Journal of
Risk and Financial Management

MDPI

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Exploring Coupled Open Innovation for Digital Servitization in Grocery Retail: From Digital Dynamic Capabilities Perspective

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Abstract: Open innovation and digital servitization have been hot topics in existing research. Moreover, the latest research in entrepreneurship and general management justifies that the performance results of specific innovation strategies are usually influenced by dynamic capabilities. However, there is little empirical research on the linkage of open innovation, digital servitization, and micro-foundations of digital dynamic capabilities that affect alliance performance. The emerging literature on open innovation provides partial insight into the micro-foundations of digital dynamic capabilities. Based on it, from a dynamic capability perspective, this paper constructs a conceptual model of research including coupled open innovation of collaborative partners, alliance's formation phases, and dynamic digital capabilities and their micro-foundations which impact alliance performance in grocery retail. The paper aims to provide an overarching view of the digital servitization process of grocery retailers and unpack the micro-foundations of the digital transformation of their business models to sustain advantages. Thus, the paper contributes to the research on open innovation, blockchain technology, artificial intelligence, and dynamic capabilities and provides two theoretical propositions. Then, having employed two illustrative case studies, this paper empirically tests theoretical propositions and justifies the role of coupled open innovation strategies for digital servitization and its micro-foundations.

Keywords: open innovation; blockchain; artificial intelligence; dynamic capabilities; digital servitization

Citation: Čirjevskis, Andrejs. 2022. Exploring Coupled Open Innovation for Digital Servitization in Grocery Retail: From Digital Dynamic Capabilities Perspective. *Journal of Risk and Financial Management* 15: 411. https://doi.org/10.3390/jrfm15090411

Academic Editors: Aleksy Kwilinski, Aleksandra Kuzior and Oleksii Lyulyov

Received: 7 August 2022
Accepted: 13 September 2022
Published: 16 September 2022

1. Introduction and Motivation for Research

In current post-pandemic contexts, characterized by crossing the perspectives of digitization and servitization (Gebauer et al. 2021), open innovation is a fundamental mechanism for companies to achieve competitive advantages (González-Sánchez et al. 2020). Open innovation (OI) requires procedures for obtaining and absorbing knowledge that resides outside the firm (Ferraris et al. 2020). Recently, scholars (Cândido and Sousa 2017; Piller and West 2014) found that the formation of collaborative ventures between retailers and technologically advanced partners is "leading to higher value creation" and "consumer-centric solution development" (Piller and West 2014). Moreover, the role of dynamic capabilities in the open innovation-type alliance is difficult to overestimate in terms of the capabilities of collaborative partners to build, integrate, and reconfigure internal and external core competencies (Teece et al. 1997).

The subject of this paper is critical and relevant, as the emerging literature on open innovation provides incomplete insight into the micro-foundations of digital dynamic capabilities. To date, to the best of the author's knowledge, the academic literature provides partial insight into this complex topic. Digital servitization of grocery retailers constitutes a major change that rearranges their activity system and therefore profoundly changes their value-creation process. "The literature tells us little about what this change entails and the key value drivers that the most advanced customer-centric service providers focus on and how they adopt outcome business models" (Visnjic et al. 2017, p. 169).

Therefore, the paper aims to provide an overarching view of the digital servitization process of grocery retailers and unpack micro-foundations of the digital transformation of their business models for a better outcome. Moreover, the paper bridges the research on open innovation, blockchain technology, artificial intelligence, and digital SSR (sensing, seizing, and reconfiguring) dynamic capabilities framework to provide an integrated conceptual model of research for the theory and decision-making tool for practice, as well as illuminating directions for future inquiry.

As objects of research, the author has chosen grocery retailers that are especially active in the global operation scope of operations and successful in their digital transformation: Walmart (USA) and Carrefours (EU) groups. The case studies of Walmart and Carrefour help to unpack the linkage between digital dynamic capabilities, business model innovation, and digital servitization. The grocery retail business was selected for the reason of its global nature and the tremendous digital transformation processes that this industry has undergone during and after the COVID-19 pandemic.

Moreover, this empirical paper fills the gap in the literature which is primarily 75% theoretical and only 25% empirical—focusing on proving the existence of dynamic capabilities (Baretto 2010). In this vein, the current paper justifies two developed theoretical propositions and illustrates a phenomenon of digital dynamic capabilities answering "how" questions: How do digital dynamic capabilities in the open innovation-type alliance entail profoundly changing grocery retailers' business model in the value-creation process? How does the renewal process of their business model exert their digital servitization?

