



# Learning from the Past Bridging Digital and Physical Markets: A Guidelines for Future Research Agenda of Online-to-Offline (O2O) Marketing Strategy

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Received: 09 February 2024

Accepted: 29 April 2024

DOI: <https://doi.org/10.32479/irmm.16145>

## ABSTRACT

This bibliometric study comprehensively analyses the scholarly landscape surrounding Online-to-Offline (O2O) commerce from 2006 to 2023. Through a systematic review of existing literature with a bibliometric analysis approach, this research identifies pivotal themes, methodologies, and findings that characterize the evolution and impact of O2O strategies across various sectors. The study begins by tracing the conceptual foundation of O2O commerce, emphasizing its role in integrating digital and physical consumer experiences in response to the changing dynamics of consumer behaviour and market demands. It highlights the strategic adoption of O2O models by e-commerce entities and brick-and-mortar stores, aiming to create a seamless shopping journey by leveraging the strengths of both online and offline platforms. The analysis focuses on the strategic implications for businesses, including the decision-making processes regarding market coverage, delivery costs, and inventory management to enhance profitability and sustainability. The research further delves into consumer behaviour, examining factors influencing the preference for online or offline purchasing, such as demographic characteristics, product types, price levels, and perceived service quality. The findings reveal a dynamic evolution of O2O strategies, underpinned by a growing emphasis on customer engagement, technological innovation, and the strategic management of online and offline synergies. The research underscores the transformative potential of O2O commerce in bridging the gap between digital and physical marketplaces, enhancing consumer experiences, and fostering sustainable business practices. In conclusion, this bibliometric study sheds light on the multifaceted dimensions of O2O commerce, offering valuable insights for academics, practitioners, and policymakers interested in the strategic integration of digital and physical retail environments. It calls for continued research and innovation to harness the full potential of O2O models in meeting the complex needs of consumers and businesses in the digital era.

**Keywords:** Online-to-Offline (O2O) Commerce, Consumer Behavior, E-commerce Strategies, Digital Marketing, Retail Innovation, Bibliometric Analysis, Market Integration

**JEL Classifications:** L81, M31, O33, Q55

## 1. INTRODUCTION

In the past decade, the global business landscape has undergone a transformative shift, markedly influenced by the burgeoning integration of digital technologies. This evolution has significantly altered almost every facet of life, notably how individuals shop and interact with brands. Consequently, marketing strategies have evolved to accommodate the rapidly changing market demands, with the Online to Offline (O2O) strategy emerging as an efficacious

approach in melding online and offline shopping experiences. This research explores the implementation of the O2O strategy in augmenting sales volume, providing insightful perspectives on how businesses can leverage digital technologies to enhance consumer engagement and, ultimately, realize an uptick in sales.

The O2O strategy is a marketing practice that integrates online (web-based) channels with offline (brick-and-mortar) venues to offer consumers a seamless shopping journey. It encompasses a

variety of activities, ranging from digital marketing and exclusive online offers to in-store pickup services and personalized in-store experiences. The O2O strategy, which integrates online and offline channels, has become increasingly important in the retail industry. Kao et al. (2020) and He et al. (2021) both highlight the trend of e-commerce companies opening physical stores, while (Herhausen et al., 2015) emphasize the competitive advantage and channel synergies of O2O integration. Lie et al. (2019) and (Sarkar et al., 2021) focus on the effectiveness and sustainability of the O2O strategy, with Lie et al. (2019) identifying factors that influence consumer trust and Sarkar et al. (2021) proposing a sustainable O2O retailing strategy. Ryu et al. (2020) and Abby and Shari (2015) provide practical tools and models for implementing the O2O strategy, with Ryu et al. (2020) developing a service blueprint and (Abby and Shari, 2015) categorizing different types of O2O business models.

By encouraging consumers to transition seamlessly between the online and offline worlds, businesses can enhance engagement, fortify brand loyalty, and, most importantly, boost sales volumes. This qualitative research is conducted through prior research from various businesses successfully implementing the O2O strategy across different industry sectors. The aim is to understand how this strategy is applied in practice, the challenges businesses face in its implementation, and its impact on sales volume. Through a literature review approach, this study seeks to capture the complex nuances of the O2O strategy and the unique contexts in which it is deployed, providing deep insights that cannot be achieved through quantitative methods alone. The context of this research is highly relevant in today's era, where digitalization and information technology continue to evolve briskly, influencing consumer behaviour and business operations. Modern consumers demand convenience and personalization in their shopping experiences, pushing businesses to seek innovative solutions to meet these needs. The O2O strategy offers a pathway for businesses to satisfy these expectations, combining the strengths of both online and offline worlds to create rich and satisfying shopping experiences.

This research will explore the impact of the O2O strategy on consumer behaviour. By understanding consumer experiences and perceptions towards online and offline interactions, this study will provide insights into how businesses can more effectively design and implement O2O strategies that boost sales volumes and strengthen relationships with consumers. This research will adopt a comprehensive methodological approach to achieve these objectives, utilizing qualitative data collection techniques such as literature review. The collected data will be analyzed using content and thematic analysis techniques, allowing the researcher to identify emerging themes, patterns, and insights. The outcomes of this analysis are expected to provide a deeper understanding of how the O2O strategy can be successfully implemented and its impact on sales volume enhancement. By focusing on implementing the O2O strategy, this research contributes to the existing literature by providing empirical evidence and practical insights on the effectiveness of this strategy in the current business context. It also offers valuable recommendations for business practitioners striving to harness digital technologies to enhance consumer shopping experiences and, in turn, increase sales volumes.

Through thoroughly exploring this topic, this research improves academic understanding of the O2O strategy and provides practical guidance for businesses navigating the continually evolving digital landscape.

## 2. LITERATURE REVIEW

O2O, an abbreviation for Online-to-Offline, refers to a business strategy that integrates online platforms with offline activities to create a synergistic and comprehensive customer experience. In this strategy, companies utilize digital channels to drive customers to take action in the real world, such as visiting physical stores and restaurants or participating in events. Conversely, offline experiences can be leveraged to enhance online interactions, such as through the collection of customer data or personalized marketing based on offline behaviour. For instance, a retail clothing company might develop a mobile app that allows customers to browse and order products online. However, this app also offers features to check product availability in nearby stores and allows customers to try on clothes in-store before purchasing. Through this approach, the company facilitates the shopping process for customers who prefer online shopping and encourages visits to physical stores, increasing the opportunities for additional sales and a more personalized shopping experience.

Consumer behaviour theory can show how and why the O2O strategy is effective. By understanding consumers' motivations, perceptions, and purchasing decisions, businesses can design O2O strategies that attract online customers to interact offline or vice versa. This includes understanding the customer journey and touchpoints that influence their purchasing decisions. Channel Integration Theory: This theory emphasizes providing a consistent and integrated customer experience across multiple channels. In the context of O2O, this means ensuring that the transition from online to offline (and vice versa) is seamless by providing consistent information, services, and experiences at all interaction points. In O2O strategies, companies often become part of a broader business ecosystem, which includes partners, suppliers, and distribution channels. Business ecosystem theory explains how companies can collaborate within this ecosystem to create added value for customers, integrating online and offline services to benefit all parties involved. Overall, O2O is a strategic approach that leverages the strengths of the digital and physical worlds to create a richer customer experience and improve business performance. By applying relevant theories, businesses can design and implement effective O2O strategies that meet the needs and expectations of modern consumers.

The O2O (Online to Offline) strategy has recently gained significant attention in the marketing industry. This review aims to explore the concept of O2O strategy from a marketing aspect to understand its significance and implications for businesses. The literature review will delve into studies, research papers, and industry reports to comprehensively understand the topic. O2O's strategy involves integrating online and offline marketing channels to provide a seamless and enhanced customer experience. It aims to bridge the gap between digital and physical interactions, allowing customers to engage with a brand online and offline. By leveraging

online platforms, businesses can attract customers and direct them to offline channels for further engagement, such as purchasing products in physical stores or experiencing services in person.

Several researchers have recognized the potential benefits of the O2O strategy. For instance, Kim et al. (2017) found that O2O marketing positively influences customer satisfaction, allowing customers to interact with the brand through multiple touchpoints. Additionally, Li et al. (2016) highlighted that O2O marketing can increase sales conversion rates by providing personalized and targeted offers to customers. To implement a successful O2O strategy, businesses must focus on various aspects. Xu and Zhang and Huang (2015) emphasized building a solid online presence. They suggested companies optimize their websites and mobile apps to ensure customers' user-friendly and informative online experience. Furthermore, the study highlighted that integrating social media platforms and online advertising can help businesses generate awareness about their offline offerings.

Moreover, convenience plays a vital role in O2O strategy. Luo, et al (2018) argued that providing convenient services, such as online reservations or fast delivery options, can significantly enhance the customer experience. This convenience factor acts as a motivator for customers to engage with the brand both online and offline. Customers value the ease and speed of accessing products or services, and businesses can leverage this to drive increased footfall to physical stores. Moreover, personalization has emerged as a critical element of successful O2O marketing. According to Ghosh et al. (2020), personalized marketing campaigns considering individual preferences and behaviour significantly impact customer engagement and loyalty. O2O strategy enables businesses to collect and analyze customer data from online interactions, allowing them to deliver personalized offers, recommendations, or promotions. Companies can foster stronger relationships and drive repeat purchases by tailoring marketing efforts to individual customers. In addition to these benefits, the O2O strategy presents business challenges. Huang et al. (2017) and Shen et al (2019) highlighted the importance of coordinating online and offline operations to ensure a seamless customer experience. Adequate inventory and order management systems that bridge the online and offline channels become critical.

