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Contemporary Paradigms and Excellence in Operations: A Systematic Literature Review

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Palavras-chave: Operations Management; Paradigms; Literature Review

1. INTRODUCTION

Excellence in operations refers to the deliberate and systematic application of principles and methods aimed at improving performance in the production and delivery of products and services. In that regard, Operations Management (OM) emphasizes that the value creation encompasses a broad body of knowledge dedicated to planning, organizing, directing, and controlling, with a focus on improving the processes that produce goods and services (Spring, 2017; Terwiesch, et al., 2019; Heizer, Render & Munson, 2020).

Both OM academics and practitioners rely on established paradigms to support decision-making, which function as lenses through which reality is interpreted. More precisely, a paradigm is a set of beliefs, values, and practices that guide scientific research, being a model accepted by the scientific community to explain phenomena and develop theories (Kuhn, 2012). Furthermore, the role of paradigms in shaping operations strategy has long been recognized in the OM literature (Clark, 1996; Hayes & Pisano, 1996).

In today's business environment, to achieve operational excellence, companies and supply chains must excel in environments characterized by uncertainty, risk, and disruption (Kumar, Luthra, Mangla & Kazançoğlu, 2020; Bryce, Ring, Ashby & Wardman, 2022; Ivanov, 2022). And conceptual frameworks have been proposed to improve performance under different paradigms and scenarios (Wieland, 2013; Lee, 2022). Faced with contemporary challenges older paradigms may not be adequate to support the development of operational core capabilities.

In this context, Gardiner (2010) argues that developing an effective operations strategy requires making long-term decisions regarding a business's competitive priorities — such as cost, quality, delivery, flexibility, and service — which must be consistent with its overall vision, mission, and strategic objectives. In addition, internal and external pressures for change have been addressed through various paradigms—such as Lean, Agile, Resilient, Green, and Sustainable — applied either individually, through integration, or by combining selected elements from each (Sharma et al., 2020).

This paper aims to describe the contemporary paradigms in Operations Management literature that guide strategies toward achieving operational excellence.

1.1 Research problem and objective

Companies and supply chains represent complementary levels of analysis of the same phenomenon in OM — which refers to the systematic design, direction, and control of processes that transform input into services and products for customers (Krajewski & Malhotra, 2022). Moreover, OM entails the management of systems or processes to create goods and/or provide services, with the processes being intrinsically interdependent within supply chains (Stevenson, 2018).

In this context, a relevant academic debate was raised regarding the role of Lean in a general theoretical understanding within the OM field by Browning and de Treville (2018), as shown in Figure 1. According to the authors, Lean has received expressive attention and undergone a process of conceptual broadening, since its initial conception in Japan. It is viewed as a philosophy, an approach to managing operations and the supply chain as well as a method for operations planning and control (Slack and Brandon-Jones, 2018). In addition, decades of research highlight the need to reassess and recalibrate the field's direction, as its

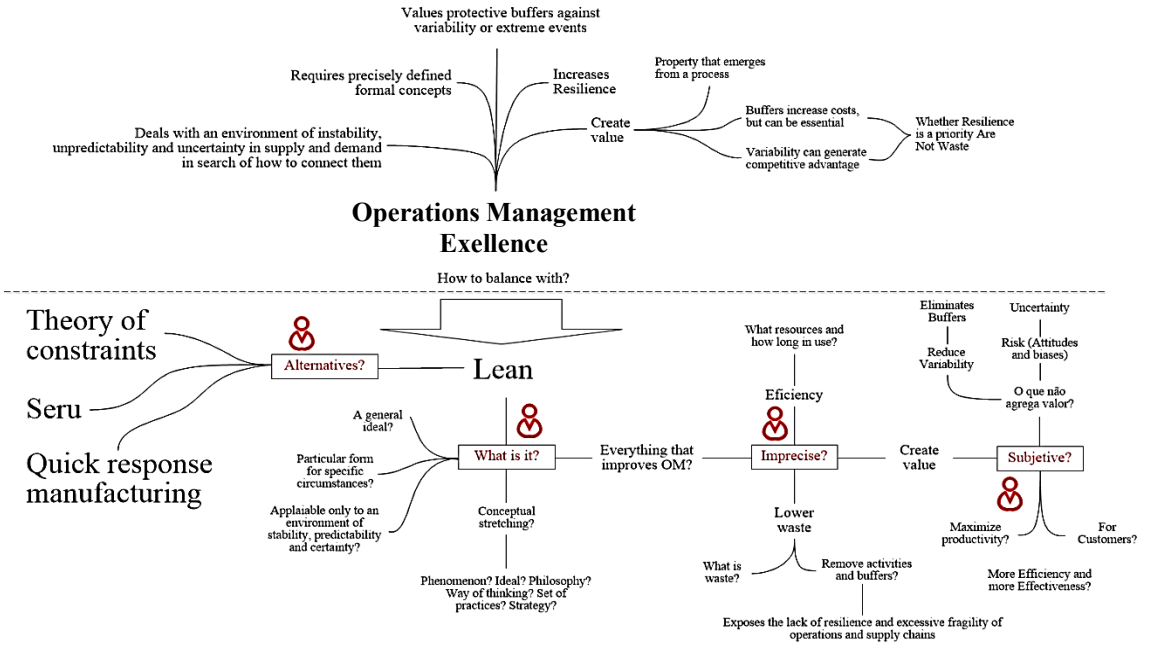
underlying research philosophies and general methodologies have often gone unchallenged, leaving room for weaknesses in the lean body of knowledge.