Schilke et al. (2018) argue that information technology (IT) is a key antecedent of knowledge-intensive dynamic capabilities (Zollo and Winter 2002) or IT-enabled (digital) dynamic capabilities (ITDCs). In this vein, this paper is a novel contribution to the digital (IT-based) dynamic capabilities needed for a digital transformation using the OI-type strategic alliances in the global grocery industry pursuing digital servitization.

The remaining part of the paper is organized as follows. First, the paper discusses the linkage of open innovation theory with the SSR dynamic capabilities framework (Teece 2007). Then the paper explores the digital dynamic capabilities and transformation of building blocks of business models that are important for successful digital servitization and develops two theoretical propositions.

Next, the paper provides two illustrative case studies of the strategic alliances between IBM and Walmart in 2016 and Alphabet and Carrefour in 2018 as empirical justifications of developed theoretical propositions. A methodology is based on case studies concerning the strategic alliances between IBM and Walmart and between Alphabet and Carrefour which are consistent with the objective of the paper. In the end, the paper develops a conceptual model for future research and foregrounds the paper's theoretical and managerial contributions.

2. Literature Review

2.1. Understanding Digital Dynamic Capabilities for Digital Servitization of Grocery Retailers Employing an Open Innovation Type of Strategic Alliance

Grocery retailers can contribute to their innovation by employing external advanced technology such as artificial intelligence and blockchain. This distributed innovation process based on the management of knowledge flows beyond retailer internal boundaries was formulated by Chesbrough and Bogers (2014) as an idea of open innovation (OI). Open innovation can be formulated as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model" (Chesbrough and Bogers 2014, p. 1).

By employing external or inbound knowledge (outside-in type of OI) and exploiting internal or outbound core competencies (inside-out type of OI), retailers can promote their digital servitization in the form of coupled-mode OI (inbound and outbound). Coupled-

mode open innovation refers to collaborative ventures (alliances, networks, and partnerships) through which joint value is created (Huizingh 2011).

OI-type alliance collaborative partners exploit their complementary resources and capabilities, "enabling a more effective process based on the exchange and transfer of knowledge between the partners" (Inigo et al. 2020), which improves innovation, e.g., digital servitization. Digital servitization can be understood as the "customer-centric" transformation of a business model through digital technologies (Paschou et al. 2020) that is enabled by alliance-based coupled open innovation.

Recently, Bogers et al. (2019) developed "a dynamic capabilities framework as a way to better understand the strategic management of open innovation, which can then help to better explain both success and failure in open innovation" (Bogers et al. 2019, p. 77). In turn, "dynamic capabilities are undergirded by three sets of organizational processes: sensing, seizing and transforming capabilities" (Teece 2007). Bogers et al. (2019) argue that these three clusters (SSR) of dynamic capabilities framework can "help companies effectively reap the full benefits of open innovation" (Bogers et al. 2019, p. 84). Put simply, such a form of coupled or co-creating type of OI (Bogers et al. 2018) undeniably enquires about the dynamic capabilities of collaborative partners in strategic alliances.

There is a lot of evidence in the open innovation literature to the effect that alliance capabilities matter (Inigo et al. 2020, p. 552). A strategic alliance is a purposive relationship between two or more independent firms that involves the exchange, sharing, or co-development of resources or capabilities to achieve mutually relevant benefits (Prashant and Harbir 2009; Gulati 1995). Strategic alliances also give access to innovation-creating knowledge (Yoo et al. 2018). Alliance capabilities in the context of open innovation and digital transformation of retailers can be thought of as micro-foundations of dynamic capabilities of collaborative partners. Bengtsson et al. (2016) discussed the importance of applying theories about the micro-foundations of strategic action in collaborative research. According to Contractor et al. (2019), micro-foundations force one "to unpack or decompose aggregate firm-level concepts in terms of individual action and interaction; to understand the process that aggregates individual actions into resultant strategy outcomes" (Contractor et al. 2019, p. 6).

According to Bogers et al. (2019), the important micro-foundations of dynamic capabilities are exploration and identification of valuable external knowledge, putting processes of OI into place to commercialize ideas, realigning the organization to integrate external knowledge, and developing a culture that promotes collaboration and adjusts the mix of internally and externally developed technologies to reflect changing customers' needs and new market opportunities. To continue this SSR micro-foundation tradition, Warner and Wäger (2019) provided an idea of digital dynamic capabilities with nine digital micro-foundations or digital sub-capabilities that retailers can employ to cope with digital servitization.

