

Lean – Balanced Scorecard Integration Framework for Small Medium Enterprises

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Lean – Balanced Scorecard Integration Framework for Small Medium Enterprises

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ABSTRACT

Lack of knowledge, management, and financial resources has led to inefficiencies in the operation process resulting in low productivity and competitiveness. Therefore, SMEs need management systems such as a Balanced Scorecard (BSC) and Lean Manufacturing (LM), two separate management systems used to determine the right strategies and priorities to achieve goals, increase productivity, and eliminate waste effectively. Both approaches can be used not only in manufacturing companies but also in service companies. However, a proper framework is needed to combine the two approaches for more efficient results. The proposed framework provides guidelines for SMEs to become business excellence using appropriate management systems. This framework consists of systematic steps that define a vision/mission, identify KPI targets, plan actions to eliminate waste, monitor, and evaluate. The literature review is used to consider the advantages of BSC and LM in addressing the problems and needs of SMEs.

Keywords: Balanced Scorecard (BSC), Continuous Improvement, Framework, Lean Manufacturing (LM), Small and Medium Enterprises (SMEs)

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1. INTRODUCTION

Performance improvement has always been discussed, with more studies emphasizing the importance of various supporting factors (Gao, 2015). Organizational performance is a multidimensional concept that generates overall value that places the organization among its competitors (Hosseini *et al.*, 2018). Therefore, efforts are needed to maintain and improve long-term business performance. According to Saunila (2016), SMEs need a measurement process and management to help improve their business performance. This process describes a company's level of achievement within a

certain period and the overall business activities (Munizu *et al.*, 2016; Kotane and Kuzmina-Merlino, 2017). Furthermore, this process supports the company to be more competitive by comparing its achievements with competitors (Yaghooi and Haddadi, 2016). However, the implementation of performance measurement and management practices in SMEs is still low due to an inadequate supply of methodologies (Garengo *et al.*, 2005; Smith and Smith, 2007). Therefore, SMEs need guidelines that align with their conditions to properly implement a performance management process to produce a systematic approach that facilitates various business activities.

Several performance managements have been used in multiple industrial sectors. One widespread use as a tool to measure and improve performance is the Balanced Scorecard (BSC) (Zizlavsky, 2014). BSC provides a clear and focused understanding of the strategies developed by top management (Gundogar and Yilmaz, 2016). BSC makes it easier for SMEs to face rapid market changes because it focuses on financial and non-financial indicators simultaneously (Lonbani *et al.*, 2015). BSC also makes SMEs more focused on strategic targets and priorities, thereby developing their management processes (Andersen *et al.*, 2001; Malagueño *et al.*, 2017). Furthermore, BSC facilitates SMEs' screening strategies into daily activities (Gomes and Lirio, 2014), thereby understanding strategic plans and objectives a lot easier (Basuony, 2014).

Malagueño *et al.* (2017) stated that BSC in SMEs provides a higher level of innovation; therefore, the benefits generated are limited to finance; instead, it also impacts the gradual development of organizational capabilities. Cooper *et al.* (2012) stated a causality relationship through a framework, which starts from determining goals, measures, targets, and initiatives within the BSC. They further noted that initiatives are specific actions taken to achieve a company's targets and goals. Therefore, all these components need to be aligned and run according to obtain the required strategy.

According to Mtar (2017), planning a strategy involves implementing the BSC, supported by effective and efficient operational actions to achieve more focused value-added activities. Unfortunately, the initiative within the BSC does not have a specific systematization that makes it easy to determine activities efficiently. Therefore, a continuous enhancement method is needed to produce an effective measurement initiative (Garengo *et al.*, 2005). Furthermore, integration between BSC and other approaches that support the efficiency and effectiveness of the initiative process is needed. Based on previous studies, one of the approaches and tools capable of providing a competitive advantage in operations is Lean Manufacturing (LM) (Bhamu and Sangwan, 2016). This approach is the basis needed to increase efficiency through structured, systematic, and sustainable activities (Hansen and Møller, 2016). De la Vega-Rodríguez *et al.* (2018) stated that the main activities of LM include process standardization, stability, and continuous improvement. LM implementation focuses on designing an efficient work system, namely developing relationships between elements to improve the system (Hansen and Møller, 2016). Then, based on the previous explanation of the BSC and the focus of the LM, the integration between BSC and LM is the right combination needed SMEs to improve their long-term business performance. With integration, Beckmerhagen *et al.* (2003) stated that it unifies tools from different functions into a single and more effective process. LM focuses on production efficiency and effectiveness (Negrão *et al.*,

