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Lean Indicators for Small Batch Size Manufacturers in High Cost Countries

N. Adlin[a]*, H. Nylund[a], M. Lanz[a], T. Lehtonen[a], T. Juuti[a]

[a]*Faculty of Engineering and Natural Sciences, Tampere University, FI-33014 Tampere University, Finland*

* Corresponding author. Tel.: +358 50 447 8378. *E-mail address:* nillo.adlin@tuni.fi

Abstract

Lean manufacturing is commonly agreed as efficient and competitive performance towards which all manufacturing companies desire to develop their operations. Literature largely supports this with numerous case studies on various industries and fields, from manufacturing to services and health business. However, among manufacturing companies of complex products, produced in small batch sizes in high cost countries, most of the companies have either not achieved lean performance or have only partially benefited from it. There is lack of sufficient descriptions and measures on how companies, other than mass producers, could achieve and sustain leanness holistically. To address this gap, this paper introduces a lean manufacturing reference framework situated in the small batch size manufacturing, which emphasises integrated product and production development, and contingent factors to better align with the demands of manufacturers. The framework is constructed based on literature review and then validated with Sustainability and Key Performance Indicators Landscape.

Keywords: lean manufacturing; engineer-to-order; manufacture-to-order; high-variety low-volume, small batch size manufacturing

1. Introduction

Lean manufacturing (LM) is widely agreed as an approach enabling efficient and competitive performance, which is now highly popular and integral among manufacturing firms. Since its introduction in the 1990's, lean has gone a long way from being a merely set of practices among automotive companies to be applied successfully also in other industries such as construction, services and health care [1,2]. According to [3] lean manufacturing is defined as an integrated socio-technical approach whose primary objective is to eliminate waste by concurrently minimizing supplier, customer or internal variability. Inter-organisationally lean is no longer applicable only within the production function but is regarded increasingly as a general practice providing competitive advantage in all areas of an enterprise [4]. Moreover, lean manufacturing related research has also developed. The practice and theories of lean manufacturing have evolved from simple copying of best practices of Toyota Production System to more comprehensive theoretical descriptions, building on existing theories such as contingency theory and resource-based view and extended towards management and business re-engineering practice [2,5].

Nomenclature

ETO	engineer-to-order
HVLV	high-variety-low-volume manufacturing
LM	lean manufacturing
LMRF	lean manufacturing reference framework
MTO	manufacture-to-order
SBSM	small batch size manufacturing

Despite of its increasing popularity across industries and its high potential applied in different areas of organisation, there is still lack of theory descriptions, measures and empirically verified lean practices to be generalisable in different contexts outside from mass production [6,7,8]. Due to this, companies operating in less repetitive manner, for example in engineer-to-

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order (ETO), manufacture-to-order (MTO), and high-variety low-volume (HVLV) environments, hereafter named as small batch size manufacturing (SBSM), have difficulties in applying the traditional lean practices. As a result, most of the companies have either not achieved the expected lean performance or have only partially benefited from it [9,10].

SBSM has certain commonly known characteristics that make the application of lean manufacturing especially difficult. Perhaps the most used explanation to differentiate SBSM is customer order decoupling point, which explains the market interaction strategies in manufacturing [11,12]. SBSM represents companies with earlier customer order decoupling point as opposed to mass producers of manufacture-to-stock. The earlier decoupling point allows more customisation of products to serve the product variability needs of the market, but at the same time makes delivery lead times longer [11]. SBSM companies have high production uncertainty in general, based on various complexity and dynamism attributes [13]. Some of the uncertainty factors are for example production volumes, product mix, and design changes [8,13,14]. As [8] argues, due to the unpredictability of early customer order decoupling point manufacturers, approaching a lean ideal becomes difficult and complex.

To address the identified gap, this paper aims to introduce a lean manufacturing reference framework (LMRF), which has the potential identifying the relevant elements of lean manufacturing in the SBSM context in high cost country environment. This again can be implied to provide means for companies to be more successful in lean implementation towards achieving competitive advantage and support further theoretical conception of lean manufacturing relevant in the specific context. The aim of the study is formulated into the following research questions:

RQ1: What elements are relevant and working among small batch size manufacturers in high cost country environment related to lean manufacturing?

RQ2: What are the unique characteristics of lean implementation among small batch size manufacturers in high cost country compared to traditional lean manufacturing?

