

SYSTEMATIC LITERATURE REVIEW: THEORY PERSPECTIVE IN LEAN MANUFACTURING PERFORMANCE

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Abstract:

This review examines the trend of applying theories in LM performance and offers the latest recapitulation of related theories in LM performance. The methodology is based on Preferred Reporting Items for Systematic Reviews (PRISMA) to search for multiple scientific information databases and to guarantee that no important study is overlooked. For the single theory, highly employed theories were the Theory of Constraints, Resource-based View/Natural Resource-based View Theory (RBV/NRBV), and Contingency Theory (CT). Meanwhile, several articles employed integrations of several theories in a publication. Concerning the year of publication, significant growth in articles with underpinned theories was published from 2020 onwards. This study offers several significant contributions to researchers to widen the knowledge related to the adaptation of theories in the field of lean performance, as research underpinned by a theory offers a solid and convincing result in investigating the research problems. The first limitation was the search string to identify the related articles, which could be extended to maximize the article search. The other limitation was the database used which was limited to the Scopus database. Despite the importance of underpinning theory in research, OM has been criticized for the inadequacies of its theory, with only one-third of OM research incorporating theory. However, a limited review was conducted on the theories used in LM performance theory. To reduce this gap, this review examines the trend of applying theories in LM performance and offers the latest recapitulation of related theories in LM performance.

Key words: *lean manufacturing, performance, theory perspective, systematic literature review*

INTRODUCTION

Due to globalization and growing production costs, businesses must review their manufacturing business models to maintain competitiveness [1]. To be competitive in the long run, manufacturers must always strive to improve and adjust to recent technological advancements [2, 3]. The manufacturing industries must incorporate new operating approaches to attain a competitive edge and raise their production capacity, efficiency, quality, and resilience [1]. The general structure that the company uses to achieve this goal is the adaptation of lean manufacturing (LM) approach [4]. LM is a management technique that aims to generate high-quality products efficiently and with little to no waste while also increasing value [5]. All research, whether quantitative, qualitative or mixed-methods, needs a theoretical foundation to prove the importance of the study and have an effective framework [6]. Without a theory, the output is essentially a collection of past studies. A theory can direct research to develop

effective strategies. The study findings will be more compelling if they are based on the theory since they can address the underlying causes of the research problems. Gioia and Pitre [7] have provided descriptions of theory as “*a coherent description, explanation and representation of observed or experienced phenomena*”. A solid theory is required to examine and explain issues, and research that draws on an established theory has yielded significant results for the discipline that has an impact [8].

A limited review was conducted on the theories used in LM performance theory. Walker, et al. [9] published the closest work that examined the theory from the standpoint of operations management (OM). However, it could only incorporate publications from three significant journals (the Journal of Operations Management, Production and Operations Management, and the International Journal of Operations and Production Management). To overcome this limitation, our study examined the Scopus database for relevant papers, which includes eight main

journals: Scencedirect, Emerald Insight, Taylor & Francis, Springer Link, Wiley-Blackwell, Inderscience, SAGE, and IEEE Explore [10].

Furthermore, OM has been criticized for the inadequacies of its theory [11, 12]. Walker, et al. [9] claimed that just one-third of OM studies use a theoretical background as the basis for their research. As a result, this review examines the trend of applying theories in LM performance. This will help researchers in the related field adapt theories in their studies and offer a solid and convincing result in investigating the research problems [8].

LITERATURE REVIEW

Theory is an explanation and representation of seen or experienced phenomena that assists in making sense of the world around the researchers and allows researchers to predict the sorts of linkages between phenomena [9]. Theories grow out of new metaphors that help build conceptual framework to grasp the problem properly. Theory testing, on the other hand, uses established theories in new settings or contexts to help researchers better understand a subject [13, 14]. To overcome the lack of theoretical growth in the field of OM, researchers typically borrow from other theoretical perspectives rather than developing new ones [9]. Because real-world management problems are often multidisciplinary in nature, it makes sense that OM draws on relevant ideas from fields such as finance, management science, organizational behavior, and marketing [15].

Walker, et al. [9] conducted systematic review based on articles from three major OM journals to study the theoretical views used in the area. Resource-based View (RBV) Theory, Industrial Organizational Theory, and Contingency Theory are the three OM theories most frequently used in OM publications. Accordingly, theoretical viewpoints in OM have evolved through time. Most theories that guided OM research were taken from other fields, such as economics, sociology, and psychology, rather than being original from the field itself [9].