2016; Dresch *et al.*, 2018); therefore, its integration in this research aims to complement BSC to achieve business targets and goals. Unfortunately, to the best of our knowledge, no research framework currently integrates BSC and LM on SMEs. Therefore, this study aims to integrate the BSC and LM frameworks through typical patterns in management systems and facilitate SMEs in using a simple framework to improve their business performance to become more efficient.

In the Section 2 of this research provides a brief overview of BSC and LM. Section 3 describes the integration process of the framework. Section 4 analyzes some of the BSC and LM frameworks used, followed by a discussion on the dimensions that need to be implemented to achieve appropriate concepts for SMEs. Conclusions and suggestions for future research are presented in section 5. The results of this research are expected to be used by SME managers to make decisions easier and for further development.

2. LITERATURE REVIEW

This section discusses the approach used in research. The definition of BSC is presented as an initial discussion, followed by literature on its application in SMEs. Furthermore, LM as an integrated approach to BSC is discussed, with Table 1 used to tabulate the principles that focus on waste elimination. This section supports illustrates the integration between LM and BSC.

2.1 BSC on SMEs

Kaplan and Norton first proposed the Balanced Scorecard (BSC) in 1992. BSC combines various steps to achieve financial and non-financial parameters, thereby leading to more detailed information. It is also used as a framework that translates the company's strategy into measurable goals based on four perspectives: finance, customers, internal business processes, and learning and growth (Yaghoobi and Haddadi, 2016). According to Lueg (2015), each goal is stated in Key Performance Indicators (KPI) with measurable targets; therefore, employees are responsible for achieving predetermined targets during a specific period.

The Balanced Scorecard comprises a strategy map (diagram) that describes the techniques utilized by companies to create value, such as by linking strategic objectives in a direct causal relationship with its perspective (Dror, 2008). Atkinson (2006) stated that from a financial perspective is the focus of BSC to provide increased value shareholders. This increase in value usually involves several measures such as profitability, return on capital, economic value-added, sales growth, market position—cash flow, etc.

Meanwhile, Kaplan and Norton (1992) stated that from the customers' perspective, BSC explains the strategies used by companies to provide value visualized from market share and customer satisfaction. They further noted that in internal business processes, BSC enhances SMEs to create value. Mehralian *et al.* (2017) stated that learning and growth indicators create a conducive environment for organizational change, innovation, and growth.

The BSC application in SMEs also helps measure performance and align the strategy into daily operational activities (Gomes and Lirio, 2014). However, Basuony (2014) stated that the implementation of BSC in large and small companies achieves varying results due to the different characteristics between the two. SMEs' organizational structure and management processes are more accessible than large companies (Basuony, 2014). SMEs have limited access to finance, experience, skills, and knowledge (Rahman *et al.*, 2017). Furthermore, they lack self-confidence and only focus on measuring short-term and not long-term company performance; therefore, they do not support the successful implementation of the BSC (Basuony, 2014; Malagueño *et al.*, 2017). Lonbani *et al.* (2016) stated that the benefits of using a BSC are its ability to provide information for decision making in the face

of a rapidly changing business environment, which tends to help SMEs with limited resources significantly.

2.2 Lean Manufacturing to Eliminate Waste

Bhamu and Sangwan (2014) stated that Lean Manufacturing (LM) is a philosophical and management process consisting of a conceptual and systematic framework that focuses on eliminating waste throughout the supply chain flow. In short, it is defined as 'doing more with fewer resources,' which means that it focuses on the effective use of resources based on customer needs (Rymaszewska, 2014). LM tends to impact its competitive ability because it aims to increase productivity and quality by reducing costs (Bhamu and Sangwan, 2014). Its principle is associated with identifying values by eliminating waste while producing flow to the customer. According to Vinodh and Ruben (2015), this process is related to identifying value-added goods as expected by the customer. Melton (2005) defined waste as anything that does not provide added value to customers. It consists of 8 types in the LM principle, defects, overproduction, waiting, non-utilized talent, transportation, inventory, motion, and excess processing, as listed in Table 1 (Kadarova and Demecko, 2016).