RQ3: What indicators of sustainable manufacturing and key performance does the identified unique characteristics of lean implementation in the chosen context highlight?

The paper is organised as follows. Section two (2) covers an overview in lean manufacturing in general and makes a synthesis of generic lean manufacturing framework. In section three (3) the research method is presented. This is followed by a systematic literature review in lean manufacturing in SBSM context in high cost countries. This section answers research questions one and two. Section four (4) describes Sustainability and Key Performance Indicators Landscape from previous study [15] and validates literature review findings in relation to the landscape. This section addresses the research question three. Finally, section five (5) covers conclusions on the research.

2. Lean manufacturing

Table 1. Generic framework of lean manufacturing.

Domain	Lean bundle	1	2	3	4	5	6	7	8
Continuous learning (CL)	Standardisation of operations	X	X	X				X	X
	Continuous improvement	X	X	X	X		X	X	
	Improvement of improvement system							X	X
Development process (DP)	Long term development	X	X	X					
	Policy deployment	X		X			X		
	Integrated development process			X			X	X	X
	Alignment with local contingent factors						X	X	X
	Consider the whole manufacturing system	X							
	Planned implementation	X					X	X	X
Principles (PRI)	Focus in value and customer orientation	X	X	X	X	X	X	X	X
	Minimise non value-added	X	X	X		X	X		X
	Just-in-time, pull and flow	X	X	X	X	X	X		
	Total quality management		X	X	X				
	Total productive maintenance	X		X	X	X			
	Develop, involve and lead people	X	X	X	X	X	X	X	X
	Develop, involve and lead suppliers		X		X	X		X	
	Transparency, visual management		X	X					
	Technology deployment		X						
Practices (PRA)	Lean methods, tools, techniques	X	X	X	X	X	X	X	X

References: (1) [39]; (2) [18]; (3) [20,16]; (4) [3,40]; (5) [17]; (6) [4]; (7) [21]; (8) [5].

Lean manufacturing has its origins in post world war era of Japan and especially in the development of Toyota Production System (TPS) [4]. While Taiichi Ohno who led the Toyota car producer during that time popularised TPS, the birth of the concept lean manufacturing is actually more of a result of outside Japan movement when US and European communities noticed the sustained competitive advantage Japanese automakers had achieved compared with traditional mass production [17].

The research on lean manufacturing has lasted for four decades and the theoretical descriptions and empirical findings have evolved ever since [2,5]. During the first years, lean manufacturing was a simple practice of copying TPS techniques to other manufacturers [5]. Today, the evidence of lean providing competitive performance to companies implementing it is widely known and the theoretical base has extended to the contexts of supply chain, product development and the whole enterprise as well as to completely other industries through the generalisable idea of lean thinking [2].

There are various framework descriptions of lean manufacturing, which differ in their viewpoints. Typically, lean is seen either as a set of practices such as methods and tools or as a philosophy with a set of principles [3,18]. Then again research in the area has since its popularisation focused on lean implementation [17,19], where company is transformed towards lean through a planned development process. Another parallel discussion on lean is done around continuous improvement and organisational learning, which originates from the Japanese Kaizen [20, 21].

As a starting point for the study a collection of lean manufacturing related references is summarised to represent the generic lean manufacturing framework (Table 1), which illustrates the typical elements of lean mentioned in the literature.

The framework is constructed into four independent and interrelated domains visible in the literature. Similar kind of structural division can be seen in [22], who divide lean manufacturing activity into goals, development process, principles and practices. However, in this paper the interpretation is that goals are built-in to domains through goal-oriented activity and continuous learning is separated as an independent domain aligned with the findings of [23]. Each domain consists of several bundles with highly interrelated elements, an idea first introduced in [3]. In this paper, this generic framework of lean manufacturing is used to track different elements covered in the SBSM context.

3. Research method

3.1. Overview

This study follows a systematic literature review described by [24], which provides a more replicable and transparent approach than traditional unstructured reviews. The approach was identified to support this study especially as it provides the minimisation of bias and errors and supports organisation and synthesis of literature accumulated in the chosen field [24,25].

