

Unpacking servitization: A review on assessing its effects on manufacturing firm performance and strategic choices



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Abstract The phenomenon of servitization entails a strategic transition from a product-centric business model to a service-oriented model to create value for customers and foster innovation. This study examines the evolutionary process of servitization in manufacturing firms by investigating how this shift influences the performance of organizations across organizational, workforce, and environmental dimensions. A comprehensive analysis of 105 scholarly articles retrieved from the Scopus database and Google Scholar spanning the period from 2012 to 2023 was conducted to uncover how manufacturing companies utilized servitization to improve their competitive advantage. The research utilized a methodical approach, incorporating content analysis and integrating the Antecedents, Decisions, Outcome, and Theory Context Method conceptual framework. It explores the impact of servitization strategy on organizational, human resources, and environmental factors while also outlining nine pivotal decisions that determine the success of both servitization and firms. The study considers various performance metrics, encompassing financial and nonfinancial indicator.

Keywords: organization, employee, performance, service transition, TCM, ADO framework

1. Introduction

Servitization is the process of transitioning from a product-centric business model to a service-centric approach, a concept introduced by Vandermerwe & Rada in 1988. Presently, manufacturing enterprises are strongly inclined to supplement their offerings with services to enhance competitiveness, turnover, and market influence (Kamal et al., 2020; Bıçakcıoğlu-Peynirci & Morgan, 2023; Yan et al., 2020). Many enterprises employ servitization strategies such as help desks, product upgrades, installation, and maintenance to engender value through customer contentment (Kowalkowski et al., 2013), eventually resulting in improved revenue streams and enabling firms to effectively adjust to market dynamics (Beuren et al., 2013; Kowalkowski et al., 2015).

Researchers globally emphasize the importance of integrating services into manufacturing firms' product portfolios to gain a competitive advantage and explore new markets, despite the risks involved (Dachs et al., 2014). Many companies face difficulties when trying to adopt servitization to improve their core manufacturing capabilities (Bortoluzzi et al., 2022; Friesenbichler & Kügler, 2022; Zhou et al., 2020). The term "service paradox in manufacturing companies" was first coined by Gebauer, Fleisch, & Friedli in 2005. Companies often encounter a financial paradox when they do not achieve the expected returns despite investing in expanding their service offerings. Moreover, some organizations experience organizational paradoxes due to structural inflexibility (Adrodegari & Saccani, 2020; Bortoluzzi et al., 2022; Brax et al., 2021). However, there is a research gap regarding the impact of servitization on nonfinancial aspects such as customer satisfaction, service culture, employee involvement, training, skills, and competencies, as well as financial metrics such as increased revenue and profitability.

The diverse body of literature presents varied viewpoints regarding the relationship between servitization and firm performance. Prominent academics such as Crozet and Millet (2017), Neely (2008), Baines & Lightfoot (2014), and Kowalkowski, Gebauer, Kamp, and Parry (2017) advocate for the benefits of servitization for manufacturing entities. Conversely, investigations by Benedettini et al. (2015), Wang et al. (2018), and Yan et al. (2019) present divergent results concerning the impacts of servitization on firm performance. Consequently, the principal aim of this research is to undertake a comprehensive analysis of the literature through systematic reviews to enhance the comprehension of the implications of servitization for firm performance. This study aims to organize collective knowledge in the field and suggest potential avenues for future research by tackling subsequent research inquiries:



- RQ1. What is the historical evolution of discussions on servitization?
- RQ2. What theoretical frameworks have been utilized in servitization studies?
- RQ3. Which specific research contexts have investigated servitization?
- RQ4. What are the factors that influence firms' decisions to embrace servitization?
- RQ5. What are the resultant implications of implementing servitization strategies?
- RQ6. What are the prospective areas for further research as indicated by the analysis of the literature?

2. Review Methodology

2.1. Identification

The terminology employed in the investigation of the Scopus database encompassed terms such as "Servitization," "performance," "Product service system," "Firm performance," "financial performance," and "profitability." The concept was developed after 2012, leading to a dearth of articles preceding that year. As a result, the search period spanned from 2012 to 2023. The initial analysis identified 379 journal articles written in English.

2.2. Screening

This systematic examination of the literature followed the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, referencing the contributions of Moher et al. (2015) and Page et al. (2020). A detailed explanation of the PRISMA methodology is presented in Figure 1. Scholars show a preference for the PRISMA methodology due to its clear and transparent approach to reporting systematic literature reviews. The focus of this study encompassed the fields of business management, accounting, economics, econometrics, and finance.

2.3. Exclusion criteria

The review exclusively examined peer-reviewed journal articles published in English, excluding conference papers, books, company reports, etc., leading to the identification of 379 papers. The evaluation was based on the alignment with the theme in the titles and abstracts of the papers, with only those addressing the research questions being retained. In total, following the predetermined criteria, 105 papers were selected and analyzed to systematically explore the research questions.

2.4. Data Synthesis and Analysis

All selected articles were analyzed both descriptively and thematically. The descriptive analysis focused on categorizing papers based on publication year, journal, citation count, and research methodology employed. The thematic analysis employed an inductive approach to investigate and elucidate the concept of servitization. The ADO and TCM frameworks were utilized for content analysis, as suggested by Lim et al. (2021), facilitating a comprehensive examination. These frameworks offer a systematic method to explore the reasons behind firms' adoption of servitization, their implementation strategies, and the resulting outcomes. The TCM framework emphasizes the theoretical underpinnings, contextual factors, and research methodologies utilized in academic articles. Conversely, Figure 2 ADO framework highlights the Antecedents, Decisions, and Outcomes associated with servitization. Incorporating these frameworks into the literature review enables a structured analysis and synthesis of existing research concerning servitization.