Punnakitikashem, et al. [14] reviewed prior studies on LM through the prisms of the primary operational behavior (OB) theoretical perspectives, such as Contingency Theory, RBV Theory, Institutional Theory, and Transaction Costs Theory. It was noted that each of the four theories has a distinct focus. Thus, it is important to choose carefully between competing ideas, as each point of view by itself is insufficient to capture the complexity of LM issues within organizations. Integrating theoretical perspectives may result in a more beneficial understanding of the complex LM issue. It has become clear that theory in OB is a useful concept for describing LM occurrences, which helps researchers in the field of LM comprehend how businesses grow and survive in the fierce markets. Theoretical frameworks, relationships, and hypotheses are frequently drawn and analyzed using the theories. The researchers contend that while designing the research framework, each theory should be considered; hence future LM research should give special consideration to this condition.

OM may be viewed as a hybrid of behavioral and natural science. A theory frequently enhances the understanding by demonstrating previously formulated empirical science principles that are supposed to explain the understanding. OM is a discipline that has developed a set of standards that address the problem of uneven industrial productivity over time. According to the rule of bottlenecks, reducing or managing bottlenecks more effectively can increase operational productivity. This understanding is aligned with the available theory, known as the Theory of Constraint, introduced by Goldratt [16]. This theory is best stated as a logical law with mathematical rather than empirical foundations that simulation may verify in terms of scientific philosophy.

Introducing new concepts or metaphors can sometimes form a conceptual model, which can then be used to improve the explanation of the subject, known as a theory-building process. Theory testing includes adapting previously generated ideas to a fresh context or circumstance to better comprehend a subject. Arguments from other disciplines, such as OB and management information systems, are used to demonstrate the potential for theory building. OM researchers may benefit from the experiences of other disciplines and employ action research to develop new theories [17].

METHODOLOGY

This section describes how to access publications within the purview of LM performance. The method involves stringent procedures as well as procedures that look at the relevant articles. Preferred Reporting Items for Systematic Reviews (PRISMA) and Meta-Analyses are common strategies for conducting literature reviews. It served as the basis for the method utilized to locate the articles. PRISMA highlights the review report, which analyzes randomized trials and may be used as a starting point for conducting systematic reviews. It also includes exclusion and inclusion criteria for articles relevant to this review [18]. According to PRISMA's founders, Moher, et al. [18], PRISMA may be used for a systematic review that emphasizes randomized trials as the basis for other types of research, such as intervention, which can present several challenges, particularly when assessing qualitative and mixed-method study designs.

PRISMA searches multiple scientific information databases and all viable research possibilities to guarantee that no important study is overlooked [19]. Given the research selection criteria, the screening strategy may be able to minimize the amount of research identified [18]. PRISMA is commonly used in medical studies, but since it stresses research problems related to the demand for a systematic review, it is appropriate for OM. This approach may also provide inclusion and exclusion criteria for specific research. The lack of methodological direction in research and the insufficiency of present methodological references have compelled academics from a variety of fields, not just medicine, to review more methodologically-based articles on SLR.

Web of Science and Scopus are the top-notch citation databases competing with one another [20]. However, the articles in this review were obtained from Scopus, a well-known database. The reason for obtaining the articles from a single database as explained by Al-Ryalat, et al. [21] is that Scopus resulted in the highest number of documents compared to WoS, making it more relevant to obtain further related articles to be reviewed. In addition, according to Patel, et al. [22], the Scopus database is the largest multidisciplinary collection of abstracts and citations, making it a key resource for researchers seeking relevant articles. It is relatively new player that challenging the dominant position of WoS. Scopus included eight central journals; Sciencedirect, Emerald Insight, Taylor & Francis, Springer Link, Wiley-Blackwell, Inderscience, SAGE, and IEEE Explore [10].

All associated terms linked to this review were searched for using Scopus search strings. Three essential keywords were determined based on the study questions: lean manufacturing, performance, and theory. Previous researchs was used to look for synonyms, related terms, and variations to extend the research keywords. These keywords were then searched in Scopus advanced searching tool, and 226 articles from the database were identified based on the search efforts. According to Kraus, et al. [23], The author’s ability to perform the review article often determines the quality of the literature review quality. This review only includes journal papers since the exclusion criteria improve the quality of the results [24]. Additionally, only English-language articles were included to reduce the complexity that may arise from the need for translation. A total of 147 items were ultimately chosen for the next phase.