Table 1. Definition of 8 lean manufacturing (LM) waste

| Eight Waste | Definition | Inferred Definition |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Defect (D) | Products that have to be repaired due to defects tend to disrupt the production flow (Al-Baik and Miller, 2014) Errors in producing products, thereby causing rework (Gupta <i>et al.</i> , 2013; Kruger, 2018) | Process results are defective / not as expected (not according to standards). |
| Overproduction (O) | Produce more products than requested or made before they are needed (Gupta <i>et al.</i> , 2013; Kruger, 2018) Making goods or products before they are needed (Harish and Selvam, 2015) | Over-process/activity resulting in unplanned excess. |
| Waiting (W) | The process of waiting for work or waiting for the material to be worked on (Al-Baik and Miller, 2014; Kruger, 2018) Idle time and delays for workers or machines (Gupta <i>et al.</i> , 2013) | Waiting for something (from the previous process) to be able to carry out the following activity. |
| Non-utilized talent (N) | Not using one's abilities for something that can be done (Gupta <i>et al.</i> , 2013; Kruger, 2018) | Not using one's skills to work on other processes. |
| Transport (T) | Material movement activity due to inefficient worksite layout (Al-Baik and Miller, 2014) Unnecessary movement of material (Gupta <i>et al.</i> , 2013; Kruger, 2018) | The process of moving from one activity to the next. |
| Inventory (I) | Unnecessary storage of raw materials and finished products (Al-Baik and Miller, 2014; Kruger, 2018) Storage of unnecessary raw, semi-finished, or finished materials adds to costs (Gupta <i>et al.</i> , 2013) | Unnecessary storage of materials and products. |
| Motion (M) | Excessive movement of workers to complete an operation (Al-Baik and Miller, 2014; Kruger, 2018) Unnecessary movement of people (Gupta <i>et al.</i> , 2013) | The activity or movement of workers unnecessarily. |
| Excess processing (E) | Excessive processes consume a lot of time, effort, and resources or produce products using inappropriate tools (Al-Baik and Miller, 2014; Kruger, 2018) The manufacturing process is unnecessary and does not add value (Gupta <i>et al.</i> , 2013) | A pointless process/activity |

The implementation of LM principles in industry, including SME manufacturing, increases productivity and achieves operational excellence (Vinodh and Ruben, 2015). LM tends to solve various problems faced by companies, which applies to the manufacturing and services of its universal nature in the long term (Rymaszewska, 2014). In Table 1 above, presents the definition of each waste at LM by reference and offers a simple description that the authors concluded to facilitate understanding of the meaning of each waste. The aim is to show that waste is used in a manufacturing context and can be adopted in a more general context.

2.3 Research Gap Analysis

Approximately 60% of companies claim to have implemented BSC (Kaplan and Norton, 2005) because it is a significant breakthrough for success. For SMEs, BSC is indispensable because it promotes growth that focuses on long-term results, can track performance, analyzes things that are important to the company, provides alignment in all parts, and clarifies objectives and accountability (Gumbus and Lussier, 2006). Studies conducted by Hussin and Yusoff (2013), Lonbani *et al.* (2016), Malagueño *et al.* (2017), Abdallah *et al.* (2018), Casas *et al.* (2020), show that the use of BSC in SMEs will facilitate the achievement of targets that can improve performance. BSC defines strategic objectives into initiatives, namely programs designed to provide resources and capacity to achieve KPI targets (Kaplan and Norton, 2004). However, the strategies needed to produce efficient initiatives using BSC have not been considered. Therefore, there is a great need to use certain approaches as tools and techniques to overcome this limitation. The LM approach focuses on eliminating waste to produce an efficient process (AlManei *et al.*, 2017), reducing costs and lead time and faster processing time (Melton, 2005). Preliminary studies carried out by Belhadi *et al.* (2018) provided several LM implementations in SMEs. The implementation process follows the LM framework; therefore, SMEs use various steps. Based on the focus of LM on waste elimination, the integration of this approach into the BSC makes it easier for SMEs to produce efficient strategic initiatives. A framework facilitates SMEs during the implementation process; however, none was found to integrate the LM and BSC approaches.