The study is structured in to three individual stages (Fig. 1). During the first stage, the review process is planned. This involves setting up the research objectives and scope, formulation of reviewing protocol, and defining inclusion and exclusion criteria for the examined literature. During stage two, the literature review is conducted following strictly to the defined plan. This stage covers the identification of research articles from chosen databases, complementing articles through snowballing, selection of studies passing the exclusion and inclusion criteria, and data extraction and synthesis. Finally, stage three involves reporting and dissemination consisting of writing a report on the results and recommendations.

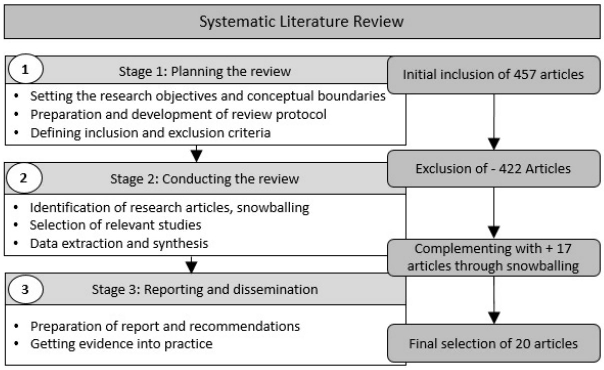

Fig. 1. Systematic literature review in the study.

3.2. Criteria for selecting studies

The following inclusion criteria were used in the study:

- Chosen search engine was Web of Science, which links to other academic search engines such as Emerald, Science Direct, and Taylor & Francis. To support the search, some additional searches were done through Google scholar.
- Peer-reviewed journal or conference papers were selected. Theses, dissertations, books or other references that have not gone through peer-reviewing process were not included.
- Different combinations of keywords were used. Lean manufacturing or lean production were used as topic keywords together (AND) with the topic keywords of engineer-to-order, manufacture-to-order, make-to-order, high-variety-low-volume, high-mix-low-volume, small and medium enterprise, high cost country, integrated product and production, organisational learning, dynamic capabilities. In addition, the abbreviations of the previously mentioned keywords and different wording variations were used accordingly. The basic rationale choosing the keywords was to find articles related to lean manufacturing in the SBSM context.
- The chosen studies aim to represent more recent research on LM, so the scope of publications was chosen within the last ten years, published in 2010 - 2019.

The first inclusion steps resulted in 457 publications including few duplicates. The following exclusion criteria were used to narrow down the sample size:

- Contextually research had to cover either engineer-to-order, manufacture-to-order, make-to-order, high-variety-low-volume manufacturing.

- Studies had to cover high cost country context in terms as opposed to low cost countries. This was chosen to ensure the results were generalisable in high cost country context.
- Studies had to include empirical studies such as case studies, surveys, industrial database analysis. This was chosen to identify research elements verified in practice. Simulation as a verification method was decided to be taken out of the scope, as it does not directly represent the actual data of an industrial company.

3.3. Selection of studies

The exclusion and inclusion were done in several iterations and the identified interesting studies opened up new possible references. Through a result of snowballing 17 new articles were identified. Some of the new articles were identified through using Google scholar to search with a new promising keyword identified from the studies or finding other publications from matching authors. Finally, after exclusion iterations and snowballing the final selected sample consisted of 20 articles from which a summary of primary contexts, number of studies per year and representing countries are shown in Fig. 2.

To improve the generalisability to SBSM context in high cost country environment, the inclusion criteria, especially the used keywords, were further developed and complemented and the exclusion criteria were made more precise throughout the literature review process. For example, several promising articles that used databases or had direct access to a group off several companies had to have coverage more than 60% in the SBSM context. Furthermore, the company's high cost country situation had to be clearly indicated. This again excluded many promising articles, which did not reveal enough information on their case companies mostly due to maintaining the anonymity of the studied organisations.

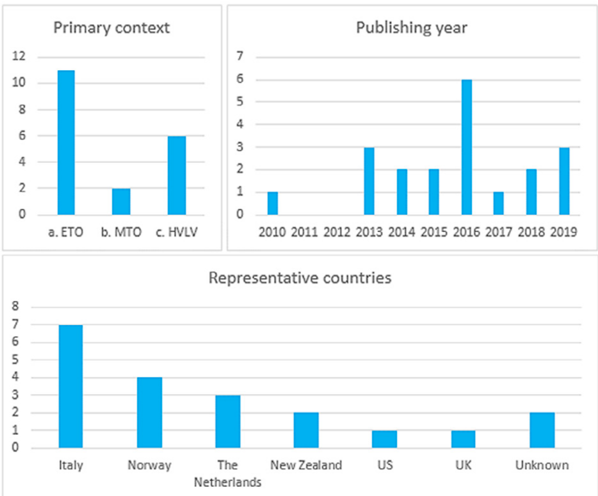

Fig. 2. Number of studies by primary context, by publishing year and by location of studies.

