

Exploring the Effects of Digital Transformation on the Post-Pandemic Retail Industry: A Systematic Literature Review

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Abstract. *Digital transformation has profoundly reshaped the retail sector during the last decade. Retail evolved from a predominantly physical industry into a hybrid ecosystem characterized by platform-based models and omnichannel strategies. The COVID-19 pandemic further accelerated the transition, acting as a major external shock. It forced retailers to rapidly adopt digital solutions to maintain operations and respond to changing consumer behaviors. Understanding the evolution of retail business model is critical, as firms must adapt to remain competitive while maintaining profitability and consumer loyalty. This study explored the influence of digital transformation on contemporary retail business models through a Systematic Literature Review (SLR) guided by the PRISMA framework. Analysing 67 peer-reviewed articles published between 2020 and 2026 retrieved from the Web of Science database, the research identifies key trends in post-pandemic retail. The findings indicate that the pandemic catalysed the shift towards seamless omnichannel retailing and contactless commerce, making digital adoption a matter of survival rather than strategic choice. The review highlights that business model innovation is essential for organisational resilience. As the firms integrate online and offline capabilities, they achieve greater operational flexibility and efficiency. Furthermore, the study demonstrates that technological integration, specifically through AI, IoT and blockchain, supports sustainability by minimizing waste and enabling circular economy practices. This research provides an overview of how digital transformation drives value creation, resilience and environmental responsibility in the global retail landscape.*

Keywords: retail, digital transformation, business mode, e-commerce, omnichannel.

Introduction

The retail industry plays a central role in modern economies, as it directly connects producers and consumers, generates significant levels of employment and contributes substantially to national gross domestic product (GDP). According to the European Commission website: “the retail ecosystem encompasses various sectors, including grocery and non-grocery retail, wholesale and online platforms. It is closely interconnected with manufacturers, importers, packaging, transportation and logistics service providers, postal and courier services providers, fulfilment centres, marketing, financial and payment services and retail real estate.” (European Commission, 2025) retail also influences consumption patterns, distribution systems and overall market dynamics, making it a key sector for economic growth and social development. Due to its interaction with consumers and rapid exposure to market changes, retail is inherently dynamic and continuously adapts to evolving economic, technological and social conditions.

In recent decades, digital technologies have increasingly reshaped economic activities across most industries, transforming how firms operate, interact with customers and create value. Technologies such as e-commerce platforms, mobile applications, big data analytics, artificial intelligence and cloud computing have altered business processes, customer experiences and competitive strategies. The retail sector has been particularly affected by these developments, as digitalization has changed traditional models of distribution, communication and service delivery.

The COVID-19 pandemic further accelerated this transformation, acting as a major external shock that forced retailers to rapidly adopt digital solution in order to maintain operations and respond to changing consumer behaviors (Gupta et al., 2023). As a result, the post pandemic retail landscape is characterized by increased reliance on digital channels, omnichannel strategies and technology driven business models (Ean et al., 2022)

Against this background, this paper aims to explore the effects of digital transformation on the post-pandemic retail industry through a systematic literature review. By synthesizing existing academic research, the study seeks to identify trends, impacts and challenges associated with digitalization in retail and to provide an overview of how the retail sector is evolving in response to technological change.

Literature review

Digital transformation has become one of the most discussed topics in contemporary management and information systems research over the last decade. Despite being widely used, researchers define the concept in different ways depending on the level of technological, organizational or strategic changes examined. Vial (2019) defines digital transformation as a process in which organizations improve their performance by integrating digital technologies into business models, operational activities and customer interactions. Similarly, Verhoef et al. (2021) argue that digital transformation should not be understood merely as the implementation of new technologies, but rather as a broader organizational shift involving structural and cultural changes as well as strategic reorientation.

Within the retail sector, *digitalization* refers to the integration of digital technologies into retail operations and customer relevant activities with the aim of increasing customer engagement and creating additional value (Hagberg et al., 2016). As digital tools become more and more integrated in retail operations, they influence the way retailers communicate with customers, organize the supply chains and deliver products and services across both physical and online environments. Reinartz et al. (2019) note that digital retail has gradually evolved from a predominantly brick store-based industry into a hybrid ecosystem shaped by omnichannel strategies and digital platform interactions.