Figure 3 illustrates the trend in publications observed over the specified period. This trend emphasizes the emergence of the field. The year 2020 marked the peak in the number of articles, totalling 14, followed by 2013 with 12 articles and 2017 with 11 articles.

Table 1, which is presented below, offers an outline of the leading ten journals along with their respective categories. As depicted in Table 1, Industrial Marketing Management has the highest number of publications, consisting of 14 scholarly articles. This journal holds a position in Scopus Quartile 1, boasting a scientific journal ranking of 2.66 and a commendable index factor rating of 161. The International Journal of Operations & Production Management and Production Planning and Control both published 7 articles each. While the International Journal of Operations & Production Management holds an SJR rating of 2.62 and an H index of 155, Production Planning and Control is rated at 1.72 in terms of SJR, with an H index of 92.

In terms of citations, the research carried out by Evans, S. et al. (2017) emerged as the most influential paper, accumulating a total of 1105 citations. Table 2 presents an overview of the highly cited articles concerning servitization, in addition to the authors' rankings determined by citations per year. Evans, S. et al. are acknowledged as prominent authors in this domain due to their remarkable average of 184.1 citations per year. The study titled "Servitization: Disentangling the Impact of Service Business Model Innovation on Manufacturing Firm Performance" by Visnjic, I., & Van Looy, B. (2014) holds the second position in terms of influence, with a cumulative citation count of 921. In the realm of author ranking, they hold the third position, averaging 102.3 citations per year. Conversely, Baines, T. et al. (2017) identified the second most influential

author, with an average of 102.3 citations per year. T., & W. Lightfoot, H. (2013) is the third most cited publication. Nonetheless, the article "Product-service systems: a literature review on integrated products and services", authored by Beuren, Ferreira, Baines, T., & W. Lightfoot, H. (2013) is the third most cited publication.