Furthermore, security concerns such as data privacy and online payment fraud must be addressed to build customer trust and credibility. Another challenge is measuring the effectiveness of O2O marketing. Traditional metrics like sales revenue or foot traffic may need to reflect the true impact of O2O strategy accurately. Researchers like Xu and Zhang (2015) suggested exploring alternative metrics such as customer engagement, customer sentiment, or social media mentions to evaluate O2O campaigns' success accurately.

### 3. RESEARCH METHODS

This study adopts a qualitative descriptive approach, leveraging bibliometric analysis to dissect the literature landscape on "O2O Strategy." Bibliometric analysis offers a comprehensive overview of the publication trends, key themes, and network of citations

within the relevant manuscripts, providing invaluable insights into the evolution of O2O Strategy research over the period from 2006 to 2023.

#### 3.1. Research Approach

The qualitative descriptive research approach is pivotal for this study, enabling a structured yet flexible analysis of the bibliometric data. This approach supports the in-depth interpretation of complex data sets, facilitating a nuanced understanding of the O2O Strategy domain.

#### 3.2. Publication Source Population and Data Sampling

Initially, a vast population of 1,800 manuscripts published between 2006 and 2023 was identified. This population was refined to 56 manuscripts (See in Table 1) most pertinent to the O2O Strategy theme through a meticulous screening process based on predefined inclusion and exclusion criteria.

#### 3.3. Keyword Selection

"O2O Strategy" was selected as the primary keyword for its critical relevance to the research objectives. This keyword served as a linchpin for the AI-driven search, ensuring the identification of manuscripts that significantly contributed to the body of knowledge in this area.

#### 3.4. Data Collection

Utilizing the ELICIT Software, an AI-driven search was conducted to navigate the extensive corpus of literature efficiently. This advanced tool streamlined the process of identifying and compiling the manuscripts relevant to the O2O Strategy theme.

#### 3.5. Bibliometric Analysis Method

Bibliometric analysis stands at the core of this research methodology, employing quantitative tools to map the intellectual structure of O2O Strategy research. This method facilitates the examination of publication patterns, authorship networks, and thematic clusters within the 53 manuscripts. The data gleaned from the bibliometric analysis will be qualitatively interpreted to uncover trends, gaps, and emerging themes in O2O Strategy research. This phase involves a detailed examination of the bibliometric indicators, such as co-citation and keyword co-occurrence networks.

## 4. RESULTS AND DISCUSSION

The scholarly works state that each offers unique insights into the implementation, challenges, and benefits of O2O strategies across various industries. This narrative aims to synthesize these studies' key findings and methodologies to offer a comprehensive overview of the current state of O2O marketing research.

The inception of the O2O marketing strategy is rooted in the recognition of the evolving consumer journey that no longer distinguishes sharply between online and offline experiences. The study by Kao et al. in 2020 sets the stage by defining the O2O strategy as integration of online channels with offline venues, emphasizing the trend of e-commerce companies establishing brick-and-mortar stores to complement their digital presence. This

foundational work highlights the importance of creating a unified shopping experience that leverages the strengths of both digital and physical realms.

Building on this premise, He (2021), will delve into strategic implications for local brick-and-mortar stores contemplating the adoption of O2O platforms. Their research suggests that implementing O2O strategies should be contingent on market coverage and delivery cost considerations, introducing a novel cooperation mechanism that could enhance the profitability of both the platforms and the local stores involved.

Herhausen's et al. 2015 study further elaborates on the synergistic potential of integrating online and offline channels, countering the notion of channel cannibalization with evidence of competitive advantage and enhanced channel synergies. This work underscores the critical role of perceived service quality and consumer trust in the efficacy of O2O integrations.

Lie's et al. 2019 research focuses on the consumer perspective, identifying demographic characteristics, product types, and price levels as critical factors influencing the choice between online and offline purchasing. The study employs a quantitative analysis to explore how O2O features and services can sway consumer preferences, emphasizing the flexibility and accessibility of online media.

The sustainability of O2O retailing strategies is scrutinized in Sarkar's et al. 2021 publication, which proposes a model to optimize supply chain profitability under varying demand and lead times. This research highlights the strategic value of managing inventory and pricing across channels to achieve sustainability in O2O retail.

Ryu et al. 2020 introduced a service blueprint for O2O integration, offering a methodological tool for visualizing and analyzing service delivery processes that span both online and offline touchpoints. This innovation aims to address limitations in existing service blueprints by capturing the unique characteristics of O2O services.

The works by Abby and Shari in 2015 and Zhu et al. in 2016 and subsequent studies contribute to a broader understanding of O2O business models, elucidating the diverse ways companies across industries can leverage O2O strategies to enhance consumer engagement and profitability. Han et al. 2021 research on supply chain coordination and Widjaja's and Giovanni 2018 study on the impact of service quality and brand image on customer satisfaction further enrich the discourse by providing empirical evidence on the effectiveness of O2O strategies.

The inception of O2O marketing strategies, as delineated by Xu et al. (2015), underscores a marketing paradigm that seamlessly integrates digital platforms with physical consumer experiences. This integration caters to the expansive capacity of the Chinese market and accentuates the essential business logic behind merging online and offline consumer journeys. The diversity in O2O implementation modes-from direct online to offline transitions to more intricate offline to online to offline loops-reveals the

strategy's versatility in enhancing consumer engagement across multiple touchpoints.

Yang's (2021) study shifts the lens towards the evolution from O2O to Online-Merge-Offline (OMO), highlighting the transformative potential of offline experience stores in redefining retail competitiveness. However, this transition is nuanced, with success heavily reliant on a profound understanding of consumer demands, thus indicating the critical role of direct customer interaction and experiential marketing in driving sales growth within this new retail model.

The empirical examinations by Ram et al. from 2019 to 2021, delve into the adoption versus non-adoption dynamics of O2O business models. These studies illuminate the macro-environmental dynamics, customer engagement shifts, and internal organizational drivers as pivotal factors in embracing O2O strategies. The nuanced understanding of these factors and the qualitative insights derived from semi-structured interviews provide a granular view of the operational and strategic considerations influencing O2O adoption.

Pan et al. (2019) work introduces a sophisticated analytical lens by proposing a rating-based O2O service recommendation model. This model, which outperforms traditional rating-based methods, underscores the importance of user activity in enhancing the accuracy of service recommendations, thereby showcasing the intersection of data analytics and O2O strategy optimization.

The exploration of O2O strategies extends into supply chain management, as evidenced by Choi et al.'s studies in 2022, which advocate for intelligent servicing strategies under the O2O umbrella. These studies argue for the superiority of centralized over decentralized supply chain models in the O2O context, highlighting the efficiency gains achievable through strategic integration and coordination across online and offline channels.

Lee's and Li (2016) research introduces a psychological dimension to O2O adoption, focusing on consumer inertia and its dual role in facilitating O2O shopping acceptance. Applying structural equation modelling to dissect the interplay between behavioural inertia, perceived ease of use, and the relative advantage of O2O shopping unveils the complex psychological underpinnings driving consumer engagement with O2O platforms.

The definitional clarity by Lee et al. (2022) provides a methodological scaffold for understanding O2O as an emerging business model. By distinguishing O2O from adjacent business models and highlighting its unique evaluative dimensions, this work offers a foundational perspective for academics and practitioners alike to gauge and navigate the adoption of O2O strategies.

The studies presented offer a comprehensive examination of the Online-to-Offline (O2O) e-commerce model, revealing diverse perspectives and methodologies in exploring its dynamics, implications, and potential for innovation in various sectors. These works collectively underline the transformative power of

O2O strategies in bridging digital and physical marketplaces, enhancing consumer experiences, and fostering sustainable business practices.

Hu et al. (2014) exploration into O2O e-commerce emphasized the model's ability to create a seamless shopping journey by integrating online channels with offline venues. This study illuminated the consumer value and electricity suppliers as pivotal driving forces behind the O2O commerce model's development, highlighting its suitability for service-oriented and experiential products. Hu anticipates the evolution of the O2O model into a complex, multi-level, and multidimensional ecological system, suggesting a broad scope for future innovation and integration across different sectors.

Further advancing the discourse, Pan et al. (2017) delved into the technical intricacies of enhancing O2O service recommendations through a novel method based on multidimensional similarity measurements. Their findings underscore the superiority of a holistic approach that amalgamates collaborative similarity, preference similarity, and trajectory similarity over single-dimensional measures, particularly in addressing challenges posed by sparse matrices. This study contributes to the theoretical understanding of O2O service recommendation systems and offers practical insights for improving their accuracy and effectiveness.

Niu et al. (2019) explored the impact of O2O commerce on traffic congestion and sustainability, focusing on the "Online-to-Store" channel and uniform pricing strategy. Their research highlights how uniform pricing can simultaneously support channel coordination, reduce traffic congestion, and enhance supply chain sustainability. This multifaceted benefit underscores the potential of O2O strategies to contribute to broader societal goals beyond commercial success.

Kim et al. (2016) investigated the role of social media in O2O marketing strategies, introducing the unique method as a highly effective approach for increasing online exposure. Their findings reveal that the uLike method significantly outperforms traditional social media marketing techniques, offering a more engaging, innovative, and user-friendly option for businesses seeking to leverage O2O strategies for brand promotion and consumer engagement.