According to Warner and Wäger (2019), *digital sensing* capabilities assume the capabilities to sense new *customer-centric trends* and the importance of such digitalization trends as big data analytics, blockchain, and artificial intelligence to deliver outstanding service for the customers. In this sense, digital vision and digital culture possess paramount importance when building digital sensing capabilities. *Digital seizing* capabilities require strategic agility to build "digital innovation labs", *gather customer feedback*, and therefore respond to new customer-centric trends by digitalization transformation. Finally, the digital transforming capabilities assume building a digital ecosystem to work with new collaborative partners that require "co-creation" and "co-opetition" activities, which help accelerate the speed of reinvention of business models (Warner and Wäger 2019).

Thus,

Proposition 1. *Grocery retailers need three clusters of digital dynamic capabilities (digital sensing, digital seizing, and digital transforming) to effectively reap the full benefits of the OI-type strategic alliance for the reinvention of their business model.*

2.2. Understanding the Linkage of Digital Dynamic Capabilities with Strategic Renewal of Business Model of Grocery Retailers That Enable Their Digital Servitization

The strength of a firm's dynamic capabilities shapes its proficiency in business model design (Teece 2018). Business model design intends to answer the questions of to whom, what, how, and why some value is delivered and provide a starting point for considering business model innovation, also in digital servitization (Kohtamaki et al. 2022, p. 262). Teece (2018) described a business model as "an architecture for how a firm creates and delivers value to customers and the mechanisms employed to capture a share of that value. It's a matched set of elements encompassing the flows of costs, revenues, and profits" (Teece 2018, p. 40). Therefore, a business model is a set of purposively crafted managerial routines exploiting their VRIO resources (Barney and Hesterly 2018) creating and delivering value to their customers and capturing this value in the form of total shareholders' return.

Thanks to the strategic design of a business model by Amit and Zott (Amit and Zott 2021) and the business model canvas (Osterwalder and Yves 2009), the building blocks of a business model are now considered an important managerial lever for business model innovation that shapes the customer value proposition and, thus, fosters digital servitization of grocery retailers.

Osterwalder and Yves (2009) argue that a business model may be understood as a building block or detailed description of the way that the elaborated strategy will be executed. Johnson et al. (2008) considered four building blocks of a business model: key resources, key processes, profit formula, and the customer value proposition. The most important block is the customer value proposition, without which a firm has no reason to exist (Lambert 2008). When it comes to the profit formula, Johnson et al. (2008) explained this block as "the blueprint that defines how a company creates value for itself providing value to the customers" (Johnson et al. 2008, p. 60).

Regarding the next block of "key resources", Lambert argued they consist of "information technology hardware and software, intellectual property, financial, physical and human resources" (Johnson et al. 2008, p. 285). Indeed, today's information technology ensures the retailer has an opportunity to deliver value to target market segments, capture value to stakeholders, and thereby provide a customer value proposition. Concerning the last building block of a business model "key processes", Johnson et al. (2008) state that operational and managerial routings allow the incumbent firm to provide value in a manner that can be successfully replicated and intensified in scale. Thus, these four building blocks are the basis of every business model of incumbent firms. Put simply, key managerial routings that exploit key idiosyncratic resources deliver value to the customer (a customer value proposition) and capture value for the stakeholders (a profit formula).

The last and most crucial block, "a customer value proposition", needs more insight. Gitomer (2005) argued that a well-built value proposition will gain the interest of the marketplace, engage the customer, solve their specific need in a better way in comparison with competitors and, to put it simply, provide a competitive advantage. Thus, digital servitization has to provide the customer value proposition (CVP), and this CVP should specifically rely on digital technology (key resources), digital dynamic capabilities (key activities), and solutions to customers' needs (profit formula).

Therefore,

Proposition 2. *Digital dynamic capabilities of grocery retailers in the OI-type of alliance with technologically advanced partners enable the strategic renewal of their business model that exerts digital servitization.*

To justify theoretical propositions empirically, the case studies of a newly established blockchain food safety partnership and digital transformation of retailers employing artificial intelligence were conducted within the last five years. The case studies have been chosen to illustrate how offline grocery giants went through a digital servitization of their business thanks to coupled open innovation and thanks to their technologically advanced alliance's high-tech partners.