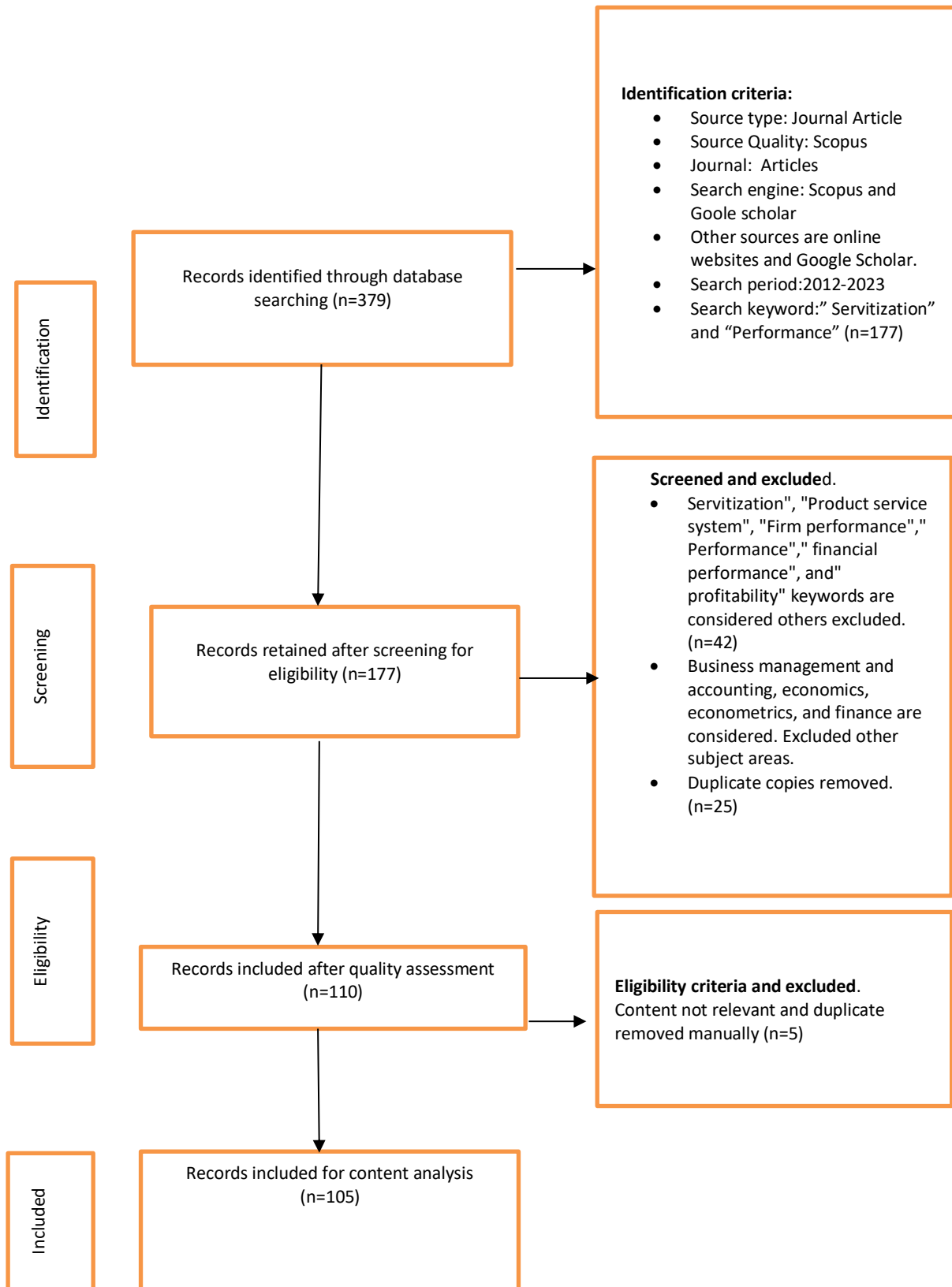


Figure 1 PRISMA flow chart.

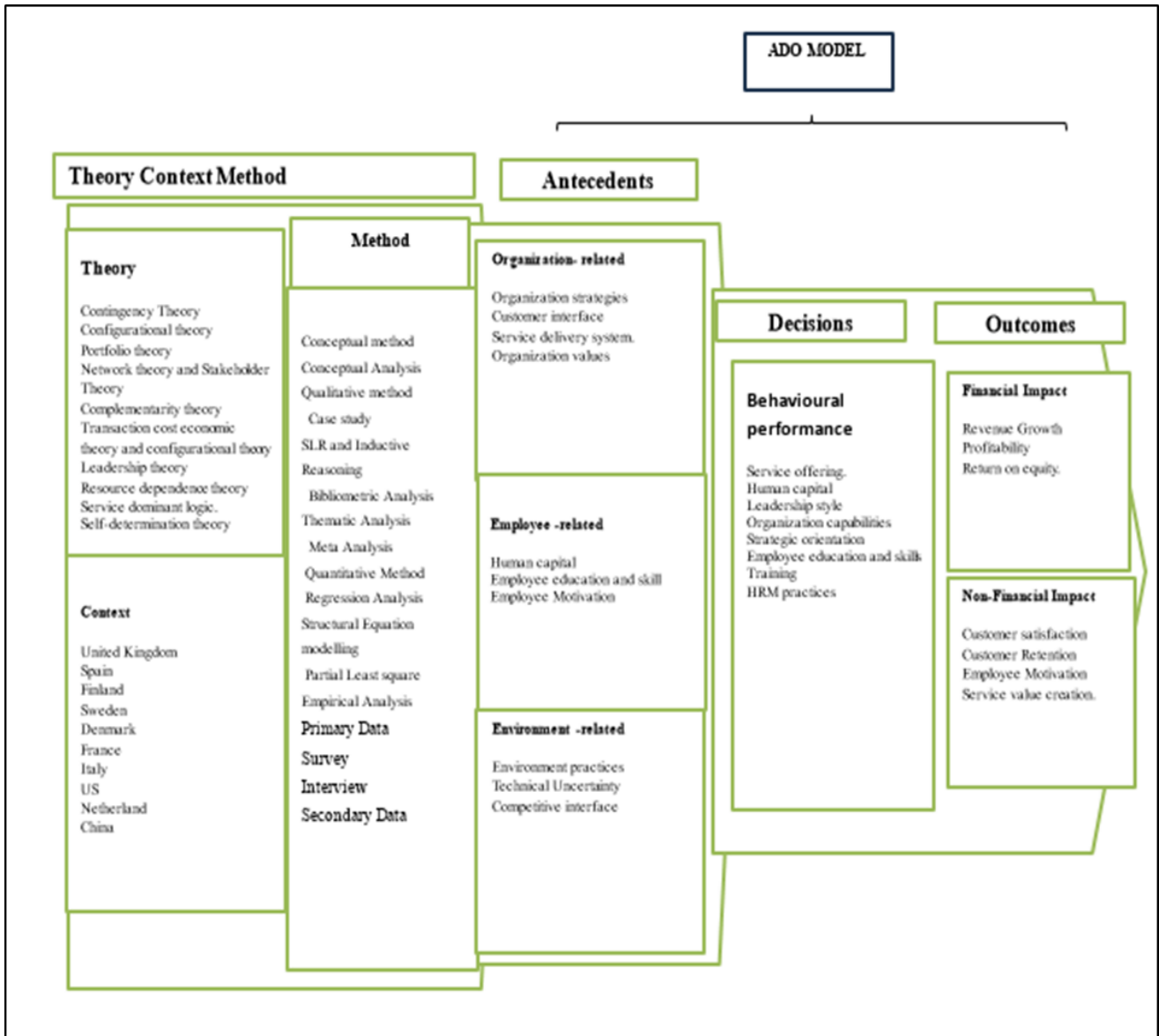


Figure 2 ADO and TCM framework.