There were no limitations on the year of publication for this study, although many researchers use it as an exclusion criterion. According to the search results, the articles were published between 2005 and 2022. Since this review was interested in following how theories were drawn and underpinned to research, the publication year was not an exclusion criterion. Table 1 summarizes the inclusion and exclusion criteria for the chosen article.

Table 1
Inclusion and Exclusion Criteria

Inclusion Criteria	Scopus-indexed articles Journal articles English language articles Empirical study
Exclusion Criteria	Non-Scopus-indexed articles Conference proceedings, review articles, book chapters and books Non-English language articles Conceptual study and review article

From the 147 articles, the authors manually evaluated the remaining works by reading the titles, abstracts, or whole articles to ensure relevant theories underpinned the articles. 102 articles were eliminated during this stage due to

the abstract and whole article reading screening procedures. The article was removed because no theory was used to underpin the research (n = 78), conceptual study (n = 11), and non-manufacturing performance-related study (n = 13). Hence, 45 articles were considered valid for further analysis. Figure 1 depicts a comprehensive flow diagram of the search process.

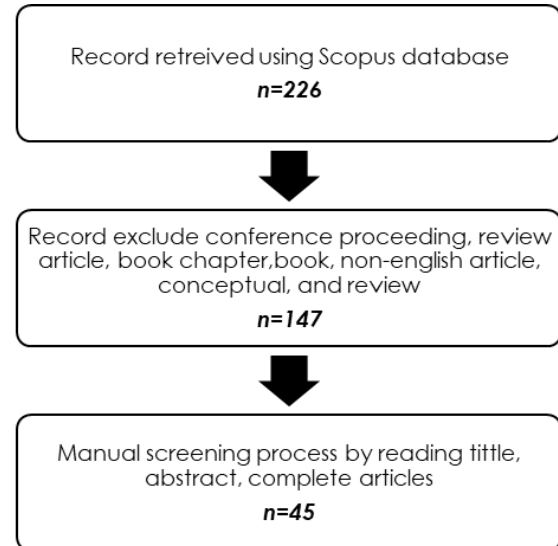


Fig. 1 Search Process Flow Diagram

In general, it can be concluded that only 45 out of 123 total articles (not including 24 conceptual studies and non-manufacturing performance-related studies), yielding 37% of articles were drawn based on theoretical justification in the field of LM performance. Next section will explain the result and analysis based on the selected 45 articles.

RESULT AND ANALYSIS

The result will be further analyzed from 45 articles based on specified research string, inclusion and exclusion stage, and manual screening process. It was revealed that five articles were published in the International Journal of Production Research, four articles were published in the International Journal of Production Economics and Journal of Manufacturing Technology Management, and three articles were published in the International Journal of Lean Six Sigma. Meanwhile, all other journals published one or two articles. Overall, it may be said that there are no unusual findings related to the published journal. Figure 2 summarizes the journal and the number of articles published.

Concerning the year of publication, seven articles were published in 2022, followed by six articles in 2021 and 9 articles in 2020. In 2019 and before, only two to four articles were published with underpinning theories related to this scope of the study. In short, it can be summarized that significant growth in articles with underpinned theories was published from 2020 onwards.

