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Unravelling the Potential of Digital Servitization in Sustainability-Oriented Organizational Performance—Does Digital Leadership Make It Different?

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Abstract: This research proposed and enhanced a statistically reliable paradigm for determining the impacts of the role of digital servitization (DS) as a potential facilitator of sustainable and smart service innovation ecosystem (SSSIE) establishment and sustainability-oriented organizational performance (SOOP) improvement. Additionally, this research aimed to cast light on the role of digital leadership (DL) as a moderator of the hypothesized model. Structural equation modeling and multigroup analysis (MGA) were employed to process and analyze the data procured from a cross-sectional convenience sample of 412 respondents representing various public service sector organizations (PSSOs). The statistical outcomes corroborated that DS was positively and significantly correlated to SSSIE establishment, and at the same time, SOOP was significantly intensified by DS and SSSIE. Next, the nexus between DS and SOOP was enhanced when SSSIE was operationalized. Lastly, the MGA outcomes confirmed that all of the coefficients in the proposed model were statistically significantly different under the moderating effect of DL. These obtained findings could bring numerous valuable in-depth insights for practitioners and policymakers in digital initiatives management and governance.

Keywords: digital servitization; organizational performance; public service sector organization; innovation ecosystem

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1. Introduction

1.1. Research Motivation

Identified as the convergence of digitalization and servitization (Lerch and Gotsch 2015), digital servitization (DS) has become a paramount notion and has drawn extensive interest from practitioners and academicians in the last few years (Kohtamäki et al. 2019; Lerch and Gotsch 2015; Paschou et al. 2020; Paiola and Gebauer 2020; Sklyar et al. 2019). DS has offered consumers with IT-enabled resolutions a means of the planned integration of products and services (Paschou et al. 2020), which was referred to as DS (Kohtamäki et al. 2019; Sklyar et al. 2019). This emerging stream of literature has produced an understanding of the role of DS in achieving organizational performance (i.e., Opazo-Basáez et al. 2018, 2022; Bustinza et al. 2021). In another stream of research, several academic studies have deepened the analyses of the interconnection between DS and the definition of sustainability (Kohtamäki et al. 2019; Marić and Opazo-Basáez 2019; Paschou et al. 2020). Nevertheless, this stream of research has been still in its formative stages (Kohtamäki et al. 2019; Gebauer et al. 2020), regardless of the prospective academic and managerial importance of explaining how DS led to sustainability (Gebauer et al. 2020). More notably, this has resulted in fragmentation and a lack of integrated thinking on how an organization could enhance their overall performance from DS in a sustainable manner.

Nevertheless, organizations' successful adoption of DS has not been without its challenges. Several DS initiatives have fallen short of their promises due to the lack of ecosystem partnerships to warrant value creation and capture. The conversion toward DS is complicated, holistic, and, thus, hard to manage, and demands in-depth insights—not only in terms of fruitful strategic alignment but also in formulating a suitable ecosystem for DS implementation (Sklyar et al. 2019). The literature on DS has increasingly begun to recognize ecosystem transformation as a major precondition for DS (Kohtamäki et al. 2019; Coreynen et al. 2020; Gebauer et al. 2020; Naik et al. 2020; Sjödin et al. 2020; Sklyar et al. 2019). Building on an updated servitization literature review, this ecosystem has become one of the increasingly emergent and predominant themes in the research field (Khanra et al. 2021). The literature provided diverse perspectives on the ecosystem, namely, ecosystem renovation from the perspectives of the business ecosystem (Gawer and Cusumano 2014; Huikkola et al. 2020; Humbeck et al. 2019), service ecosystem (Alaimo et al. 2020; Jovanovic et al. 2019; Sklyar et al. 2019), and innovation ecosystem (Adner 2006, 2016; Adner and Kapoor 2010; Jacobides et al. 2018; Kamalaldin et al. 2021; Kummitha 2018). Notwithstanding the comparatively extensive studies that have been performed in the realm of DS, there have been still several gaps in the scholarly knowledge of the appropriate ecosystem for DS.

With the goals of ameliorating the quality and efficiency of citizen welfare services (Christensen and Lægreid 2007), there has been increasing pressure on public sector organizations to find more advanced ways of generating and delivering public services amidst socioeconomic challenges, namely, an aging population, population growth, and limited financial and human resources. Additionally, the contribution to sustainable development, outlined in an organization's sustainable development goals, means that all social components must adhere to specific economic, environmental, and social dimensions in the global world. With regard to this, PSSOs have not been excepted from these responsibilities. Therefore, PSSOs, through DS, may be given the chance to be effective and efficient in the generation and delivery of public services to citizens and to collaborate with other members in the ecosystem to achieve higher performance in a sustainable manner. Most of the studies related to DS have been commonly discussed in the context of large enterprises (Martín-Peña et al. 2019; Naik et al. 2020), while PSSOs' perspectives have earned meager coverage thus far.

On the other hand, the successful implementation of DS has not been without challenges for organizations. PSSOs have typically faced DS barriers, such as the more traditional mindset of leaders. However, these advancements have influenced public sector modernization, and thus require public sector leaders to adapt to these shifts and developments (Bekkers 2007). One of the most effective approaches that PSSOs could use to overcome these barriers have been to develop their DL.

1.2. Research Questions

Taken together, these factors highlight the need to rethink and formulate a new kind of ecosystem, to tap into the significant potential of DS, and to assure the enhancement of SOOP, which is SSSIE. Simultaneously, there is also a need to determine the mechanism for the successful implementation of DS, which is DL. Consequently, these considerations inspire the intriguing research questions (RQs), as follows:

RQ1. What is the impact of DS on SOOP?
RQ2. Does SSSIE mediate the interconnection between DS and SOOP?
RQ3. Does DL act as a moderator of the interconnections between DS, SOOP, and SSSIE?

1.3. Research Structure

In this regard, these RQs are addressed through composing the current manuscript in the following structure. After the introduction, the selected literature review is outlined in Section 2. The linkages between the components of the hypothesized model are introduced in Section 3. The methodological facets are defined in Section 4. The main observations are

delineated in Section 5. The final section ends with valuable implications and orientations for further works.

2. Literature Review

2.1. Theorical Background

Resource-advantage theory (RAT). RAT has been chronicled to be evolved from the two primary theories, namely resource-based theory proposed by Conner (1991) and competitiveness theory suggested by Alderson (1957) as well as Alderson (1965). As RAT expanded the RBV, which contemplated the organization as the integration of tangible and intangible resources the organization possessed, monitored, or reached, when an organization obtained a relative advantage in resources, it would attain its market positions of competitive leverage which, in turn, resulted in superior organizational performance (Hunt and Davis 2008).

Relational view theory (RWT). RWT was first founded by Dyer and Singh (1998) and was expanded by Lavie (2006); it pondered the networks and organizational dyads as units of analysis to cast light on relational rents. Due to the velocity of evolvement in the digital era, it was obviously that no organization could keep pace by itself (Bogers et al. 2018); in-depth collaboration would facilitate organizations to obtain the indispensable capabilities, experiences, and comprehensions in deploying digital initiatives (Ardolino et al. 2017). Thus, RWT was well-regarded as a very fruitful theoretical lens to investigate how interdependent interconnections were shaped in the context of DS.

In line with the perspectives of Klein and Myers (1999), the abovementioned theories applied in this study acted purely as sensitizing tools in a flexible manner rather than as a rigorous instrument for theory testifying.

2.2. Conceptual Framework

Digital servitization. As stated by Storbacka (2018), digitization fundamentally reflected the transformation from analogue to digital. More instrumentally, it has been a technical process converted analog information into a digital type which could be processed by similar technologies (Tilson et al. 2010). It facilitated scalability in the efficient generation and delivery of products/services (Ness et al. 2015), expanded the reach of organizations (Weill and Woerner 2015), and radically changed an entire organizational business model (Li 2018). Nevertheless, digitization could not typically spur a disruptive shift—more often than not, almost all organizations have applied digital technologies to incrementally revamp their existing value proposition (Furr and Shipilov 2019).

Digitization and the evolvement of digital technologies have been lately receiving flourishing concern in servitization research (Raddats et al. 2019), as digitalization has made numerous organizations look for approaches to move from product-centric paradigms to producing digital service-oriented offerings (Kohtamäki et al. 2020; Kowalkowski et al. 2017).

The terminology "servitization" first emerged in the work of Vandermerwe and Rada (1988). It was employed to depict how organizations were moving from the old and outdated concentration on products/services to integrated bundles/systems, with services in the lead part. The academic attention to servitization has been increasing exponentially and has been underlined in over a thousand studies over the past three decades (Fliess and Lexutt 2017; Rabetino et al. 2018).

With the support of these digital technologies, organizations have searched for value creation in their operations and provided advanced customer experiences. From this, a novel notion in the servitization literature known as DS has occurred (Coreynen et al. 2020; Gebauer et al. 2020; Paschou et al. 2020), in which organizations have adapted to modern technological developments by producing digitally enabled advanced services (Schroeder et al. 2020; Ziaee Bigdeli et al. 2018). Since then, the concept of DS has been evolving as part of the interplay in discussions over digitalization and servitization (Kohtamäki et al. 2022).

Although a universally acknowledged notion for DS has not yet been reached due to the immaturity of the DS literature, nonetheless, it could be identified conclusively as

the evolvement of novel services and/or the amelioration of prevailing ones by means of digital technologies application to empower modern business models, to seek new approaches of cocreating value, as well as to give rise to knowledge from data, revamping the organizations' operational and environmental performance (Paschou et al. 2020).

DS has been widely acknowledged as a paramount lever in giving rise to valuable implications for organizational interconnections with its ecosystem (Sklyar et al. 2019) which, in turn, gain organizational performance in a sustainable manner.