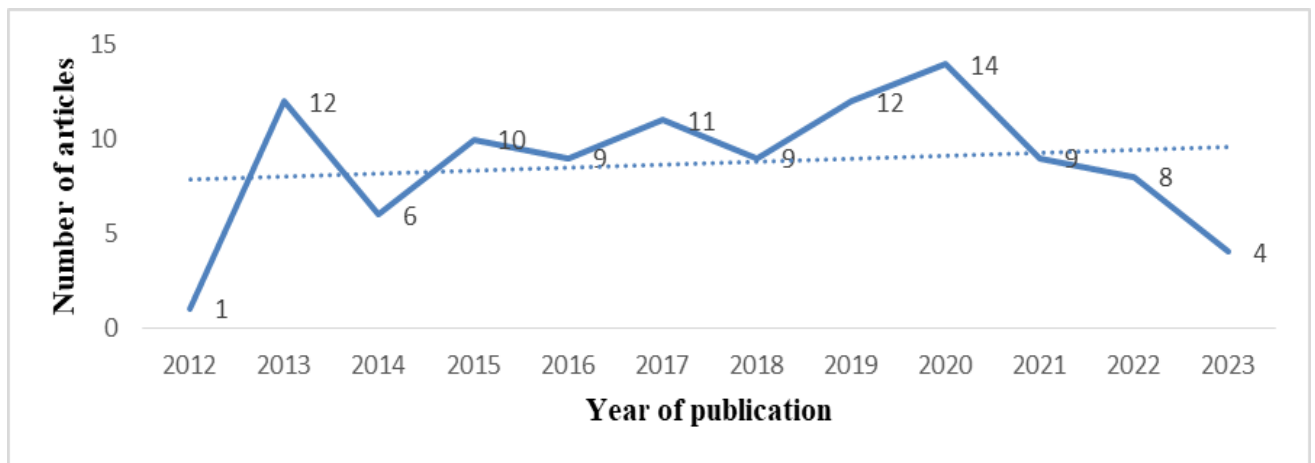


Figure 3 Trend in Publications.

Table 1 Top 10 Publication Volume and H Indexes of the Journal.

Journal	TP	SJR Rank	Scopus	H Index
Industrial Marketing Management	14	2.66	Q1	161
International Journal of Operations & Production Management (IJOPM)	7	2.62	Q1	155
Production Planning & Control	7	1.72	Q1	92
Journal of Manufacturing Technology Management	5	2.08	Q1	84
Journal of Service Management	4	2.88	Q1	77
International Journal of Production Economics,	3	3.03	Q1	214
Journal of Business Research	3	2.9	Q1	236
Journal of Cleaner Production	2	1.98	Q1	268
Production and Operations Management	2	3.12	Q1	129
Journal of Business & Industrial Marketing	2	0.85	Q1	78

Note: TP-Total Publications SJR-Scientific Journal Ratings

Table 2 Most Cited Articles in the Review.

Rank	Author	Total citations (n=7,005)	Rank	Author	Citations per year (n=976.9)
1	Evans, S. et al., (2017)	1105	1	Evans, S. et al., (2017)	184.1
2	Visnjic, I., & Van Looy, B. (2014).	921	2	Baines, T. et al., (2017).	123.6
3	Beuren et al., 2013,	789	3	Visnjic, I., & Van Looy, B. (2014).	102.3
4	Baines, T. et al., (2017).	742	4	Raddats, C., Kowalkowski, C. et al., (2019)	98.7
5	Baines & W. Lightfoot, 2013,	690	5	Kowalkowski et al., 2017	94.1
6	Cusumano et al., 2014	630	6	Visnjic, I., Wiengarten, F., & Neely, A. (2016).	79.2
7	Kindström, D., & Kowalkowski, C. (2014).	598	7	Beuren et al., 2013,	78.9
8	Kowalkowski et al., 2017	565	8	Cusumano et al., 2014	78.7
9	Visnjic, I., Wiengarten, F., & Neely, A. (2016).	555	9	Baines & W. Lightfoot, 2013,	69
10	Kowalkowski et al., 2017(b)	410	10	Kowalkowski et al., 2017(b)	68.3

Source: Lim et al., (2021) Citations per year = total citations ÷ current year (2023) minus year of publication.

3. Thematic Analysis

The examination of the selected articles delved into three main domains, covering the evolution of servitization, the rationale behind incorporating servitization, and the benefits it offers to the organization and various stakeholders.

3.1.1. Introduction Phase (1988-1999)

In 1988, Vandermerwe & Rada introduced a framework consisting of three levels of servitization, encompassing the provision of either products or services, products and services, and products and services in conjunction with assistance, knowledge, and self-service (Robinson et al., 2016). The adoption of servitization by businesses aimed to enhance their competitiveness through the augmentation of the value of their products. Thus, servitization is commonly known as service transition, service infusion, or hybrid offerings (Fang et al., 2008; Brax, 2005; Nijssen et al., 2022). Notably, Rolls-Royce implemented servitization within the aviation industry, offering comprehensive care to establish enduring service agreements with customers.

3.1.2. Medieval phase (2000-2013)

During the medieval period, which spanned from 2000 to 2013, manufacturing companies shifted from selling individual products to providing bundled products and services to enhance their value proposition (Baines & W. Lightfoot, 2013). This value enhancement conferred a competitive advantage and led to increased revenues (Leemann & Essig, 2013). The services offered included product smoothing, financing, insurance, maintenance, technical support, and basic training (Cusumano et al., 2014; Visnjic et al., 2014). Furthermore, companies began innovating their products and services to withstand intense market competition (Shin et al., 2022). This innovation plays a crucial role in improving customer service and the financial performance of organizations (Lin et al., 2019; Visnjic et al., 2014).