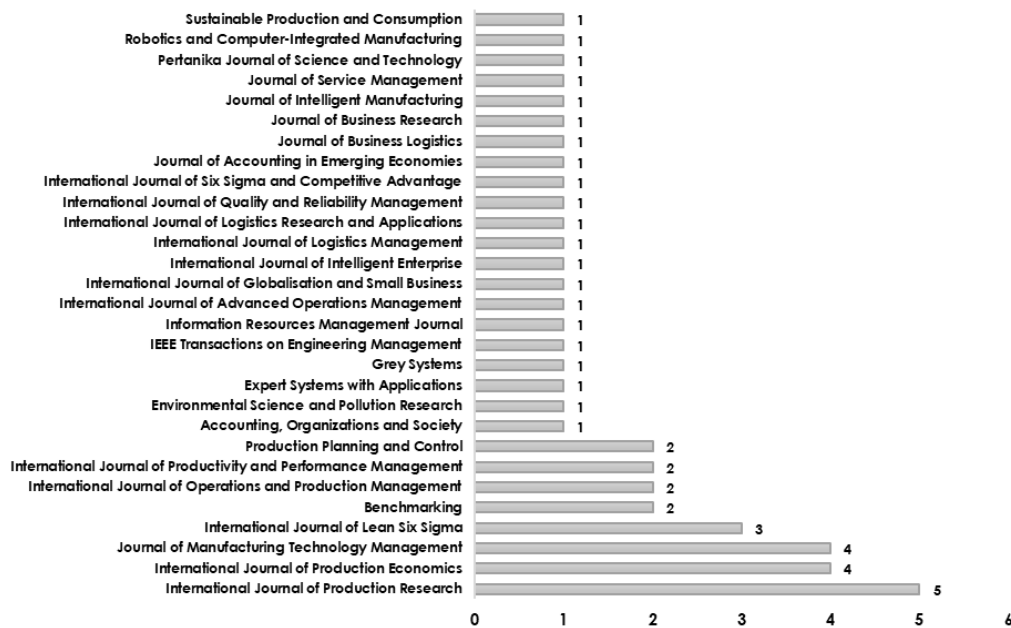


Fig. 2 Journal and Number of Articles



Fig. 3 Year of Publication

In relation to the theories used, 37 articles used a single theory in their study. Meanwhile remaining eight articles used multiple theories to underpin their research. In detail, for the single theory used, eight theories were employed of Theory of Constraint, five articles used RBV or natural Resource-based View Theory (NRBV), four articles were drawn using Contingency Theories, and two articles used employed Configurational Theory and Dynamic Capabilities Theory. Furthermore, 15 papers had support from other theories, namely, Practice-Culture Congruence Theory, Blue Ocean Leadership Theory, Complementarity Theory, Evolutionary Theory, Fisher’s Theory, Implicit Voice Theories, Knowledge-Based Perspective, Organization Theory, Prospect Theory, Social Exchange Theory, Socio-Technical System Theory, Socio-Technical Theory, Theory of Grey Systems, and Theory of Routine Dynamics.

As for the multiple theories used in a publication, there was no duplication in the combination theory used. However, it can be highlighted that five articles used Contingency Theory in combination with other common theories used in LM performance, such as Dynamic Capabilities Theory and Theory of Constraint. Additionally, RBV has been used by two articles in combination with Contingency Theory and Complementarity Theory. Details on the theory/theories used in the articles are explained in Table 2.

Table 2

Theory/Theories used in the Articles

Theory/Theories	Count	Article (s)
Single Theory		
Theory of Constraints	8	[25-32]
Resource-based View Theory/Natural Resource-based View Theory	5	[33-37]
Contingency Theory	4	[38-41]
Configurational Theory	2	[42, 43]
Dynamic Capabilities Theory	2	[44, 45]
Others (Journal with one publication)	14	[37, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59]
Integrated Theories		
Contingency Theory + Behavioral Theory	1	[60]
Contingency Theory + Dynamic Capabilities Theory	1	[61]
Contingency Theory + Practice-based view	1	[62]
Contingency Theory + Resource Dependence Theory	1	[63]
Resource-based view + Complementary Theory	1	[64]
Resource-based View + Theory of Systems	1	[65]
Concept of Fit + Complementarity Theory + Theory of Systems	1	[66]

DISCUSSION

Theory of Constraints

Goldratt introduced the Theory of Constraint in the middle of the 1980s, and has expanded quickly since The Goal was published [67]. In the book The Goal, Theory of Constraint emerged from the Optimized Production Timetables idea and was later called Optimized Production Technology. Goldratt outlined the principles of Optimized Production Technology in the form of a novel on real implementations. Later, the second book, The Race, was published to address challenges and introduce a logistical

mechanism for the material movement known as the drum-buffer-rope. By 1987, the overarching notion had taken on the Theory of Constraint and was viewed as a broad theory for managing the business. This improvement acknowledged that management or policy restrictions could not be the primary restraint in most firms. To properly implement the concept of ongoing growth and go beyond the bounds of policy, Goldratt [16] offered the thinking process as a contemporary paradigm of Theory of Constraint.