3.4. Data extraction and synthesis

A spreadsheet database was constructed for collecting the literature review results and for further analysis of the chosen sample articles. Within the database, each studied article was compared with the general framework of lean manufacturing build prior to the systematic literature review. Every time the examined results of the studies mentioned a bundle from the framework, the study was interpreted as accepting the bundle unless the empirical evidence indicated the negative effects of the mentioned bundles. However, the latter was not the case in any of the studies. Furthermore, during the comparison phase, an option for complementing the general framework was also enabled in case there would be new elements introduced in LM studies within SBSM context.

To further analyse the results of the examined studies, generic summaries were formulated from each of the bundle. These results aimed to identify the specific characteristics of the bundles within the studied context. The differences between the studied context and the generic LM bundles were then categorised in different forms to identify the level of difference compared with the generic LMRF.

4. Lean manufacturing in small batch size manufacturing in high cost country environment

4.1. Profile of the selected studies

95% of the studies have been published between the years 2013 and 2019, with only one study published earlier in 2010. Studies are primarily focusing in ETO, which covers twelve of the studies. There are six studies in the HVLV context and two within MTO context. However, many of the studies especially in the HVLV context cover ETO and MTO firms as well as job shops. 90% of the empirical sources were from case studies, where three represents longitudinal studies. In two of the studies the primary empirical source was collected through questionnaires. Appendix A describes the full list of selected references in the study

Geographically studies are European centric, where 16 studies are made in Europe, especially in Italy, Norway and the Netherlands. Furthermore, some authors had several studies fitting in the literature review scope. To mention the most visible first authors, M. Bertolini is present in the study with three studies while K. Kjersem, W.H. Knol, and S.E. Birkie all are involved in two studies.

As a summary, the study profile brings a current look into the specific context of SBSM in high cost countries. The collection of studies covers various different kinds of manufacturers fitting in the context with a rich set of empirical sources. Although most of the empirical evidence come through observations, many of the studies provide direct sight into the case companies with qualitative and quantitative data.

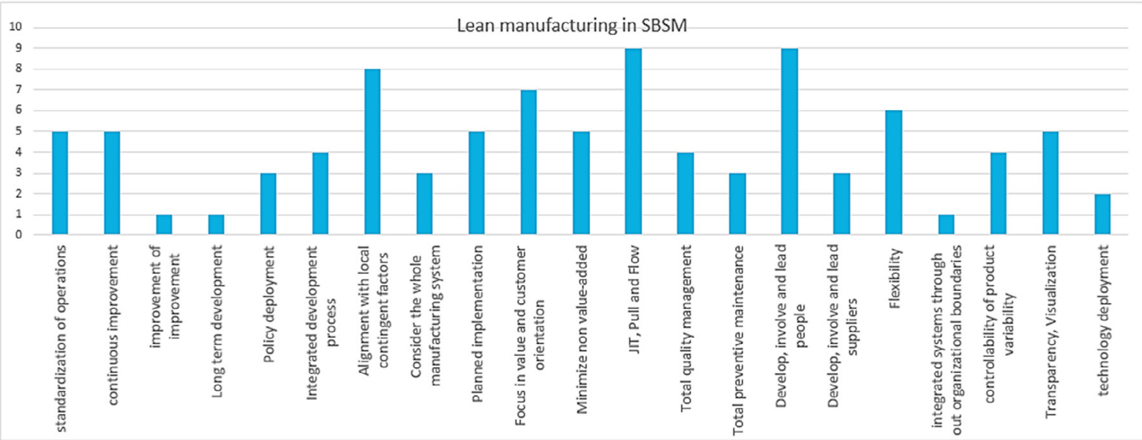

Fig. 3. Lean manufacturing in SBSM.