3.1.3. Development phase (2013-2023)

Since 2013, manufacturing enterprises have been leveraging servitization to remain competitive by meeting customer demands. Servitization benefits not only business-to-consumer brands such as Netflix, Uber, and Dim Dom (Essig et al., 2016) but also business-to-business enterprises (Malhotra & Van Alstyne, 2014). Technological progress has undeniably supported these organizations (Kowalkowski et al., 2017). Companies such as Adobe, which offers creative cloud services; Xerox, which provides document solutions (Lee et al., 2016); and space goods transit services, which offer comprehensive fleets (Kleemann & Essig, 2013), illustrate how servitization has empowered firms. This empowerment stems from both offensive and defensive advantages, such as cost savings and enhanced efficiency (Baines & Shi, 2015). For instance, IBM's strategic outsourcing, business consulting, technology services, and maintenance (Marjanovic et al., 2020) have contributed to cost reductions. Similarly, Renault Motors' emphasis on product and raw material recycling has led to reduced production costs (Opazo-Basáez et al., 2018).

The progression of servitization and its focal points at various stages are depicted in Figure 4. In the years 2013-2014, organizations primarily perceived servitization as a business framework. However, significant transformations have taken place in the past nine years due to technological advancements. The significance of servitization has recently been emphasized as a model of customer solutions.

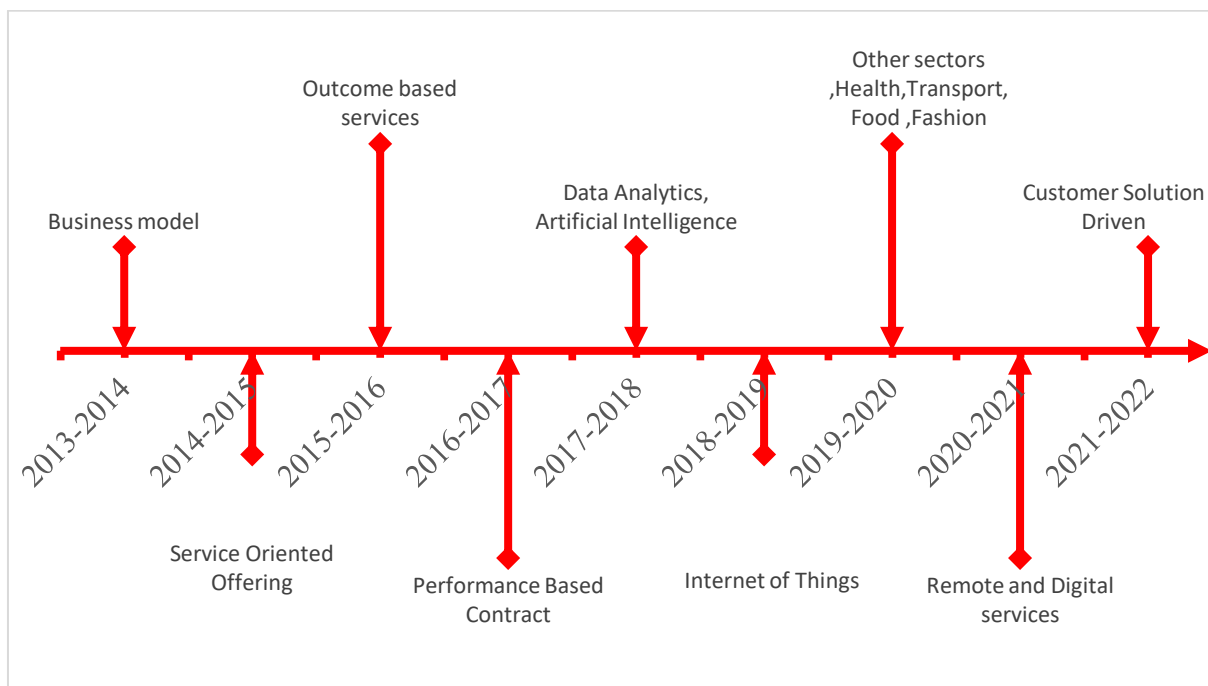


Figure 4 Evolution of servitization regarding Focus Area.

3.2. TCM Framework

This section employs the TCM framework to assess the chosen literature and provides in-depth insights into the theories, contexts, and methodologies utilized in the literature.

3.2.1 Theory

Table 3 outlines the theories employed by researchers. Recently, the resource-based view (RBV) theory has emerged as a predominant choice among scholars. This theory elucidates how combinations of valuable, rare, inimitable, and organized resources can create competitive advantages for a company (Kohtamäki et al., 2019). The authors highlight how servitization can facilitate value creation by effectively reconfiguring resources to exploit business prospects. In addition to the RBV, scholars have also incorporated contingency theory and configurational theories. While contingency theory offers insights into formulating servitization strategies to surmount challenges (Reim et al., 2019), configurational theory identifies key factors contributing to the success of servitization (Forkmann et al., 2017). Moreover, theories such as portfolio theory, network and stakeholder theory, service-dominant logic, and self-determination theory were prevalent from 2013 to 2018.

3.2.2. Context

To classify research on servitization, countries are taken into consideration. The data for the ten most prominent nations where servitization research has been conducted are displayed in Table 4. With 24, 14, and 10 research publications on servitization and its effect on company performance, respectively, the UK, Spain, and Finland are the top three countries.



The list shows that to help businesses, all developed nations are concentrating on servitization. According to five articles, China is the only developing nation in tenth place.