Theory of Constraint explains the limiting factors towards organizational performance [68]. There are two main concepts of Theory of Constraint, first is each organization should have one constraint that limits the organization from achieving a competitive edge. The second concept of Theory of Constraint is that the constraint that exists in the organization would provide opportunities for the organization to improve further [69]. According to Goldratt [16], the principal of Theory of Constraint focus on continuous improvement with five focusing steps; (1) identifying the constraint, (2) identifying how to make use of the resources on the constraint, (3) everything must be made on improving the constraint, (4) elevate the constraints, and (5) repeat first step if a constraint was breached in any of the preceding stages. According to Balakrishnan, et al. [70], in the area of OM, Theory of Constraint has sparked an intriguing discussion. There are also questions on the practicality of Theory of Constraint, how much of a refocus it represents, and how it relates to and contrasts with past OM developments, however acceptability by academics and practitioners has increased along with its growth.

Gupta, et al. [28] highlighted that Theory of Constraint aid the organization in identifying constraint but do not provide the tools to identify the situation. Hence, they proposed LM techniques such as Value Stream Mapping (VSM), 5S, and Fishbone diagram to guide the organization in identifying the constraint. According to Filho and Uzsoy [31], continuous improvement focus on bottleneck areas that involves considerable learning and fine-tuning of the mechanisms used. This results in cumulative benefits and is aligned with the concept of Theory of Constraint. Stump and Badurdeen [27] explained LM mass customization integration when used with Theory of Constraint as it offers a method of inventory control and system pacing on the manufacturing floor. Meanwhile, Landa, et al. [30] analyzed productivity-limiting elements in a setting of electrical panel manufacturing drawn by Theory of Constraint perspectives. Patti and Watson [25] investigated varying effects of downtime frequency and duration using the drum-buffer-rope concept. Additionally, Anand and Kodali [29] employed Theory of Constraint by conducting a study to identify the constraint that unable organizations to achieved the desired benefits after the LM implementation. As such, manufacturers can effectively integrate Theory of Constraint to identify limitations and improve flexibility and productivity.

Resource-Based View Theory

RBV explains the internal resources of the competitive advantage in a company. RBV generally seeks internal resources to explain why some companies in the same field may differ in competitive advantage performance [67]. In RBV, it is assumed that the company is a profit-maximizing entity guided by rational managers, moving towards stability, and aiming to obtain higher profits than the other companies in the shared market [71]. RBV Theory took place between 1984 and the mid-1990s, and embarked on an article written by Wernerfelt [72]. Later, contributions related to the resource-based theory were carried out by many scholars, most notably by Barney [73], Barney [74], Conner and Prahalad [75], and more. A firm's sustained competitive advantage was derived from resources with four attributes: valuable, rare, inimitable, and non-substitutable.

This theory has received a lot of criticism as RBV has evolved, and indirect adjustments to the current RBV have also been suggested. This claim was supported by Goldratt and Cox [67], who stated that the difficulty with the concept of resources is that it does not clearly distinguish between resources and capabilities as an enabler. Later, Peteraf and Barney [76] accepted that the capability-related literature is entirely compatible with RBV and should not be seen as a distinct theory. It is, therefore, an extension of RBV to a dynamic environment. The natural Resource-based View Theory (NRBV) is used in studies of sustainability and the environment. The NRBV focuses on how businesses may obtain a competitive edge by safeguarding the environment, conserving resources, and cutting down on waste [37].

Ghobakhloo [35] examined the role of IT in light of RBV as a valuable, rare, and imperfectly imitable resource and valued resource. Furthermore, IT-enabled organizational competencies are expected to play a significant role as a bridge between IT resources and performance enhancement. Hence, RBV drawn by Ghobakhloo [35] has shown that capabilities mediate between resource and competitive advantage. Moyano-Fuentes, et al. [34] used the RBV Theory to understand resource consequences in the LM context. When supply chain operations are successfully integrated, the purchasing firm's strategic resources are interwoven with the supplier, resulting in tacit and intangible procedures, skills, and connections that are often valued as a source of competitive advantage for firms. Tang, et al. [36] draw on the logic of the NRBV Theory to investigate the effects of zero waste practices as a resource on firm-level circular economy target performance and organizational identity. In addition, Agyabeng-Mensah, et al. [37] explain the NRBV by demonstrating the potential of environmental performance and LM in generating competitive advantage and increasing business and environmental performance.