3. Method

The explanatory nature of the paper's research questions ("how") prompted the author to conduct two comparative case studies (Eisenhardt and Graebner 2007). The paper employs a multiple case studies strategy to obtain a "more robust theory because the propositions are more deeply grounded in varied empirical evidence" (Eisenhardt and Graebner 2007, p. 27). This paper relies on an extensive archival search that included company reports, internal documents, industry publications, and CEOs' statements to obtain a better micro-level understanding (Barr et al. 1992) of digital dynamic capabilities. Using these data, the micro-foundations of digital dynamic capabilities as drivers of business model innovation that exert digital servitization of grocery retailers are identified.

As objects of research, the author has chosen grocery retailers that are especially active in the global operation scope of operations and successful in their digital transformation: Walmart (USA) and Carrefours (EU) groups. The aim of the case studies of Walmart and Carrefour is to unpack the linkage between digital dynamic capabilities, business model innovation, and digital servitization.

Eisenhardt and Graebner (2007) argued that it is appropriate to use a case study if phenomenon-driven research questions are subjects of investigation. A case study can be considered an experiment that could be repeated (Yin 2009). "Empirical studies are appearing that provide support for the (dynamic capabilities) framework. These often take an in-depth case study approach" (Teece 2012, p. 1400).

When it comes to the presentation of evidence, Eisenhardt and Graebner (2007) state that there is no strict norm in large-scale studies when presenting results. To demonstrate the digital dynamic capabilities of concrete retailers, the paper has employed a conceptual frame developed by Teece (2011) that helps to unravel data that were collected in search of the micro-foundations of digital dynamic capabilities. The conceptual model of the research is presented in Figure 1. The conceptual model's arrows correspond to provided theoretical propositions and explain the sequences of the case studies analyses and how the research questions will be answered.

How should digital dynamic capabilities in the open innovation-type alliance that entails profoundly changing grocery retailers' business model in the digital servitization process be researched?

There are three sets of digital dynamic capabilities that can be amplified to reconfigure of building blocks of the business model of grocery retailers to exert their digital servitization. The first bundle of digital dynamic capabilities (digital sensing) of grocery retailers is contributing to sensing customer-centric trends, scanning for technological trends, and formulating digital strategies for digital servitization. The second bundle of digital dynamic capabilities (digital seizing) is identifying and investing in an OI-type collaborative partnership network, reallocating digital idiosyncratic innovative resources of technologically advanced partners.