In response, Hopp and Spearman (2021) described four lenses for Lean (process, flow, network, and organization), hoping to move beyond the trial-and-error experience, i.e. to address gaps between applied and basic research. Conversely, researchers who support it are convinced that Lean thinking and practice are here to stay — a consolidated phenomenon focused on creating and delivering products to customers with cost and time efficiency (Cusumano et al., 2021).

This misalignment indicates that scholars have yet to reach a consensus on the meaning of Lean within the context of OM. In this sense, Browning and de Treville (2021) argue that competitive advantages are lost when any improvement in Operations Management (OM) is broadly categorized as Lean and, therefore, a clear distinction must be made between operational excellence — a general ideal — and Lean, which represents a specific approach to achieving it.

According to the authors' reasoning (see Figure 1), it is necessary to reconcile operational excellence with the growing recognition of resilience within the OM community, for example, the need for inventory buffers to protect against variability or extreme events. In this regard, research on supply chain resilience capabilities and their performance measurement has been expanding in recent years (Han, Chong & Li, 2020).

Figure 1. Operations Management excellence, Lean and Resilience



Source: Authors, systematized from Browning and de Treville (2021).

At the same time, improving flow is a core OM theme and is set to become even more important following contemporary technological developments in manufacturing, requiring an inventory diagnosis for its improvement (Land et al., 2021). Moreover, manufacturing systems must promptly adapt to changing demand and factory conditions, the supply network, and customer needs, and mass personalization requires responsive and flexible manufacturing operations capable of producing individualized products in dynamic batch sizes at scale in a cost-effective manner (Qin & Chen, 2021). In addition, the case and the context are important in solving or mitigating inventory management problems through safety stock (Barros, Cortez & Carvalho, 2021).

Furthermore, the relationship between lean management and resilience in supply chains, whether negative or positive, still not clear in the existing literature (Ruiz-Benítez, López & Real, 2018). Resilience is a recent concept in OM and represents the proactive ability of any operating system to deal with minor or major disruptions (Ivanov and Dolgui, 2019), combining the capabilities of reducing the damage caused by a given risk and restore performance to an acceptable level (Ahmed & Rashdi, 2021). In addition, capabilities enable building of resilience and be applied as performance metrics (Han, Chong & Li, 2020). Addressing this important issue, we formulated a research question.

RQ1: What is the role Resilience play in operations management literature?

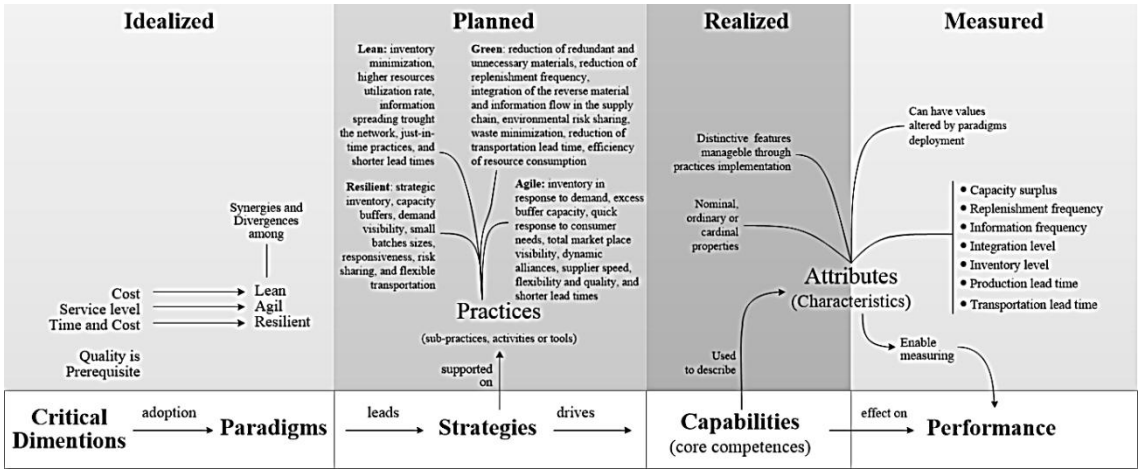
Expanding the scope of our research valuable insights can be found in studies on competitive priorities, which are pursued through both Lean and resilience.

It is not new the understanding that production strategy requires dynamic adjustments according to the operational context, and that such adjustments are guided by the paradigms embraced (Clark, 1996). Similarly, there is no one-size-fits-all solution in OM. Hayes and Pisano (1996) had pointed out that manufacturing managers should not focus primarily on selecting the latest fashionable improvement initiative or merely strive to be 'lean'. Instead, authors state that they should harness improvement programs in the service of a broader manufacturing strategy develop and reinforce unique operational capabilities.

When competitive priorities — such as cost, quality, flexibility, and delivery time — are pursued, a dilemma in operations strategy arises in deciding how to allocate resources given real-world constraints (Pagell, Melnyk & Handfield, 2000). Organizations' key competitive priorities involve trade-offs and must align with operations strategy decisions related to structure (capacity, facilities, technology, and vertical integration) and infrastructure (workforce, quality, production planning and processes) (Boyer and Lewis, 2009). Regarding this, exploring the link between performance and competitive priorities may offer a promising pathway for new theoretical approaches.

However, simultaneously addressing multiple paradigms and competitive priorities may not be feasible or desirable. Carvalho and Cruz-Machado (2011) studied the synergies and divergences among the Lean, Agile, Resilience, Green, and Sustainable (LARGS acronyms) paradigms in the context of supply chain management. This reasoning is systematized in Figure 2, which includes causal connections (arrows) and action steps — idealized, planned, realized, and measured.