Sustainability-oriented organizational performance. Organizational performance has been well-acknowledged to be a prominent construct which was identified as the level of accomplishment in reaching organizational goals during operations (Al-Samman and Al-Nashmi 2016). As such, the proper evaluation of performance was argued to be a critical step toward gaining fruitful organizational performance management (Furrer et al. 2008). The notion of performance in the 1970s was supposed to focus on both organizational means and ends (Georgopoulos and Tannenbaum 1957). In this sense, performance was determined as how far an organization, as a social system with specific resources, was capable of fulfilling its targets without being obliged to leverage its resources and means or inducing excessive strain on its staff. In the 1980s, performance referred to how far an entity, as a social system, could take both its means and ends into consideration (Robbins 1987). This clarification was consistent with the earlier one recommended by Georgopoulos and Tannenbaum (1957). However, Cherrington (1989) advocated that organizational performance mentioned the accomplishment or effectiveness of an entity as an orientation of the organizational way that it was undertaken fruitfully to reach its goals. In the subsequent decade, the 1990s, organizational performance was argued to be largely rested on the performance of the high quality of the organizational staff (Everett E. Adam, Adam 1994). Organizational performance is predominantly concentrated on the capacities of an entity to efficiently and effectively make use of its available resources to succeed in its goals and ponder their relevance to its users. Building on this description, the three components, namely "efficiency", "effectiveness", and "relevancy", became the primary focus.

Taken literally, sustainability reflected a capability to sustain several entities, outcomes, or processes over time (Basiago 1999). Nevertheless, in the body of literature on development advocated by numerous academics, researchers, and practitioners, the notion of sustainability was employed to connote ameliorating and maintaining a vigorous economic, ecological, and social system for the development of human beings (Kuliga et al. 2019; Mensah and Enu-Kwesi 2018). On the perspective of Stoddart et al. (2011), it could be understood as the efficient and equitable resource allocation intragenerationally and intergenerationally with the operation of socioeconomic practices within the delimitations of a finite ecosystem. It has been contemplated as a dynamic equilibrium in the process of interplay between the population and the carrying capability of its environment, such that the population evolved to demonstrate its complete potential without instigating any irreversible adverse impacts on the carrying capability of the environment on which it rested. To that end, this raised a claim to rethink about the way human beings should manage their economic and social lives based on the available ecological resources for their development.

Taken together, the notion of SOOP in this research can be comprehended as the organizational capacities of making use of the available resources in an efficient and effective manner to grasp the interconnectivity of ecological, social, and economic dimensions of organizational sustainability (Williams et al. 2017) to succeed in addressing ecological, social, and economic issues of an organization across political, temporal, and spatial dimensions which can not be handled in isolation (Martínez León and Calvo-Amodio 2017).

However, the challenges in relation to the greater SOOP through leveraging the DS have been too great to tackle in isolation. In this regard, the integration between collaboration, cocreation, and value sharing within an ecosystem would speed up the process and achieve the standards of the outcomes.

Sustainable and smart service innovation ecosystem. The terminology "ecosystem" has been extensively employed in an assortment of contexts outside its initial frontier implementation in biological mechanisms (Moore 1993; Autio and Thomas 2014; Gomes et al. 2016). Building on the perspectives of Wareham et al. (2014), the ecosystem could be categorized into two forms. More instrumentally, the first form placed its concentration on a group of actors linked through resource transfer and production cycle. Meanwhile, the second type put an accent on interlinked technologies, collaboration, as well as competition between entities in terms of providing relevant products/services (Carayannis et al. 2017).

The notion of business ecosystem, which was first established by Moore (1993), referred to the economic interconnection resting on the interplay among divergent entities that undertook various functions, shared resources, as well as jointly fostered the evolvement of the system. This type of ecosystem was featured by exploration, expansion, authority, and update (Herrmann and Nadkarni 2013). It also enabled interdependency and dynamic coevolution (Martin 2011). The fundamental conception of business ecosystems has been subsequently deployed in the field of innovation management and broadly implemented in the investigation on the interconnection between innovation networks and ecosystems (Autio and Thomas 2014; Cai et al. 2020; Jian Chen et al. 2016; Shaw and Allen 2016). As proposed by Zahra and Nambisan (2012), the innovation ecosystem was identified as a group of organizations which interacted and shared a collection of dependencies as it manufactured technologies and product/service for the consumers.

The establishment and evolvement of their sustainable innovation ecosystem stemmed from the action of focal enterprises in the innovation ecosystem in relation to tackling innovation paradoxes as well as formulating innovation paradox management systems by shaping dual sustainable strategic innovation units, intensifying sustainable organizational ties between the internal and external, whereas cocreating and sharing innovation values would result in fostering (Zeng et al. 2017).

The change to the service economy and fast advancement of smart technologies have significantly altered traditional commodity trading grounded on business models. Zheng et al. (2017) advocated a smart product service ecosystem which heavily rested on smart interaction, mutual cooperation, resource sharing, and optimal configuration to integrate consumers, smart product service systems, smart service platforms, as well as product service suppliers for cocreation value and consumer experience amelioration.

Meanwhile, the smart innovation ecosystem which reflected on the rules of smart specialization strategy to reach sustainable regional growth (Carayannis and Rakhmatullin 2014) was characterized by an open network configuration, a great degree of modularity, a portfolio of interconnections dominated by informal ties, nonredundant ties related to actors of various natures and disciplines, as well as the existence of local innovation communities (Panetti et al. 2019).

Outstandingly, the sustainable and smart product innovation ecosystem, which was proffered by Yin et al. (2020), could be comprehended as a novel open innovation mechanism for sustainable and smart product innovation which altered from value chain-based mode to ecosystem-based mode to generate an effective environment for the interaction between actors, reaching the sustainability goal as well as the shared value of all stakeholders.

Due to the increasing demands for the cooperation of numerous stakeholders as well as the provision of sustainable complementary components and services in PSSOs, a form of ecosystem largely based on the recommendation of Yin et al. (2020) is proposed in this research. Accordingly, SSSIE in this research places an emphasis on the in-depth collaboration and value cocreation between interrelated entities in sustainable development strategies pertaining to the creation and delivery of service value arising from smart solutions to generate shared value for all stakeholders.

Remarkably, the implementation of DS within PSSO has been difficult, partly owing to the traditional mindset of leaders; thus, highlighting the demand for advanced leadership to make these PSSOs become robust and adaptive.

Digital leadership. Leadership style was specified as the behaviors' leader parallel to decision-making prototypes, the involvement of a group or subordinates, and the level of autonomy offered to the latter (Martin et al. 2013). DL could be identified as a social impact process mediated by modern information technologies to induce a shift in viewpoints, behavior, and performance with persons, teams, and/or entities (Avolio et al. 2000). In the present study, DL refers to the advanced management style of encouraging and affecting working partners in an efficient and effective manner by constantly adopting and expanding digital initiatives with the goal of generating a more agile and flexible organizational processes.

3. Hypothesis Formulation

Based on the perspective of Kohtamäki et al. (2019), the integration of smart solutions across organizational boundaries has been considered to be pivotal. This was because smart solutions have had to be formulated to function and interplay with the resolutions provided by other numerous organizations, utilized by customers, allocated by distributors, sustained by various service partners, and managed by stakeholders as well (Kohtamäki et al. 2019). These solutions have entailed changes pertaining to business model conformation (Visnjic et al. 2018) and collaborative innovations when organizations struggled to shape their business paradigms and practices to achieve smooth collaboration (Kohtamäki et al. 2019).

DS has raised a claim on cooperation across organizational boundaries, as smart solutions interplayed with product/service software systems of other entities to operate smart autonomous ecosystems (Tronvoll et al. 2020). This essence has been paramount because, in DS, the evolvement of smart solutions moved beyond single organizations' boundaries (Kohtamäki et al. 2019). Additionally, the volume of essential resources and capacities has been so gigantic that an entity has been unable to perform such movements on its own, demanding the capabilities to governance an ecosystem of suppliers, complementors, as well as stakeholders (Kohtamäki et al. 2019). Building on the macro standpoint, alternations in organizational boundaries has induced an effect on the entity of the value systems, roles, competences, and cooperative practices between actors, which resulted in the change in architectures within ecosystems (Rabetino and Kohtamäki 2018). By doing so, new ecosystems would be likely to be constituted (Kohtamäki et al. 2019). To that end, the hypothesis of this research is pointed as follows.

Hypothesis 1 (H1). *DS is positively related to SSSIE.*

There has been a growing body of extant literature in terms of organizational performance, underlining the positive impact of servitization on sales proliferation (Kohtamäki et al. 2013), revenue growth and the whole organizational performance (Visnjic and Van Looy 2012), profitability (Gebauer et al. 2011), and value creation (Pawar et al. 2009). Servitization has also been well-acknowledged as an innovative paradigm to accomplish sustainable value in production and consumption (Yang and Evans 2019).

On the other hand, most organizations would admittedly benefit from digitalization or digital transformation, as these processes would perk up cost efficiency owing to ameliorated internal flows and novel or enhanced revenue streams (Hallstedt et al. 2020). Additionally, digital technologies application also unlocked prospects to greater supervise and track the activities of products/services during the entire life-cycle, as well as optimized the product/service utilization which, in turn, resulted in sustainability benefits pertaining to improvements in organizational efficiency and effectiveness by means of material flow management, enhancing safety as hazardous duties were altered with knowledge-intensive responsibilities (Ren et al. 2018).

As proposed by Kharlamov and Parry (2020), a large amount of empirical evidence also substantiated the positive influences of the integration between servitization and digitalization on organizational profitability. Simultaneously, DS has been typically linked

to the awareness of sustainable development (Kohtamäki et al. 2019; Paschou et al. 2020). In particular, DS was advocated to generate multitudinous benefits for society and the environment, namely diminution in energy utilization, fewer environmental effect, positive influence on social sustainability, value creation for the whole society, and the formulation of sustainable production procedures (Paschou et al. 2020). Hinged on the above discussion, the hypothesis of this study is postulated as follows.