From previous studies discuss BSC and LM, although BSC is only used to divide the objectives into four perspectives (Duarte and Cruz-Machado, 2015; Chiarini and Vagnoni, 2016; Thanki and Thakkar, 2018). However, these studies have not shown an integration between the BSC and LM frameworks used to guide the management system efficiently to improve business performance. Meanwhile, the integration between BSC and LM will be able to complement each other's shortcomings into a uni-

fied system. BSC as an approach that focuses on the strategic scope has not been able to manage strategy efficiently (Salem *et al.*, 2012). Meanwhile, LM as an approach that focuses on eliminating inefficiencies in operations, does not discuss in detail about the company's overall strategy (Karim and Arif-Uz-Zaman, 2013). Therefore, the integration of BSC and LM is expected to be a tool for SMEs to carry out business activities comprehensively, from the strategic to operational levels in a structured manner to make it easier for SMEs to improve their business performance.

3. METHODOLOGY

This research aims to propose a framework that integrates BSC and LM for SMEs to increase their business performance efficiently based on identification of related study. Based on previous literature studies, this research reviews and identifies the BSC and LM implementation framework as the basis for proposing a framework generally in line with the SMEs' characteristics. These management systems in SMEs have provided benefits even though their implementation is not always successful (Hu *et al.*, 2015; Heinicke, 2018). Therefore, this research presents a framework that integrates these two systems to increase SMEs' productivity. The several phases of the research methodology are show in Figure 1.

In this study start from identifying the literature review of the need for SMEs to promote their development in the business world. This led to the utilization of a framework as a benchmark for conducting business activities. Previous research identified the characteristic of an appropriate framework for SMEs based on their capacities and limitations. For instance, the research carried out

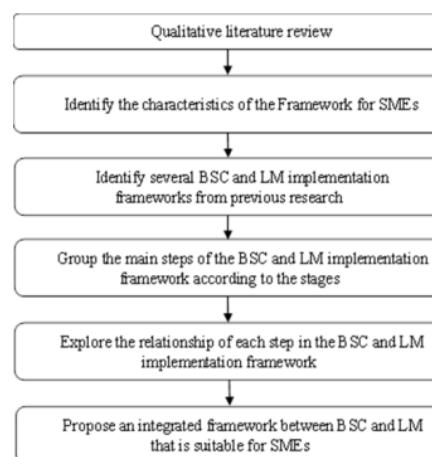


Figure 1. Methodological approach for lean-balanced scorecard framework.

by Goubil-Gambrell (1991) suggested taking a systematic approach to identifying the formation of the framework. However, this research indicated that both management systems, BSC and LM, can be integrated and applied to SMEs in Indonesia. A standard and straightforward implementation framework is needed before they are integrated. Therefore, the next step is to identify the framework of the BSC, and LM based on various previous references. The identification results are then grouped into main stages to produce more straightforward stages. This is where the generalization process is carried out. After being grouped, the next step is to explore the relationship between each stage of the BSC and LM. The goal is to find out if there are similarities in the process from the existing stages, it will be formed into one stage only, while the other stages are analyzed to generate structured and relevant stages with the principle of the BSC and LM. The final step is to adjust the results of the stages to the needs of SMEs so that the framework is expected to be easy to understand and apply.

46 4. RESULTS AND DISCUSSION

4.1 BSC – LEAN Implementation Framework

SMEs need a framework that is in line with their characteristics in running their business systems while considering their limitations (Hussin and Yusoff, 2013; Vieira *et al.*, 2017). Therefore, this study will describe the implementation framework of BSC and LM to be integrated as a solution to the needs of SMEs. ⁴¹udies conducted by Chytas *et al.* (2011), İbiş *et al.* (2014), Marković *et al.* (2015) and Balkovskaya and Filneva (2016) present the BSC framework with different stages,

but still within the same scope of similarities. Similarly, research related to LM has been widely applied in SMEs by Dresch *et al.* (2018), Belhadi *et al.* (2016) and Bhamu and Sangwan (2016). The BSC and LM implementation frameworks consist of various sequences based on the needs of the industries. Ensuring the basic sequence of the BSC and LM frameworks tends to simplify their integration process, which benefits SMEs.

