [137] examine the impact of brands' social media interactivity on customer engagement behaviors. One can conclude that perceived openness positively influences customers' behavioral engagement. *Perceived openness directly influences customer engagement.*

Objectivity is the extent to which opinions, recommendations, and evaluations are free from bias, prejudice, or personal interests. In digital marketing, objectivity can play a significant role in shaping customer engagement [138]. A customer may invest considerable time evaluating whether the message is objective and trustworthy. Thus, when customers perceive a brand as objective and unbiased, they are more likely to trust its recommendations and engage with its content [139], [140]. This increased trust can lead to higher conversations, more engagement, and an improved customer experience. Hence, trustworthiness can be considered as the key enabler of customer engagement [141] fosters a higher level of social exchange,

which ultimately leads to a higher level of customer engagement. Therefore, brands need to strive for objectivity by providing transparent information, balanced insights, and avoiding manipulative tactics. Objectivity can build credibility, foster trust and increase customer engagement by drawing more "likes", "shares" and "comments". A higher level of perceived objectivity is positively associated with customer engagement.

We conclude that **H13**: Digital transparency has a positive influence on customer engagement.

5.6 Involvement

Involvement refers to the level of a customer's participation or interest in a specific brand or service. Based on the literature, Zaichkowsky defines involvement as "a person's perceived relevance of the object based on inherent needs, values, and interests" [74]. Involvement can be an affective, cognitive, or motivational construct but not behavioral. Involvement isn't just about participation; it's a window into someone's thoughts, feelings, mental state, and the value they attach to a situation [36].

5.6.1 Involvement & satisfaction

The relationship between satisfaction and involvement in customer behavior can be complex and multifaceted. It often depends on various factors, including the nature of the product or service, the customer's preferences and goals, and the specific context of the consumer experience [142]. It can serve as an antecedent, shaping expectations and initial attitudes; a motivational mediator, driving the pursuit of satisfaction; and a moderator, affecting the strength and nature of the relationship between satisfaction and various outcomes like customer engagement and loyalty [143].

Some authors confirm that involvement leads directly to satisfaction ([23], [50], [144]). Consumers demonstrating high brand involvement usually develop a more profound and meaningful connection with the brand, leading to heightened satisfaction. Highly involved consumers often have higher expectations for the brand. They invest time and effort in researching and understanding the brand's offerings, values, and promises. When the brand meets or exceeds these elevated expectations, it results in higher satisfaction. Brands can adapt their offerings and experiences to match the preferences and needs of highly involved customers. Therefore, personalization and customization can enhance satisfaction by delivering a more relevant and enjoyable experience.

Other authors consider the involvement as an output of satisfaction ([145],[146],[147],[148]). In the e-service context, Shu-Ching Chen [149] demonstrated that involvement plays a partial mediating role in the connection between satisfaction and loyalty. Satisfaction creates a positive foundation for customer involvement by fostering trust, emotional connections, and a desire to engage further with a brand or service. Satisfaction often results from meeting or exceeding customer expectations. It can establish an emotional connection with the brand, making customers more inclined to be involved with it. Involvement has various forms, such as increased usage, brand advocacy, loyalty, or participation in related activities or communities. High satisfaction levels often lead to greater customer or user involvement, as satisfied individuals are more motivated to interact further with what has positively met their expectations or needs. Therefore, involvement would moderate the relationship between emotions, satisfaction, and CE.

H14: The level of involvement moderates the relationship between satisfaction and CE.

6. Concluding comments

In the field of digital marketing and customer relationship management, the impact of an omnichannel customer's perception of digital transparency on the dimensions of customer relationship quality and customer engagement is a matter of substantial interest insofar as it handles important questions for societies wishing to offer a successful customer experience. Nowadays, competition between companies is extremely fierce, and the quality of online channel integration can significantly impact customer satisfaction and loyalty. Companies that deliver a consistent and seamless user experience across all online channels are more likely to engage and attract their customers.

In the digital age, companies increasingly adopt an omnichannel approach to interact with their customers. Understanding how different channels complement and integrate to deliver a consistent customer experience is essential to staying competitive in the marketplace. As a result, customers are increasingly informed and attentive to company practices and expect a fluid, transparent, and seamless experience when interacting with a company via different channels. Digital transparency has become a fundamental requirement for gaining customer trust and building solid relationships.

As for customers, digital transparency enables them to better understand the policies, practices, and technologies used by a company. It reduces uncertainty and concerns about how their data and information are managed. This study would explore how a company with a presence in several online channels can, through its channels, improve its customers' perception of digital transparency, positively influence customer relationship quality, and ultimately lead to customer engagement.