Hypothesis 2 (H2). *DS is positively related to SOOP.*

The cooperative combination apparatus in the innovation ecosystem could facilitate for the integration of the innovation outcomes of each member entity in this system into customer-oriented resolutions (Fukuda and Watanabe 2008) as well as formulate a wide range of collaborative interconnections with other members within the ecosystem to meet the growingly complicated and various demands through service innovation. On the other hand, the rigorous research and development amongst the organizations (Persaud 2005), along with the intensification of certain skills and procedures hinged on technologies (Kortmann 2014), also provided organizations with the advantages and market associations necessitated for maintenance and growth (Lichtenstein et al. 1974). Moreover, the innovation ecosystem could lead to the reduction in organizational expenses and an increase in value creation (Esty and Porter 1998).

The SSSIE has been an open system shaped to reach cocreation, coexistence, win–win sharing so as to access the goals of sustainable development. The trust of all the members in this ecosystem would result in the enrichment in the capacities of resource exchange, especially, the achievability of absorption and retention of advanced knowledge, as well as lessened transaction expenses and knowledge transfer. On the other hand, the organizational modern technologies and novel knowledge portfolio could be enlarged to assist the organization to reach higher organizational performance in a sustainable manner through sharing advanced knowledge and in-depth communication with other members in the ecosystem. Hence, the research hypothesis is posited as follows.

Hypothesis 3 (H3). *SSSIE is positively related to SOOP.*

PSSO has typically coped with DS hurdles, namely a deficiency of digital competences and resources and barriers to networking with other organizations. One of the effective approaches that PSSO could overcome these challenges with has been to improve and advance their DS capacities. Veritably, the transition toward DS has been complicated, holistic, and, thus, hard to manage and request sufficient understandings not only of vigorous strategic alignment between digital capacities and servitization, processes and modern information technologies but also formulating the ecosystem and organizational boundaries to deploy DS for the consumers and ecosystem (Sklyar et al. 2019). In doing so, the exploitation of chances stemming from the implementation of DS could drive PSSOs to ameliorate and modernize their internal processes. PSSOs would obtain the valuable opportunities to redesign both their external and internal communication processes, with advanced approaches to perk up information reach and richness as well as to undertake all the operations that they could not otherwise perform. In a nutshell, organizational performance has been growingly reliant on the external resources which were not directly controlled by the organization itself (Iansiti and Levien 2004); the SSSIE could offer technical collaboration, the sharing of knowledge and channels to enrich the flow of valuable information, service harmonization, and other reinforcements to meet a wide range of complex demands of customers and stakeholders which, in turn, allowed all the members in the ecosystem to reach higher SOOP. Hence, the research hypothesis is posited as follows.

Hypothesis 4 (H4). *SSSIE instigates a mediating effect on the interlink between DS and SOOP.*

Leadership has been contemplated as a vector of organizational innovation and acclimatization in uncertain, troublous environments (Colovic 2021). The literature has chronicled that leadership has played a paramount part in DS deployment (Yeow et al. 2018). More concretely, attributable to the two main functions including vision communication as well as followers and other stakeholders' engagement in reaching the targeted vision (Gupta et al. 2004), the leader was supposed to play the primary role in starting strategic shifts comprising sensemaking and sense giving (Gioia and Chittipeddi 1991). Along this line, managerial cognition was also underlined as the microcornerstone of organizational capacities to sense, seize, and reconfigure organizational resources to match with the expected and/or demanded strategic change (Helfat and Peteraf 2014). Alternatively, leaders could mobilize their staff to modify their practices and thinking with the advanced organizational reality via effectively shaping transformation initiatives in a manner which connected with and reshaped the shared design of what the organization represented (Raffaelli et al. 2019). Therefore, the hypotheses that guided this study are formulated as follows.

Hypothesis 5a (H5a). *DL instigates a moderating effect on the interlink between DS and SSSIE.*

Hypothesis 5b (H5b). *DL instigates a moderating effect on the interlink between DS and SOOP.*

Hypothesis 5c (H5c). *DL instigates a moderating effect on the interlink between SSSIE and SOOP.*

In order to achieve the complete comprehension on the cause–effect interconnections amongst dimensions, the conceptual framework and its hypotheses are delineated in Figure 1.

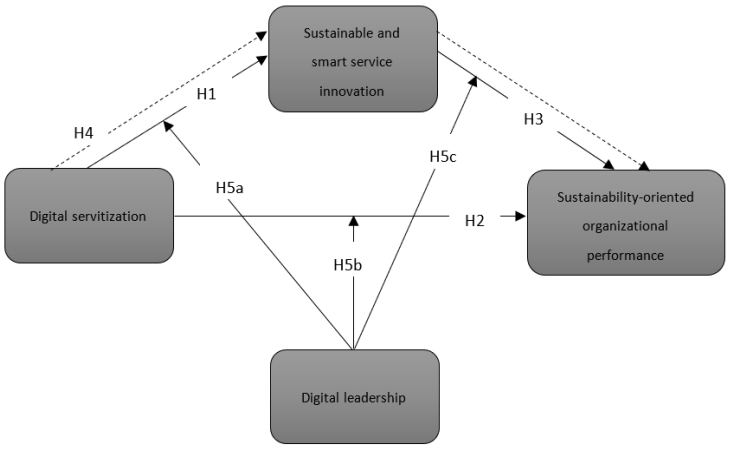

Figure 1. Theoretical hypothesized model.

4. Methodological Features

The methodological path unfolded for the investigation of this research was made up from the combination of qualitative and quantitative research designs.

4.1. Construct Domains Determination and Scale Items Generation

The items generation in this research was implemented through the two-phase procedure recommended by Churchill (1979), namely extensive review of the literature and experts' perspectives collection. Subsequently, the initial series of items for each construct were probed via small-scale pilot survey for measure purification and dimensionality of the scale investigation (Churchill 1979). As there were no items which necessitated to be revised, the final structured questionnaire was shaped up and administered. The five-point Likert scale ranging from "1 = staunchly disagree" to "5 = staunchly agree" was employed for all the constructs of the present research.

Digital servitization. The measurement scales for DS in this research comprised of three components: identity, dematerialization, and collaboration, which benefitted from the explorations of Tronvoll et al. (2020).

Sustainable and smart service innovation ecosystem. The scales for SSSIE consisted of the 5 subdimensions, namely diversity, innovation resource decentralization, dynamism of co-innovation, open collaboration, and coevolution, which resulted from the recommendations of Yin et al. (2020).

Sustainability-oriented organizational performance. The SOOP was evaluated through five aspects, namely Economic performance, Environmental performance, Community performance, Human performance, and Governance performance. Accordingly, the items for assessing Economic performance in this study stemmed from the outcomes of Helm and Andersson (2010). The items applied to measure Environmental performance were formulated from those suggested by Mishra and Suar (2010), Jennifer Chen et al. (2007), Rettab et al. (2008), and O'Connor and Spangenberg (2008). The criteria employed to measure the Community performance were gauged according to Mishra and Suar (2010) and Graafland et al. (2004). The scales of Human performance were hinged on the achievements of Mishra and Suar (2010), Rettab et al. (2008), and O'Connor and Spangenberg (2008). Items of Governance performance were directed by the obtained observations of Rettab et al. (2008), Herman and Renz (2004), Fredette and Bradshaw (2012), Li and Hambrick (2005), and Gill et al. (2005).

Digital leadership. The measure of DL comprised six subdimensions drawn from the outcomes of Roman et al. (2018).

4.2. Sample and Data Collection

The quantitative design with questionnaire survey approach to capture data was employed in this study as it was effortless to illuminate, efficient in time, and effective in expense consumption (Saunders et al. 2009).

Target population and data collection. The informants engaged in this research comprised all accountants hailing from different PSSOs. This was due to their vital roles in evaluating, disclosing, and assuring all the organizational information as well as giving advice for the leaders in measurement and management performance (Huang and Watson 2015). Especially, the accountants would become a prerequisite for the organizational favorable outcome due to the progressive permeation of digital technologies (Zybery and Rova 2014). The convenience sampling technique was deployed to procure the primary data. In this approach, the statistical data collection was proceeded by way of circulating the survey questionnaire to any potential respondents who met the requested criteria, typically located at nearby areas of the researchers and willingness to partake (Robinson 2013). The selection would be conducted until the sample size quotient was reached. Additionally, as follow-up, calls and reminders were corroborated in numerous studies to enable the research to enhance the likelihood of survey completion (Andres 2012; Neal et al. 2020). The follow-up phone calls were placed to nonrespondents to remind them to take part in the study. A sample size of 400 has been critical for robust factor loadings and great reliability (Hair et al. 2014). Initially, a total of 495 questionnaires were distributed conveniently among the potential respondents from the May 2021 to October 2021 time period across different areas of the South of Vietnam. Afterward, 412 valid responses were acquired, corresponding to a response rate of 83.23 percent of the participants. The obtained sample size for the proposed model was deemed suitable for structural equation model analysis and would not impact the statistical strength of the model.

Research analytic approach. The hypothesized model was subject to a series of test based on the two-step procedure recommended by Anderson and Gerbing (1988). In carrying this out, the measurement model and structural model were gauged with the support of SPSS version 26 and AMOS version 26. Alternatively, a MGA was also implemented to deeply explore whether there were any considerable differences in the path coefficients sprung from the different types of DL.

5. Research Analysis Exposition

5.1. The Outer Model Extrapolation

The measurement model was analyzed through evaluating the internal consistency reliability, convergence, as well as discriminant validity of the items group.