Table 3 Theoretical Foundation of the Study.

Theory	2013-2018	2019-2023	Total
Resource-based view theory		4	4
Contingency Theory		2	2
Configurational theory		2	2
Portfolio theory	1		1
Network theory and Stakeholder Theory	1		1
Complementarity theory		1	1
Transaction cost economic theory and configurational theory		1	1
Leadership theory		1	1
Resource dependence theory		1	1
Service dominant logic	1		1
Configuration and contingency Theory	1		1
Resource-based theory and structural contingency theory		1	1
Self-determination theory	1		1
Motivation Opportunity Ability theory		1	1

Table 4 Top 10 Countries Conducting Research on Servitization and Its Impact on Firm Performance.

Context	Number of Articles (2012-2023)
United Kingdom	24
Spain	14
Finland	10
Sweden	8
Denmark	7
France	7
Italy	7
United States	7
Netherland	5
China	5

3.2.3 Methods

The goal of this work was to determine the most popular methods and approaches in the field of servitization research. Table 5 provides a summary of certain research outcomes and the methods that researchers have employed. Researchers have conducted their studies using both case and empirical methodologies. A few academics have also investigated complex information about servitization using qualitative methodologies.

3.3 Analysis of the ADO Framework

3.3.1. Antecedents

The antecedents associated with organizations act as the primary drivers for engaging in or abstaining from specific organizational activities (Lim et al., 2021). The adoption of servitization is heavily influenced by organizational strategy, capabilities, and operations (Lenka et al., 2018).

3.3.1.1 Organization-Related

In the realm of servitization, the focal point of organizational strategic transformation lies in the development of service-centric frameworks (Yan et al., 2020; Ahamed et al., 2013). The propensity of enterprises to embrace servitization is influenced by their profit-driven objectives, which steer the formulation of appropriate organizational approaches (Raddatz et al., 2017). By engaging in partnerships with clients and leveraging technology, enterprises strive to achieve favorable outcomes from the integration of servitization (Kamal et al., 2020). An illustrative example is the inception of Man Fleet Management by the MAN Truck and Bus Company to offer innovative services and enhance vehicle performance optimization (Radda et al., 2015).

Table 5 Servitization Research Methods.

Method	Sample Articles	Findings
Conceptual Method	Bıçakcıoğlu-Peynirci, & Morgan (2023)	Scholars have emphasized that companies dominating in products are taking chances to pursue expansion focused on services. The allocation of financial resources is predicated on the belief that a servitization plan will assist businesses in sustaining sustainable growth in the face of unpredictability.
Thematic Analysis	Raddats et al. (2019)	The researchers discovered that manufacturers' service operations are impacted by technology improvements. Manufacturing companies, for instance, are using digital asset monitoring to offer intermediary services. Despite their high cost, these digital technologies provide up more ways to enhance service delivery.
Case study	Kreye, (2019; Kreye (2022); Jovanovic et al., (2019), Robinson et al., (2016),	Researchers found that by putting servitization strategies into place, manufacturers may control the expansion of their businesses. However, because profit margins are unpredictable, putting plans into practice does not guarantee increased income for businesses. Whether or not the strategies are successfully implemented determines the returns on investment and return on assets.
SLR and Bibliometric analysis	Kowalkowski et al. (2017); Zhang, and Banerji, (2017); Nudurupati et al. (2016)	The complexity of the relationship between servitization and business outcomes was unveiled by researchers. A significant obstacle to servitization implementation is the high investment involved, leading to increased costs for businesses. Challenges also arise from the resistance of customers and employees to embrace a new perspective.
Meta-Analysis	Brax et al., (2021)	Due to servitization, some businesses make large profits, while others incur losses. An inadequate understanding of operational procedures and organizational strategy leads to operational and strategic issues that impede the successful execution of services.
Empirical Analysis Partial least square, Structural Equation model	Foggia (2021); Benedettini & Neely (2019); Ruiz-Alba et al., 2019, Marjanovic et al., 2020, Lin et al.,2021; Yeo et al.,2021	Firms are observed by researchers to be transitioning from product-centric to service-focused business models despite facing considerable investment costs and financial instabilities. Collaborating with value-added service providers has often proven more advantageous for companies in delivering improved services. However, the scenario differs when businesses aim to provide fundamental services.
Correlation and Regression analysis	Van der Borgh, Nijssen, and Schepers (2023). Li (2015)	These empirical works are all related to a single outcome. Businesses should make greater investments in human resources by offering better compensation since employee happiness is crucial to the execution of servitization initiatives. When staff members are motivated and possess the necessary knowledge to implement the plan, businesses can see excellent outcomes.
Multiple Regression Analysis	Raddats et al., 2015,	Additionally, Raddats et al. have emphasized the significance of personnel resources and skills in the servitization strategy's implementation. Employee training enables manufacturers to successfully serve clients and maintain their position as market leaders.
Survey method	Bortoluzzi et al., 2022; Valtakoski & Witell,2018; Bustinza et al., 2015; Vendrell et al., 2021; Yan et al., 2020;	The researchers discovered that modern technology and successful organizational techniques complement one another. For there to be a return on investment, tactics, and technology must be correctly matched.
Exploratory study	Khan et al., 2022; Raddats et al., 2017	The implementation of a servitization strategy is noted by researchers to come with inherent risks. To mitigate uncertainties, manufacturers are advised to initially pinpoint capacity deficiencies and then enhance their programs. Ultimately, this approach can aid businesses in risk management and profitability.