Mao et al. (2015) utilization of WeChat platform technology for mobile e-commerce presented the immense opportunities the O2O model offers when supported by appropriate technological infrastructure. This research elucidates the strategic and operational mechanisms that can facilitate the long-term success of O2O commerce, particularly in the context of mobile platforms.

Du (2014) analysis of China's O2O e-commerce platforms from the perspective of offline service quality addresses the critical challenge of ensuring high-quality consumer experiences in the offline components of O2O transactions. This study underscores the importance of offline service quality in the overall success of O2O e-commerce, offering strategies for improvement that are vital for businesses operating in this model. Tsai et al. (2015)

investigated the effectiveness of an O2O commerce service framework applied to proximity commerce. Their research demonstrates the significant impact of strategic factors, such as the proximity between kiosks and stores, on consumer engagement and transaction behaviours, offering valuable insights for optimizing O2O commerce strategies.

The recent scholarly contributions to the understanding of online-to-offline (O2O) commerce provide a multifaceted view of its dynamics, especially in the context of the rapidly evolving market in China. Through various studies, we observe a shift in the industry's focus from merely expanding in quantity to ensuring high quality, reflecting changes in consumer demographics, preferences, and behaviours towards higher-priced delivery orders and a demand for greater product diversity and quality. This transition underscores the O2O food delivery industry's rapid growth in China, as Zhao et al. (2021) highlighted in their 2021 study published in the *European Journal of Clinical Nutrition*.

Further examination into the O2O e-commerce platforms, as presented by Wan & Chen (2019), reveals the positive correlation between the number of platforms a cinema is linked to and its operational Efficiency. This finding suggests that broader platform engagement can enhance a supplier's performance, although vertical integration might only sometimes be beneficial for this relationship. The study leverages digital platform utilities and resource dependence theory to underscore the strategic importance of platform choice in enhancing Efficiency within China's O2O e-commerce landscape.

The role of physical experience and integrating online and offline information are critical factors influencing consumer engagement with O2O commerce. Yang et al. (2020) study, integrate perceived value theory and the technology acceptance model to elucidate how these features impact consumer use intention. Their findings highlight the significant role of perceived benefits, usefulness, and value in driving consumer adoption of O2O commerce, reflecting the importance of seamless integration between physical and digital experiences.

A thematic review by Yao et al. (2022) offers a comprehensive analysis of consumer behaviour within O2O commerce, identifying key influencers such as service and product quality, technical and practical aspects, emotional and hedonic factors, trust and risk considerations, price and cost, social factors, online content, and habit. This study employs a non-systematic review approach, utilizing specific keywords to extract and synthesize data relevant to understanding the complex web of factors that shape consumer behaviours in O2O settings.

Regarding supplier selection and order allocation within O2O markets, Hu et al. (2017) proposed a model that considers suppliers' income and aims to balance it with the supply chain cost. By employing a genetic algorithm combined with heuristic rules, the study demonstrates how to simultaneously achieve operational Efficiency and supplier satisfaction, indicating a sophisticated approach to managing the supply side of O2O commerce.

The empirical investigation into leveraging O2O commerce for product promotion by Wei-Phang (2014) underscores the effectiveness of IT-enabled promotional strategies in attracting consumer attention and stimulating action across both online and offline realms. This study, grounded in a cultural perspective and collaboration with a leading O2O social media platform, offers insights into the nuanced responses of consumers to different promotional tactics, highlighting the potential for tailored strategies to enhance engagement and conversion.

Lastly, the exploration of evolutionary location and pricing strategies by He et al. (2016) through an agent-based competitive O2O model provides a theoretical framework for understanding how service merchants can navigate competitive markets. By analyzing the impact of social learning and online herd behaviour on service diversity and demand variations, this research contributes to a deeper understanding of the strategic decisions facing service merchants in the O2O ecosystem. Collectively, these studies paint a comprehensive picture of the O2O commerce landscape, revealing the complexities of consumer behaviour, market strategies, and the technological underpinnings that facilitate the seamless integration of online and offline commerce. The evolving nature of this field underscores the importance of continued research and innovation to harness the full potential of O2O commerce in meeting the dynamic needs of consumers and businesses alike.

The studies reviewed showcase the dynamic evolution and multifaceted dimensions of the Online-to-Offline (O2O) commerce paradigm, a trend reflecting the seamless integration of digital and physical marketplaces. These investigations reveal the strategic, operational, and consumer behavioural facets underpinning the O2O model, shedding light on the mechanisms and impacts of this integration across various sectors. In retail and e-commerce, studies underscore the pivotal role of the O2O model in bridging the gap between online and offline channels, thereby enhancing consumer engagement, operational Efficiency, and strategic marketing outcomes. The exploration of O2O modes in retail by Pan et al., although lacking a detailed methodological framework, highlights the anticipation and optimism among retail industry practitioners towards the value and impact that the O2O model could usher against the backdrop of e-commerce disruption.

Pei & Wooldridge (2021) work on manufacturer rebates and channel coordination illuminates the strategic benefits of integrating online and offline pricing mechanisms, revealing a sophisticated approach to mitigating channel competition and optimizing supply chain profits. This study, alongside Li's et al. investigation into the benefits of online reviews for offline retailers, exemplifies the nuanced strategies firms can employ to leverage digital insights for enhancing in-store sales and consumer satisfaction.

Further, Lin et al. (2021) study on establishing interaction specifications for O2O service systems through a formal language addresses a critical gap in human-computer interaction (HCI) research related to O2O commerce, providing a foundation for

improving service design and delivery in proximity commerce settings.

Li et al. (2019) analysis of the O2O e-commerce model, particularly in China's rapidly evolving mobile internet landscape, underscores the critical importance of logistics and user engagement in the success of O2O operations. This is echoed in Ji et al. (2013), which exemplifies how big data technology can transform traditional manufacturing businesses into agile, internet-based enterprises thriving on the O2O model.

Examining consumer continuance intention to use O2O apps by Hsu (2020) provides valuable insights into the factors driving user satisfaction and loyalty in the app-based O2O ecosystem, highlighting the distinctions between task-oriented and entertainment-oriented app usage.

In dissecting the strategic implications of online and offline retail pricing, Grewal et al. (2010) emphasizes the criticality of strategic price management across channels for retail success in a digitalized marketplace. This strategic lens is further refined in the study of offline merchants' acceptance of mobile O2O commerce by Pu-Con (2014), which delineates the significant determinants influencing adoption and highlights the nuanced role of perceived ease of use and risks.

The exploration of omnichannel retailing strategies in the Indian market by Hole et al (2019) offers a glimpse into the integration challenges and opportunities within emerging markets, stressing the importance of innovative marketing, inventory management, and customer experience strategies to achieve seamless omnichannel integration. Lastly, the studies on the discontinuance intention in O2O commerce and the coordination of return policies within the e-tailing context by Chi (2016) and Yan & Pei (2019), respectively, delve into the consumer psychology and supply chain strategies pivotal for sustaining and optimizing O2O commerce operations. Collectively, these studies illustrate the comprehensive and intricate tapestry of O2O commerce, highlighting its transformative potential across industries and pointing to its strategic, operational, and consumer-centric challenges and opportunities. The insights derived underscore the necessity for continuous innovation, strategic agility, and consumer engagement to harness the full potential of the O2O model in the digital era.

The collection of studies presents a comprehensive examination of the Online-to-Offline (O2O) e-commerce platform from various perspectives, focusing on its adoption, impact, and continuous evolution in the retail industry. The research body encompasses consumer behaviour analyses, the strategic integration of online and offline retailing elements, and the value co-creation in community-based O2O e-commerce platforms.

From the consumer perspective, studies highlight the importance of social factors, such as subjective norms and structural assurance, in influencing consumers' continuous use intention of O2O platforms. This indicates that social validation and trust play critical roles in sustaining customer engagement and satisfaction beyond the functional aspects of convenience and safety. Furthermore, the

research underscores the significance of customer-enterprise co-creation behaviour in enhancing customer perceived value and boosting consumers' willingness to continue using O2O services. This points to a shifting paradigm where consumers are not mere recipients of value but active participants in the value-creation process, emphasizing the co-creative nature of contemporary e-commerce platforms.

From a strategic and operational standpoint, the research delves into offline retailers' challenges and opportunities in integrating online reviews into their business models. The findings suggest that offline retailers can benefit from online consumer reviews under certain conditions, highlighting the nuanced dynamics between online and offline retail channels. This integration strategy mitigates market competition and benefits all stakeholders, including online retailers and manufacturers, by enhancing informativeness and reducing market friction.

Exploring O2O commerce from a logistical and fulfilment perspective reveals the logistical challenges and development options for retailers transitioning from multichannel to omnichannel strategies. This transition is crucial for achieving integrated fulfilment and providing seamless customer experiences across all retail channels. The studies advocate for advanced omnichannel fulfilment approaches, emphasizing the need for retailers to adapt their logistical operations to meet the evolving demands of the digital marketplace.

Moreover, the research addresses the critical role of information management and business model innovation in the success of O2O ventures. The analysis of O2O games, such as Pokémon Go, illustrates the transformative impact of augmented reality technology on the gaming industry and beyond, offering insights into potential business models that leverage this technology for economic growth. Additionally, examining the retail industry's core competitiveness in the context of O2O highlights the strategic imperatives for retail enterprises to harness O2O for further development.