4.2 Framework Characteristics for SMEs

Baba Md Deros *et al.* (2006) stated that organizations are guided in carrying out activities in a comprehensive and controlled manner using a framework, which is a simplified theoretical principle with easy guidelines. A structured, precise, and systematic framework facilitates organizations to achieve the desired results (Baba Md Deros *et al.*, 2006; Kumar *et al.*, 2011). According to Soni and Kodali (2013), the framework meets at least one of the following requirements: (i) Consider all elements in the system, (ii) Must be described in terms of activity stages, and (iii) Informative, which means that the details in the framework show the relationship between activities. There are differences in building a framework applicable to large companies and SMEs because they have to adjust to their various conditions (Kumar *et al.*, 2011). Large companies face high complexity, while SMEs need to implement more straightforward business steps (Bäuml, 2014). Some things that need to be considered when developing a strategic framework for SMEs are shown in Table 2.

The table above presents some of the characteristics of the framework requirements in SMEs. Each aspect is explained along with its meaning to make it easier to understand what is meant. This list is used as a material consideration for establishing an integrated framework of BSC and LM to form a targeted frame-

Table 2. Characteristics of management frameworks in SMEs

| Characteristic | Description |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Simple | The structure and implementation form of the framework is easy to understand |
| Systematic | The framework has transparent relationships for each stage |
| Consider resources and skills | Consider the extent of the resources and skills possessed |
| ⁵⁴ Consider costs | Planning needs to predict the number of costs incurred |
| Focus on the role of ³² the business actor in setting the vision, mission, and values | ³² The determination of the vision, mission and specific values of the business that is ⁴⁴ carried out strengthens the basis of the framework implementation |
| Utilize the competencies | Utilizing existing competencies and predict their potential. |
| General in nature | The framework adapts to various conditions |
| can be followed up | The resulting framework is translated into actions, or a guide needs to be taken |
| Informal documentation and reviews | Building a framework considers informal matters such as suggestions and opinions from employees and others. |

Source : Hussin and Yusoff (2013), Belhadi *et al.* (2016).

work for SMEs.

4.3 BSC Implementation Framework

The BSC framework makes it easier for SMEs to translate their vision, mission, and business strategy into a more systematic manner. Some literature has shown the benefits of BSC regardless of the size of the business being run. Table 3 shows a BSC framework of several studies. The complexity of the BSC implementation framework can be an obstacle for SMEs in implementing it because it seems more complicated. However, SMEs have understood some of the points above as factors for business success (Irjayanti *et al.*, 2016, 2016). Therefore, the framework needs to be simplified so that SMEs are easier to understand and implement. In Table 3. shows that several implementation frameworks were carried out almost in the same stages by determining the vision/mission, strategic objectives, maps, KPIs, targets, and several additional steps. For example, Monte and Fontenete (2012) stated that there is a stage for determining performance evaluation indicators referred to as KPIs. According to Chytas *et al.* (2011), the relationship between these KPIs is depicted in the strategy map. Furthermore, strategic initiatives are determined to be carried out based on the targets and KPIs. According to the author, based on the above references, the principles of the BSC framework are shown in Table 4. The BSC framework directs the

planning of KPIs, targets, and programs or initiatives pursued to achieve the company's strategic missions and visions. From the several sources above, it is concluded that this BSC framework translates a company's mission to achieve its goals to determine the required targets for each KPI. However, it does not provide specific formulations related to the techniques needed to achieve these targets. Therefore, the LM approach is used and integrated into the BSC framework to determine effective and efficient implementation steps to attain predetermined KPI targets.

4.4 Implementation Framework of LM

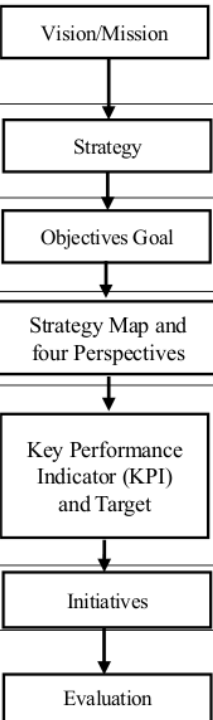
LM as a waste elimination approach that aims to increase efficiency and effectiveness needs to be implemented according to systemized stages. When the implementation is not based on clear and systematic objectives and scope, it fails to run smoothly. For this reason, the LM framework facilitates its implementation.