Figure 2. Management process in supply chains



Source: Authors, systematized from Carvalho and Cruz-Machado (2011).

In this context, research on LARGS have been gaining increasing attention, reflecting a growing interest in addressing contemporary challenges in OM (Maryniak, 2022; Qin and Chen, 2022; Sonar, Gunasekaran, Agrawal & Roy, 2022; Zhou, Wang, Shi, & Chen, 2022).

Understanding the relationship between performance and the various paradigms in the OM literature (see Figure 2) is essential for achieving operational excellence. Thus, we formulated the second research question.

RQ2: What are the contemporary paradigms that drive operational excellence, and what are their core concepts, application contexts, and research approaches?

2. THEORETICAL FOUNDATION

To address the proposed research questions, a research design was established involving a systematic literature review and a bibliometric analysis (Linnenluecke, Marrone & Singh, 2020). This process supported a critical synthesis of recent literature based on lexicographic and content analysis.

2.1 Methodological design

The systematic literature review was conducted with a descriptive purpose (Grant and Booth, 2009). The search was carried out in the Scopus and Web of Science (WOS) databases, considering articles from indexed journals between January 2000 and August 2023, with following search equation. This procedure resulted in 541 articles, which were consolidated into two .bib files.

- Scopus: TITLE-ABS-KEY (lean) AND TITLE-ABS-KEY (resilience) AND PUBYEAR > 2000 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE , "English")), resulting 167 articles; and, also, TITLE-ABS-KEY ("operations management") AND TITLE-ABS-KEY (resilience) AND PUBYEAR > 2009 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) resulting 72 articles; total Scopus= 239;
- WOS: TS=(lean) AND TS=(resilience), 2000-01-01 TO 2023-08-24, resulting 201 201 articles; and, also, TS=("operations management") AND TS=(resilience), 2000-01-01 TO 2023-08-24, resulting 101 articles; total WOS= 302.

Both files were merged, and duplicates as well as papers without abstracts were removed, resulting in 371 articles. Subsequently, 152 articles were excluded after reading the abstracts and checking the alignment of studies with OM.

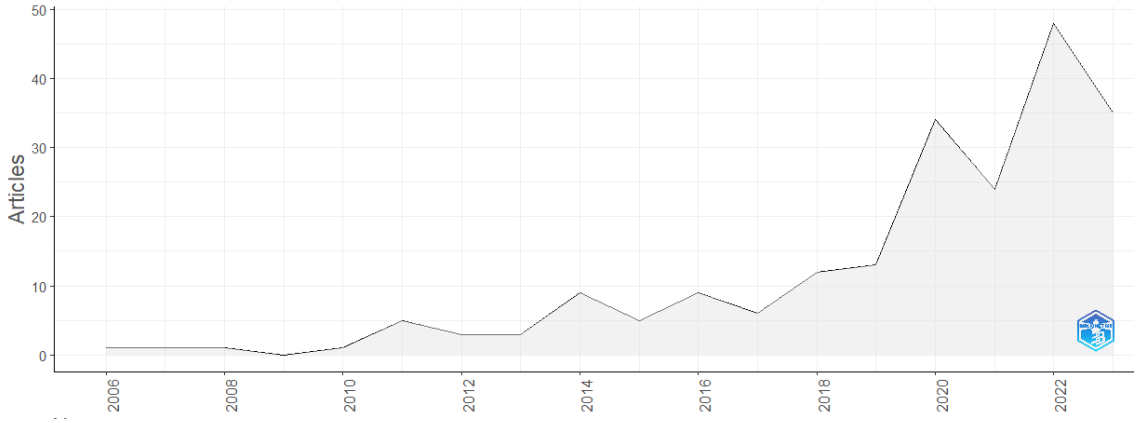
Thus, a final database comprising 219 articles was obtained, which was then analyzed in a bibliometric study (Aria and Cuccurullo, 2017; Derviş, 2020), using RStudio software and Bibliometrix package (RStudio Team, 2024). The most relevant sources, productive authors, and frequently cited manuscripts were identified through performance analysis and scientific mapping. Additionally, a lexicographic analysis of the article abstracts was conducted using IRaMuTeQ software. In this analysis, default parameter settings and text segments of fifty lexical forms in length (i.e., words, terms, etc.) were adopted, generating both Correspondence Factor Analysis, based on principal forms, and similarity analysis — using the maximum tree algorithm with terms appearing fifty times or more.

The content of the papers was described and interpreted with the support of bibliometric and lexicographic analyses, allowing for a broader understanding and helping to address the research questions.

2.2 Bibliometric analysis

A total of 219 papers were written by 639 authors between 2004 and 2023. Collaboration is key amongst authors (0,34), with 20 authors published alone. The annual growth rate for scientific production is 22.04%, with a noticeable increase starting in 2018 (see Figure 3). The papers can be summarized as follows: 0.34 articles per author; 5431 references; 744 author appearances; 18 single-authored papers; 3.40 co-authors per article; and 15.07% of the publications involved international co-authorships.

Figure 3. Annual Scientific Production per year



Source: Authors, using RStudio software.

The averages are: 2.98 years of age; 32.60 citations; 7.78 citations per year per document. The most relevant keywords-plus (ID) was resilience (59), OM (28), performance (28), supply chain management (22), supply chains (18), management (17) and Lean Production (15). The corresponding author's countries articles frequency was USA (30), UK (28), China (19), Germany (15), and Brazil (12), collectively representing 47.4%.