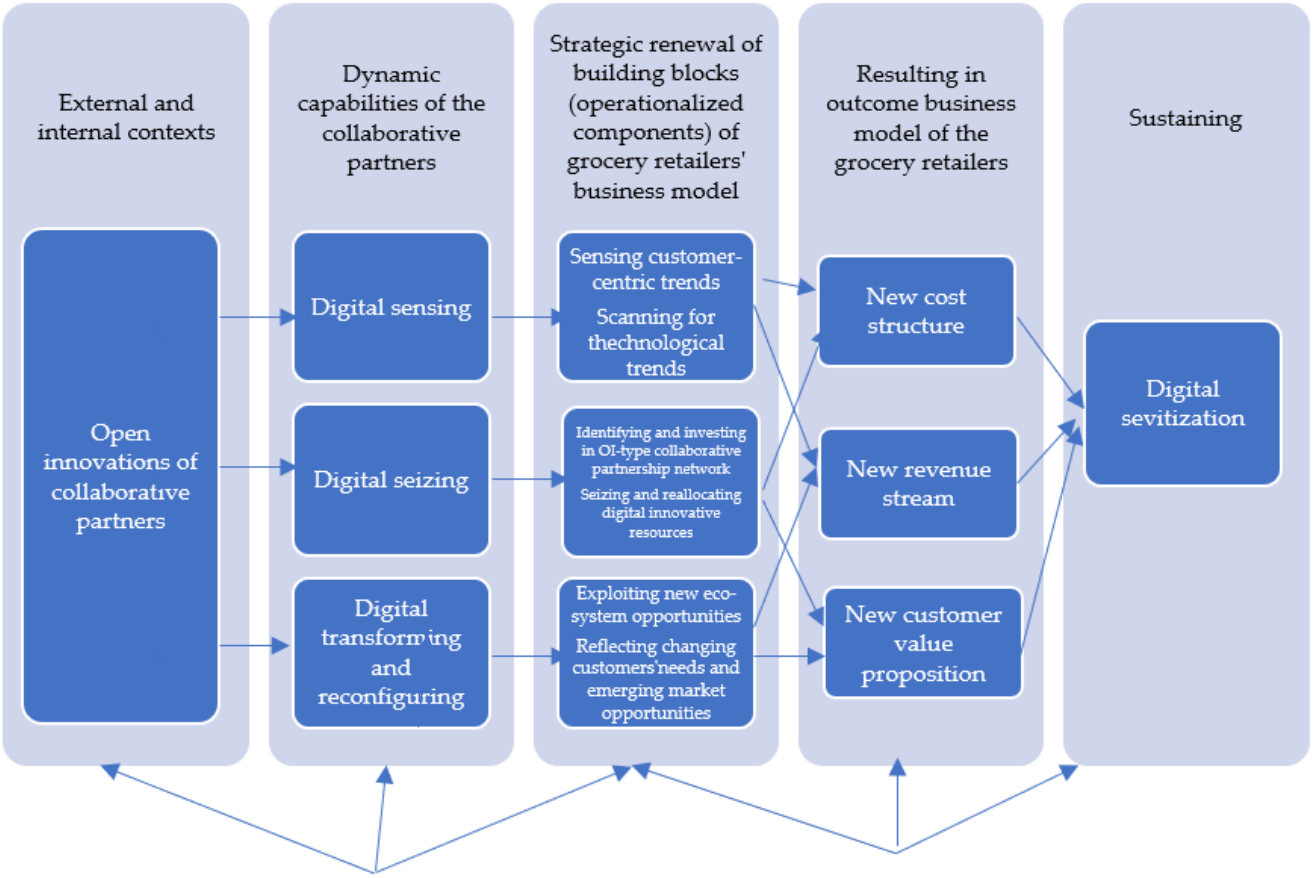

Figure 1. The conceptual model of current research. Adopted from Čirjevskis (2019) and modified.

The third bundle of digital dynamic capabilities (digital transforming) is contributing to reorchestrating of internally developed and externally acquired digital technologies and knowledge by exploiting new ecosystem opportunities. As the consequences of those renewals of building blocks of the business model, the grocery retailers establish a new cost structure, new revenue stream, and new customer value proposition, thereby exerting and sustaining a digital servitization of their business as presented in the model of research in Figure 1.

4. Case Studies to Interpret: Blockchain Technology and Artificial Intelligence for Digital Servitization of Grocery Retailers

Kohtamaki et al. (2022) argue that future empirical works can provide more detailed insights on how digital servitization unfolds for solution providers. Moreover, Kohtamaki et al. (2020) suppose that companies might prefer different paths to digital servitization, depending upon the different industries and contexts. They are convinced that future studies should provide more specific evidence on the evolvement of different paths to digital servitization and an overview of their transformational process (Kohtamaki et al. 2022).

In this vein, two case studies below provide detailed insight on different paths of digital servitization of grocery retailers in terms of the transformation of different components of their value chain (of "inbound" and "outbound" logistics) (Porter 2008) and different building blocks of their business models (Osterwalder and Yves 2009) pursuing their digital servitization in the global operational context.

4.1. Implementing Blockchains in the Grocery Industry: Walmart's Alliance with IBM Transformed the "Inbound" Logistics of Its Value Chain and, Thus, Business Model

According to Planer, Planet Retail RNG director: "the online and offline worlds are coming together. These abilities to connect with the customer and mine data are going to be one of the main capabilities for the future" (Thomasson 2018, p. 1). A real case of the digital servitization of grocery retail as an example of that was the strategic alliance between IBM and Walmart. Regarding their *digital sensing* cluster of dynamic capabilities, Walmart expected that this collaborative venture would bring transparency and traceability "from farm to fork" (Magee 2017). Walmart had had a series of meetings with IBM to identify the parameters and the data attributes they would capture.

Blockchain food tracking is predicted to ensure stronger quality assurance, more precise recall, and fresher produce and meat. When it comes to the *digital seizing* dynamic capabilities cluster, Walmart began a 12-month project to think about how to deliver fresher produce to customers efficiently and effectively. Partners have started programming and developing user interfaces (Magee 2017). Partnering with IBM brings Walmart's traceability and transparency to its entire food supply network with the blockchain (Magee 2017).

Finally, regarding *digital reconfiguring* dynamic capabilities, Walmart is able to track and trace where food comes from and how it flows from the farm to the table. With a blockchain, Walmart could pull a product's tracking information in less than three seconds. Blockchain ensures reduced waste and spoilage and fewer contamination incidents (Lawrence 2018). The blockchain solution dramatically improves the supply chain transparency of Walmart that exerts its digital servitization, thus justifying *the first theoretical proposition.*

Walmart's CFO Brett Biggs has stated: "We've focused on improving fresh presentation and product quality and this has resulted in stronger sales and market share gains" (Thadamalla 2020, p. 1). Walmart's total revenue grew to USD 127.99 billion in 2019 from USD 124.89 billion in 2018. Walmart's grocery sales accounted for 56%, making the retailer the largest grocer in the US (Thadamalla 2020).