Reliability. The composite reliability (CR), which was applied to gauge the internal consistency, typically focused on the indicators having disparate loadings, while Cronbach's alpha, which was considered as an estimator hinged on the indicator intercorrelations, could generally be explicated in a similar approach employed for reliability analysis (Hair et al. 2014; Henseler et al. 2009). The value of Cronbach's alpha was demanded to be larger than the threshold of 0.8 as bolstered by C.-F. Chen (2008), and the CR value should be higher than 0.8 to meet the proposals of Hair et al. (2018).

Convergent validity. The factor loadings of the items pool and Average Variance Extracted (AVE) were utilized to assess the convergent validity. The endorsement of maintaining indicators with standardized loading greater than the value of 0.7 (Hair et al. 2014; Henseler et al. 2009) was applied in this research. Additionally, the AVE was proffered to be equal or exceed the advocated thresholds of 0.5 (Hair et al. 2018).

The procured outputs delineated in Table 1 were consistent with broadly suggested cut-offs, thus avowing good internal consistency reliability as well as sound convergence validity.

Table 1. Results summary of Convergent validity.

Construct	Item Acronyms	Convergent Validity		Construct Reliability		Discriminant Validity
		Factor Loadings Ranges	AVE	Cronbach's Alpha	Composite Reliability	
Digital Servitization						
Identity						
Legitimization	**LEG**	0.757–0.818	0.581	0.894	0.896	Yes
Agility	**AGI**	0.729–0.853	0.577	0.899	0.902	Yes
Dematerialization						
Data-centricity	**DC**	0.736–0.851	0.612	0.858	0.859	Yes
Data-related opportunities	**DRO**	0.719–0.758	0.594	0.879	0.801	Yes
Collaboration						
Multiactor coupling	**MAC**	0.753–0.846	0.571	0.885	0.886	Yes
Reciprocal value proposition	**RVP**	0.785–0.841	0.552	0.856	0.857	Yes
Sustainable and Smart Service Innovation Ecosystem						
Diversity	**DIV**	0.811–0.873	0.582	0.886	0.887	Yes
Innovation resource decentralization	**IRD**	0.728–0.804	0.664	0.851	0.852	Yes
Dynamism of co-innovation	**DCI**	0.771–0.814	0.650	0.867	0.868	Yes
Open collaboration	**OC**	0.740–0.847	0.646	0.871	0.873	Yes
Coevolution	**CE**	0.786–0.823	0.673	0.895	0.897	Yes
Sustainability-Oriented Organizational Performance						
Economic performance	**ECP**	0.804–0.833	0.652	0.879	0.881	Yes
Environmental performance	**ENP**	0.782–0.844	0.679	0.874	0.875	Yes
Community performance	**CP**	0.775–0.840	0.587	0.866	0.867	Yes
Human performance	**HP**	0.792–0.852	0.668	0.870	0.872	Yes
Governance performance	**GP**	0.711–0.796	0.595	0.848	0.849	Yes
Digital Leadership						
E-communication competency	**ECC**	0.779–0.819	0.601	0.845	0.847	Yes
E-Social Competency	**ESC**	0.809–0.847	0.557	0.876	0.877	Yes
E-Change Management Competency	**EMC**	0.838–0.857	0.529	0.894	0.895	Yes
E-Team Competency	**ETAC**	0.818–0.860	0.534	0.884	0.886	Yes
E-Tech Competency	**ETEC**	0.834–0.841	0.555	0.868	0.869	Yes
E-Trust Competency	**ETRC**	0.801–0.826	0.527	0.841	0.842	Yes

Discriminant validity. Discriminant validity warranted that the constructs were not reflected and unassociated to each other. Concerning cross-loading, indicators on the appointed latent variable were requested to be larger than the other variables' loadings (Henseler et al. 2009). In this case, the constructs could not be interchangeable. Meanwhile, the Fornell–Larcker criterion enabled to assess discriminant validity on the construct degree, and the cross-loadings criteria gauged it on the indicator degree (Henseler et al. 2009). As such, the square root of the construct's AVE was recommended to be higher than the corresponding correlation estimates between it and the others (Fornell and Larcker 1981). Rested on the statistical results in Table 2, all the criteria pertaining to discriminant validity was reached in this measurement model.

Table 2. Results summary of Discriminant validity.

	LEG	DC	AGI	DRO	ECP	MAC	HP	RVP	DIV	DCI	ECC	IRD	ENP	ETEC	ETAC	OC	CP	ESC	CE	EMC	GP	ETRC
LEG	**1**																					
DC	0.054	**1**																				
AGI	0.322	0.073	**1**																			
DRO	0.041	0.279	0.033	**1**																		
ECP	0.055	0.037	0.286	0.057	**1**																	
MAC	0.007	0.087	0.048	0.224	0.054	**1**																
HP	0.107	0.019	0.008	0.036	0.058	0.052	**1**															
RVP	−0.006	0.099	0.003	0.058	0.031	0.039	0.037	**1**														
DIV	0.078	0.005	0.063	0.016	0.011	0.031	0.041	0.084	**1**													
DCI	0.076	0.090	0.014	0.065	0.036	0.071	0.017	0.028	0.185	**1**												
ECC	0.086	0.116	0.087	−0.004	0.008	0.014	0.011	0.081	0.014	0.152	**1**											
IRD	0.060	0.045	0.051	0.096	0.121	0.113	0.093	0.055	0.146	0.005	0.103	**1**										
ENP	0.084	0.030	0.072	0.125	0.015	0.123	0.084	0.049	0.203	0.115	−0.013	0.093	**1**									
ETEC	0.058	0.098	0.034	−0.003	0.123	0.057	0.094	−0.036	0.173	0.179	0.038	−0.003	0.120	**1**								
ETAC	0.052	0.048	0.080	0.029	0.072	0.061	0.045	0.095	0.043	0.182	0.176	0.082	0.003	0.118	**1**							
OC	0.056	0.081	0.055	0.071	0.092	0.077	0.065	0.049	0.077	0.051	0.097	0.106	0.108	0.086	0.024	**1**						
CP	0.034	0.016	0.027	0.022	0.078	0.287	0.068	0.055	0.026	0.067	0.013	0.081	0.126	0.006	0.098	0.089	**1**					
ESC	0.028	0.017	0.033	−0.011	0.003	0.044	0.075	0.040	0.071	0.039	0.083	−0.006	0.097	−0.064	−0.008	0.163	0.040	**1**				
CE	0.047	0.014	0.032	0.016	0.042	−0.006	0.019	0.070	0.101	0.062	0.066	0.129	0.017	0.151	−0.052	0.040	0.002	0.023	**1**			
EMC	0.069	0.065	0.028	0.028	0.056	0.041	0.076	0.038	0.072	−0.046	0.021	0.045	0.110	0.068	0.116	−0.044	0.020	−0.018	0.046	**1**		
GP	0.053	0.106	0.066	0.018	0.010	0.037	0.011	0.064	0.078	0.076	0.090	0.022	0.065	0.162	0.058	0.147	0.065	0.017	0.078	0.142	**1**	
ETRC	0.033	0.104	0.040	0.049	0.088	0.053	0.036	−0.031	0.199	0.147	0.026	−0.002	0.039	0.093	0.136	0.045	0.055	0.087	0.069	0.004	0.097	**1**

5.2. Fitting the Proffered Model

The measurement model and structural model were examined through several goodness-of-fit measures, namely the Normed Chi-Square (Chi-square/df), Goodness of Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA) were employed for absolute fit assessment, and the Tucker–Lewis Index (TLI) and the Comparative Fit Index (CFI) were utilized for incremental fit evaluation (Tiglao et al. 2020). The outputs tabulated in Table 3 corroborated that the measurement and structural models perfectly fitted the procured data.

Table 3. Results of measurement and structural model evaluation.

The Goodness of Fit Measures	Minimum Cut-Off	Measurement Model	Structural Model	Recommended by
Chi-square/df	<3	1.847	1.983	Tiglao et al. (2020)
TLI	≥0.9	0.973	0.946	Tiglao et al. (2020)
CFI	≥0.9	0.938	0.924	Tiglao et al. (2020)
GFI	≥0.9	0.909	0.893	Tiglao et al. (2020)
RMSEA	<0.06	0.032	0.038	Xia and Yang (2018)

5.3. The Inner Model Exploration

Direct effect. The outcomes in Table 4 underlined that all path coefficients were statistically significant with the medium effect sizes, as the effect sizes ranging from 0.3 to 0.7 were regarded as medium (Teo and Noyes 2011). More concretely, the higher DS (β = 0.564; $p < 0.001$) was authenticated to be the most vigorous component to boost the establishment of SSSIE, hence undergirded H1. Differently put, through the enhancement of DS, the formulation and operationalization of SSSIE would be successful. Simultaneously, H2 and H3 were buttressed since the analyses convinced that substantially increased DS (β = 0.316; $p < 0.01$) and SSSIE (β = 0.297; $p < 0.01$) would lead to an increase in SOOP. This means that a greater DS and better SSSIE would significantly gain the SOOP.

Table 4. Structural coefficients (β) of the proffered model.

Hypothesis No.	Hypothesized Path			Estimate	S.E.	C.R.	Results
H1	DS	→	SSSIE	0.564 ***	0.179	3.693	Undergirded
H2	DS	→	SOOP	0.316 **	0.161	2.842	Undergirded
H3	SSSIE	→	SOOP	0.297 **	0.122	2.724	Undergirded

Notes: ** $p < 0.01$; *** $p < 0.001$.

Mediating effect. The mediating effect emerged when the positive interconnection between the independent and dependent elements was intervened by a mediating component (Otache et al. 2019). The partial mediation came out when both direct and indirect effects were substantial, or the full mediation arose when the indirect effect was substantial and direct effect was insubstantial (Cheung and Lau 2007). The results in Table 5 highlighted that SSSIE was a mediator of the interlink between DS and SOOP.