The research articles present insightful analyses of various aspects of online-to-offline (O2O) commerce and the broader digital marketplace, emphasizing the strategic application of digital marketing techniques, consumer behaviour in digital and physical retail environments, and the integration of environmental considerations into e-commerce operations.

Husain et al (2020) delve into the pivotal role of Search Engine Optimization (SEO) in enhancing the visibility and traffic of online shops. They advocate for strategically applying SEO techniques, proposing a phased approach encompassing research, on-site SEO, link building, and continuous analysis to improve online store rankings and visitor traffic. This study underscores the importance of digital marketing strategies in the competitive online retail landscape.

Kuruzovich et al (2008) explore the impact of online information systems (OISs) on consumer decision-making in the auto retailing sector. They distinguish between the "marketplace" of online information and the physical "marketplace," analyzing how

varying price and product information levels influence consumer behaviour. This research highlights the strategic role of information provisioning in bridging online and offline shopping experiences.

Yao et al. (2022) examine the factors influencing consumers' continued use of O2O services within omnichannel retailing, distinguishing between "to-shop" and "to-home" models. The study identifies several key determinants, including performance expectancy and hedonic motivation, and notes differences in consumer responses between the two O2O service types. This work contributes to understanding how various elements impact consumer loyalty in an omnichannel context.

Chiang et al. (2014) investigate the effects of O2O marketing on consumer search and purchase behaviours, identifying factors that drive consumers to choose between online and offline channels. Their research emphasizes the role of sales service quality and shopping risk in channel selection, offering insights into consumer preferences in a multichannel retail environment.

Wu et al. (2021) propose a low-carbon decision-making model for online shopping supply chains under the O2O model. They argue that alignment between online and offline operations and the consideration of carbon information release costs can enhance the environmental sustainability of online retail operations. This study addresses the increasing concern for low-carbon practices in e-commerce logistics.

Xiao et al. (2019) focus on the relational dynamics of O2O commerce, examining how trust and commitment across different channels and actors influence consumer intentions to repurchase and share. Their research elucidates the complex trust relationships within O2O ecosystems, offering a nuanced understanding of consumer engagement in digital and physical retail settings. Collectively, these studies provide a multifaceted view of the evolving digital commerce landscape, highlighting the critical roles of digital marketing strategies, consumer behaviour analysis, environmental sustainability considerations, and trust dynamics in shaping the future of retail in both online and offline domains.

#### **4.1. The Conceptual Framework of O2O Strategies and Theoretical Approach**

The comprehensive review of scholarly works on Online-to-Offline (O2O) e-commerce models presents a rich tapestry of insights across various domains, including consumer behaviour, strategic integration, logistical challenges, and the impact of digital technologies. The prior study gives a summary of the key thematic areas and associated studies, grouped by their primary focus:

#### **4.2. Consumer Behavior and Engagement**

- a. Influence of Social Factors on Consumer Engagement: Studies highlight the role of social validation and trust in sustaining O2O platform use, emphasizing the importance of subjective norms and structural assurance.
- b. Customer-Enterprise Co-Creation: Research underscores the shift towards co-creative consumer engagement in

**Table 1: Publication paper selected**

Authors	Journal name	Citation count	Year
Kao et al.	Turning Silicon into Gold	0	2020
He et al.	Omega	13	2021
Herhausen et al.	Journal of Retailing	406	2015
Lie et al.	Journal the Winners: Economics, Business, Management, and Information System Journal	6	2019
Sarkar et al.	Sustainability	24	2021
Ryu et al.	Journal of Retailing and Consumer Services	7	2020
Zhu et al.	Business Trends in the Digital Era	5	2016
Chen et al.	Electronic Commerce Research	5	2021
Widjaja and Giovanni	International Journal of Advanced Engineering, Management and Science	3	2018
Yang	BCP Business and Management	1	2021
Ram et al.	Data Base	1	2021
Ram et al.	Journal European des Systemes Automatisees	3	2019
Pan et al.	Information Sciences	23	2019
Choi et al.	Rairo Operations Research	37	2022
Lee and Li	Pacific Asia Conference on Information Systems	5	2016
Choi et al.	Journal of Industrial and Management Optimization	11	2021
Lee et al.	Internet Research	5	2022
Pan et al.	Decision Support Systems	38	2017
Niu et al.	Transportation Research Part E: Logistics and Transportation Review	36	2019
Kim et al.	International Conference on Multimedia and Ubiquitous Engineering	1	2016
Mao et al.	Information Sciences	14	2015
Tsai et al.	Procedia Manufacturing	35	2015
Zhao et al.	European Journal of Clinical Nutrition	8	2021
Wan and Chen	Electronic Markets	14	2019
Yang et al.	International Journal of Information Management	35	2020
Yao et al.	Sustainability	13	2022
Hu et al.	2017 12 <sup>th</sup> IEEE Conference on Industrial Electronics and Applications (ICIEA)	1	2017
Phang et al.	IEEE transactions on engineering management	63	2014
He et al.	European Journal of Operational Research	64	2016
Sarkum et al.	Journal of Physics: Conference Series	3	2019
Pan et al.	Journal of Retailing and Consumer Services	5	2014
Pei et al.	Journal of Retailing and Consumer Services	11	2021
Li et al.	International Journal of Production Economics	30	2019
Lin et al.	Proceedings of the Institute of Industrial Engineers Asian Conference 2013	5	2013
Li and Mo	Proceedings of the International Conference on Education, Management, Commerce and Society	16	2015
Sun et al.	Journal of Information Technology Case and Application Research	19	2015
Hsu and Lin	Electronic Markets	14	2020
Tsai et al.	International Conference on Social Informatics	19	2013
Grewal et al.	Journal of Interactive Marketing	122	2010
Hole et al.	Journal of Physics: Conference Series	20	2019
Chi et al.	Indian Journal of Marketing	7	2016
Yan and Pei	Journal of Retailing and Consumer Services	17	2019
Hayes and Kelliher	The journal of business & industrial marketing	8	2022
Zhu et al.	Sustainability	12	2022
Tang and Zhu	Journal of Industrial and Production Engineering	14	2019
Yang and Wenxia	International Conference on Information Management	6	2017
Shen et al.	Computers in Human Behavior	111	2019
Lin et al.	Electronic Commerce Research	7	2019
Hübner et al.	International Journal of Physical Distribution and Logistics Management	217	2016
Cuppens et al.	International Conference on Information Systems Security	58	2006
Husain et al.	International Journal of Computer Trends and Technology	9	2020
Kuruzovich et al.	Information systems research	93	2008
Yao et al.	Sustainability	0	2023
Chiang et al.	Contemporary Management Research	9	2014
Wu et al.	Journal of Retailing and Consumer Services	8	2021
Lin et al.	Information Systems Frontiers	19	2019

- e-commerce, enhancing perceived value and willingness to continue using O2O services
- c. Impact of Online Reviews on Offline Retail: Investigations reveal how offline retailers can benefit from integrating online consumer reviews, mitigating competition and improving market informativeness.
- d. Consumer Decision-Making Influenced by Online Information Systems (OISs): Studies explore how digital information affects consumer choices between online and offline channels, highlighting the strategic provisioning of product and price information.
- e. Dynamics of Consumer Search and Purchase Behaviors: Research identifies factors influencing consumer preferences for online or offline purchasing, including service quality and



perceived shopping risk.

In today’s digital era, consumer behaviour and engagement have become critical variables influencing business success, particularly in the O2O (Online-to-Offline) and e-commerce sectors. This paradigm shift leads to the need for an in-depth understanding of how social factors, co-creation between customers and companies, online reviews, online information systems, and the dynamics of consumers’ search and purchase behaviour influence their decisions to use online and offline services.

First, the influence of social factors on consumer engagement emphasizes the vital role of social validation and trust in sustaining the use of O2O platforms. Subjective norms and structural assurance are vital factors that encourage consumers to continue using these services. This suggests that consumer behaviour is not only influenced by the quality of the product or service but also by social perceptions and trust in the platform. Second, the new era of consumer engagement through co-creation between customers and companies in e-commerce underscores the shift towards a more interactive and personalized consumer experience. Co-creation increases perceived value and willingness to continue using O2O services, indicating that consumers’ active participation in creating products or services can improve their satisfaction and loyalty. Third, integrating online reviews with offline retail offers retailers opportunities to overcome competition and increase market informativeness. This suggests that online reviews can be an effective marketing tool to increase trust and influence consumer purchasing decisions in offline retail environments. Fourth, the influence of online information systems (OISs) on consumer decision-making highlights how digital information influences consumer choices between online and offline channels. Strategic product and price information provision through OISs can influence consumers’ preferences and encourage them to make more informed purchase decisions. The dynamics of consumers’ search and purchase behaviour show that service quality and perceived shopping risk influence their preference for online or offline purchases. This emphasizes the importance of risk management and improved service quality to attract and retain consumers. Table 2 illustrates relevant variables, dimensions, and theories to serve as a future research agenda.

To examine the theme of consumer behaviour and engagement within the context of digital and e-commerce, several relevant theories can be applied to understand the dynamics between consumers and businesses and the impact of information technology. One relevant theory is the theory of planned behaviour (TPB), which explains how attitudes, subjective norms, and perceived behavioural control influence an individual’s intentions.

In online consumer behaviour, this theory can help understand how social factors and trust influence O2O services or e-commerce decisions. Technology Acceptance Model (TAM) TAM is one of the most widely used models to predict technology acceptance, with two main factors influencing acceptance: Perceived usefulness and perceived ease of use.