The results of this study could provide crucial information for marketing and CRM decision-makers. They could use this knowledge to develop strategies aimed at improving digital transparency and enhancing the quality of customer relationships to boost customer engagement and loyalty. Our literature review is the first one that presents the impact of CIQ and digital transparency in enhancing online customer engagement. As a perspective of this paper, following Churchill 1979's paradigm [150], our research model from the literature will be followed by two qualitative studies with marketing professionals and omnichannel customers, which serve to test the hypotheses, analyze the existence of a link between CIQ and the perception of transparency, and enrich and contextualize the construct items. After refining the model and verifying the hypotheses, a quantitative study will be carried out among omnichannel online customers.

7. Future directions

The emergence of technological innovations such as Artificial Intelligence (AI), Big Data, Augmented Reality (AR), Virtual Reality (VR), and the Internet of Things (IoT) are all catalysts for this transformation. The adoption of these 18 new technologies can significantly help companies to enhance customer engagement while considering channel integration quality, relationship quality, and digital transparency. The effective use of AI helps companies to better understand their customers and improve OCE by matching customers' needs on the right platform with the right channel at the right time [151].

In the digital era, AI has proven to be a strong ally, streamlining marketing efforts and enhancing the customer experience. AI has become the catalyst for tailored solutions, where every customer interaction mirrors their unique objectives and values. Real estate professionals have skillfully navigated the digital landscape, offering immersive experiences and sustainable solutions through AI-driven personalization and virtual product trials by VR and AR [152]. AI can increase customer engagement in multichannel retailing through various methods that streamline the shopping experience, provide personalized recommendations, and foster trust and transparency. Here's how AI can do it:

- **Seamless omnichannel experience:** AI-powered systems can integrate data from multiple channels, including websites, mobile applications, social media, and physical stores, to offer customers a seamless omnichannel experience [153]. As a result, consistency and continuity are achieved across all touchpoints, allowing customers to move smoothly from one channel to another while enjoying a coherent shopping experience. For example, an exploratory study [205] proves the crucial role of artificial intelligence in improving the omnichannel customer experience. The results demonstrate that some dimensions of the omnichannel customer experience are more closely related to omnichannel experiential elements, such as customization, coherence, and flexibility. Integration and connectivity, on the other hand, are seen as in-house retail capabilities that enable the implementation of an omnichannel strategy.
- **Personalized product recommendations:** AI algorithms recognize customer details, such as shopping history, browsing behavior, and preferences, to generate personalized product recommendations. These trends were outlined in [154], highlighting the positive impact of adopting artificial intelligence solutions to drive retail marketing strategies on different touchpoints, from supply chain optimization to the in-store shopping experience. The retailers improve customer engagement by providing relevant suggestions adapted to their needs.

- **Virtual Try-On and Visual Search:** AI-powered tools enable virtual try-on experiences and visual search capabilities, allowing customers to digitally try products or search for items using images. This enhances engagement by providing interactive and immersive shopping experiences that cater to modern consumer preferences.
- **Personalized Customer Service:** The chatbots and virtual assistants utilizing GPT-4 could deliver more intelligent and human-like interactions. These systems would help to meet customer needs, understand complex inquiries, predict customer requests, and offer more accurate, context-aware responses which increase customer satisfaction and engagement. This fosters loyalty by delivering prompt and helpful service across all channels. In this context, a recent study done by Kumar et al. [155] investigates the nuanced impacts of virtual assistant interfaces on consumer engagement in online retailing. Their study discloses the complex impacts of voicebots versus chatbots, various product categories and location levels on user engagement in online retail. It shows that voicebots enhance cognitive and affective engagement, particularly with experiential products, while chatbots perform better in cognitive tasks, but lag slightly behind in fostering emotional connections. Aligning virtual assistant strategies with product categories appears to be crucial.
- **Transparent pricing and product information:** AI algorithms can analyze pricing data and competitor information to ensure transparent and competitive pricing strategies. The consistent and transparent pricing information help retailers to build trust and engage customers [156].

Overall, AI plays a critical role in enhancing customer engagement for multichannel retail by providing personalized experiences, optimizing operations, and enhancing transparency and trust. In addition, augmented reality and virtual reality will also play an essential role in improving customer engagement by offering immersive, interactive experiences that engage and delight consumers.

8 Conclusion

This paper presents a systematic review of customer engagement based on PRISMA protocol. Several papers were analyzed including the past, present, and future directions of online customer engagement, presenting their antecedents and relationships with different constructs. We determine three main axes influencing customer engagement: relationship quality (i.e., trust, satisfaction, and commitment), channel integration quality, and digital transparency. As a limitation, the mediating role of digital transparency with regard to channel integration quality to enhance customer engagement has never been addressed, which will be the aim of our future work, where we will handle existing and new links qualitatively and quantitatively.

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