Table 5. The outcomes of indirect effect analysis.

Route of Paths	Direct Effect	Indirect Effect	Mediation	Results
DS → SSSIE → SOOP	0.476 ***	0.331 **	Partial mediation	H4 was undergirded

Notes: ** $p < 0.01$; *** $p < 0.001$; NS: not significant.

Moderating effect. The MGA could be employed to explore the emergence of the moderating impacts on the hypothesized model by analyzing the significance of differences between parameters in the structural model between the groups proffered (Arbuckle 2003). The sample of DL was divided into two groups (high DL versus low DL) consistent with the

sample median. The constrained model was put into use due to the statistically significant difference (p-value = 0.000 < 0.05) in compatibility criteria between the constrained model and unconstrained model. The results in Table 6 convinced that DL played a moderating role in the hypothesized model, thus, H5a–H5c were undergirded.

Table 6. Results of moderating effect of digital leadership.

Causal Relationship			Low DL (n = 277)		High DL (n = 135)		Difference between Parameters (Low DL–High DL)		Hypothesis Testing Results
			Estimate	p	Estimate	p	Estimate	p	
DS	→	SSSIE	0.483	0.715	0.552	0.000	−0.069	0.715	H5a was undergirded
DS	→	SOOP	0.378	0.530	0.332	0.000	0.046	0.530	H5b was undergirded
SSSIE	→	SOOP	0.343	0.410	0.301	0.003	0.042	0.407	H5c was undergirded

6. Final Remarks

6.1. Implications

Implication for theory. As the body of literature on DS has been in an emergent phase (Gebauer et al. 2020; Kohtamäki et al. 2020), a deeper analysis on this type of topic has been called for by the academic community (Kohtamäki et al. 2019; Tronvoll et al. 2020). This could be elucidated by the fact that DS has been typically obscure and nearly unmanageable for numerous leaders (Kohtamäki et al. 2021). Most organizations have lagged behind their digital expectations or even fell prey to the operational model complicatedness that DS induced (Jovanovic et al. 2021). Additionally, the extant body of DS research has constrained empirical investigations of complicated and holistic transformation processes, as prior servitization and DS research have mainly placed their concern on content research (Kohtamäki et al. 2021; Rabetino et al. 2018). In response to this, the current manuscript targeted at providing nuanced insights on DS within PSSOs in developing countries during digital transformation in the future. Methodologically, the combination of qualitative and quantitative research designs enabled the researchers to capture empirical supports in favor of precedent assumptions on digital servitization through intensive analysis of the data procured from 412 accountants within the PSSOs in the Southern areas of Vietnam. The acquired observations of this study offered outlooks for practitioners to grasp and advance the vision on DS application and, simultaneously, served as a guide for managers in developing the mechanisms needed to implement and govern the DS on several aspects.

As the DS adoption within the PSSOs has been complicated, it has raised an urgent claim for seeking new insights on the underlying approaches that PSSOs require to reach better performance through leveraging DS. As DS has driven the evolvement of smart resolutions to move beyond the boundaries of single organizations (Kohtamäki et al. 2019), it has demanded in-depth collaboration with ecosystem members (Sklyar et al. 2019). The fast innovations in digital technologies have made them become complex for one single organization to keep up with the speed of transformation (Tronvoll et al. 2020; Linde et al. 2021). Consequently, PSSOs needed to look for proper partners who could complement their capacity gaps and make up for their drawbacks in the DS process. Thus, having an ecosystem perspective becomes helpful, as ecosystem partners complement each other's capacities, resources, technologies, and offerings, to exist, evolve, and deliver digitally enabled advanced services to their consumers (Kamalaldin et al. 2021). Building on the perspective of Tronvoll et al. (2020), the in-depth collaboration across organizational boundaries has been a prerequisite as smart resolutions would typically be interplayed with product/service software systems of other entities to operate smart autonomous ecosystems. The current research extended the value of the rising DS research stream (Paschou et al. 2020; Sklyar et al. 2019) through proposing a form of ecosystem suitable for the pursuit of DS, which is a SSSIE. More concretely, the formulation and operationalization

of SSSIE could allow the PSSO to establish interlinks and secure alignment in various phases of ecosystem partnerships with ecosystem members. Furthermore, under the mediating role in the interconnection between DS and SOOP, SSSIE could facilitate the resource exchange between all members within the ecosystem and lead to a reduction in numerous expenses pertaining to transaction, knowledge transfer, and research and development, as well as uncertainty and risk decline caused by the market. In doing so, it could enable PSSOs to exploit the structural flexibility and integrity of DS to increase the SOOP.

On the other hand, the rapid shifts in the advancement of technology and subsequent alternations in social trends resulted in a gap in the prevailing resources and capacities of the PSSOs. Therefore, critics have also recommended that each organization should individually implement efficient and effective approaches to renovate these digital technologies to drive better operational performance (Hess et al. 2016). In this regard, there has been a demand to obtain in-depth understandings on how DS in PSSOs could lead to more advanced levels of organizational performance appropriate with the pursuit of sustainable development. In conformity with our predictions, the obtained findings in this study provided evidence for the advantage of DS deployment in ameliorating and increasing SOOP through extending the application of DS in PSSO research. In doing so, this study casted light on how DS becomes more and more central for success in organizational operations in a sustainable manner through delineating the effect of DS on SOOP. Undoubtedly, an intense concentration on these opportunities would improve operational efficiency (Coreynen et al. 2017).

As the digital technologies deployment in the generation and delivery of public services by PSSOs have been well-acknowledged as a needed reaction towards the modernization of PSSOs, the transforming pivotal organizational operations, as well as structure and the capabilities to alter management notions, has been recognized as a demand to explore and exploit the advantages of digital technologies (Matt et al. 2015). Keeping these considerations in mind, this research innovatively introduced DL as a moderator variable. Accordingly, the obtained findings of this research corroborated those proliferated understandings on the role of DL in the process of DS implementation, as well as that SSSIE formulation and operationalization could act as a prerequisite to gain SOOP. Succinctly put, the greater the DL that could be reached, the more likelihood the constant digital initiatives adoption and enlargement could be accessed to enable PSSOs to achieve more agile and flexible organizational processes.

Implication for practice. This research provided numerous managerial implications for practitioners and policymakers who have been active in efforts of digital transformation implementation. Concretely, the practitioners were recommended to critically conduct a revision of the whole organizational constitution as well as formulate a sound service-oriented organizational identity and organizational culture to consolidate DS-oriented organizational transformation (Tronvoll et al. 2020). Alternatively, there has been a requirement on investment in partnership (Reim et al. 2018) as digital transformation hinted at boundary-spanning practices (Tronvoll et al. 2020). Notably, organizations should reshape their capacities and mindset through leveraging organizational inherent competences and practices to build up an advanced mindset to maximize value for all members in the ecosystem (Tronvoll et al. 2020). Moreover, the leaders of PSSOs were suggested to advance an explicit, shared, and compelling vision for both the organizations and the whole ecosystem and, simultaneously, furnish their staff with the compulsory technological infrastructure and skillsets to sustainably boost their adaptability with the changing working scenario. Last but not least, policymakers and the influencers of government were encouraged to focus on innovative features and assure a possible environment for innovation deployment through embarking on introducing policies that would facilitate digital technologies application as well as stimulate and incentivize the service innovation-orientated model development rested on digital technologies.

6.2. Limitations and Future Scopes

Incontrovertibly, the outcomes of this study were suggested to be pondered with caution due to a series of limitations which, in turn, provide the starting points for novel avenue creation for future research. Firstly, the findings of this research might not be promptly transferable to other contexts due to geographical provenance emphasis on one country. As such, corroboration of this research within various sectors and contexts would be an open question for further works. The second drawback lied in the relative smallness of the data set captured through an anonymous survey-based approach drawn from a convenient sample of digitally savvy respondents working in one subsector. These recruited respondents could not reflect the broader experiences regardless of the high validity pertaining to the depth of data generation. Hence, it could open up novel standpoints in thwarting these limitations through drawing a random sample with more modern statistical techniques and additional sources of information procurement. Thirdly, the deployment of cross-sectional design for the short-term impacts of relational norms might undermine the causal conclusions of the observations. Future works would have benefited from the longitudinal research design for the features investigation in the sample over time to keep abreast with the ever-changing digital transformation. Fourthly, the obtained observations drawn from the survey data captured from the questionnaire would probably be challenging for several organizations if put into practice. Moreover, the secondary data was recommended to be included to add additional insights. Fifthly, the clarification of SSSIE was heavily banked on a semantic aggregation of constructs and demonstrative depictions captured from the previous literature. Additionally, the sixth limitation was related to providing detailed guidance to shed light on the SSSIE transformation process in DS. Nonetheless, further in-depth investigations were inspired to formulate the related constructs and produce more effective guidance for the SSSIE transformation process in DS. Last but not least, the notion of SOOP is based on the analyses of the previous literature, which somehow could not describe explicitly the idiosyncrasies of SOOP. Consequently, it would apparently not be a drawback in the future when numerous painstaking attempts were taken for in-depth exploration of the main idiosyncrasies of SOOP.