4.2. Digital Servitization of Traditional Retailer's Business Model through Artificial Intelligence: Carrefour Alliance with Alphabet Transforming "Outbound" Logistics of Its Value Chain

When it comes to artificial intelligence (AI) technology, Krakowski et al. (2022) argue that AI affects competitive (dynamic) capabilities and organizational performance. Digital transformation with AI adoption shapes the incumbent competitive advantage and, in turn, requires managerial staff to develop new digital dynamic capabilities to stay relevant in an AI-based competitive landscape (Krakowski et al. 2022). Moreover, Csaszar and Laureiro-Martínez (2018) argue that AI-based dynamic capabilities have the potential to substitute human foresight.

As a story to reveal what retailers want with AI, having employed coupled OI strategies with Alphabet, Carrefour fostered digital dynamic capabilities to integrate and reconfigure external core competencies of high-tech collaborative partners for the group's digital servitization; thus, it reframed modes of thinking, reinvented its retailer's business model, and provided a new customer value proposition for their millions of customers as follows:

Europe's largest retailer has insightfully *sensed* and strategically *seized* an increasingly competitive global grocery market by entering into a strategic partnership with the ITC giant Alphabet *to create a "new grocery shopping experience" for its customers* (Floridi 2019). From 2019, Carrefour customers can buy Carrefour products through Google Assistant-connected speakers, such as Google Home, as well as a new Google shopping website in France (Floridi 2019). Thereby, Carrefour has *reorchestrated* and significantly improved its digital maturity, navigating its new innovative digital ecosystem, redesigning its internal structure, and strategically renewing its business model pursuing digital servitization.

Has Alphabet accelerated a long-awaited digital transformation for Carrefour? Analysts' consensus estimated that Carrefour expected 2020 a net profit of EUR 1.02 billion, which was almost twice bigger than in that in 2017, and the company's total revenue could be around EUR 71.57 billion. This was slightly lower than 2019's revenue of EUR

71.14 billion (Valuespectrum.com 2021). The impact was moderate, and to push digital servitization further, in November 2021, Carrefour unveiled a 2026 Digital Strategy, and this strategy adopted a "data-centric, digital first" approach (Ratna 2022, p. 2). In fact, by adopting a "data-centric, digital first" culture, Carrefour drives profound changes to traditional business processes including pricing, assortment strategy, activity forecasts, logistics, supply flows, and administrative processes.

The digital servitization of Carrefour contributes to the new customer experience, with greater personalization, and improved performance in terms of operational efficiency (Carrefour.com 2022). Today, customer-centric-based digital transformation is a norm at Carrefour. The retailer swiftly reacts to customer behavior and surely shapes the future of the grocery industry in Europe. The digital servitization strategy of Carrefour Group had proven successful and therefore has justified *the second research proposition*.

Research outcomes on the digital servitization of Walmart and Carrefour employing the OI-type strategic alliances with technologically advanced partners have been summarized in Table 1. Table 1 synthesizes the analysis of each of the relationships represented by the arrows in the conceptual model of research (Figure 1), provides an overarching view of the digital servitization process of grocery retailers in OI-type alliance, and unpacks the micro-foundations of the digital transformation of their business models and new customer value proposition to sustain advantages in global competitive battle in grocery retail business.

Table 1. Digital dynamic capabilities of Walmart in the OI-type of alliance with IBM and Carrefour in the OI-type alliance with Alphabet for strategic renewal of their business models exerting digital servitization.