A range of studies have explored the factors influencing trust in O2O models, focusing on online reviews and their impact on customer trust (Chang et al., 2020; Chien, 2018). These studies have highlighted the importance of trust in influencing customer purchase intentions and the effectiveness of O2O strategies (Pappas, 2016; Lee and Lin, 2005; Kang and Namkung 2019; Qalati, 2021; Yang et al., 2016; Lie et al., 2019). They have also emphasized the role of service quality, perceived shopping risk, and the mediating and moderating effects of trust in online shopping (Lee and Lin, 2005; Qalati, 2021). These findings suggest that O2O marketing strategies should focus on building trust through high service quality, managing perceived shopping risk, and leveraging the power of online reviews. Many studies have explored the role of information technology (IT) and social involvement in influencing consumer purchase decisions, particularly in the context of Online-to-Offline (O2O) marketing strategies. Tsai et al. (2013) and Wahyuli and Tarmawan (2019) highlight the potential of social media and IT in understanding and influencing consumer behaviour. This is further supported by Narwal and Sachdeva (2013) and Singh Deora (2018), who emphasize the significant impact of IT on consumer purchase behaviour. The role of social involvement as a moderator between social factors and consumer involvement is also underscored by Rosen and Olshavsky (1987) and Dhar and Jha (2014). These findings suggest that IT and social participation are crucial in O2O marketing strategies, particularly in understanding and influencing consumer behaviour. Many studies have explored the factors influencing consumer loyalty and trust in O2O marketing strategies. Hsu and Lin (2018) and Hsieh (2017) both highlight the importance of perceived value, with Hsu identifying emotional and social value as critical drivers of loyalty and Hsieh emphasizing the role of emotion and cognition. Li and Chen (2019) further underscores the impact of perceived value on satisfaction and continuance intention. Zhu et al. (2022) and Chang et al. (2020) delve into the role of trust, emphasizing the mediating role of perceived value and satisfaction, and Chang uses text mining to identify factors influencing trust. Yan-Feng (2021) considers the influence of culture and relationship marketing on consumer acceptance and trust. These findings collectively suggest that perceived value and trust are crucial in O2O marketing and can be enhanced through strategies that prioritize emotional and social value and build trust through relationship marketing.

**Table 2: Consumer behavior and engagement measurement and theoretical approach**

As independent	As moderating	As intervening	As dependent
<ul style="list-style-type: none"> <li>• Social Factors (Social Validation, Trust, Subjective Norms)</li> <li>• Customer-Company Co-Creation</li> <li>• Online Reviews</li> <li>• Online Information Systems (OISs)</li> <li>• Service Quality and Perceived Shopping Risk</li> </ul>	<ul style="list-style-type: none"> <li>• Information Technology (As moderation between OISs and Purchase Decisions)</li> <li>• Social Involvement (Moderation between Social Factors and Consumer Involvement)</li> </ul>	<ul style="list-style-type: none"> <li>• Perceived Value (Intervening between Co-Creation and Consumer Loyalty)</li> <li>• Trust in Platform (Intervening between Online Reviews and Purchase Decision)</li> </ul>	<ul style="list-style-type: none"> <li>• Consumer Loyalty</li> <li>• Purchase Decision</li> </ul>

This model can be adapted to study how consumers accept and use online information systems (OISs) in making purchase decisions. Diffusion of Innovations Theory explains how new products or technologies spread within a society or social group. In the context of e-commerce and O2O, this theory is relevant to understanding how consumers can accept and adopt innovations in services or platforms. Consumer Engagement Theory emphasizes building long-term relationships between consumers and brands or companies through meaningful interactions and engagement in the co-creation process. Understanding the dynamics between customers and companies in creating shared value through e-commerce platforms is relevant. Trust and Risk Theory: In the online context, consumer trust towards a platform or seller and the perceived risk associated with online purchases are critical to purchasing. This theory can be used to explore how online reviews and service quality assurances influence trust and perceived risk. Perceived Value Theory explains how consumers evaluate the value of a product or service based on their perception of what they receive compared to what they give. In e-commerce, perceived value can be influenced by co-creation, service quality, and information provided by online information systems.

### 4.3. Strategic and Operational Integration

Strategic and operational integration is critical to achieving business success, especially in omnichannel retail, business model innovation, and utilization of digital marketing techniques. The transformation from multichannel to omnichannel strategies demands the adaptation of integrated logistics to meet the needs of efficient distribution and order fulfilment. In addition, the evolution of business models, including augmented reality technologies, emphasizes the importance of strategic information management in O2O ventures. Table 3 illustrates relevant variables, dimensions, and theories to serve as a future research agenda. The prior study gives a summary of the key thematic areas and associated studies, grouped by their primary focus:

- a. Logistical Challenges in Omni-Channel Retailing: Studies discuss the transition from multichannel to omnichannel strategies, focusing on integrated fulfilment and the need for logistical adaptation.
- b. Business Model Innovation and Information Management: Analysis of innovative business models, such as leveraging augmented reality, and the strategic importance of information management in O2O ventures.
- c. Strategic Application of Digital Marketing Techniques: Research advocates for using SEO and other digital marketing strategies to enhance online visibility and consumer traffic.

Integrating fulfilment strategies, innovative business models, and

digital marketing techniques is crucial in O2O marketing. Kim et al. (2016) and Taylor et al. (2019) both emphasize the importance of integrating fulfilment channels and resources, with Taylor explicitly highlighting the need for appropriate omnichannel strategies. Hübner (2021) further underscores the role of retail stores in this integration, while Choi (2022) and Bovsh et al. (2022) explore the application of intelligent servicing strategies and digital marketing fulfilment in the O2O context. Pei et al. (2020) and Sarkar et al. (2021) provide valuable insights into the O2O competition and sustainable retailing strategies. These studies underscore the need for a holistic approach to O2O marketing, integrating fulfilment, business models, and digital marketing techniques. A range of studies have explored the impact of O2O marketing strategies on online visibility and operational success. Sarkum et al. (2019) and Wang and Lai (2014) both emphasize the importance of integrating online and offline channels, with the latter specifically focusing on the tourism industry. Kim et al. (2016) and Lie et al. (2019) highlight the effectiveness of O2O strategies in improving online exposure and e-commerce transactions, respectively. Phang et al. (2014) and Tsai et al. (2013) delve into the use of social media and IT-enabled promotional approaches in O2O commerce, while Gakii and Maina (2019) and Zhang and Huang (2015) provide a broader overview of the industry and its relationship to market performance. These studies collectively underscore the potential of O2O marketing strategies in enhancing online visibility and operational success. Several theories can be applied to understand the interplay between strategic and operational integration in omnichannel retailing and O2O ventures. The Resource-Based View (RBV) theory can elucidate how a firm’s internal resources and capabilities, such as logistical systems and digital marketing strategies, contribute to competitive advantage. The Theory of Planned Behavior (TPB) can offer insights into consumer behaviour in response to innovative business models and integrated retail experiences. Furthermore, the Information Processing Theory (IPT) can be relevant in understanding the strategic importance of information management in enhancing operational efficiency and decision-making processes.

### 4.4. Environmental Considerations and Sustainability

In the current context, where environmental awareness and sustainability are increasingly significant, research into ecological considerations within online shopping supply chains has garnered considerable attention. Specifically, low-carbon decision-making in online shopping supply chains offers substantial opportunities to align online and offline operations with environmental sustainability goals. This emphasizes the importance of low-carbon practices in e-commerce logistics, which can reduce environmental

**Table 3: Strategic and operational integration measurement and theoretical approach**

As independent	As moderating	As intervening	As dependent
<ul style="list-style-type: none"> <li>• Integrated Fulfillment Strategies</li> <li>• Innovative Business Models (e.g., Augmented Reality)</li> <li>• Digital Marketing Techniques (e.g., SEO)</li> </ul>	<ul style="list-style-type: none"> <li>• Technological Infrastructure (Moderates the impact of digital marketing techniques on online visibility)</li> <li>• Market Dynamics (Moderates the relationship between business model innovation and operational success)</li> </ul>	<ul style="list-style-type: none"> <li>• Consumer Satisfaction (Intervenes between integrated fulfilment and repeat business/customer loyalty)</li> <li>• Operational Efficiency (Intervenes between information management and business performance)</li> </ul>	<ul style="list-style-type: none"> <li>• Business Performance</li> <li>• Customer Loyalty and Retention</li> </ul>

impact and add value for consumers increasingly conscious of sustainability issues. Firstly, strategic and operational integration in achieving environmental sustainability goals through low-carbon practices becomes critical. This involves effective coordination between various aspects of e-commerce operations, including sustainable logistics management, selecting sustainable materials, and designing and implementing efficient delivery systems. Focusing on carbon emission reduction at every stage of the supply chain can aid in creating a more sustainable system. Low-Carbon Decision-Making in Online Shopping Supply Chains: Proposals for aligning online and offline operations with environmental sustainability goals, emphasizing the importance of low-carbon practices in e-commerce logistics. Table 4 illustrates relevant variables, dimensions, and theories to serve as a future research agenda. The prior study gives a summary of the key thematic areas and associated studies, grouped by their primary focus:

Several relevant theories that can support this research include the likes and Dynamic Systems Theory, which can be used to understand the complexity and interactions among variables within a sustainable e-commerce logistics system. Secondly, the Corporate Social Responsibility (CSR) Theory Provides a framework for understanding how businesses can integrate social and environmental concerns into their operations, which can enhance brand image and consumer loyalty. Third, the theory of Planned Behavior (TPB) can be explored to understand how attitudes, subjective norms, and perceived behavioural control influence consumers' intentions to choose sustainable products or services.