Institutional Theory

External pressure impacting business performance and decision-making has been identified using Institutional Theory [77]. It offers a practical, theoretical framework

for investigating the factors, including monetary incentives, the legal and social environment, culture, traditional and historical values, and the evaluation of available resources, that motivate organizational attempts to acquire legitimacy [78].

This theory discusses the three main isomorphic institutional pressure organizations utilize to create and execute similar institutional norms, structures, and practices. These pressures are coercive, normative, and mimetic [79]. The most often observed mechanism is coercive, which typically manifests as the formal and informal effects imposed by law and the compliance required by regulatory organizations. Second, belonging to a social group and professionalization are the main causes of normative isomorphism. Organizations are under pressure to increase their understanding of environmental sustainability, account for altering cultural norms and conceptions, and then handle environmental challenges. Finally, mimetic occurs when an organization replicates creative tactics uncovered by other organizations attempting to sustain the environment [79, 80].

Abobakr, et al. [4] examine the relevance of various institutional pressure in encouraging organizations to implement LM and resource planning systems, as well as sustainability measures, customers, rivals, and the government, are all external isomorphic sources that put pressure on businesses to adopt resource planning systems and LM. Utilizing Institutional Theory, Ferdousi, et al. [77] investigate how institutional pressures affect LM implementation in the apparel industry. The results indicate that mimetic and normative effects impacted the decision to use the LM. Pull production, Kanban, Kaizen, and 5S are LM strategies implemented due to intense competition from the success of other businesses attributed to mimetic pressures. In contrast, normative pressures were developed from lean leadership and knowledge. The moderating impact of institutional pressures on the adoption of environmental management and its subsequent effects on firm performance is examined using Institutional Theory [81]. To ensure long-term environmental conservation and economic potential, firms are advised to use LM practices supported by environmental management practices with institutional forces.

Configurational Theory

Configuration coordinates operations to achieve certain goals [42]. According to Configurational Theory, resources can have either an enhancing or synergistic relationship, in which one resource improves the influence of another, or a suppressive relationship, in which one resource diminishes the impact of another [82]. According to Configurational Theory, organizational elements, including departments, structures, and processes, are interrelated and dependent on one another [83, 84]. As a result, Configurational Theory can be valuable for understanding how cross-functional activities support and collaborate effectively. According to Miller [84], Configurational Theory studies how internal complementarities that fit together might generate a combined competitive advantage.

Using Configurational Theory, Marodin, et al. [42] investigate the moderating function of lean product development on the effects of LM on quality and inventory performance, in which lean product development and LM are considered as complementary activities in a business, with the potential to increase one another's influence on competitive performance. To build a more productive and efficient organization, it is necessary to pursue both LM and lean product development and align the objectives of those two functional domains [85]. The analysis by Buer, et al. [43] was based on Configurational Theory. It revealed a correlation between the interaction term and operational performance and suggested that combining LM and industrial digitalization enhances operational effectiveness.

Dynamic Capabilities Theory

The organizational learning process lays the basis for the development of regular and structured routines that enable the company to adapt to its dynamic and competitive environment. Dynamic capabilities are a company's ongoing, systematic, and higher order routines that work to improve its operational routines that produce profits for the company, so they are more successful in the present and more adaptable to the future [86]. The Dynamic Capabilities Theory is founded on the idea that a firm's operating environment always evolves. Employee innovation is essential to a company's evolution, and innovations must be evaluated within the same fictitious inertial frame of reference since they result in change.

Using Dynamic Capability Theory, Rathore, et al. [44] evaluate the relationships between LM and innovative capabilities. This framework offers a collection of general ideas that businesses may use to identify the creative capability that will improve long-term success. The Dynamic Capabilities Theory underpinned by Novais, et al. [45] examined the relationship between LM, cloud logistics, and supply chain integration and their effects on firm performance. They assumed that the supply chain integration was seen as a dynamic capability and concluded a positive framework relationship.

Theory Integration

From the result obtained, several studies have integrated two or more theories to draw their research framework. A total of six studies integrated two theories, while one integrated three.