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References

Adam, Everett Adam, Jr. 1994. Alternative quality improvement practices and organization performance. *Journal of Operations Management* 12: 27–44. [CrossRef]

Adner, Ron. 2006. Match Your Innovation Strategy to Your Innovation Ecosystem. *Harvard Business Review* 84: 98–107. [PubMed]

Adner, Ron. 2016. Ecosystem as Structure. *Journal of Management* 43: 39–58. [CrossRef]

Adner, Ron, and Rahul Kapoor. 2010. Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal* 31: 306–33. [CrossRef]

Alaimo, Cristina, Jannis Kallinikos, and Erika Valderrama. 2020. Platforms as service ecosystems: Lessons from social media. *Journal of Information Technology* 35: 25–48. [CrossRef]
Alderson, Wroe. 1957. *Marketing Behavior and Executive Action: A Functionalist Approach to Marketing Theory*. Homewood: Richard D. Irwin, Inc.
Alderson, Wroe. 1965. *Dynamic Marketing Behavior: A Functionalist Theory of Marketing*. Homewood: Richard D. Irwin, Inc.
Al-Samman, Eyad, and Murad Mohammed Al-Nashmi. 2016. Effect of corporate social responsibility on nonfinancial organizational performance: Evidence from Yemeni for-profit public and private enterprises. *Social Responsibility Journal* 12: 247–62. [CrossRef]
Anderson, James, and David Gerbing. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin* 103: 411–23. [CrossRef]
Andres, Lesley. 2012. *Designing and Doing Surveys*. London: SAGE Publications.
Arbuckle, James. 2003. *AMOS 5.0: Update to the AMOS User's Guide*. Chicago: Smallwaters Corporation.
Ardolino, Marco, Mario Rapaccini, Nicola Saccani, Paolo Gaiardelli, Giovanni Crespi, and Carlo Ruggeri. 2017. The role of digital technologies for the service transformation of industrial companies. *International Journal of Production Research* 56: 2116–32. [CrossRef]
Autio, Erkko, and Llewellyn D. W. Thomas. 2014. Innovation ecosystems: Implications for innovation management. In *The Oxford Handbook of Innovation Management*. Edited by Mark Dodgson, David Gann and Nelson Phillips. Oxford: Oxford University Press, pp. 204–28.
Avolio, Bruce, Surinder Kahai, and George Dodge. 2000. E-leadership. *The Leadership Quarterly* 11: 615–68. [CrossRef]
Basiago, Andrew. 1999. *Economic, Social, and Environmental Sustainability in Development Theory and Urban Planning Practice: The Environmentalist*. Boston: Kluwer Academic Publishers.
Bekkers, Victor. 2007. Modernization, public innovation and information and communication technologies: The emperor's new clothes? *Information Polity* 12: 103–7. [CrossRef]
Bogers, Marcel, Henry Chesbrough, and Carlos Moedas. 2018. Open Innovation: Research, Practices, and Policies. *California Management Review* 60: 5–16. [CrossRef]
Bustinza, Oscar, Marco Opazo-Basáez, and Shlomo Tarba. 2021. Exploring the interplay between Smart Manufacturing and KIBS firms in configuring product-service innovation performance. *Technovation*, 1–10. [CrossRef]
Cai, Yuzhuo, Jinyuan Ma, and Qiongqiong Chen. 2020. Higher Education in Innovation Ecosystems. *Sustainability* 12: 4376. [CrossRef]
Carayannis, Elias, and Ruslan Rakhmatullin. 2014. The Quadruple/Quintuple Innovation Helixes and Smart Specialisation Strategies for Sustainable and Inclusive Growth in Europe and Beyond. *Journal of the Knowledge Economy* 5: 212–39. [CrossRef]
Carayannis, Elias, Evangelos Grigoroudis, David Campbell, Dirk Meissner, and Dimitra Stamati. 2017. The ecosystem as helix: An exploratory theory-building study of regional co-opetitive entrepreneurial ecosystems as Quadruple/Quintuple Helix Innovation Models. *R&D Management* 48: 148–62. [CrossRef]
Chen, Ching-Fu. 2008. Investigating structural relationships between service quality, perceived value, satisfaction, and behavioral intentions for air passengers: Evidence from Taiwan. *Transportation Research Part A: Policy and Practice* 42: 709–17. [CrossRef]
Chen, Jennifer, Dennis Patten, and Robin Roberts. 2007. Corporate Charitable Contributions: A Corporate Social Performance or Legitimacy Strategy? *Journal of Business Ethics* 82: 131–44. [CrossRef]
Chen, Jian, Xielin Liu, and Yimei Hu. 2016. Establishing a CoPs-based innovation ecosystem to enhance competence—The case of CGN in China. *International Journal of Technology Management* 72: 144. [CrossRef]
Cherrington, David. 1989. *Organizational Behavior: The Management of Individual and Organizational Performance*. Boston: Allyn and Bacon.
Cheung, Gordon, and Rebecca Lau. 2007. Testing Mediation and Suppression Effects of Latent Variables. *Organizational Research Methods* 11: 296–325. [CrossRef]
Christensen, Tom, and Per Lægreid. 2007. The whole-of-government approach to public sector reform. *Public Administration Review* 67: 1059–66. [CrossRef]
Churchill, Gilbert. 1979. A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research* 16: 64–73. [CrossRef]
Colovic, Ana. 2021. Leadership and business model innovation in late internationalizing SMEs. *Long Range Planning* 55: 1–17. [CrossRef]
Conner, Kathleen. 1991. A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within Industrial Organization Economics: Do We Have a New Theory of the Firm? *Journal of Management* 17: 121–54. [CrossRef]
Coreynen, Wim, Paul Matthyssens, and Wouter Van Bockhaven. 2017. Boosting servitization through digitization: Pathways and dynamic resource configurations for manufacturers. *Industrial Marketing Management* 60: 42–53. [CrossRef]
Coreynen, Wim, Paul Matthyssens, Johanna Vanderstraeten, and Arjen van Witteloostuijn. 2020. Unravelling the internal and external drivers of digital servitization: A dynamic capabilities and contingency perspective on firm strategy. *Industrial Marketing Management* 89: 265–77. [CrossRef]
Dyer, Jeffrey, and Harbir Singh. 1998. The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. *The Academy of Management Review* 23: 660–79. [CrossRef]
Esty, Daniel, and Michael Porter. 1998. Industrial Ecology and Competitiveness. *Journal of Industrial Ecology* 2: 35–43. [CrossRef]
Fliess, Sabine, and Eva Lexutt. 2017. How to be successful with servitization—Guidelines for research and management. *Industrial Marketing Management*, 1–18. [CrossRef]

Fornell, Claes, and David Larcker. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research* 18: 39–50. [CrossRef]
Fredette, Christopher, and Patricia Bradshaw. 2012. Social capital and nonprofit governance effectiveness. *Nonprofit Management and Leadership* 22: 391–409. [CrossRef]
Fukuda, Kayano, and Chihiro Watanabe. 2008. Japanese and US perspectives on the National Innovation Ecosystem. *Technology in Society* 30: 49–63. [CrossRef]
Furr, Nathan, and Andrew Shipilov. 2019. Digital doesn't have to be disruptive. *Harvard Business Review* 97: 94–103.
Furrer, Olivier, Howard Thomas, and Anna Goussevskaia. 2008. The structure and evolution of the strategic management field: A content analysis of 26 years of strategic management research. *International Journal of Management Reviews* 10: 1–23. [CrossRef]
Gawer, Annabelle, and Michael Cusumano. 2014. Industry platforms and ecosystem innovation. *Journal of Product Innovation Management* 31: 417–33. [CrossRef]
Gebauer, Heiko, Anders Gustafsson, and Lars Witell. 2011. Competitive advantage through service differentiation by manufacturing companies. *Journal of Business Research* 64: 1270–80. [CrossRef]
Gebauer, Heiko, Marco Paiola, Nicola Saccani, and Mario Rapaccini. 2020. Digital servitization: Crossing the perspectives of digitization and servitization. *Industrial Marketing Management* 93: 382–88. [CrossRef]
Georgopoulos, Basil, and Arnold Tannenbaum. 1957. A Study of Organizational Effectiveness. *American Sociological Review* 22: 534–40. [CrossRef]
Gill, Mel, Robert Flynn, and Elke Reissing. 2005. The governance self-assessment checklist: An instrument for assessing board effectiveness. *Nonprofit Management and Leadership* 15: 271–94. [CrossRef]
Gioia, Dennis, and Kumar Chittipeddi. 1991. Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal* 12: 433–48. [CrossRef]
Gomes, Leonardo Augusto de Vasconcelos, Ana Lucia Figueiredo Facin, Mario Sergio Salerno, and Rodrigo Kazuo Ikenami. 2016. Unpacking the innovation ecosystem construct: Evolution, gaps and trends. *Technological Forecasting and Social Change* 136: 30–48. [CrossRef]
Graafland, Johan, Sylvester Eijffinger, and H. SmidJohan. 2004. Benchmarking of Corporate Social Responsibility: Methodological Problems and Robustness. *Journal of Business Ethics* 53: 137–52. [CrossRef]
Gupta, Vipin, Ian MacMillan, and Gita Surie. 2004. Entrepreneurial leadership: Developing and measuring a cross-cultural construct. *Journal of Business Venturing* 19: 241–60. [CrossRef]
Hair, Joe F., Christian Ringle, Siggi Siegfried Gudergan, Andreas Fischer, Christian Nitzl, and Con Menictas. 2018. Partial least squares structural equation modeling-based discrete choice modeling: An illustration in modeling retailer choice. *Business Research* 12: 115–142. [CrossRef]
Hair, Joe F., Marko Sarstedt, Lucas Hopkins, and Volker Kuppelwieser. 2014. Partial least squares structural equation modeling (PLS-SEM). *European Business Review* 26: 106–21. [CrossRef]
Hallstedt, Sophie, Ola Isaksson, and Anna Öhrwall Rönnbäck. 2020. The Need for New Product Development Capabilities from Digitalization, Sustainability, and Servitization Trends. *Sustainability* 12: 10222. [CrossRef]
Helfat, Constance, and Margaret Peteraf. 2014. Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal* 36: 831–50. [CrossRef]
Helm, Scott, and Fredrik Andersson. 2010. Beyond taxonomy. *Nonprofit Management and Leadership* 20: 259–76. [CrossRef]
Henseler, Jörg, Christian Ringle, and Rudolf Sinkovics. 2009. Advances in International Marketing. *Advances in International Marketing* 20: 277–319. [CrossRef]
Herman, Robert, and David Renz. 2004. Doing Things Right: Effectiveness in Local Nonprofit Organizations, A Panel Study. *Public Administration Review* 64: 694–704. [CrossRef]
Herrmann, Pol, and Sucheta Nadkarni. 2013. Managing strategic change: The duality of CEO personality. *Strategic Management Journal* 35: 1318–42. [CrossRef]
Hess, Thomas, Christian Matt, Alexander Benlian, and Florian Wiesböck. 2016. Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive* 15: 103–19.
Huang, Xiaobei Beryl, and Luke Watson. 2015. Corporate social responsibility research in accounting. *Journal of Accounting Literature* 34: 1–16. [CrossRef]
Huikkola, Tuomas, Rodrigo Rabetino, Marko Kohtamäki, and Heiko Gebauer. 2020. Firm boundaries in servitization: Interplay and repositioning practices. *Industrial Marketing Management* 90: 90–105. [CrossRef]
Humbeck, Philipp, Kathrin Pfähler, Marc Wiedenmann, and Georg Herzwurm. 2019. The Impact of Servitization and Digital Transformation—A Conceptual Extension of the IPOO-Framework. *Procedia CIRP* 81: 914–19. [CrossRef]
Hunt, Shelby, and Donna Davis. 2008. Grounding supply chain management in resource-advantage theory. *The Journal of Supply Chain Management* 44: 10–21. [CrossRef]
Iansiti, Marco, and Roy Levien. 2004. *The Keystone Advantage: What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability*. Boston: Harvard Business School Press.
Jacobides, Michael, Carmelo Cennamo, and Annabelle Gawer. 2018. Towards a theory of ecosystems. *Strategic Management Journal* 39: 2255–76. [CrossRef]