Table 1 shows the journals with the highest number of publications (left), with emphasis on the *International Journal of Production Economics* and the *International Journal of Production Research*, both in Zone 1 referring to Bradford's law. Additionally, the figure highlights the most productive authors (right), with Dmitry Ivanov standing out for having the highest fractionalized number of publications (Nf = 4.5).

Table 1. Ten top Sources and Authors

Order	Source	N	H-Index	Authors	N	Nf
1	Int J Prod Econ	16	214	IVANOV, D	7	4.5
2	Int J Prod Res	15	170	SAURIN, T	7	2.4
3	Int J Logist Manag	10	84	TORTORELLA, G	5	0.89
4	Int J Lean Six Sigma	9	47	DUBEY, R	7	0.73
5	J Manuf Technol Manag	6	84	AHMED, W	3	1.5
6	Prod Oper Manag	6	129	ALTAY, N	3	1.2
7	J Clean Prod	5	268	ANTONY, J	3	0.45
8	Sustainability	5	136	BREEN, L	3	0.78
9	Ann Oper Res	4	118	BRYDE, D	3	0.25
10	IEEE Trans Eng Manag	4	103	CHEN, X	3	1.5

Source: Authors, using RStudio software.

Note: N, articles number | H-Index, Scimago Journal & Country Rank (SJR) | Nf, number of articles fractionalized (citations received by each paper divided by the square root of the number of co-authors).

Additionally, the ten most cited articles were ranked by total number of citations (see Table 2), with particular emphasis on Dmitry Ivanov and Rameshwar Dubey — whose recent works have the highest TC/Y — and on the *Int J Prod Res* which appears 3 times.

Table 2. Ten top manuscripts per citation

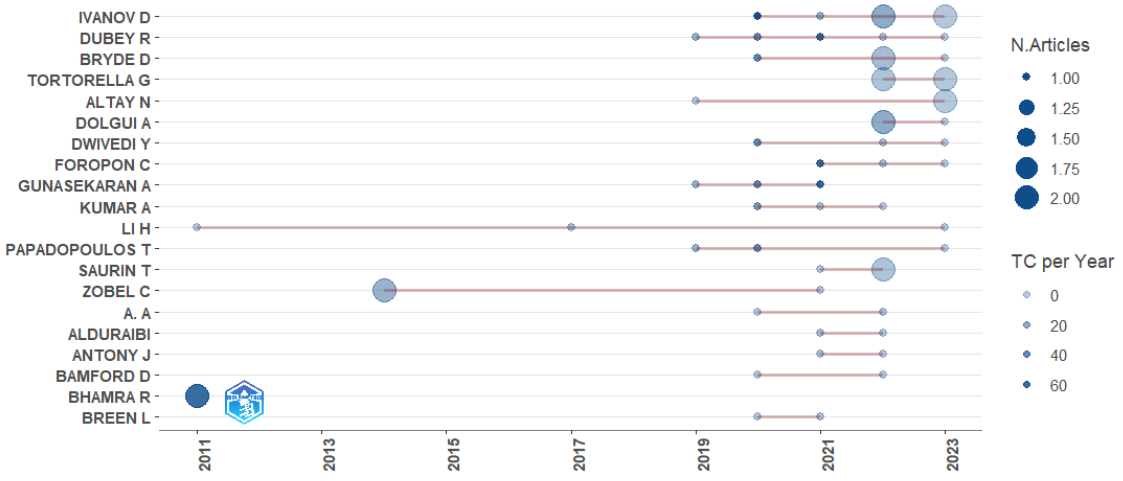
Order	Article	DOI	TC	TC/Y	NTC
1	Bhamra R, 2011, Int J Prod Res	10.1080/00207543.2011.563826	624	48.0	2.07
2	Ivanov D, 2022, Ann Oper Res	10.1007/s10479-020-03640-6	396	198.0	22.36
3	Dubey R, 2021, Int J Prod Res	10.1080/00207543.2019.1582820	330	110.0	11.70
4	Burnard K, 2011, Int J Prod Res	10.1080/00207543.2011.563827	267	20.5	0.88
5	Sahebjamnia N, 2015, Eur J Oper Res	10.1016/j.ejor.2014.09.055	206	22.9	3.54
6	Kumar A, 2020, Sustain Oper Comput	10.1016/j.susoc.2020.06.001	182	45.5	4.21
7	Choi TM, 2018, Prod Oper Manag	10.1111/poms.12838	179	29.8	2.95
8	Zobel CW, 2014, Comp Oper Res	10.1016/j.cor.2011.09.024	169	16.9	2.35
9	Caldera HTS, 2019, J Clean Prod	10.1016/j.jclepro.2019.01.239	168	33.6	2.86
10	Bryce C, 2020, J Risk Res	10.1080/13669877.2020.1756379	150	37.5	3.47

Legend: TC, number of times each manuscript has been cited | TC/Y, yearly TC average | NTC, normalized total citations.

Source: Authors, using RStudio software.

The evolution of the production patterns of the top ten authors over time is depicted in Figure 4, which displays their yearly publications. The size of the bubbles represents the number of documents produced per year, while the color intensity reflects the total citations received by those publications in that year.

Figure 4. Twenty top Authors production over time



Source: Authors, using RStudio software.