A large number of technologies currently support digital transformation in retail. Artificial Intelligence (AI) and Machine Learning (ML) support functions such as personalized recommendations, demand forecasting, and automated decision-making (Davenport et al., 2020). Big data analytics allows retailers to process large volumes of customer and transaction data in order in order to better understand consumer behavior and optimize operations (Wamba et al., 2017). At the same time, Internet of Things (IoT) technologies contribute to the development of smart retail environments through devices such as RFID systems, sensors, and intelligent shelves, improving inventory control and in-store experiences. Cloud computing further supports digital transformation by offering scalable infrastructure and real-time access to data and services. In addition, digital platforms facilitate interactions between retailers, customers, and external partners, contributing to the emergence of new business models and transforming market dynamics (de Reuver et al., 2018).

Together, these technologies form the technological foundation of digital transformation in retail and support more flexible, data-driven and consumer-oriented business strategies.

Sorescu et al. (2011) note that business models consist of interconnected elements related to *format, activities, and governance*. From this systems perspective, innovation in retail business models involves changes not only in individual, isolated activities, but also in the relationship

between these components and the value creation and capture chain. Business model transformation therefore extends beyond isolated tactical adjustments, such as introducing a new product category, and instead reflects broader organizational reconfiguration across channels, operations, and stakeholder relationships. The relevance of these transformations became particularly visible during the COVID-19 pandemic, when many retailers adapted their operations through the expansion of online channels, click-and-collect systems, and contactless delivery solutions.

Methodology

Following the review of the theoretical foundations concerning retail evolution and digital transformation, the research continues toward a systematic examination of the ways in which digital transformation has reshaped the retail sector in the post-pandemic environment. To address this objective, the study adopts a Systematic Literature Review (SLR) methodology with focus on contemporary retail business models and their transformation through digital technologies. The review process follows the PRISMA framework, which supports a transparent and replicable procedure for identifying, screening, and selecting relevant academic sources (Page et al., 2021).

The Web of Science (WoS) database was selected as the primary source of literature due to its strong academic reputation and extensive coverage of peer-reviewed journals. Another important consideration was the database's suitability for systematic review procedures, especially because it offers standardized indexing and reliable citation metadata. Previous methodological studies have highlighted the advantages of WoS for systematic reviews, especially in terms of consistency and reproducibility of search results (Gusenbauer et al., 2020). Compared with broader databases, WoS provides stricter journal selection standards. This helps reduce the inclusion of low-quality or non-academic sources. Although expanding the search to additional databases could have increased the number of retrieved studies, the present research prioritizes methodological rigor, quality control, and transparency in the selection process.

The study aims to explore how digital transformation influences retail business models in the period following the COVID-19 pandemic. Based on this objective, the systematic review is guided by the following research question: *How has digital transformation reshaped retail business models in contemporary retail environments?*

To address this question, the search strategy was developed around three interconnected thematic dimensions: digital transformation, business models, and retail.

The first group of keywords included the terms “digital transformation,” “digitization,” and “digitalization.” These concepts were selected in order to capture the variety of expressions used in academic literature to describe technology-driven organizational change. Even though “digital transformation” is the dominant concept in recent research, the other terms are frequently used across different disciplines and contexts, making their inclusion necessary for a broader and more accurate literature coverage.

The second thematic dimension focused on business models and included the keywords “business model,” “value creation,” and “innovation.” Existing literature often discusses transformations in retail through concepts related to innovation and value creation without explicitly referring to the term “business model.” Including these additional concepts therefore increased the methodological nature of the search process and reduced the possibility of excluding relevant studies addressing similar phenomena from different theoretical perspectives.

The third thematic dimension focused on the retail sector itself and included the keywords “retail,” “retailing,” “retailer,” “online retail,” “e-commerce,” and “omnichannel.” These terms

were selected to reflect the broad variety of retail formats and distribution channels discussed in the literature, ranging from traditional physical stores to digitally integrated and hybrid retail environments. Including both conventional and digital retail terminology helped ensure that the search captured studies addressing different forms of retail business models and their ongoing transformation.

Based on these three conceptual dimensions, the search strategy was designed to identify studies examining the relationship between digital transformation and retail business model innovation. The following search query was applied in the Web of Science database:

TS= ("digital transformation" OR digitization OR digitalization)

AND ("business model" OR "value creation" OR innovation)*

AND (retail OR retailing OR retailer OR "online retail*" OR e-commerce OR omnichannel))*

For the literature search, the Topic (TS) field available in Web of Science was used instead of limiting the search exclusively to article titles. The TS field includes titles, abstracts, and author keywords, allowing for broader coverage of the literature. This approach was considered more appropriate for a systematic review because many studies discuss digital transformation or business model innovation extensively within the abstract or keywords without necessarily mentioning these concepts directly in the title.