Integration of Contingency Theory

Contingency Theory, which the researchers highly employed in the scope of LM performance as an integration to other main theories, which are Behavioral Theory by Islami [60], Dynamic Capability Theory by Abdelilah, et al. [61], Practice-Based View by Akanmu and Nordin [62], and Resource Dependence Theory by Jacobs, et al. [63]. To comprehend the potential effects of environmental variables, Contingency Theory is used as a theory [87]. This theory states that organizations must change their organizational structures to succeed and, thus, function more

effectively. The most adaptive companies are those with internal features that fit environmental requirements [88].

Islami [60] investigated how LM supply chain activities affected company performance using Behavioral Theory as a relational source of performance. In terms of information sharing and strategic supplier partnership, which are based on another activity that a firm undertakes, Contingency Theory quantifies the relationship between LM supply chain procedures and performance. Based on the study from Islami [60], the Contingency Theory was employed to investigate the conflicting findings of past analyses that analyze the links between LM and performance by considering the contingent roles of the strategic supply relationship and information sharing. Abdelilah, et al. [61] employ Contingency Theory to study the potential moderating influence of customer demand unpredictability on the perspective of dynamic capacities. Agility is a trait that facilitates resource reconfiguration in response to environmental changes, opportunities, and threats. Using Contingency Theory, the researcher can increase the explanatory power of the dynamic capability model.

Jacobs, et al. [63] study the connections between internal LM towards operational and organizational performance using the Resource Dependence Theory. According to Contingency Theory, a standard set of procedures could not be suitable in every business environment, which might be utilized and considered for the outcome variable. In light of technological disruption, Jacobs, et al. [63] evaluate the contingency viewpoint of these interactions. The research by Akanmu and Nordin [62], based on the theories of Practice-Based View and Contingency Theory, emphasizes the roles that OM practices play in putting sensible plans for enhancing sustainable performance via performance variations into reality.

Integration of Resource-Based View Theory

RBV Theory was integrated with other theories, such as the Complementary Theory and the Theory of Systems by Blackhurst, et al. [65]. RBV explains the internal resources of the competitive advantage in a company. RBV typically refers to internal resources to provide light on why various businesses operating in the same sector exhibit different scales of competitive advantage [67]. Al-Hakimi, et al. [64] examined the interaction between technical and human LM to analyze the impacts of manufacturing technology and LM on operational performance. Because each practice can have a distinct relationship to performance, RBV proposes that the specific effect of both technical and human LM practices may be unique and would lead to operational performance. According to Complementary Theory, a firm's resources may be utilized or exploited to increase its strategic worth compared to other resources. Al-Hakimi, et al. [64] concluded that technical LM are predicted to contribute more to operational improvement when technical and human LM are employed together as compared to when they are utilized individually. To provide the framework a strong theoretical foundation, Blackhurst, et al. [65] draw the hypothesis using two

theories. They construct a framework relating to supply resiliency reducers using the RBV of the organization and Systems Theory principles to describe the mitigation capabilities that may ultimately lead to improved performance.

Integration of The Concept of Fit, Complementary Theory, And Theory of Systems

Iqbal, et al. [66] used the Theory of Systems, Complementary Theory, and Fit Theories to support their framework and hypotheses development. Agile and lean manufacturing are key competencies that might assist businesses in meeting various customer expectations. However, the relationship between agile manufacturing and LM is still debatable, which is why integrated theories are offered. The alternative hypothesis investigates the impact of agile production and LM on business performance.

The operation of the LM and agile manufacturing subsystems, in combination with infrastructure and management strategies, is demonstrated using the Theory of System. The Theory of Fit states that the degree of consistency between two or more variables or components must be considered while assessing fit. Better management, integrated learning management, agile manufacturing, and infrastructure are all likely to result from a good fit. The Complementary Theory, Theory of Fit, and Theory of System framework consider LM and agile manufacturing as one complete bundle because the piecemeal implementation of performance improvement initiatives is less likely to provide positive and solid operational performance, thus suggesting the presence of complementarity between LM and agile manufacturing. For LM and agile manufacturing to provide the intended outcomes, supporting functional procedures, also known as management and infrastructure practices, must be developed.