4.2. An overview on lean manufacturing in SBSM

In the study, all of the generic lean bundles were found in SBSM context although to some of the dimensions visibility was only limited. See Fig. 3 for the popularity of different lean bundles in SBSM. In general, these results are aligned with [26] findings that all lean practices have relevance in high complexity and dynamic manufacturing context such as ETO. Moreover, their research complements to the data gathered in this study by also arguing that there is no question whether some bundle is applicable or not in SBSM. Instead, it is more of a question on how the bundles are tailored and combined. [26]

Correspondingly, on the level of practices, Value Stream Mapping (VSM) stands out clearly as the most applied single practice. Comprehensiveness of this particular practice comes from the fact that it is used as part of other tools and it functions as a navigational, supportive or prioritising tool for using other development tools accordingly. Thus, the function of VSM is fundamentally the same as generally known, but most of the studies represent some forms of extensions to the traditional VSM to address more certain SBSM requirements such as the high variability of produced products [27], high demand uncertainty [28] and some local constraints that reduce the pure applicability of pull production flow [6].

Kanban systems and takt time were the second and third most applied lean practices applied in the studied context. These practices seem to function well in SBSM context already during the early implementation steps of lean practices i.e. [29]. Other practices visible more than once were PDCA learning cycles i.e. [30], CONWIP, FIFO i.e. [31], and value added/non-value added visualisation i.e. [7].

Peculiar to the lean manufacturing in SBSM context is the use of practices outside of the traditional lean tools for supporting achieving lean performance. Here, project management practices i.e. [14,32], product modularisation i.e. [8,33] and Enterprise Resource Planning i.e. [30,10] were the three most popular applications visible in more than two studies. These practices seem to be used to form alignment in between the lean practices and the local contingent factors. They consider project orientated, high demand for product variability and complex information management cultures in SBSM. In addition, Material Resource Planning was mentioned more than once in the studies i.e. [34].

SBSM companies benefit from lean in various types. The four most represented benefits within the study are lead time reduction i.e. [29,35], work in progress reduction i.e. [28,34], non-value added time reduction i.e. [6,30] and cost reduction i.e. [7,14]. These benefits were visible in four studies or more. Also, adherence to schedule and value added time reduction were visible in two studies.

Continuing to the examination of lean bundles, the three most visible lean bundles in SBSM are 1) JIT, pull and flow i.e. [8,13,34]; 2) develop, involve and lead people i.e. [10,36,37], and 3) alignment with local contingent factors i.e. [27,33,35]. These bundles were explicit in more than eight references. Furthermore, 4) focus in value and customer orientation i.e. [28,30], and 5) flexibility i.e. [8,38] were explicit in six references.

In JIT, Pull and flow related research there is an emphasis on requirements of taking the local starting point into account. For example [6] states that it must be understood that the result in SBSM context production flow is typically something else than pure pull production. Therefore, hybrid production and synchronization pull with existing culture is important. Becoming lean happens through a transformation process, where pull does not happen overnight.

Developing, involving and leading people seem not to differentiate from the generic lean literature, but its role is evidently important. Then again, alignment with local contingent factors differentiates lean manufacturing in SBSM compared with generic LMRF. Although explicitly mentioned in half of the studies, it has to be noted through the lines that most of the studies represent some form of unique combination of lean methods tools and principles extended with other method, tools and principles outside of traditional lean i.e. [7,28,34].

In the bundle of focus in value and customer, orientation especially among ETO firms there is a highlight in the extending scope of manufacturing system. Because of the demand for higher product variability, products are more customised and product development is part of a project delivery [8,29]. Therefore, instead of pure value capturing in production, also value creation and understanding customer requirements receives more attention i.e. [8,33]. This seems to increase the need for value as a concept in general.

The bundle of flexibility is of particular interest as it stands out in LM in SBSM. Although flexibility has been linked to lean manufacturing in general, several references promote flexibility in SBSM context that could be interpreted as an individual bundle i.e. [8,27]. The reason is perhaps because process flexibility in traditional lean literature is considered self-evident, but in SBSM, context process flexibility is complemented with product flexibility and therefore deserves its own mentioning.

By contrast, there was a low representation of the bundle of improvement of improvement, long-term development, system integration throughout organizational boundaries and technology deployment. The lack of these elements can be since in a significant number of studies, the lean implementation is in its early stage and the case studies cover only a short period of research results. Also, as it is stated, companies tend to emphasize short-termness in relation to long-termness [36].