The PRISMA framework has become one of the most widely used approaches for conducting systematic literature reviews due to its emphasis on transparency and methodological consistency. Previous studies in retail and related research fields have successfully adopted PRISMA-based methodologies, including the works of Yang et al. (2017), Melacini et al. (2018), and Risberg (2023). These studies demonstrate the usefulness of PRISMA for organizing the literature selection process. It lead to identifying dominant research directions, and analyzing theoretical and methodological patterns across existing publications. The continued use and citation of these reviews further supports the academic relevance and methodological credibility of PRISMA as a framework for evidence synthesis.

The initial search generated 434 records. Since the research focuses specifically on post-pandemic developments in retail, the dataset was first filtered by publication year. Only studies published between 2020 and 2026 were retained, as this period captures both the outbreak of the COVID-19 pandemic and the accelerated digital transformation that followed. After applying this criterion, the number of records decreased to 367.

A second filtering stage focused on document type. To maintain academic rigor and ensure the inclusion of validated research findings, only peer-reviewed journal articles were retained. Conference proceedings, editorials, book chapters, and other publication types were excluded at this stage, reducing the dataset to 293 articles.

The next step involved applying a language filter. Articles published in English and German were included in the review. English-language publications were expected to dominate the international literature, while German-language studies were included in order to broaden the scope of the review and reduce potential language bias. Since the researcher is proficient in German, these sources could be assessed and interpreted accurately. Following this step, the sample consisted of 286 studies.

The dataset was then refined further using Web of Science research categories. Only categories directly related to the research topic were retained, including Business, Management, Economics, Environmental Sciences and Studies, and Green and Sustainable Science and Technology. After this stage, the final dataset used for the screening process contained 227 articles. The complete selection procedure was documented through a PRISMA flow diagram to ensure transparency and reproducibility.

During the eligibility stage, all remaining articles were assessed through full-text review in order to verify their relevance to the research objective. This process reduced the number of eligible studies to 67. Most excluded articles focused on industries outside the retail sector, such as banking, manufacturing, transportation, or industrial production. Other studies were excluded because they concentrated primarily on corporate social responsibility (CSR) topics without establishing a direct connection to retail business model transformation or digitalization. The remaining 67 articles formed the final sample for the qualitative analysis.

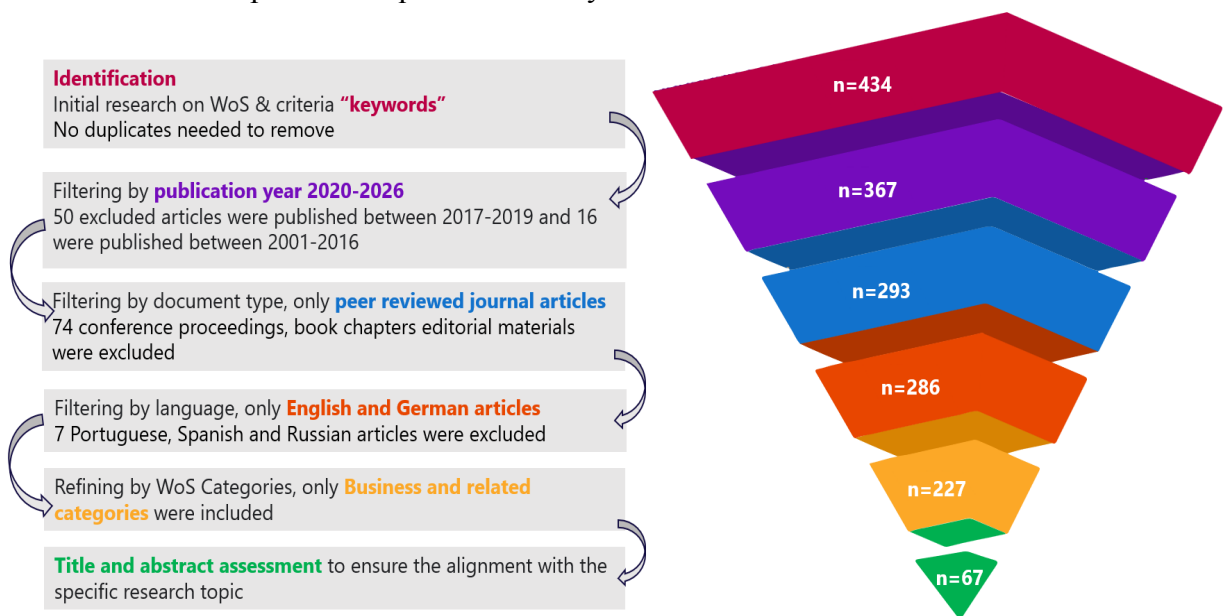


Figure 1. PRISMA flow chart on the article selection process

Source: Autor's own research with the help of Microsoft PowerPoint.