To develop effective organizational approaches, manufacturers need to possess a comprehensive understanding of customer requirements and obstacles. The utilization of web-based platforms allows manufacturers to streamline customer engagement (Adrodegari et al., 2018). The identification of opportunities for cross-selling is facilitated through collaboration between sales and service, in conjunction with the utilization of tools for evaluating customer value. This heightened understanding ultimately results in customer contentment and enhanced financial outcomes (Kowalkowski et al., 2017; Nijssen et al., 2022; Tomaskova & Kanovska, 2016). The adoption of value-based selling, combined with a customer-centric outlook, assists in identifying customer needs, satisfaction levels, and societal and environmental benefits (Kimita et al., 2022; Lin et al., 2019; Yeo et al., 2021). Prominent illustrations include Otis and Kone, which deliver customer-centric services by providing maintenance services with modest profit margins.

Moreover, grasping customer demands empowers enterprises to provide advanced services through improvements in service provision and supply chain procedures (Ruiz-Alba et al., 2019; Salonen et al., 2017). This, in turn, nurtures customer retention (Tomaskova & Kanovska, 2016), as customer satisfaction and allegiance are directly influenced by the service performance of enterprises (Vendrell-Herrero et al., 2021). Motivation opportunity ability theory suggests that formal training enhances the service provision capabilities of enterprises, thus creating new opportunities for them. Consequently, corporations such as Amazon are driven to employ features such as subscription models (Karatzas et al., 2020). Organizational values serve as foundational principles that steer behavior when organizations concentrate on innovation, customization, flexibility, and diversity (Ahamed et al., 2013). This necessitates the development of adaptable protocols, a clear strategic vision, the identification of competencies, and the cultivation of reliable partnerships with service providers (Yan et al., 2020; Gaiardelli & Songini, 2020).

3.3.1.2. *Related employees*

Human capital holds significance in organizations that adopt servitization. The arrangement of human capital directly affects the results, with productivity experiencing a rise parallel to the education levels of employees (Chowhan, 2016). As a result, enterprises ought to involve proficient staff members possessing a diverse range of skills, including design, sales, and execution (Kimita et al., 2022; Kreye et al., 2015). Efficient work behavior is observed in employees who establish a sense of belonging to their respective organizations. An illustration of this is evident in Starbucks' human resource strategy, which integrates empowerment, ownership, and feedback mechanisms to enhance service provision. Performance appraisals rely on an employee's dedication to self-initiative, self-realization, and answerability, thereby cultivating a satisfying work ambiance (Baik et al., 2019).

After hiring procedures, organizations are required to concentrate on cultivating technical competencies related to products and upholding employee retention (Baik et al., 2019; Raddats et al., 2015; Smith et al., 2005). The ability to generate knowledge and exercise critical thinking are fundamental sources of service innovation (Adam, 2018). The introduction of product-service innovation correlates with heightened labor efficiency (Siclen-Luna et al., 2020), as exemplified by Toyota's manufacturing system, which underscores training based on 14 foundational principles.

Employee motivation holds a key position in the sphere of employee retention. It emerges as a necessity propelled by either intrinsic or extrinsic factors that impact both employee performance and organizational efficiency (Kreye, 2016). Personnel displaying high levels of motivation deliver superior services and contribute to organizational efficacy (Löfberg et al., 2015; Martinez et al., 2017). Intrinsic motivation may stem from opportunities for skill enhancement, while extrinsic motivation is influenced by external factors. Instances of employee discontent and skepticism toward the system often stem from a perceived lack of control over organizational protocols (Bikfalvi et al., 2012; Kreye, 2016).

3.3.1.3. *Environmental practices*

Servitization promotes the adoption of environmentally sustainable practices, leading to enhanced resource efficiency and advantages. An exemplary case is Rolls-Royce, which generates half of its income from services, with a significant emphasis on environmental factors resulting in notable decreases in both material and energy usage (Baines & Lightfoot, 2013; Miller et al., 2019; Nullmeier et al., 2016). Strategic initiatives such as cloud-based subscription models and cognitive solutions are driving companies such as General Electric, Siemens, and Microsoft toward a more service-oriented and competitive strategy (Kowalkowski et al., 2013).

Nevertheless, the existence of technological uncertainties concerning the durability of a product poses challenges for enterprises. The dissemination of knowledge via digital technologies is influenced by sociotechnical principles and the societal shaping of technology (Robinson et al., 2016). However, developing countries face obstacles in upholding traditional approaches (Bikfalvi et al., 2012; Ou, L. et al., 2023; Chen, Z., 2023). Nonetheless, modern technologies such as the Internet of Things, cloud computing, and big data analysis have a beneficial impact on performance (Bortoluzzi et al., 2022).

3.3.2. *Decisions*

Decisions are denoted as behavioral performance, encompassing service innovation, human capital, service offerings, and environmental practices. According to the literature review, nine crucial decisions influence servitization and firm performance. These include leadership style, resources, capabilities, strategic orientation, service offerings, human capital, employee education, training, and HRM practices, along with service-oriented cultural transformation. The tactics for managing change are shaped by organizational characteristics such as leadership style, opposition, support, and engagement.