Dresch *et al.* (2018) stated that the LM implementation framework starts by preparing an operational performance improvement plan before measuring operational performance using the right LM tool. The following process is to make improvements based on the assumptions and analysis in the previous stage, which in the end, maintains operational improvements in a sustainable manner. In Table 5 shows some LM frameworks accord-

Table 3. BSC Implementation Framework According to Several Sources

| | Chytas <i>et al.</i> (2011) | Monte and Fontenete (2012) | İbiş and Kutlu (2014) | Balkovskaya and Filneva (2016) | Alamoudi and Alandijany (2017) | Marković <i>et al.</i> (2015) | Rangkuti (2011) | Niven (2006) |
|----------------------------------|-----------------------------------|----------------------------------|-----------------------------|--------------------------------------|-----------------------------------------|-------------------------------------|--------------------|-----------------|
| Vision | x | x | x | x | x | | x | x |
| Mission | x | x | x | x | x | | x | x |
| Strategy | | | x | | | | | x |
| Strategic objectives | x | | | x | x | x | x | |
| Strategic intent | 43 | | x | | | | | |
| 4 Perspectives / strategy map | x | x | x | x | x | x | x | x |
| Critical Success Factor (CSF) | x | | x | | | | | |
| Company objective | | | x | | | | | |
| Key Success Factor (KSF) | | | | | | x | | |
| Key Performance Indicator (KPI) | x | | x | x | x | x | x | x |
| Performance evaluation indicator | | x | | | | | | |
| Analysis relation of KSF and KPI | | | | | | x | | |
| Relation of KPI | 6 | | | | | | | |
| Targeting KPI | x | x | x | | x | | x | x |
| Initiative's strategies | | | | | | | x | x |
| Implementation | | | | | | | x | |
| Continuous improvement (CI) | x | | | | | | | |
| Evaluating / Monitoring | | | | | x | | | |

Table 4. BSC Implementation Framework

| Implementation Framework | Definition |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | A vision is a statement or sentence that includes the principles and values compiled by company executives as a guide for all business activities to be conducted (Niven, 2006; İbiş <i>et al.</i> , 2014). Meanwhile, in general, the strategies carried out to achieve this vision is described in the mission (İbiş <i>et al.</i> , 2014). |
| | Strategy is a tactic that connects and achieved the vision/mission. In this context, the company decides to use a scorecard broken down into more detailed objectives, measures, targets, and initiatives (Niven, 2006). |
| | Furthermore, strategies is explicitly translated in the form of clear objectives by showing what the company wants to achieve as a whole (Chytas <i>et al.</i> , 2011; Rangkuti, 2011; Marković <i>et al.</i> , 2015; Alamoudi and Alandijany, 2017). |
| | Company objectives are developed by describing a strategy map divided into four perspectives and linked using arrows in a causal pattern (Niven, 2006; Marković <i>et al.</i> , 2015; Alamoudi and Alandijany, 2017). |
| | Objectives from each perspective are translated into KPIs as a means of encouraging the achievement of company targets. Therefore, all employees know their contribution to the main goals of the company. It contains targets from KPIs associated with different timeframes (Niven, 2006; Chytas <i>et al.</i> , 2011; Rangkuti, 2011; Marković <i>et al.</i> , 2015; Balkovskaya and Filneva, 2016; Alamoudi and Alandijany, 2017). |
| | Initiatives are special programs, activities, or actions that needed to be taken to ensure predetermined targets (Niven, 2006; Rangkuti, 2011) |
| | In the end, the initiatives that have been carried out are continuously checked to determine the process used to develop the performance progress (Alamoudi and Alandijany, 2017). |

ing to several sources.

Belhadi *et al.* (2016) stated that the proposed framework has the same sequence of stages with a more detailed description of activities. This sequence is like the preparatory stage by defining policies and objectives, forming an LM team, providing training, determining boundaries, analyzing current conditions, implementing improvements, monitoring, standardizing, redefining LM goals and limitations. Similar to the framework by Dombrowski *et al.* (2010), which starts with a commitment then carries out the practice of LM tools and the implementation of continuous improvement. Meanwhile, Rose *et al.* (2010) presented a shorter framework that lacks the activities needed to be carried out, even though it starts by implementing LM. Table 6. shows the basic frameworks for LM implementation. In Table 6. concludes steps for implementing LM based on various references found in Table 5. Although in Table 5 there are several stages with different names, and then we analyze the similarity of the steps, which are then given the same or different names without changing the meaning. The LM framework begins by describing the organization's vision as the company's great ideals. Next, determine the policy as a com-

mitment in carrying LM. This policy is revealed to be a company-defined objectives measured manner. After that, identify wastes that hinder the achievement of goals, make improvement plans, apply plans, monitor the implementation process, and re-plan future improvements by redefining the goals.