Results and discussions

The analysis of the 67 selected studies provides an overview of the ways in which digital transformation and emerging technologies are reshaping both the retail sector and its associated supply chains. Across the reviewed literature, researchers discuss several major strategic developments. These include mainly the expansion of omnichannel retailing, the growing use of artificial intelligence, and the integration of Internet of Things (IoT) technologies aimed at improving operational performance and customer interaction. One of the most frequently recurring themes identified in the review relates to the impact of the COVID-19 pandemic. This topic was explicitly discussed in approximately 18% of the analyzed papers. The pandemic is widely described as a turning point that accelerated the transition toward digital platforms. Contactless shopping solutions and new forms of retail interaction were also included were also addressed. In addition, many studies emphasize the importance of business model innovation in helping retailers balance efficiency, flexibility, and customer expectations in rapidly changing market conditions.

The reviewed literature also highlights the contribution of technological integration to organizational resilience and sustainability across different retail contexts.

COVID-19 pandemic as a catalyst for retail digital transformation

The COVID-19 pandemic began at the end of 2019. It was officially declared a global pandemic by the World Health Organization in March 2020. The health crisis, together with the restrictions introduced to limit the spread of the virus, generated substantial disruptions across economic sectors worldwide. In retail, lockdowns, social distancing measures, and mobility restrictions significantly affected both consumer behavior and the day-to-day functioning of businesses. These events and social measures created pressure for rapid operational adaptation.

Among the 67 articles included in the review, 15 studies explicitly identified the pandemic as a major accelerator of digital transformation within the retail sector. These studies describe COVID-19 as an external shock that forced retailers to accelerate digital adoption. The digitalization was not simply part of long-term strategic development, it was more an immediate response of the activity sector necessary for business continuity and survival (Allagiannis et al., 2025; Ean et al., 2022). The transformation occurred through multiple interconnected processes, including the rapid implementation of digital technologies, the redesign of customer interaction channels, and the restructuring of existing business models.

One of the strongest drivers of this transformation was the temporary closure of physical stores during lockdown periods, which led to fast declines in customer traffic and in-store sales (Allagiannis et al., 2025). As a result, many retailers redirected their activities toward digital channels and accelerated investments in online operations (Baldivia et al., 2024). In parallel, some companies introduced service robots. Other automated solutions were also adopted in an effort to better integrate digital and physical retail environments while remaining competitive within increasingly technology-driven markets (Ean et al., 2022).

Retailers that had previously relied primarily on physical stores were compelled to implement digital alternatives such as e-commerce platforms, mobile applications, and online marketing tools (Palmié et al., 2022). In South Africa, for instance, major food retailers adopted “click-and-collect” services and mobile-based purchasing systems, contributing to a reported 50% increase in online sales during 2020 (Ean et al., 2022).

The pandemic also accelerated the adoption of omnichannel retail strategies among small and medium-sized retailers. These strategies aimed to create more integrated customer experiences by connecting websites, mobile applications, social media platforms, and physical stores into a unified retail ecosystem. Implementing such systems required retailers to overcome important operational and technological challenges. Among the basic steps was the integration of information technologies capable of supporting customer engagement, sales optimization, and feedback management (Baldivia et al., 2024).

At the same time, concerns regarding physical interaction and public health increased demand for contactless retail solutions (Wang et al., 2024). As a consequence, retailers expanded the use of technologies such as contactless payment systems, automated vending solutions, and digitally enabled self-service stores (Heins, 2023).

Finally, Joshi et al. (2023), in their analysis of the Czech retail sector, demonstrate that the pandemic also encouraged the adoption of more advanced digital technologies, including Artificial Intelligence (AI), Machine Learning (ML), and Augmented Reality (AR). Their findings indicate that the crisis accelerated the development of voice-assisted shopping systems and intensified the use of digital marketing practices aimed at improving customer interaction and personalization.

Business Model Innovation and Resilience

The findings show that 28 of the 67 reviewed studies describe the pandemic as a major driver of business model innovation in retail. Many retailers had to rethink how they create value and interact with customers. Studies suggest that companies needed to balance efficiency-focused strategies, which support quick adaptation, with more innovative approaches that encourage deeper transformation (Hu et al., 2025; Yang et al., 2023). Research from China shows that retailers using “New Retail” models, which combine online and offline operations, performed better during the pandemic than traditional retailers in terms of efficiency and productivity (Yang et al., 2023).