The literature review reveals certain differencing criteria in lean manufacturing in SBSM context in relation to the generic LMRF (Table 2). In the following are the primary findings of these described per domain.

Table 2. Differencing characteristics of Lean manufacturing in SBSM.

	Differencing criteria in lean manufacturing in SBSM	Sample references
CL	Difference in the scope of standardisation. Need for both product and process variation decrease. Fundamentally objective the same, but means are extended.	[8,13,33]
	In continuous improvement, there is emphasis of customised routines as part of existing operations.	[7,23]
DP	Difference in alignment with local contingent factors. Mindfully customised implementation of practices in the different phases of lean implementation.	[14,27,34]
	Policy deployment and integrated development process have extended dimensions. Need to take contingent factors of the overall development process.	[7,28,32]
PRI	The meaning of value and customer orientation changes. Value capture of production is extended to value creation.	[8,30,33]
	In JIT, pull and flow implementation of other hybrid/pull techniques are accepted.	[6,14,27]
	Modularisation is a new element to the lean principles and emphasises the broader means to control product variability	[8,33,38]
PRA	Practices are customised combinations of available lean practices. Also practices outside of traditional lean tools are broadly in use.	[7,26]

In continuous learning, the scope of standardisation extends. In SBSM, making stability and reference points in the development environment are not only in the mere production, but also increasingly in product development and in between these two very distinct functional areas. It is noticeable that the meaning of standardisation has not changed, but the means to enable standardisation has broadened.

The biggest difference in the development process is the alignment with the local contingent factors, which again is different in SBSM compared with mass production. This bundle is seen as driving force for many other bundles, also in other domains, such as continuous improvement, policy deployment and JIT, pull and flow. Literature identifies contingent factors in learning maturity, the maturity of development process and in direct operations.

Another area that gets attention in a development process in SBSM is the integrated development process, where product development and production development are made concurrently. Concurrent engineering is nothing new to lean, but in SBSM context, the interpretation may be more integrated than parallel, for example optimising order-to-delivery process lead times as a whole, instead of product development and production separate.

In lean principles, new element is suggested, and several traditional bundles are extended. Control of product variability, referring to many cases to product mass customisation becomes a new element to enable more means to predictability to the naturally uncertain SBSM context. Moreover, focus in value and customer orientation as well as JIT, Pull and flow is extended with new elements to provide balance with the operational contingent factors.

Finally, in practices the basic idea implies that existing lean practices are applied with sound customisation and a combination with applicable methods, tools and techniques originating outside from the lean toolbox.

5. Validation with Sustainability and Key Performance Indicators Landscape

5.1. Sustainability and Key Performance Indicators Landscape

The Sustainability and Key Performance Indicators Landscape defines a set of metrics for manufacturing operations management. The metrics are classified into the subtopics of economics, labour, human rights, social, product responsibility, environment, and technology. These are categorised focusing on their relevance to different levels of an enterprise, such as employee, manufacturing unit, the whole factory as well as the surrounding society. Similarly, the set of metrics are classified whether they can be precisely measured, or they are subjectively interpreted. [15]

The landscape offers improved management of information flow because the measurement and metrics of manufacturing operations are important and integral part of decision-making. It offers a holistic view on the metrics and their relationships. The cause-and-effect connections between the metrics can be identified and investigated. This can be utilised to monitor manufacturing operations as well as to track problems and errors. [15]

5.2. Validation of Lean Manufacturing Reference Framework in small batch size manufacturing in high cost country

The Sustainability and Key Performance Indicators Landscape is used for initial validation purposes in the study to examine and deepen the research results. The aim of the validation is to analyse, whether the specific characteristics of lean manufacturing in SBSM context differentiate or emphasize certain types of performance metrics in relation to the generic lean manufacturing.

From the 199 indicators found in the landscape's metrics, 123 metrics directly or indirectly are contributed by lean manufacturing. In addition, 18 metrics can possibly have an effect from lean manufacturing. On the social and environmental dimensions, such as labour, health, and emissions, lean manufacturing has mostly an indirect or possible relationship to lean. However, in technical indicators, such as process flow, quality and productivity lean has primarily a direct positive relationship.