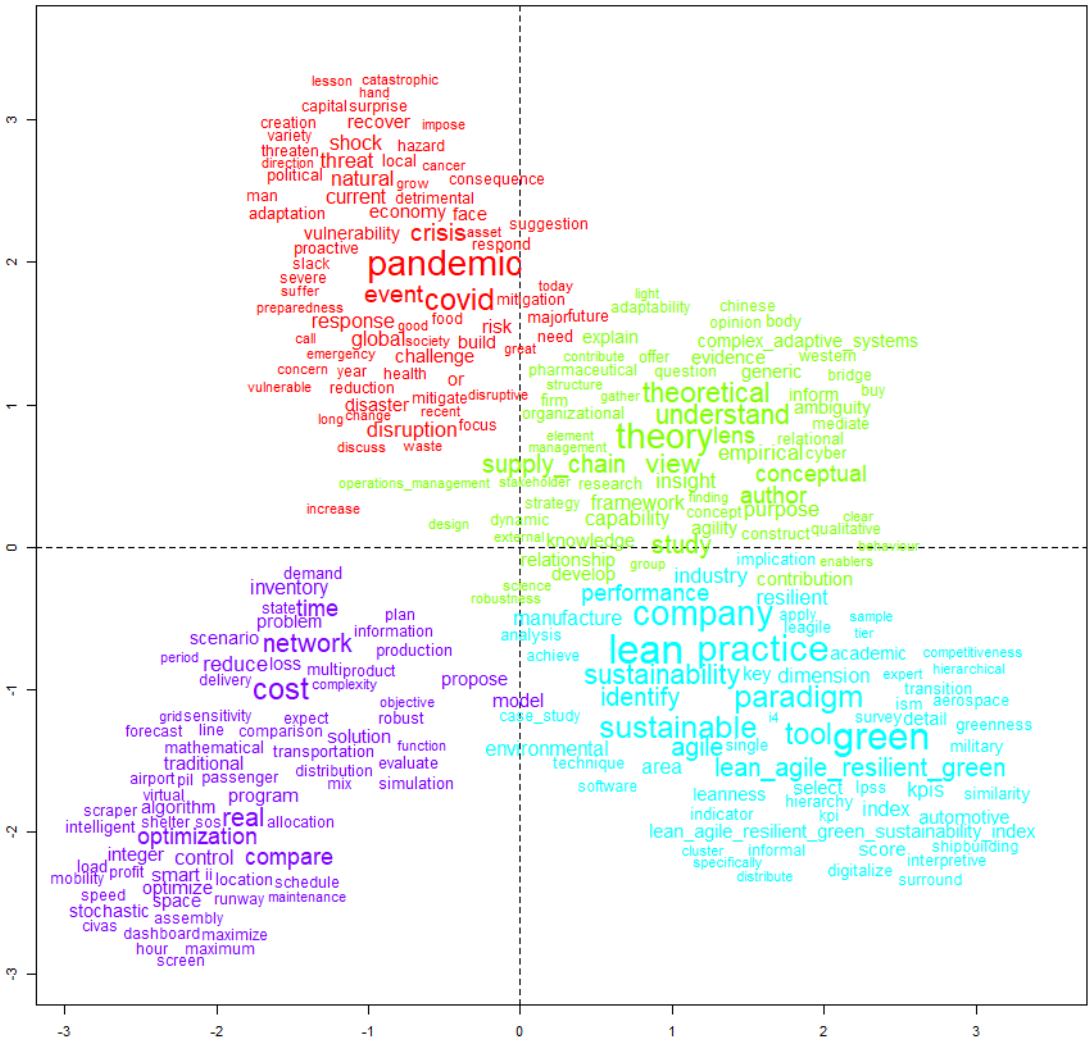
In addition to the quantitative analysis of the articles, the conceptual structure of the abstract content was mapped through a lexicographic analysis.

2.3 Lexicographic analysis

The lexicographic study considered all 219 abstracts to identify language patterns through factorial and similarity analyses. The correspondence factor analysis, shown in Figure 5, indicates that 74.93% of the variability is captured by two factors: 39.63% by Factor 1 (horizontal axis) and 35.2% by Factor 2 (vertical axis). The size of the words indicates the relative importance of the lexical forms.

Additionally, four distinct clusters were identified: (*i*) environmental factors (upper left, e.g., pandemic and COVID-19); (*ii*) theoretical concerns in supply chain (upper right, understand, theory etc.); (*iii*) empirical improvement approaches (lower left, e.g., cost and optimization); and (*iv*) paradigms (lower right, LARGS etc.). The lower right quadrant is associated with the contemporary paradigms and the research questions formulated. It is important to highlight that these lexical forms were commonly combined by authors in their papers, which were selected based on the search terms resilience and OM.