Nudurupati et al. (2016) and Shin et al. (2022) propose a meticulous selection of service innovation based on firm objectives, input availability, and firm capability. The decisions regarding servitization adoption are typically made by dynamic leaders, with resistance often encountered from autocratic and autonomous leaders (Kim & Toya, 2019; Rese & Maiwald, 2013).

3.3.3. Outcomes

The impact of servitization on both the financial and nonfinancial aspects of firms has been a central focus of scholarly investigations. The correct execution of servitization has the capacity to offer monetary benefits to enterprises in terms of resources, profit margins, and investment returns. Apart from financial advantages, organizations can also accumulate nonmonetary benefits, including improved workplace productivity, employee growth, staff incentivization, client contentment, customer loyalty, and corporate reputation.

The academic perspective put forth by Li (2015) and Lin (2019) indicates that the integration of servitization is more feasible for larger organizations. Research findings suggest that the implementation of servitization varies across business sizes, with larger corporations gravitating toward advanced services and smaller entities focusing on fundamental service offerings (Zhang, 2021). Businesses are advised to place greater emphasis on strategic planning and operational efficiency. However, uncertainties remain regarding the measures adopted to address the challenges posed by servitization and, consequently, the expected financial implications (Demeter & Szász, 2013). Strategic orientations such as technology, market, and service focus are linked to service innovation and enhanced financial performance (Sjödin et al., 2019). Through the effective utilization of resources in production and consumption, businesses can also contribute to environmental improvement (Yang & Evans, 2019). The advancement of service value creation and delivery within the value network is a key objective for enhancing organizational environmental sustainability (Evans et al., 2017).

4. Future directions

The current investigation is focused on exploring the relationship between servitization and business performance, emphasizing dimensions and the servitization index over objective and subjective elements. Future research should consider variables such as manufacturing capabilities, company size, age, industry categorization, and business context. Exploring the link between servitization and firm performance could be enriched through the utilization of empirical investigations and case studies. Well-established theories such as structured contingency theory, resource-based view theory, and motivation, ability, and opportunity theory provide insightful perspectives. By conducting empirical research, these theories can be employed to scrutinize the connections, influencing factors, and statistical assessments concerning servitization in PSS providers. The authors have pinpointed several potential areas for future research in Table 6 to be further explored.

Table 6 Future Research Areas.

Research area	Description	Author References
Determine and analyze the needs of the customer	To better understand client preferences and help businesses develop tactics that work for them, surveys, interviews, and market research can be carried out.	Alghisi .and Saccani, 2015; Marques 2013; Shimomura et al., 2017; Song, 2017
Create a service design.	Apply design thinking to provide cutting-edge services that benefit both buyers and providers.	Kwon et al., 2021; Kreye, 2018; Salonen et al., 2017; West & Di Nardo, 2016.
Integration of new technology	Analyze the effects of cloud computing and IoT on servitization	Boehmer et al., 2019; Bortoluzzi et al., 2022; Zhang et al., 2021
Alignment of service-oriented organizations	Recognize the impact that human resources and organizational structure have on a service-oriented culture.	Heirati et al., 2023; Sholihah et al., 2020; Yan et al., 2020; Zhang et al., 2022.
Partnership for external collaboration	Analyze the degree to which cost reduction can be achieved by cooperation with outside service providers.	Kowalkowski et al., 2015; Nijssen et al., 2022.
Pricing strategy and revenue-generating method	Determine the effects of outcome-based pricing, performance-based contracts, subscription-based business models, and free-to-fee services.	Kamal et al., 2020; Wittmann et al., 2014.
Strategies for Marketing and Communication	Use case studies, client endorsements, and digital marketing platforms to effectively convey the importance of your capacity to provide intricate solutions.	Nudurupati et al., 2016; Visnjic & Van Looy, 2014.
Support for After-Sale Services	Formulate service-level agreements about maintenance and warranty services.	Adrodegari et al., 2018; Bakás et al., 2013; Rudnick et al., 2020,
Constant Assessment and Service Execution	Evaluate client feedback, and service performance, and improve customer happiness and delivery efficiency.	Kleemann & Essig, 2013; Tomaskova & Kanovska, 2016,

5. Final Considerations

The ongoing analysis has conducted an extensive review of the literature on servitization and its impact on company performance. By applying the TCM and ADO framework, this study identifies precursors linked to organizations, employees, and the environment that impacts servitization strategies. The decisions made by companies can have a positive influence on profitability. Nevertheless, to fully benefit from these advantages, companies need to address these constraints. Moreover, the research has outlined potential paths for future studies directed at improving the implementation of servitization in the manufacturing industry.

6. Implications of the study

This research recommends that manufacturing sectors cultivate a culture of service to effectively navigate through the transition. It is imperative for managers to address employee opposition and set up service-oriented objectives to foster ongoing innovation. Initiatives aimed at raising awareness should be implemented within the business community, policy-making bodies, and industry groups to enlighten them about the advantages, possibilities, and methodologies of servitization. Programs focused on enhancing skills should provide employees with the necessary expertise in service design, customer interaction, data analysis, and digital tools. Collaborative research ventures with scholars and academic institutions have the potential to establish exemplary practices within the industry and enhance key performance metrics, such as revenue expansion and client satisfaction.

Ethical considerations

Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

Funding

This research did not receive any financial support.

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