Jovanovic, Marin, David Sjödin, and Vinit Parida. 2021. Co-evolution of platform architecture, platform services, and platform governance: Expanding the platform value of industrial digital platforms. *Technovation*, 1–14. [CrossRef]
Jovanovic, Marin, Jawwad Raja, Ivanka Visnjic, and Frank Wiengarten. 2019. Paths to service capability development for servitization: Examining an internal service ecosystem. *Journal of Business Research* 104: 472–85. [CrossRef]
Kamalaldin, Anmar, David Sjödin, Dusana Hullova, and Vinit Parida. 2021. Configuring ecosystem strategies for digitally enabled process innovation: A framework for equipment suppliers in the process industries. *Technovation* 105: 102250. [CrossRef]
Khanra, Sayantan, Amandeep Dhir, Vinit Parida, and Marko Kohtamäki. 2021. Servitization research: A review and bibliometric analysis of past achievements and future promises. *Journal of Business Research* 131: 151–66. [CrossRef]
Kharlamov, Alexander, and Glenn Parry. 2020. The impact of servitization and digitization on productivity and profitability of the firm: A systematic approach. *Production Planning & Control* 32: 185–97. [CrossRef]
Klein, Heinz, and Michael Myers. 1999. A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly* 23: 67–93. [CrossRef]
Kohtamäki, Marko, Jukka Partanen, Vinit Parida, and Joakim Wincent. 2013. Non-linear relationship between industrial service offering and sales growth: The moderating role of network capabilities. *Industrial Marketing Management* 42: 1374–85. [CrossRef]
Kohtamäki, Marko, Rodrigo Rabetino, Suvi Einola, Vinit Parida, and Pankaj Patel. 2021. Unfolding the digital servitization path from products to product-service-software systems: Practicing change through intentional narratives. *Journal of Business Research* 137: 379–92. [CrossRef]
Kohtamäki, Marko, Rodrigo Rabetino, Vinit Parida, David Sjödin, and Stephan Henneberg. 2022. Managing digital servitization toward smart solutions: Framing the connections between technologies, business models, and ecosystems. *Industrial Marketing Management* 105: 253–67. [CrossRef]
Kohtamäki, Marko, Vinit Parida, Pankaj Patel, and Heiko Gebauer. 2020. The relationship between digitalization and servitization: The role of servitization in capturing the financial potential of digitalization. *Technological Forecasting and Social Change* 151: 119804. [CrossRef]
Kohtamäki, Marko, Vinit Parida, Pejvak Oghazi, Heiko Gebauer, and Tim Baines. 2019. Digital servitization business models in ecosystems: A theory of the firm. *Journal of Business Research* 104: 380–92. [CrossRef]
Kortmann, Sebastian. 2014. The Mediating Role of Strategic Orientations on the Relationship between Ambidexterity-Oriented Decisions and Innovative Ambidexterity. *Journal of Product Innovation Management* 32: 666–84. [CrossRef]
Kowalkowski, Christian, Heiko Gebauer, and Rogelio Oliva. 2017. Service growth in product firms: Past, present, and future. *Industrial Marketing Management* 60: 82–88. [CrossRef]
Kuliga, Saskia, Benjamin Nelligan, Ruth Dalton, Steven Marchette, Amy Shelton, Laura Carlson, and Christoph Hölscher. 2019. Exploring individual differences and building complexity in wayfinding: The case of the seattle central library. *Environment and Behaviour* 51: 622–65. [CrossRef]
Kummitha, Rama Krishna Reddy. 2018. Entrepreneurial urbanism and technological panacea: Why Smart City planning needs to go beyond corporate visioning? *Technological Forecasting and Social Change* 137: 330–39. [CrossRef]
Lavie, Dovev. 2006. The Competitive Advantage of Interconnected Firms: An Extension of the Resource-Based View. *Academy of Management Review* 31: 638–58. [CrossRef]
Lerch, Christian, and Matthias Gotsch. 2015. Digitalized Product-Service Systems in Manufacturing Firms: A Case Study Analysis. *Research-Technology Management* 58: 45–52. [CrossRef]
Li, Feng. 2018. The digital transformation of business models in the creative industries: A holistic framework and emerging trends. *Technovation* 92–93: 1–10. [CrossRef]
Li, Jiatao, and Donald Hambrick. 2005. Factional Groups: A New Vantage on Demographic Faultlines, Conflict, and Disintegration in Work Teams. *Academy of Management Journal* 48: 794–813. [CrossRef]
Lichtenstein, Paul, Tom Fuhremann, and Ken Schulz. 1974. Translocation and metabolism of carbon-14-labeled phorate as affected by percolating water in a model soil-plant ecosystem. *Journal of Agricultural and Food Chemistry* 22: 991–96. [CrossRef] [PubMed]
Linde, Lina, Johan Frishammar, and Vinit Parida. 2021. Revenue Models for Digital Servitization: A Value Capture Framework for Designing, Developing, and Scaling Digital Services. *IEEE Transactions on Engineering Management*, 1–16. [CrossRef]
Marić, Josip, and Marco Opazo-Basáez. 2019. Green Servitization for Flexible and Sustainable Supply Chain Operations: A Review of Reverse Logistics Services in Manufacturing. *Global Journal of Flexible Systems Management* 20: 65–80. [CrossRef]
Martin, Jeffrey. 2011. Dynamic Managerial Capabilities and the Multibusiness Team: The Role of Episodic Teams in Executive Leadership Groups. *Organization Science* 22: 118–40. [CrossRef]
Martin, Scott, Hui Liao, and Elizabeth Campbell. 2013. Directive versus Empowering Leadership: A Field Experiment Comparing Impacts on Task Proficiency and Proactivity. *Academy of Management Journal* 56: 1372–95. [CrossRef]
Martínez León, Hilda C., and Javier Calvo-Amodio. 2017. Towards lean for sustainability: Understanding the interrelationships between lean and sustainability from a system thinking perspective. *Journal of Cleaner Production* 142: 4384–402. [CrossRef]
Martín-Peña, María-Luz, José-María Sánchez-López, and Eloísa Díaz-Garrido. 2019. Servitization and digitalization in manufacturing: The influence on firm performance. *Journal of Business & Industrial Marketing* 35: 564–74. [CrossRef]
Matt, Christian, Thomas Hess, and Alexander Benlian. 2015. Digital Transformation Strategies. *Business & Information Systems Engineering* 57: 339–43.