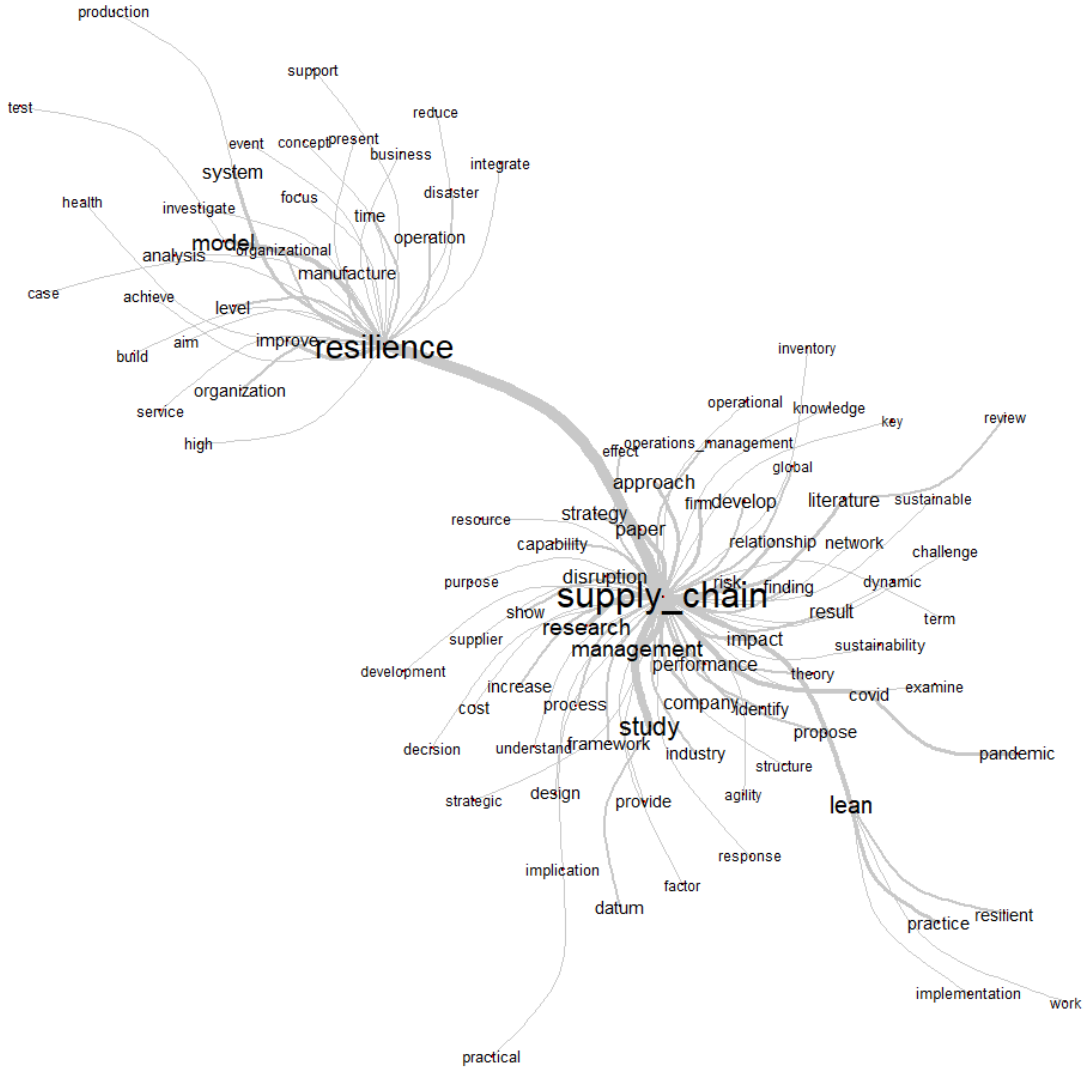
Figure 5. Similarity analysis of abstracts



Source: Authors, using IRaMuTeQ software.

The similarity analysis (see Figure 6) indicates that the lexical forms *resilience* and *supply chain* form distinct communities and are strongly connected (represented by the thickest link), suggesting that authors frequently mention them together in papers abstracts. This highlights that resilience is a key concern within the *supply chain* and OM literature.

Figure 6. Correspondence factor analysis of abstracts



Source: Authors, using IRaMuTeQ software.

These results reveal a strong relationship between resilience-supply chains in the recent OM literature, indicating that resilience is preferably addressed at the systemic level rather than in isolation within manufacturing and production systems. Furthermore, the integration of bibliometric and lexicographic analyses provides deeper insights into RQ1.

2.4 Core concepts, application contexts, and research approaches

In this section, we further explore the paradigms cluster identified in Figure 5, as it is closely related to the second research question (RQ2). Table 3 systematizes the main characteristics of the top ten most cited manuscripts (see Table 2).

These references articles are predominantly qualitative and theoretical, embedded in the organizational context, and have OM as the theoretical framework, with resilience as a central concept. Moreover, when the theoretical framework is Lean, resilience appears as one among several other concepts and paradigms (Ivanov, 2022; Caldera, Desha and Dawes, 2019; Mason-Jones, Naylor and Towill, 2000). Concerning RQ1, resilience is associated with risk, uncertainty, and disruptions in most articles, indicating that better OM systems must address these associated factors. Furthermore, when the terms resilience and OM are searched together, the literature shows that there is no single associated paradigm. Instead,

it is necessary to recognize that, in contemporary OM literature, a plurality of theoretical concepts and paradigms can be assumed to guide organizational strategies.

Table 3. Characterization of top ten manuscripts

Article	Paper Type	Approach	Theoretical framework	Core concept	Other concepts
Bhamra R, 2011, Int J Prod Res	Review	Quali	OM	Resilience	Risk, vulnerability and adaptative capacity
Ivanov D, 2022, Ann Oper Res	Theorization	Quali	Lean and OM	Viability	Lean, Agility, resilience, sustainability, digitalization, viability
Dubey R, 2021, Int J Prod Res	Empirical investigation	Quali	OM	Resilience	Data analytics capability and flexibility
Burnard K, 2011, Int J Prod Res	Theoretical Framework	Quali	OM	Resilience	Risk and uncertainty
Sahebjamnia N, 2015, Eur J Oper Res	Conceptual framework	Quanti	OM	Resilience	Disruptive events and Disaster Recovery
Kumar A, 2020, Sustain Oper Comput	Theorization	Quali	OM	Resilience	Sustainability and Disruption
Choi TM, 2018, Prod Oper Manag	Review	Quali	OM	Big data	Big data strategies and methods
Zobel CW, 2014, Comp Oper Res	Conceptual modeling	Quanti	Operations	Resilience	Multi-event disaster
Caldera HTS, 2019, J Clean Prod	Theoretical Framework	Quali	Lean and green	Sustainable	Profitability, resilience, social and environmental impact on sustainability
Bryce C, 2020, J Risk Res	Review	Quali	Lean and operations	Resilience	Uncertainty, risk, and disruption

Source: Authors.