CONCLUSION AND SUGGESTIONS FOR FUTURE STUDIES

The firm has had to reconsider its manufacturing strategies to stay competitive due to globalization and growing production costs. Lean concepts serve as the foundation for businesses' overall framework to achieve this goal. LM implementation approaches encourage the reduction of waste to succeed [89, 90]. Many well-known researchers have examined the different tool sets for LM as it has been proven beneficial in a wide variety of sectors with multiple successful occurrences [91, 92]. This paper reviewed 45 articles in the field of LM performance available in the Scopus database. Theory of Constraint, RBV/NRBV Theory and Contingency Theory have been extensively used to study LM performance. These theories were discovered to be the most relevant and served as the foundation for future studies to draw their research framework.

When these reviews of theories are combined with other relevant theories in LM performance studies, it provides future researchers with substantial insight, particularly when attaining a competitive edge in a highly competitive market. Several key points were identified in the theoretical perspective of LM performance. First, Schmenner and Swink [12] and Boer, et al. [11] highlighted the lack of

theories in OM. In addition, Walker, et al. [9] reported that only one-third of OM studies incorporate a theoretical tradition to ground their research. The review of the articles has confirmed this finding. The review has concluded that only 37% of articles were drawn based on theoretical justification in LM performance. However, in a positive view, there was significant growth in articles with underpinned theories, as the interest to draw a framework based on theories significantly increased from 2020 onwards.

To address the lack of theory issue, several OM employed or promoted the usage of terminology from adjacent fields to explain OM occurrences, as they cannot invent the wheel. Hence OM scholars must draw on the work of other disciplines. Boer, et al. [11] proposed three instances of how theories from other disciplines may be used in OM, known as namely, transaction cost economics, from economics, the RBV Theory from strategic management, and organizational learning, from organization theory. They also consider the advantages and disadvantages of adapting theories from different disciplines. According to Punnakitikashem, et al. [14], OB theoretical frameworks, including Transaction Costs Theory, RBV Theory, Institutional Theory, and Contingency Theory, may assist OM researchers in reducing the gaps. Some contend that OM should improve as a field by building its theory [9, 13]. On the other hand, OM's importance in developing its theories is not narrowed by the concepts successfully introduced into OM.

Another important aspect is that combining or integrating the many theoretical perspectives may offer a better practical way to comprehend the intricate LM phenomena. Although one theory is insufficient to explain the intricacies of LM within manufacturing industries, it is nevertheless vital to properly integrate the theories. Well-established and accepted theories should be carefully examined before being built upon or integrated [93]. A good theory should include a clear explanation of how and why certain interactions lead to particular outcomes, and this interaction is, therefore, essential for developing excellent theories. A theory must specify how it will be assessed for empirical testing to be considered sound and good [94].

There is a limited study conducted to review the theories used in the field of LM performance, and the closest article conducted in the literature was Walker, et al. [9]. It revealed that the researchers highly employed RBV Theory, followed by Industrial Organization and Contingency Theories. However, this review argued the findings and revealed that Theory of Constraint was highly employed, followed by RBV and Contingency Theory. This discrepancy could be due to the review conducted by Walker, et al. [9] being considered to be outdated, as at least three articles were conducted drawn by Theory of Constraint from 2015 onwards.

It was also interesting to highlight that even though Contingency Theory was not the mostly theory used, Contingency Theory was highly used by the LM performance researchers as integration into other main theories. One

factor in integrating Contingency Theory was that the study on LM performance has matured, and the interest has shifted from practice justification to contextual condition understanding [88]. Hence, the contextual condition perspective is suggested to be incorporated as a theoretical insight to view OM related issues [88, 95]. In addition, Contingency Theory was integrated to investigate the inconsistency between findings of practice performance, where several research discovered a positive relationship between lean and improved operational effectiveness. Meanwhile, several research were unable to support these findings. As a result, it shows that Contingency Theory, which explains why no explicit strategies are employed in every manufacturing setting, may cause this discrepancy [96].

The implications of the research we discussed and this study are acknowledged to have several limitations that may be addressed in future theory-related research on LM performance. First is the limitation in the search string in the Scopus database used to identify the related articles. This review extended the research keywords based on previous research and synonyms. However, there was a possibility that more keywords could be extended to maximize the article search. Hence, future research could improve this limitation by extending the existing keywords. In addition, This study was limited to the Scopus database obtained the articles, and it would be interesting to see if the same trends in OM theory are observed across a wider range of OM articles from another journal database to have a more comprehensive overview.

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