Operational flexibility was also an important factor in business resilience. Companies that adapted their products and services while expanding digital sales channels achieved better sales results and adjusted more easily to market changes (Shekarian et al., 2023). In contrast, businesses that relied only on physical stores faced greater difficulties and were less adaptable.

The pandemic also changed consumer behaviour and accelerated digital engagement. More consumers turned to online shopping because of health concerns and movement restrictions (Neiberger et al., 2020). At the same time, customers developed new expectations, including a preference for contactless shopping and “phygital” experiences that combine physical and digital retail. In Germany, for example, the pandemic created new opportunities for online grocery shopping, although this growth slowed once restrictions were lifted (Dannenberg et al., 2020).

Sustainability

The literature shows that technology integration helps retailers respond more effectively to external challenges such as the COVID-19 pandemic and market instability. Organizational resilience is strongly connected to digital flexibility, which allows businesses to adjust sales channels and product offerings during crises (Shekarian et al., 2023). Companies that combined product or service changes with digital sales channels achieved better results, while businesses that depended only on physical stores struggled more.

Digitalization also improves supply chain flexibility by helping firms balance efficiency and innovation. Research suggests that digital supply chains strengthen overall business resilience (Poku et al., 2025). In unstable and uncertain business environments, digital transformation also supports both gradual and major innovations (Su et al., 2025). In addition, retailers can improve long-term resilience by managing multiple business models and integrating physical and digital operations through technology (Casciani et al., 2022).

Technology also helps reduce environmental impact and supports sustainable business practices. Many studies highlight the importance of reducing waste and improving resource management. For example, Ou et al. (2021) found that digital tools in the fresh food sector help retailers predict consumer demand and adjust prices more effectively. This reduced food waste while also increasing profits. Other studies show that combining blockchain and Internet of Things (IoT) technologies improves supply chain management, reduces waste, and lowers carbon emissions (Nazir et al., 2024).

Technology-based strategies are also important for the growth of online second-hand and resale platforms. These platforms encourage sustainable consumption and support the circular economy by making it easier and safer for consumers to buy and sell used products.

Conclusion

This research paper examines how digital technologies are changing the global retail industry, especially after the disruptions caused by the COVID-19 pandemic. Using a systematic review of academic literature, the study shows that major crises, including global health emergencies, often accelerate the adoption of e-commerce and omnichannel business models. The findings point to technologies such as artificial intelligence, blockchain, and the Internet of Things as important tools for improving operational efficiency and strengthening customer engagement. The reviewed studies also indicate that innovation in business models can help companies become more resilient while supporting sustainability by reducing waste and more efficient supply chains.

Overall, the literature suggests that retail is mainly moving toward hybrid environments where physical and digital experiences are closely connected in order to respond to changing consumer expectations and purchasing habits.

This study contributes to the existing literature by bringing together and organizing current research on digital transformation in post-pandemic retail. It also provides useful insights for both researchers and practitioners by highlighting major trends, identifying gaps in the literature, and outlining possible directions for future research.

Future studies could build on these findings by examining how digital transformation affects retail performance, resilience, and competitiveness in real business settings. More research is also needed on consumer behaviour in hybrid and omnichannel retail environments, particularly regarding digital trust, customer engagement, and changing purchasing patterns. In addition, technology-focused research on artificial intelligence, the Internet of Things, and other digital innovations could provide a clearer understanding of how these technologies contribute to operational efficiency and supply chain optimization. Comparative studies across different countries and markets would also be valuable, as the pace and nature of digital adoption can vary significantly depending on the context. Finally, long-term studies are needed to evaluate whether the digital transformations adopted after the pandemic remain sustainable over time and how they continue to influence organizational resilience and sustainable retail practices.

Although this study followed a systematic and structured research approach, several limitations should be considered. First, the literature review relied exclusively on the Web of Science database. While Web of Science is recognized as a reliable and high-quality academic source, limiting the search to a single database may have excluded relevant studies available through platforms such as Scopus, PubMed, or Google Scholar. Second, the review applied specific inclusion and exclusion criteria, including restrictions related to language and publication period, which may have resulted in the omission of relevant research published in other languages or outside the selected timeframe. Third, like most systematic literature reviews, the conclusions of this study depend on the quality and methodological rigor of the studies included in the analysis. Finally, the thematic analysis and categorization of findings involved a degree of interpretation, which may introduce some level of researcher bias despite efforts to maintain consistency and transparency throughout the process.

These limitations should be taken into account when interpreting the results and may serve as a basis for future research. Expanding the review to multiple databases, incorporating grey literature, and combining different methodological approaches could provide a broader and more systematic understanding of digital transformation in the retail sector.

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