The validation of lean manufacturing in SBSM in relation to landscape metrics reveals three interesting findings that support future research. First finding is that the social dimension may have more emphasis in SBSM than in generic lean manufacturing. In more detail, from the social perspective individual worker and its development and wellbeing is focal. This interpretation is supported with an assumption that less repetitive manufacturing environment leaves more routines and knowledge tacit of the workers as opposed to mass production where repetitive routines and knowledge are naturally more explicit. In addition, in several cases found in the literature review the training and commitment dimensions of people were seen critical for lean implementation. However, this has generally been known in lean manufacturing literature earlier and thus may not be a unique characteristic of SBSM context.

The second finding is that among SBSM companies a starting point for accessing and using various technical performance indicators can be weak. Lean in SBSM seem to improve both the accessibility towards many technical key performance indicators and the performance itself. In many of the studies that indicated significant improvements in production lead time and WIP reduction, companies had to, for example, create the capabilities to identify and measure such performance in the first place before actually measuring the improvement. The argument here is that when looking into the technical performance of individual companies, the level of understanding and ability to measure such metrics is as important as the performance results. This kind of aspect is not well explicit in the literature.

The third finding is that in technical performance metrics process flexibility among SBSM companies is fundamentally different as opposed to mass producers. Complementing to process flexibility in the technical performance indicators, lean manufacturing in SBSM seem to also promote product flexibility for example in the forms of mass customisation and project orientation, or reuse of design knowledge in the forms of more advanced information management. The product flexibility should be also introduced as a key performance indicator to the Sustainability and Key Performance Indicators Landscape.

Last, the validation of lean manufacturing in SBSM gives a clear overview that lean manufacturing principles and its fundamental original ideas of efficient flow and aim of reducing non-value added activity have not changed. Instead, there are only extensions of means in lean manufacturing in SBSM. These extensions come in different forms, some address customisation of generic lean elements, changing structurally the elements and their dyadic relationships, or adding something new, such as extended scope for developing a manufacturing system including product development and production or new tools originating outside of lean such as modular product architecture, project management and change management.

6. Conclusions

This paper makes an overview to lean manufacturing literature in SBSM context. It contributes to the lean manufacturing and advanced manufacturing related research by providing strictly SBSM specific outlook for literature in a way not done before. It provides new information in SBSM context by executing a systematic literature review and using only research results that have been verified or supported with empirical evidence.

As a theoretical contribution, the paper suggests that lean manufacturing in SBSM context is fundamentally the same as in the generic lean manufacturing literature, and due to the contingent characteristics in the context, lean manufacturing development activities has to be 1) customised to the local circumstances and 2) extended and aligned with other practices used in the context. It is suggested that in SBSM context product development becomes an inseparable element as part of the developed manufacturing system. This means either new elements or perspectives in existing lean bundles or entirely new bundles.

There are at least two practical implications in research results. First, SBSM companies aiming towards lean performance must acknowledge how their context differentiates from the generic lean manufacturing approaches. This paper suggests some specific characteristics of lean manufacturing in SBSM that have to be taken into consideration when managing a longer-term lean development program. Second, the literature review provides a good collection of successful examples of lean manufacturing applications and their effects in SBSM. These examples can be used as benchmarks in structuring company's own targets and development process.

In lean manufacturing related literature, there is a significant number of conceptual proposals for new or extended practices that lack empirical verification. The LMRF and its specific characteristics in SBSM context could be used as an initial validation to compare emerging conceptual theories. The direct future research involves a comparison of a new developed method that combines mainly practices from lean manufacturing, project management and design management, to the LMRF. The idea in this kind of LMRF implication is to understand whether a new concept contributes to a lean related performance targets.

Appendix A. List of selected articles in the literature review

(1) Bertolini et al. (2013); (2) Matt 2013; (3) Powell et al. (2014); (4) Braglia et al. (2019); (5) Birkie et al. (2017); (6) Bertolini & Romagnoli (2013); (7) Kjersem & Junge (2016); (8) Birkie & Trucco (2016); (9) Kjersem et al. (2015); (10) Bokhorst & Slomp (2010); (11) Bertolini et al. (2017); (12) Synnes & Welo (2016); (13) Thomas et al. (2016); (14) Pearce et al. (2018); (15) Knol et al. (2018); (16) Knol et al. (2019); (17) Böhme et al. (2014); (18) Lodgaard et al. (2016); (19) Rossini et al. (2019); (20) Junge et al. (2011).

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