Selected Digital Dynamic Capabilities (Warner and Wäger 2019)	The Renewal of the Operationalized Components of Business Model (Johnson et al. 2008) of Grocery Retailer in OI-Type of Alliance with Technologically Advanced Partners	Micro-Foundations (Processes) of Digital Dynamic Capabilities in Renewal of Business Model of Walmart in OI-Type of Alliance with IBM Pursuing Digital Servitization	Micro-Foundations (Processes) of Digital Dynamic Capabilities in Renewal of Business Model of Carrefour in OI-Type of Alliance with Alphabet Pursuing Digital Servitization
Digital sensing (sensing customer-centric trends, scanning for technological trends, formulating digital strategies, and promoting a digital mindset)	Identify changing customer behaviors and discover valuable external digital technologies (*key resources*)	Sensing the advantages of blockchain technology, wherein users could easily path all the transactions in real time, Walmart decided to implement blockchain technology in its supply chain. In 2017, Walmart collaborated with IBM to enhance the transparency and traceability of its entire supply chain network with the support of blockchain technology (Sharma 2019, p. 1)	Carrefour sensed that customers want simple and personalized experiences that help them decide on what to buy by easily building baskets and providing seamless checkout. Carrefour contributed to digital transformation by employing Google Cloud Platform and G Suite's collaboration tools (Javalgi 2018, p. 1)
Digital seizing (rapidly reallocating resources, using a digital innovation lab, setting an appropriate speed of execution, and pacing strategic responses)	Invest in OI-type alliance, mobilize external valuable, rare, inimitable, and non-substitutable (VRIO) resources 2018 to address customers' needs, and capture value from doing so (*key processes*)	Having seized external digital innovative technologies, Walmart has worked closely with IBM to create a user-friendly, low-cost, blockchain-enabled traceability solution that "creates shared value for the entire leafy green farm to table continuum" (Neil 2019, p. 1)	More than 1000 employees of Carrefour were trained with the support of Google Cloud in six months, and Google Cloud's G Suite productivity and collaboration solutions (Gmail, Calendar, Drive, Hangouts, Docs, etc.) were deployed to more than 160,000 Carrefour employees. (PYMNTS.com 2018)
Digital transformation (exploiting new ecosystem capabilities and reorchestrating internally developed and externally acquired digital technologies and knowledge)	Realign the partnering companies to integrate external knowledge and digital technologies to reflect changing customers' needs (*profit formula*) and, thus, provide a *new customer value proposition*	The OI-type alliance with IBM strengthened Walmart's ability to protect customers' health from the threat of foodborne illness. With blockchain technology in place, Walmart has enhanced its ability to trace contaminated food back to its source (Sharma 2019, p. 1)	The OI-type alliance enabled Google to provide its technological competencies in AI, Cloud, and new consumer shopping interfaces to Carrefour, while Carrefour offered its competencies, expertise, and knowledge in logistics and sales (PYMNTS.com 2018)

Source: developed by the author. Abbreviations: OI, open innovation.

5. Conclusions, Contributions, Limitations, and Future Research Question

The author aimed to bridge the research on digital dynamic capabilities, open innovation, blockchain technology, artificial intelligence, and building blocks of business models to provide a conceptual model of digital servitization for theory and practice. Two research

questions have been answered by providing two theoretical propositions that have been empirically justified using two case studies.

"Studies that provide a better understanding of business model innovation, implementation, and change will also shed light on important aspects of dynamic capabilities" (Teece 2018, p. 40). This paper contributes to this scientific request. Kohtamaki et al. (2022) are convinced that future empirical works can deliver a more insightful view of how digital servitization unfolds for solution providers and provide more concrete empirical evidence on the specific paths to digital servitization and an overarching view of the transformation process (p. 262).

What is more, Kohtamaki et al. argue that "future research direction on the digital servitization path toward smart solutions should be empirically mapped in different contexts, industries, ecosystems, and cases" (Kohtamaki et al. 2022, p. 262). Having justified two theoretical propositions and answered two research questions, this paper has also contributed to this scientific request.

Figure 2 summarizes the theoretical and managerial contributions, visualizes answers to research questions, and illustrates the relationship between research variables.