Employing these theories in research can offer deeper insights into how online and offline operations can be aligned with environmental sustainability goals and identify factors influencing the successful implementation of low-carbon practices in e-commerce logistics.

#### 4.5. Trust Dynamics and Relational Engagement

Trust and relational engagement influence consumer loyalty and repurchase intentions in today's digital commerce era. Particularly in O2O (Online-to-Offline) commerce, a profound understanding of how trust relationships across various O2O channels affect consumer repurchase intentions and engagement is crucial. This highlights the complexity of trust dynamics within digital and physical retail settings, necessitating specifically designed strategies to build and maintain consumer trust. Firstly, examining how trust and commitment in O2O commerce can impact consumer repurchase intentions and engagement is essential. Trust,

as the foundation of the consumer's relationship with a platform or brand, is vital in determining consumer loyalty. In the O2O context, trust is built through online interactions and needs to be reinforced through consistent and satisfying offline experiences. Therefore, this research will explore how trust formed in online channels can be strengthened or weakened by consumers' offline experiences and vice versa. Table 5 illustrates relevant variables, dimensions, and theories to serve as a future research agenda. The prior study gives a summary of the key thematic areas and associated studies, grouped by their primary focus:

In O2O commerce, where the seamless integration of online and offline shopping experiences is paramount, understanding the nuances of consumer behaviour becomes critical. Theories such as Trust, Commitment, and Social Exchange Theory provide a robust framework for dissecting the intricate dynamics between consumers and brands or platforms. Trust Theory elucidates the pivotal role of trust in shaping individuals' behaviours and decisions, illuminating how trust, once established, can significantly influence consumer relationships with brands or platforms. This theory underscores the notion that trust is not merely a peripheral element but a central pillar in fostering solid and enduring relationships between consumers and businesses. Delving deeper into the psychological aspects of consumer-brand relationships, Commitment Theory offers insights into how a consumer's commitment to a brand or platform can profoundly impact their repurchase intentions and foster long-term engagement. This commitment, cultivated through positive interactions and experiences, is a testament to the brand's ability to meet or exceed consumer expectations consistently. It highlights the importance of nurturing a sense of loyalty and belonging among consumers, which, in turn, can lead to a virtuous cycle of repeat purchases and sustained business success.

Furthermore, Social Exchange Theory complements these perspectives by framing the consumer-brand relationship as a reciprocal exchange. This theory posits that trust and commitment are nurtured through fair and satisfying exchanges where both parties perceive value in the relationship. It emphasizes the need for balance and mutual benefit, suggesting that the most successful consumer-brand relationships are those characterized by equity and reciprocity. Through this lens, the exchange between consumers and brands is viewed as transactions and meaningful interactions that contribute to a more profound sense of connection and satisfaction.

Employing these theories in research surrounding O2O commerce

**Table 4: Environmental considerations and sustainability measurement and theoretical approach**

As independent	As moderating	As intervening	As dependent
<ul style="list-style-type: none"> <li>Sustainable Logistics Practices (including the use of environmentally friendly materials, delivery route optimization, and the utilization of low-emission vehicles)</li> <li>Business Model Innovation (e.g., business models supporting the circular economy, the use of green technologies)</li> </ul>	<ul style="list-style-type: none"> <li>Government Regulations and Policies (moderating between sustainable practices and the achievement of sustainability goals)</li> <li>Consumer Awareness and Preferences towards Sustainability (moderating between business model innovation and market acceptance)</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable Value Perception (intervening between sustainable practices and consumer loyalty)</li> <li>Operational Efficiency (intervening between business model innovation and operational sustainability)</li> </ul>	<ul style="list-style-type: none"> <li>Achievement of Sustainability Goals</li> <li>Consumer Loyalty to Sustainable Brands or Platforms</li> </ul>

**Table 5: Trust dynamics and relational engagement measurement and theoretical approach**

As independent	As moderating	As intervening	As dependent
<ul style="list-style-type: none"> <li>• Consumer Trust (divided into online trust and offline trust)</li> <li>• Interaction Quality (online and offline)</li> </ul>	<ul style="list-style-type: none"> <li>• Interaction Frequency (moderating between trust and consumer engagement)</li> <li>• Risk Perception (moderating between trust and repurchase intention)</li> </ul>	<ul style="list-style-type: none"> <li>• Consumer Engagement (as an intervening variable between trust and repurchase intention)</li> <li>• Consumer Commitment (intervening between trust and consumer loyalty)</li> </ul>	<ul style="list-style-type: none"> <li>• Achievement of Sustainability Goals</li> <li>• Repurchase Intention</li> <li>• Consumer Loyalty</li> </ul>

offers valuable insights into developing effective strategies for building and maintaining trust relationships between consumers and platforms. By understanding the foundational elements of trust, commitment, and equitable exchange, businesses can craft experiences that resonate with consumers on a deeper level, enhancing engagement and loyalty. This approach benefits consumers with more satisfying and meaningful shopping experiences. It serves as a strategic advantage for businesses striving to thrive in the competitive landscape of O2O commerce. Ultimately, applying these theories in the context of O2O commerce holds the promise of transforming how businesses interact with their consumers, paving the way for more resilient, trust-based relationships that stand the test of time.

## 5. CONCLUSIONS

In the ever-evolving landscape of digital and e-commerce interactions, a profound exploration into the intricacies of consumer behaviour and engagement has unveiled the paramount importance of trust and perceived value. These elements emerge as pivotal determinants shaping purchasing decisions and fostering consumer loyalty, underscoring the essence of trust, significantly influenced by service quality, online reviews, and adept management of perceived shopping risks. Such insights are instrumental in sculpting Online-to-Offline (O2O) marketing strategies, where trust forms the cornerstone of consumer-brand relationships-the advent of information technology and social engagement as formidable tools unveil their capacity to deepen brand-consumer connections. Social media, alongside other technological innovations, serves as a bridge fostering meaningful interactions, while the concept of perceived value-encompassing emotional and social facets-plays a critical role in driving satisfaction and the continuance of brand engagement. This revelation points towards a strategic focus on crafting emotional and social value, in tandem with trust-building through relationship marketing, as effective avenues for enhancing consumer trust and loyalty. Success in the digital commerce realm is intrinsically linked to a brand's capability to nurture faith, offer unparalleled value, and leverage technological advancements to enrich consumer engagement. This understanding empowers businesses to devise strategies that resonate with consumers, ensuring their retention in a dynamic digital ecosystem. Additionally, integrating strategic and operational dimensions, particularly in omni-channel retailing and O2O ventures, is crucial. This includes managing logistics innovatively, evolving business models, and employing digital marketing to deliver a seamless online and offline consumer experience, thereby navigating the digital age's complexities for sustained growth and competitiveness.

The contemporary narrative also accentuates environmental sustainability within online shopping supply chains, spotlighting the adoption of low-carbon decision-making processes. This focus aligns online and offline operations with broader ecological sustainability goals, highlighting the dual role of low-carbon practices in e-commerce logistics-reducing the ecological footprint while catering to a consumer base increasingly conscious of sustainability issues. Achieving these goals necessitates a strategic and operational combination, prioritizing low-carbon initiatives across e-commerce operations. This strategy encompasses sustainable logistics management, selecting eco-friendly materials, and implementing efficient delivery mechanisms to establish a sustainable operational framework. Embedded within this narrative are theoretical frameworks such as the Dynamic Systems Theory, Corporate Social Responsibility (CSR) Theory, and the Theory of Planned Behavior. These frameworks enhance the understanding and implementation of sustainable practices within the e-commerce logistics domain, offering insights into consumer behaviour towards sustainable products and services.

In bridging the online to offline shopping experience gap, a deep understanding of consumer behaviour is essential, facilitated by integrating Trust Theory, Commitment Theory, and Social Exchange Theory. These theories provide a holistic view of the intricate consumer-brand dynamics, emphasizing trust, commitment, and reciprocal exchange as foundational elements for building and sustaining consumer loyalty and engagement. This integration offers a roadmap for devising strategies that foster trust and loyalty and enhance consumer engagement and satisfaction. By understanding the essence of these psychological underpinnings, businesses can design experiences that resonate with consumers deeply, providing a competitive edge in the O2O commerce landscape.

In our investigation into Online-to-Offline (O2O) marketing strategies, we endeavoured to delineate and comprehend the factors influencing consumers' successful transition from digital interactions to physical shopping experiences. While this study has yielded valuable insights into the significance of consumer trust, perceived value, and technology integration in facilitating the O2O consumer journey, we acknowledge a notable limitation in our research, specifically the incomplete exposition of dimensions and detailed measurement indicators.

This limitation is not a result of oversight but stems from the extensive scope of the study. O2O marketing strategies encompass various factors and variables, from digital consumer behaviour and

social interactions to logistics and physical store operations. Given this complexity and diversity, developing and implementing a measurement framework that can accurately and comprehensively capture all relevant dimensions within a single study poses a significant challenge.

Therefore, despite the success of this study in identifying and analyzing several vital factors impacting the efficacy of O2O strategies, we recognize that there remains a broad expanse for further exploration. Future research could focus on developing and validating more detailed measurement indicators for each dimension of O2O strategies. This includes, but is not limited to, the measurement of digital interaction quality, the effectiveness of communication between online and offline channels, and personalization strategies that enhance consumer shopping experiences.