Among the 219 articles in the final database, we analyzed those addressing the LARG paradigms. The systematization aimed to understand their contributions, identify which paradigm was studied, and examine the terminology adopted by the authors (see Table 4). These articles predominantly originate from supply chain research and focus on competitive priorities, particularly performance.

Moreover, the focus on modeling reflects an early stage of theoretical development, consistent with the features of emerging theories. In addition, there is a lack of consensus on their designation (such as paradigms, practices, or strategies) and on how they should be structured or integrated. In other words, since they are not the same concepts and are often studied simultaneously in literature, it remains unclear whether they are conflicting, complementary, or capable of being integrated.

The findings indicate that Leanness, Agility, Resilience, Greenness, and Sustainability are the contemporary paradigms proposed in the literature to support operational excellence, and they are predominantly addressed in supply chain studies.

Table 4. Articles that emphasize LARGS concepts

Article	Context	Contribution	Denomination	L	A	R	G	S
Ramirez-Peña et al., 2020	Supply chain and I 4.0	Sustainable Performance model	Paradigm	✓	✓	✓	✓	✓
Sonar et al., 2022	Supply chain	Model to select suppliers	Paradigm	✓	✓	✓	✓	✓
Salleh, Abd Rasidi, and Jeevan,2020	Seaport system Supply chain	Management tool for performance	Paradigm	✓	✓	✓	✓	
Anvari, 2021	Petrochemical Industries Supply chain	Sustainable Performance	Paradigm	✓	✓	✓	✓	✓
Maryniak, 2022	Supply chain	Models of building resilience	Type	✓	✓	✓	✓	
Qin and Chen, 2022	Supply chain	Sustainable management	Undefined			✓		✓
Azevedo, Carvalho and Cruz-Machado, 2016	Automotive companies and Supply chain	Index for Sustainability	Paradigm	✓	✓	✓	✓	✓
Das, 2019	Food Supply chain	Sustainable	Practices	✓		✓	✓	✓
Caldera, Desha, and Dawes 2019	Enterprises (small and medium-sized)	Enablers and barriers for Sustainable business practice	Paradigm, thinking	✓			✓	✓
Rajesh, 2018	Manufacturing Supply networks	Similarities and dissimilarities in strategic objectives	Paradigm	✓	✓	✓	✓	✓
Zhou et al., 2022	Free-Floating Car-Sharing Providers Supply chain	Models for Optimal Strategy (Green, Resilient and Sustainable)	Undefined			✓	✓	✓
López, and Ruiz-Benítez, 2020	Aerospace manufacturing Supply chain	Sustainability Multilevel analysis	Strategies	✓		✓	✓	
Amjad, Rafique, and Khan, 2021	Automotive parts Supply chain and I 4.0 manufacturing	Framework for implement LARG	Paradigm, practice, and approach	✓	✓	✓	✓	
Govindan et al., 2014	Supply chain	Impact of LRG on social, economic and environmental sustainability	Practice	✓		✓	✓	

Legend: L, Lean | A, Agile | R, Resilience | G, Green | S, Sustainable. Source: Authors.

Source: Authors.

Additionally, we systematized these paradigms (LARGS) based on the authors' conceptions presented in Table 4, within the supply chain context, as detailed below:

- *Lean* (L), refers to the application of principles and practices both within the company and beyond its organizational boundaries (Ramirez-Peña et al., 2020), with the aim of adding value to meet customer demands more efficiently, quickly, and predictably (Sonar et al., 2022), and is generally intended to reduce waste (Rajesh, 2018);
- *Agil* (A), refers to the ability to understand market conditions and respond as quickly as possible to constantly changing customer requirements (Ramirez-Peña et al., 2020). It involves being flexible and responsive to market dynamics (Sonar et al., 2022), particularly in terms of product, process, and pricing strategies to remain competitive (Rajesh, 2018);
- *Resilient* (R), refers to the ability to recover from disturbances and return to the original state (Ramirez-Peña et al., 2020). It involves developing responsive capabilities through flexibility and redundancy to anticipate and act on market changes while minimizing demand risks (Sonar et al., 2022), being robust enough to handle sudden supply/demand fluctuations or disruptions (Rajesh, 2018);
- *Green* (G), refers to the integration of environmental considerations, including product design, procurement and material selection, manufacturing processes, product delivery to final consumers, and end-of-life management after its useful life (Ramirez-Peña et al., 2020). It focuses on R's strategies — such as recycling, remanufacturing, reducing, reverse logistics, and refurbishing (Sonar et al., 2022) while also aiming to align with sound business practices, core values, and increased profitability (Rajesh, 2018);
- *Sustainable* (S), refers to the coordinated and voluntary integration of economic, environmental, and social considerations (Ramirez-Peña et al., 2020). It involves pursuing goals across all three dimensions of sustainable development (Sonar et al., 2022), emphasizing eco-efficiency, and adopting core competencies such as waste reduction and adaptability to market changes (Rajesh, 2018).

These definitions focus on expected outcomes without detailing their operationalization, and they remain non-exhaustive, frequently encompassing overlapping or even conflicting concepts. Several authors have highlighted this issue.