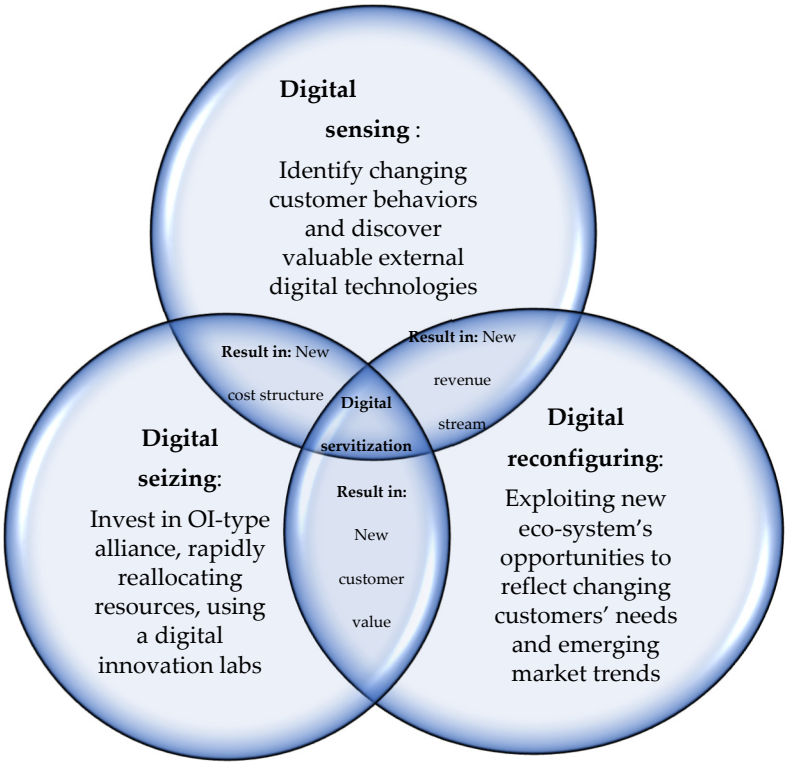

Figure 2. Integration of digital dynamic capabilities and strategic renewal of business model's components (outcome business model) in the process of digital servitization. Source: adapted from Čirjevskis (2019) and modified.

Figure 2 schematically maps a logical structure of the digital servitization paradigm as a product of digital dynamic capabilities and the renewal of building blocks of the business models. Figure 2 also presents the main proposed construct for future research as well as for practical recommendations on the OI-type alliance formation process. To effectively reap the full benefits of coupled open innovation, collaborative partners need three clusters of dynamic digital capabilities related to open innovation strategy in search of digital servitization.

Figure 2 demonstrates that the intersection of digital sensing and digital seizing capabilities results in a more efficient cost structure and the intersection of digital sensing and digital transforming capabilities results in a new revenue stream. The intersection

of digital seizing and digital transforming capabilities can provide a new customer value proposition. Thereby, the digital dynamic capabilities transform and renew the grocery retailer's operationalized components of their business model and underpin the retailer's digital servitization. Therefore, the primary theoretical contribution is the digital dynamic capabilities framework that serves as a tool for the analysis of a renewal of a business model of a grocery retailer in an OI-type of alliance with technologically advanced partners and pursuing digital servitization.

This article also contributes to researchers with a new view of the importance of digital dynamic capabilities and their role in changing the business model of a grocer within their digital servitization process. What is more, the research has contributed to the scientific interest of the Strategy Practice group of Strategic Management Society (USA) by providing answers to the questions that the group asks: "How do individual strategists and their teams shape strategy and firm performance? What is their role in the development and leverage of a firm's resources, capabilities, and processes? . . . What are the micro-foundations of the activities involved in the doing of strategy?" (Strategic Management Society 2022, p. 1). Specifically, this paper clarifies micro-foundations of digital dynamic capabilities that underpin the renewal of a business model of grocery retailers in OI-type alliances in pursuing digital servitization.

Regarding contribution to managers and investors, the presented model in Figure 2 encourages practitioners to grasp an exact relationship between micro-foundations of each perspective: digital dynamic capabilities, the process of the renewal of building blocks of the business model, and a digital servitization process. This model given in Figure 2 can be relevant to companies in other industries pursuing digital servitization. Therefore, the current research provides the application of the digital dynamic capabilities framework as a managerial tool for the business analysis of the renewal of a business model's components of a company in the digital servitization processes employing an OI-type strategic alliance.

When it comes to limitations of research, considering the conceptual nature of this paper, the data sample is relatively small, and therefore, a more robust quantitative analysis to prove or disprove proposed theoretical hypotheses will be needed in future research. The connection between the model and empirical context (grocery) and the proposed conceptual model probably would be also applicable in other (non-grocery) contexts.

Regarding digital dynamic capabilities dimensions associated with the OI-type alliance development, future research can ask a remaining research question: how are digital dynamic capabilities dimensions interrelated, and how does this interplay relate to development alliance phases within open innovation settings? Furthermore, as a future study, it would be interesting to present a questionnaire to grocery retail companies and, through structural equations, analyze the proposed relationships between research variables.

Funding: This research received no external funding.

Acknowledgments: This article is based on a conference manuscript presented at the Strategic Management Society (SMS) Special "Conference Governing Knowledge and Imagination in the Digital Era" at SDA Bocconi School of Management in Milan Italy 2022. The previous manuscript has been extended with new empirical and secondary data based on current research. The author would like to thank the anonymous reviewers of the SMS conference's manuscript for their valuable comments, recommendations, and insights. The financial support of RISEBA University of Applied Sciences for this paper's development is gratefully acknowledged.

Conflicts of Interest: The author declares no conflict of interest.

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