Mensah, Justice, and Francis Enu-Kwesi. 2018. Implication of environmental sanitation management in the catchment area of Benya Lagoon, Ghana. *Journal of Integrative Environmental Sciences* 16: 23–43. [CrossRef]
Mishra, Supriti, and Damodar Suar. 2010. Does Corporate Social Responsibility Influence Firm Performance of Indian Companies? *Journal of Business Ethics* 95: 571–601. [CrossRef]
Moore, James. 1993. Predators and Prey: A New Ecology of Competition. *Harvard Business Review* 71: 75–86. [PubMed]
Naik, Parikshit, Andreas Schroeder, Kawaljeet Kaur Kapoor, Ali Ziaee Bigdeli, and Tim Baines. 2020. Behind the scenes of digital servitization: Actualising IoT-enabled affordances. *Industrial Marketing Management* 89: 232–44. [CrossRef]
Neal, Zachary, Jennifer Watling Neal, and Amelia Piteo. 2020. Call Me Maybe: Using Incentives and Follow-Ups to Increase Principals' Survey Response Rates. *Journal of Research on Educational Effectiveness* 13: 784–93. [CrossRef]
Ness, David, John Swift, Damith Ranasinghe, Ke Xing, and Veronica Soebarto. 2015. Smart steel: New paradigms for the reuse of steel enabled by digital tracking and modelling. *Journal of Cleaner Production* 98: 292–303. [CrossRef]
O'Connor, Martin Paul, and Joachim Spangenberg. 2008. A methodology for CSR reporting: Assuring a representative diversity of indicators across stakeholders, scales, sites and performance issues. *Journal of Cleaner Production* 16: 1399–415. [CrossRef]
Opazo-Basáez, Marco, Ferran Vendrell-Herrero, and Oscar Bustinza. 2018. Uncovering Productivity Gains of Digital and Green Servitization: Implications from the Automotive Industry. *Sustainability* 10: 1524. [CrossRef]
Opazo-Basáez, Marco, Ferran Vendrell-Herrero, and Oscar Bustinza. 2022. Digital service innovation: A paradigm shift in technological innovation. *Journal of Service Management* 33: 97–120. [CrossRef]
Otache, Innocent, Kadiri Umar, Yakubu Audu, and Ugbede Onalo. 2019. The effects of entrepreneurship education on students' entrepreneurial intentions. *Education + Training* 63: 967–91. [CrossRef]
Paiola, Marco, and Heiko Gebauer. 2020. Internet of things technologies, digital servitization and business model innovation in BtoB manufacturing firms. *Industrial Marketing Management* 89: 245–64. [CrossRef]
Panetti, Eva, Adele Parmentola, Marco Ferretti, and Elisabeth Beck Reynolds. 2019. Exploring the relational dimension in a smart innovation ecosystem: A comprehensive framework to define the network structure and the network portfolio. *The Journal of Technology Transfer* 45: 1775–96. [CrossRef]
Paschou, Theoni, Mario Rapaccini, Federico Adrodegari, and Nicola Saccani. 2020. Digital servitization in manufacturing: A systematic literature review and research agenda. *Industrial Marketing Management* 89: 278–92. [CrossRef]
Pawar, Kulwant, Ahmad Beltagui, and Johann Riedel. 2009. The PSO triangle: Designing product, service and organisation to create value. *International Journal of Operations & Production Management* 29: 468–93. [CrossRef]
Persaud, Ajax. 2005. Enhancing Synergistic Innovative Capability in Multinational Corporations: An Empirical Investigation. *Journal of Product Innovation Management* 22: 412–29. [CrossRef]
Rabetino, Rodrigo, and Marko Kohtamäki. 2018. To Servitize Is to (Re)position: Utilizing a Porterian View to Understand Servitization and Value Systems. *Practices and Tools for Servitization* 18: 325–41. [CrossRef]
Rabetino, Rodrigo, Willem Harmsen, Marko Kohtamäki, and Jukka Sihvonen. 2018. Structuring servitization-related research. *International Journal of Operations & Production Management* 38: 350–71. [CrossRef]
Raddats, Chris, Christian Kowalkowski, Ornella Benedettini, Jamie Burton, and Heiko Gebauer. 2019. Servitization: A contemporary thematic review of four major research streams. *Industrial Marketing Management* 83: 207–23. [CrossRef]
Raffaelli, Ryan, Mary Ann Glynn, and Michael Tushman. 2019. Frame flexibility: The role of cognitive and emotional framing in innovation adoption by incumbent firms. *Strategic Management Journal* 40: 1013–39. [CrossRef]
Reim, Wiebke, David Sjödin, and Vinit Parida. 2018. Mitigating adverse customer behaviour for product-service system provision: An agency theory perspective. *Industrial Marketing Management* 74: 150–61. [CrossRef]
Ren, Shan, Yingfeng Zhang, Yang Liu, Tomohiko Sakao, Donald Huisingh, and Cecilia Almeida. 2018. A comprehensive review of big data analytics throughout product lifecycle to support sustainable smart manufacturing: A framework, challenges and future research directions. *Journal of Cleaner Production* 210: 1343–65. [CrossRef]
Rettab, Belaid, Anis Ben Brik, and Kamel Mellahi. 2008. A Study of Management Perceptions of the Impact of Corporate Social Responsibility on Organisational Performance in Emerging Economies: The Case of Dubai. *Journal of Business Ethics* 89: 371–90. [CrossRef]
Robbins, Stephen. 1987. *Organizational Theory: Structure, Design, and Application*. San Diego: Prentice-Hall.
Robinson, Oliver. 2013. Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide. *Qualitative Research in Psychology* 11: 25–41. [CrossRef]
Roman, Alexandru, Montgomery Van Wart, XiaoHu Wang, Cheol Liu, Soonhee Kim, and Alma McCarthy. 2018. Defining E-leadership as Competence in ICT-Mediated Communications: An Exploratory Assessment. *Public Administration Review* 79: 853–66. [CrossRef]
Saunders, Mark, Philip Lewis, and Adrian Thornhill. 2009. *Research Methods for Business Students*. New York: Pearson.
Schroeder, Andreas, Parikshit Naik, Ali Ziaee Bigdeli, and Tim Baines. 2020. Digitally enabled advanced services: A socio technical perspective on the role of the internet of things (IoT). *International Journal of Operations & Production Management* 40: 1243–68. [CrossRef]
Shaw, Duncan, and Tim Allen. 2016. Studying innovation ecosystems using ecology theory. *Technological Forecasting and Social Change* 136: 88–102. [CrossRef]

Sjödin, David, Vinit Parida, Marko Kohtamäki, and Joakim Wincent. 2020. An agile co-creation process for digital servitization: A micro-service innovation approach. *Journal of Business Research* 112: 478–91. [CrossRef]
Sklyar, Alexey, Christian Kowalkowski, David Sörhammar, and Bård Tronvoll. 2019. Resource integration through digitalisation: A service ecosystem perspective. *Journal of Marketing Management* 35: 974–91. [CrossRef]
Stoddart, Hannah, Kirsty Schneeberger, Felix Dodds, Andrew Shaw, Milena Bottero, Jack Cornforth, and Robert White. 2011. *A Pocket Guide to Sustainable Development Governance*. New York: Stakeholder Forum.
Storbacka, Kaj. 2018. Extending service-dominant logic—Outside marketing and inside managerial practice. In *The SAGE Handbook on Service-Dominant Logic*. Edited by Robert Lusch and Stephen Vargo. Thousand Oaks: SAGE Publications, pp. 639–54.
Teo, Timothy, and Jan Noyes. 2011. An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: A structural equation modeling approach. *Computers & Education* 57: 1645–53. [CrossRef]
Tiglao, Noriel Christopher, Janna De Veyra, Niki Jon Tolentino, and Mark Angelo Tacderas. 2020. The perception of service quality among paratransit users in Metro Manila using structural equations modelling (SEM) approach. *Research in Transportation Economics* 83: 1–13. [CrossRef]
Tilson, David, Kalle Lyytinen, and Carsten Sørensen. 2010. Research Commentary—Digital Infrastructures: The Missing IS Research Agenda. *Information Systems Research* 21: 748–59. [CrossRef]
Tronvoll, Bård, Alexey Sklyar, David Sörhammar, and Christian Kowalkowski. 2020. Transformational shifts through digital servitization. *Industrial Marketing Management* 89: 293–305. [CrossRef]
Vandermerwe, Sandra, and Juan Rada. 1988. Servitization of business: Adding value by adding services. *European Management Journal* 6: 314–24. [CrossRef]
Visnjic, Ivanka, and Bart Van Looy. 2012. Servitization: Disentangling the Impact of Service Business Model Innovation on the Performance of Manufacturing Firms. *SSRN Electronic Journal* 31: 169–80. [CrossRef]
Visnjic, Ivanka, Andy Neely, and Marin Jovanovic. 2018. The path to outcome delivery: Interplay of service market strategy and open business models. *Technovation* 72–73: 46–59. [CrossRef]
Wareham, Jonathan, Paul Fox, and Josep Lluís Cano Giner. 2014. Technology Ecosystem Governance. *Organization Science* 25: 1195–215. [CrossRef]
Weill, Peter, and Stephanie Woerner. 2015. Optimizing your digital business model. *IEEE Engineering Management Review* 43: 123–31. [CrossRef]
Williams, Amanda, Steve Kennedy, Felix Philipp, and Gail Whiteman. 2017. Systems thinking: A review of sustainability management research. *Journal of Cleaner Production* 148: 866–81. [CrossRef]
Xia, Yan, and Yanyun Yang. 2018. RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods* 51: 409–28. [CrossRef] [PubMed]
Yang, Miying, and Steve Evans. 2019. Product-service system business model archetypes and sustainability. *Journal of Cleaner Production* 220: 1156–66. [CrossRef]
Yeow, Adrian, Christina Soh, and Rina Hansen. 2018. Aligning with new digital strategy: A dynamic capabilities approach. *The Journal of Strategic Information Systems* 27: 43–58. [CrossRef]
Yin, Dao, Xinguo Ming, and Xianyu Zhang. 2020. Sustainable and Smart Product Innovation Ecosystem: An integrative status review and future perspectives. *Journal of Cleaner Production* 274: 1–19. [CrossRef]
Zahra, Shaker, and Satish Nambisan. 2012. Entrepreneurship and strategic thinking in business ecosystems. *Business Horizons* 55: 219–29. [CrossRef]
Zeng, Delin, Jingbo Hu, and Taohua Ouyang. 2017. Managing Innovation Paradox in the Sustainable Innovation Ecosystem: A Case Study of Ambidextrous Capability in a Focal Firm. *Sustainability* 9: 2091. [CrossRef]
Zheng, Maokuan, Xinguo Ming, Liya Wang, Dao Yin, and Xianyu Zhang. 2017. Status Review and Future Perspectives on the Framework of Smart Product Service Ecosystem. *Procedia CIRP* 64: 181–86. [CrossRef]
Ziaee Bigdeli, Ali, Tim Baines, Andreas Schroeder, Steve Brown, Eleanor Musson, Victor Guang Shi, and Armando Calabrese. 2018. Measuring servitization progress and outcome: The case of "advanced services". *Production Planning & Control* 29: 315–32. [CrossRef]
Zybery, Ilirjana, and Lindita Rova. 2014. The role of the accountants in the framework of the modern technological developments and digital accounting systems. *European Scientific Journal* 24: 30–48.