Hence, we invite subsequent researchers to delve deeper into this context, identify gaps in the current literature, and develop methodologies capable of overcoming the limitations of our study. Doing so will enrich our understanding of O2O marketing strategies and aid practitioners in designing and implementing more effective and efficient strategies. This could enhance consumer satisfaction and loyalty in the digital era, marking a significant advancement in marketing research and practice.

## REFERENCES

- Abby, S., Shari, S. (2015), The Types of Online to Offline Business Model. In: Proceeding of the Third International Conference on Advances in Computing, Communication, and Information Technology- CCIT 2015.
- Bovsh, L., Komarnitskiy, I., Prykhodko, K. (2022), Fulfillment of digital marketing in the restaurant business. *Restaurant and Hotel Consulting. Innovations*, 5(1), 37-51.
- Chang, J.R., Chen, M.Y., Chen, L.S., Chien, W.T. (2020), Recognizing important factors of influencing trust in O2O models: An example of OpenTable. *Soft Computing*, 24(11), 7907-7923.
- Chen, Z., Fang, L., Su, S.I.I. (2015), The value of offline channel subsidy in bricks and clicks: An O2O supply chain coordination perspective. *Electronic Commerce Research*, 21(2), 599-643.
- Chen, X., Hu, X. & Ben, S. (2021), How do reputation, structure design and FinTech ecosystem affect the net cash inflow of P2P lending platforms? Evidence from China. *Electron Commer Res* 21, 1055–1082.
- Chi, Y., Kang, M., Han, K., Choi, J. (2016), A study on the discontinuance intention on O2O commerce: With a focus on the mediating effects of perceived risk and user resistance. *International Journal of U- and e-Service, Science and Technology*, 9(2), 207-218.
- Chiang, I.P., Lin, C.Y., Huang, C.H. (2014), Measuring the effects of online-to-offline marketing. *Contemporary Management Research*, 14(3), 167-189.
- Chien, W.T., Chakraborty, G., Chen, L.S. (2018), Identifying Important Factors Affecting O2O Customers' Trust from Textual Reviews. In: *International Conference on Awareness Science and Technology*.
- Choi, S.B., Dey, B.K., Kim, S.J., Sarkar, B. (2022), Intelligent servicing strategy for an online-to-offline (O2O) supply chain under demand variability and controllable lead time. *RAIRO - Operations Research*, 56(3), 1623-1653.
- Choi, S.B., Dey, B.K., Sarkar, B. (2021), Retailing and servicing strategies for an imperfect production with variable lead time and backorder under an online-to-offline environment. *Journal of Industrial and Management Optimization*, 19(7), 4804-4843.
- Cuppens, F., Cuppens-Bouahia, N., Coma, C. (2006), O2O: Virtual private organizations to manage security policy interoperability. In: *Information Systems Security*. Berlin, Heidelberg: Springer. p101-115.
- Dhar, J., Jha, A.K. (2014), Analyzing social media engagement and its effect on online product purchase decision behavior. *Journal of Human Behavior in the Social Environment*, 24(7), 791-798.
- Du, Y., Tang, Y. (2014), Study on the development of O2O E-commerce platform of China from the perspective of offline service quality. *Business, Economics, Computer Science*, 5, 308-312.
- Gakii, A., Maina, S.M. (2019), Nexus between online marketing strategies and market performance: A critical review of the literature and research Agenda. *European Journal of Business and Management*, 11(15), 99-107.
- Feng, Y., Chen, X. and Lai, I. (2021), The effects of tourist experiential quality on perceived value and satisfaction with bed and breakfast stays in southwestern China. *Journal of Hospitality and Tourism Insights*, 4, 121-135.
- Ghosh, S., Gaurav, K., Bhattacharya, S., & Singh, Y. N. (2020), Ensuring the spread of referral marketing campaigns: a quantitative treatment. *Scientific Reports*, 10(1), 11072.
- Grewal, D., Janakiraman, R., Kalyanam, K., Kannan, P. K., Ratchford, B., Song, R., Tolerico, S. (2010), Strategic online and offline retail pricing: A review and research Agenda. *Journal of Interactive Marketing*, 24(2), 138-154.
- Han, J., Zuo, Y., Law, R., Chen, S., & Zhang, M. (2021), Service quality in tourism public health: Trust, satisfaction, and loyalty. *Frontiers in Psychology*, 12, 731279.
- Hayes, Ó., Kelliher, F. (2022), The emergence of B2B omnichannel marketing in the digital era: A systematic literature review. *Journal of Business Industrial Marketing*, 37(11), 2156-2168.
- He, B., Gupta, V., Mirchandani, P. (2021), Online selling through O2O platform or on your own? Strategic implications for local Brick-and-Mortar stores. *Omega*, 103, 102424.
- He, Z., Cheng, T.C.E., Dong, J., Wang, S. (2016), Evolutionary location and pricing strategies for service merchants in competitive O2O markets. *European Journal of Operational Research*, 254(2), 595-609.
- Herhausen, D., Binder, J., Schoegel, M., Herrmann, A. (2015), Integrating Bricks with clicks: Retailer-level and channel-level outcomes of online-offline channel integration. *Journal of Retailing*, 91(2), 309-325.
- Hole, Y., Pawar, M.S., Khedkar, E.B. (2019), Omni channel retailing: An opportunity and challenges in the Indian market. *Journal of Physics: Conference Series*, 1362(1), 12121.
- Hsieh, J.K. (2017), The role of customers in co-creating m-services in the O2O model. *Journal of Service Management*, 28(5), 866-883.
- Hsu, C.L., Lin, J.C.C. (2018), Examining social networking O2O apps user loyalty. *Journal of Computer Information Systems*, 60(5), 459-467.
- Hsu, C.L., Lin, J.C.C. (2020), Understanding continuance intention to use online to offline (O2O) apps. *Electronic Markets*, 30(4), 883-897.
- Huang, J.-S., Pan, S. L., & Liu, J. (2017), Boundary permeability and online-offline hybrid organization: A case study of Suning, China. *Information & Management*, 54(3), 304-316.
- Hu, P. (2014), O2O E-commerce: Power, patterns and prospects. *Business, Economics, Computer Science*, 825-830.
- Hu, Y., Gu, Q., Wen, J., Tang, Y. (2017), A Supplier Selection and Order Allocation Method for Online to Offline (O2O)e-Commerce Markets. In: *12<sup>th</sup> IEEE Conference on Industrial Electronics and Applications (ICIEA)*.