Groover (2015) argues that L is a shop floor prerequisite for A at the organizational level. Sonar et al. (2022) emphasize that applying L principles in the supply chain context is particularly challenging, as it demands extensive coordination and collaboration among the various stakeholders involved. Ramirez-Peña et al. (2020) state that is usual the combination of L and A (Leagile), and highlight that, differ in focus although G and S are often used interchangeably: G mainly addresses environmental concerns, whereas S encompasses economic, environmental, and social dimensions.

Additionally, Leagile upholds flexibility principles as seen in A, which contradicts the green supply chains' focus on inventory reduction (Rajesh, 2018). The author points out other contrasts that remain unaddressed in the literature: the A principle adopted in R supply chains contradicts the L management principles; building redundancy for managing vulnerabilities in R supply chains directly contradict the focus on efficiency as seen in S supply chains; and the emphasis on product reusability and reverse logistics networks increases complexity, opposing the reduction of complexity typically practiced in resilient supply networks.

Therefore, the literature has yet to sufficiently explore how multiple contemporary paradigms can be integrated to advance operational excellence in enterprises and supply chains. The findings from this section offer insights that help address RQ2.

3. DISCUSSION

Our research path began with an exploration of the latent debate surrounding the roles of Lean and Resilience in the field of Operations Management, which led to the formulation of RQ1. However, a comprehensive review of contemporary literature revealed the need for a broader inquiry, due to the emergence of new OM paradigms — prompting the development of RQ2. This progress enables us to highlight important implications for both practitioners and researchers, as outlined below.

Findings indicate that efficiency-focused traditional paradigms fall short in capturing the complexity of Operations Management in the current century. Through a comprehensive search equation designed to synthesize the literature, we observed in the abstracts a predominance of terms such as *resilience* and *supply chain*, as identified through a similarity analysis (lexicographic study). In addition, a trending topic referred to by the acronym LARGS emerged prominently among the most cited sources, authors, and manuscripts (bibliometric analysis).

This analysis revealed that RQ1 remains inadequately addressed in the current body of literature, particularly regarding how it is incorporated or substituted within, given competing priorities and emerging paradigms. Finding that aligns with the conflict identified by Browning and De Treville (2021) regarding the expanding scope of Lean. A different world may require distinct paradigms, rather than making existing ones compatible or reshaping them, which represents an important theoretical implication.

Moreover, despite our systematic review of several studies on LARGS paradigms addressing RQ2, something still seems to be missing. Merely differentiating them through conceptual definitions and contrasting their characteristics or practices — often conflicting and/or incompatible — appears to be insufficient. Perhaps for this reason, research on the integration of the LARGS paradigms remains underexplored in the literature (Sonar et al., 2022), with most studies focusing on only a few of them — for example, resilience (Leng, 2025) or combinations such as green and resilience (Qin & Chen, 2022). Perhaps the authors explore only those paradigms that exhibit more synergies than divergences (Carvalho and Cruz-Machado, 2011).

In practice, companies and their supply chains must be supported by consistent market positioning while offering distinct products, adopting multiple competitive advantages, and applying varied production strategies (make-to-stock, make-to-order, and make-to-availability). Long-term success requires that a company differentiate itself from its competitors by offering something unique and valuable to customers, whether this be a quick service, high reliability, low costs, or innovative products (Spring, 2017).

This plurality is context-dependent and may require a combination of approaches in areas such as quality management, production control, operational efficiency, and customer interaction, among others. Maybe for this reason, companies that combine various OM concepts and practices often refer to their systems as X Production Systems or X Manufacturing Systems, where 'X' stands for the company name (Netland, 2013) and reflects the use of a combination of core concepts drawn from both academic literature and industry practices. Thus, it seems that no pure form of these paradigms is implemented outside the original contexts in which they were conceived.

In this sense, both academic studies and company practices should consider contextual factors — particularly environmental and demand-related uncertainties — when directing management efforts and making choices guided by the desired competitive priorities, thereby selecting one or more of the LARGS paradigms.

4. CONCLUSION

This paper described the contemporary paradigms in Operations Management (OM) literature that guide strategies toward achieving operational excellence. We examined how resilience is addressed in OM and its associated contemporary paradigms, focusing on conceptual foundations, application contexts, and research approaches.

Our findings indicate that the principles implicit in traditional OM paradigms are insufficient to describe and address contemporary complexities. Thus, no single paradigm is suitable for all situations and contexts, as it may fail to produce optimal outcomes. And simply broadening the approach does not necessarily resolve the issue. Just as stylish clothing worn in the wrong context can cause discomfort, a paradigm misaligned with its operational environment may hinder, rather than enhance performance. Such a narrow focus risks limiting the search for excellence in OM.

Furthermore, the operational management process — involving competitive positioning, paradigm selection, strategy formulation, and the implementation of operational capabilities — plays a crucial role for both companies and suppliers in achieving performance.

It is essential to recognize that companies and supply chains operate as socio-technical systems, designed to ensure operational performance while coping with environmental and demand-related uncertainties. The greater these uncertainties, the higher the entropy and complexity of these systems, and consequently, the greater the effort required to manage operations. In real-life situations, the meaning of operational excellence should not be uniform across all companies and supply chains. And it may not be possible to excel in all competitive priorities simultaneously.

Future work would investigate the role of emerging technologies (e.g., artificial intelligence, automation, and smart industry) in paradigm choice. It would also be valuable to understand how companies and supply chains formally define their strategies, as well as the temporal migration cycles in the relationship between paradigms and strategies. Also, it would be an opportunity for research study the importance of physical arrangements, since manufacturing flexibility can be achieved through various means.

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