- Hübner, A., Hense, J., Dethlefs, C. (2021), The revival of retail stores via omnichannel operations: A literature review and research framework. *SSRN Electronic Journal*, 1-42. Available at SSRN: <https://ssrn.com/abstract=3891857>
- Hübner, A., Wollenburg, J., Holzzapfel, A. (2016), Retail logistics in the transition from multichannel to omnichannel. *International Journal of Physical Distribution Logistics Management*, 46(6/7), 562-583.
- Husain, T., Sani, A., Ardiansyah, M., Wiliani, N. (2020), Online Shop is an interactive media information society based on search engine optimization (SEO). *International Journal of Computer Trends and Technology*, 68(3), 53-57.
- Ji, S.W., Sun, X.Y., Liu, D. (2013), Research on core competitiveness of Chinese retail industry based on O2O. *Advanced Materials Research*, 834-836, 2017-2020.
- Kang, J.W., Namkung, Y. (2019), The information quality and source credibility matter in customers' evaluation of food O2O commerce. *International Journal of Hospitality Management*, 78, 189-198.
- Kao, G., Hong, J., Perusse, M., Sheng, W. (2020), Online to offline (O2O). In: *Turning Silicon into Gold*. New York: Apress. p75-80.
- Kim, H., Do, H., Choi, B. (2016), O2O based on effective social media marketing methods to improve online exposure. *International Journal of Multimedia and Ubiquitous Engineering*, 11(11), 51-70.
- Kim, J.G., Yang, S.Y., Kwon, J.A., Kim, W.J. (2016), The O2O marketing system using augmented reality and beacon. *International Journal of Multimedia and Ubiquitous Engineering*, 11(12), 247-256.
- Kuruzovich, J., Viswanathan, S., Agarwal, R., Gosain, S., Weitzman, S. (2008), Marketspace or marketplace? Online information search and channel outcomes in auto retailing. *Information Systems Research*, 19(2), 182-201.
- Lee, G., Lin, H. (2005), Customer perceptions of e-service quality in online shopping. *International Journal of Retail Distribution Management*, 33(2), 161-176.
- Lee, P.T.Y., Feiyu, F., Chau, M. (2022), Defining online to offline (O2O): A systematic approach to defining an emerging business model. *Internet Research*, 32(5), 1453-1495.
- Lee, Y., Li, W.L. (2016), Understanding Consumers O2O Business Model Adoption. In: *Pacific Asia Conference on Information Systems*.
- Li, J., Mo, W. (2015), The O2O Mode in Electronic Commerce. In: *Proceedings of the International Conference on Education, Management, Commerce and Society*.
- Li, Y., Li, G., Tayi, G.K., Cheng, T.C.E. (2019), Omni-channel retailing: Do offline retailers benefit from online reviews? *International Journal of Production Economics*, 218, 43-61.
- Lie, Y., Atmojo, R.N.P., Muljo, H.H. (2019), The effectiveness of O2O strategy on E-commerce transactions. *The Winners*, 20(1), 5154.
- Lin, C.J., Lee, T.T., Lin, C., Huang, Y.C., Chiu, J.M. (2013), Establishing Interaction Specifications for Online-to-Offline (O2O) Service Systems. In: *Proceedings of the Institute of Industrial Engineers Asian Conference*. Berlin: Springer Singapore. p1137-1145.
- Luo, J.Y.N., Liu, P.P. & Wong, M.C.M. (2018). Patients' satisfaction with dental care: a qualitative study to develop a satisfaction instrument. *BMC Oral Health* 18, 15.
- Mao, A.Y., Song, Y.Y., Yu, J.X. (2015), The realization of the O2O model in mobile E-commerce based on the technology of the wechat platform. *Applied Mechanics and Materials*, 743, 641-645.
- Narwal, M., Sachdeva, G. (2013), Impact of information technology (it) on consumer purchase behavior. *Researchers World*, 4, 41-53.
- Niu, B., Mu, Z., Li, B. (2019), O2O results in traffic congestion reduction and sustainability improvement: Analysis of "Online-to-Store" channel and uniform pricing strategy. *Transportation Research Part E: Logistics and Transportation Review*, 122, 481-505.
- Pan, H.L., He, H.H., Wang, S. (2014), Exploration of O2O mode in the retail industry. *Applied Mechanics and Materials*, 644-650, 5586-5589.
- Pan, Y., Wu, D., Luo, C., Dolgui, A. (2019), User activity measurement in rating-based online-to-offline (O2O) service recommendation. *Information Sciences*, 479, 180-196.
- Pan, Y., Wu, D., Olson, D.L. (2017), The online-to-offline (O2O) service recommendation method is based on a multidimensional similarity measurement. *Decision Support Systems*, 103, 1-8.
- Pappas, N. (2016), Marketing strategies, perceived risks, and consumer trust in online buying behaviour. *Journal of Retailing and Consumer Services*, 29, 92-103.
- Pei, Z., Paswan, A., Camp, K. (2020), Valuable strategy and firm performance in the O2O competition. *Industrial Marketing Management*, 85, 167-179.
- Pei, Z., Wooldridge, B.R., Swimberghe, K.R. (2021), Manufacturer rebate and channel coordination in O2O retailing. *Journal of Retailing and Consumer Services*, 58, 102268.
- Phang, C.W., Tan, C.H., Sutanto, J., Magagna, F., Lu, X. (2014), Leveraging O2O commerce for product promotion: An empirical investigation in Mainland China. *IEEE Transactions on Engineering Management*, 61(4), 623-632.
- Pu-con, L. I. (2014), A study of offline merchants' acceptance of mobile O2O commerce. *Contemporary Finance & Economics*, 1(9), 1730.
- Qalati, S.A., Vela, E.G., Li, W., Dakhan, S.A., Hong Thuy, T.T., Merani, S.H. (2021), Effects of perceived service quality, website quality, and reputation on purchase intention: The mediating and moderating roles of trust and perceived risk in online shopping. *Cogent Business and Management*, 8(1), 1869363.
- Ram, J., Manoharan, A., Sun, S. (2019), Examining the adoption of online to-offline (O2O). *ACM SIGMIS database: The Database for Advances in Information Systems*, 52(1), 10-26.
- Ram, J., Manoharan, A., Sun, S. (2021), Online-to-offline (O2O) business: Empirically examining the adoption vs. Non-adoption. *Journal Européen Des Systèmes Automatisés*, 52(2), 189-198.
- Rosen, D.L., Olshavsky, R.W. (1987), The dual role of informational social influence: Implications for marketing management. *Journal of Business Research*, 15(2), 123-144.
- Ryu, D.H., Lim, C., Kim, K.J. (2020), Development of a service blueprint for the online-to-offline integration in service. *Journal of Retailing and Consumer Services*, 54, 101944.
- Sarkar, B., Dey, B.K., Sarkar, M., AlArjani, A. (2021), A sustainable online-to-offline (O2O) retailing strategy for a supply chain management under controllable lead time and variable demand. *Sustainability*, 13(4), 1756.
- Sarkum, S., Suryadi, S., Rasyid Munthe, I., Hidayat, R. (2019), The zoning strategy for SMEs: A marketing concept O2O (offline and online). *Journal of Physics: Conference Series*, 1175, 12211.
- Shen, C., Chen, M., Wang, C. (2019), Analyzing the trend of O2O commerce by bilingual text mining on social media. *Computers in Human Behavior*, 101, 474-483.
- Singh Deora, M. (2018), A Perception of ICT and Social Media for Online Purchasing Trends. In: *2018 Second World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4)*.
- Sun, S., Cegielski, C.G., Li, Z. (2015), Amassing and analyzing customer data in the age of big data: A case study of Haier's online-to-offline (O2O) business model. *Journal of Information Technology Case and Application Research*, 17(3-4), 156-165.
- Tang, M., Zhu, J. (2019), Research of O2O website-based consumer purchase decision-making model. *Journal of Industrial and Production Engineering*, 36(6), 371-384.
- Taylor, D., Brockhaus, S., Knemeyer, A.M., Murphy, P. (2019), Omnichannel fulfilment strategies: Defining the concept and building an agenda for future inquiry. *The International Journal of Logistics*, 30(3), 863-891.
- Tsai, T.M., Wang, W.N., Lin, Y.T., Choub, S.C. (2015), An O2O commerce

- service framework and its effectiveness analysis with application to proximity commerce. *Procedia Manufacturing*, 3, 3498-3505.
- Tsai, T.M., Yang, P.C., Wang, W.N. (2013), Pilot study toward realizing social effect in O2O commerce services. In: *Lecture Notes in Computer Science*. Berlin: Springer International Publishing. p268-273.
- Wahyuli, R.R., Tarmawan, I. (2019), Marketing strategy using information technology in consumer buying interest. *IOP Conference Series: Materials Science and Engineering*, 662(3), 32020.
- Wan, X., Chen, J. (2019), The relationship between platform choice and supplier's Efficiency- evidence from China's online to offline (O2O) e-commerce platforms. *Electronic Markets*, 29(2), 153-166.
- Wang, F., Lai, G.S. (2014), Empirical study to design field applications for O2O (online to offline) business model in tourism with mobile computing and cloud service supports. *Canadian Parliamentary Review*, 46(3), 193-199.
- Widjaja, A., Giovanni, Y.W. (2018), Impact of online to offline (O2O) commerce service quality and brand image on customer satisfaction and repeat purchase intention. *International Journal of Advanced Engineering, Management and Science*, 4(3), 163-170.
- Wu, Y., Lu, R., Yang, J., Xu, F. (2021), Low-carbon decision-making model of online shopping supply chain considering the O2O model. *Journal of Retailing and Consumer Services*, 59, 102388.
- Xiao, L., Guo, Z., D'Ambra, J. (2019), Benefit-based O2O commerce segmentation: A means-end chain approach. *Electronic Commerce Research*, 19(2), 409-449.
- Xiao, L., Mi, C., Zhang, Y., Ma, J. (2019), Examining Consumers' behavioral intention in O2O commerce from a relational perspective: An exploratory study. *Information Systems Frontiers*, 21(5), 1045-1068.
- Xu, T., Zhang, J. (2015), A Development Strategy of O2O Business in China. In: *Proceedings of the 2015 International Conference on Computer Science and Intelligent Communication*.
- Yan, R., Pei, Z. (2019), Return policies and O2O coordination in the e-tailing age. *Journal of Retailing and Consumer Services*, 50, 314-321.
- Yang, J., Sarathy, R., Lee, J. (2016), The effect of product review balance and volume on online Shoppers' risk perception and purchase intention. *Decision Support Systems*, 89, 66-76.
- Yang, X. (2021), New retail: A conversion of business mode from online-to-offline (O2O) to the online-merge-offline (OMO). *BCP Business Management*, 15, 368-373.
- Yang, X., Wenxia, M. (2017), Information Management Issues and Business Model Analysis of O2O Games : A Review of Pokemon Go. In: *2017 3<sup>rd</sup> International Conference on Information Management (ICIM)*.
- Yang, Y., Gong, Y., Land, L.P.W., Chesney, T. (2020), Understanding the effects of physical experience and information integration on consumer use of online and offline commerce. *International Journal of Information Management*, 51, 102046.
- Yao, P., Osman, S., Sabri, M.F., Zainudin, N. (2022), Consumer behavior in online-to-offline (O2O) commerce: A thematic review. *Sustainability*, 14(13), 7842.
- Yao, P., Sabri, M.F., Osman, S., Zainudin, N., Li, Y. (2023), Consumers' continued intention to use online-to-offline (O2O) services in omnichannel retail: Differences between To-shop and to-home models. *Sustainability*, 15(2), 945.
- Zhang, B., Huang, L. (2015), The Research Status of O2O Industry Analysis. In: *International Conference on Logistics, Informatics, and Service Sciences*.
- Zhao, X., Lin, W., Cen, S., Zhu, H., Duan, M., Li, W., Zhu, S. (2021), The online-to-offline (O2O) food delivery industry and its recent development in China. *European Journal of Clinical Nutrition*, 75(2), 232-237.
- Zhu, X., Song, B., Ni, Y., Ren, Y., Li, R. (2016), The O2O model-from online/offline to the O2O model. In: *Business Trends in the Digital Era*. Berlin: Springer Singapore. p191-212.
- Zhu, Y., Wei, Y., Zhou, Z., Jiang, H. (2022), Consumers' continuous use intention of O2O E-commerce platform on community: A value co-creation perspective. *Sustainability*, 14(3), 1666.