4.5 Integration Framework of BSC-Lean

The following proposed integration framework is based on the implementation concept adopted from the BSC and LM. The use of the BSC framework provides benefits in the realm of corporate strategy, while the use of the LM framework provides convenience in the process of reducing waste. Given the high need for SMEs to develop their business more systematically and the demands to strengthen internal systems to be competitive, there is a need to combine both BSC and LM methods, leading to the development of new approaches.

However, to combine the two methods, a framework is needed that can provide gradual guidance for SMEs. Therefore, the BSC and LM methods in this study will be combined into a single unit in a framework. This study

Table 5. LM Implementation Framework According to Several Sources

| | Rishi <i>et al.</i> (2018) | Dresch <i>et al.</i> (2018) | Belhadi <i>et al.</i> (2016) | Bhamu and Sangwan (2016) | Mostafa <i>et al.</i> (2013) | Karim and Arif-Uz-Zaman (2013) | Dombrowski <i>et al.</i> (2010) |
|---------------------------------------|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|------------------------------------|--------------------------------------|---------------------------------------|
| Vision | | | | | | | x |
| Strategic goals | | | | | | | x |
| Policy | | | x | x | | x | |
| Objectives | | | x | x | | | |
| Identify drivers & barriers | | | | x | | | |
| Education & Training | | | | x | x | x | |
| Lean team | | | x | | x | x | |
| Lean perimeter | | | x | | | | x |
| Master plan | | | x | | | | |
| Lean indicator | | | x | | | | |
| Define problem & waste | x | | | | x | x | |
| Analyze the data | x | | x | | x | | |
| Identify root cause | x | | | | | | |
| Lean tools selection/ proper planning | | x | x | | x | x | x |
| Measure the operation performance | | x | | | x | x | |
| Implementation/ improvement | x | x | x | x | x | x | x |
| Lean assessment | | | | | | x | x |
| Control | x | | | | | | |
| Monitoring | | | x | | | | |
| Evaluation | | | | x | | x | x |
| Continuous improvement | | x | | x | | x | |
| Documentation | | | | | x | | |
| Standardization | | | x | | x | | |
| Generalization action | | | x | | | | |
| Extension lean perimeter | | | | | x | | |
| Realign lean strategy | | | | | | | x |

describes a Lean-Balanced Scorecard framework with several stages, which can be seen in Figure 2. The explanation of each stage will be explained as follows:

Step 1: The first stage of the Lean-Balanced Scorecard framework is to determine the company's vision and mission. A business, including SMEs, need to build a vision and mission as a first step, where to build these two things, the principles of the BSC and LM approaches are considered. Vision is a goal to be achieved by the company in the medium and long term.

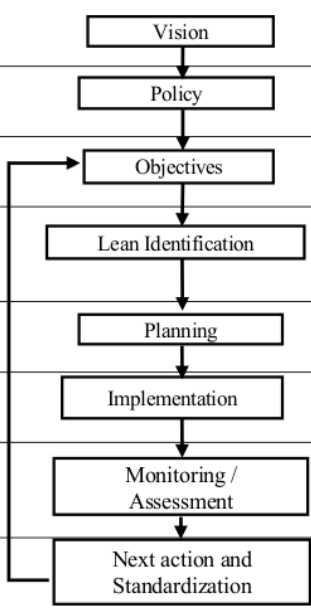
The vision was formed in a brief statement containing objectives, market focus, and intervals of the objectives to be achieved (Kaplan and Norton, 2008). Therefore, this vision statement must be balanced with a mission that outlines the strategy to achieve the vision (İbiş *et al.*, 2014). All company executives must approve this vision and mission if the owner usually determines it as of

the highest position in the company in the context of SMEs. These two things are essential to determine at the beginning so that the activities carried out within the company are directed towards the same goal.

Step 2: The next stage of this framework is to determine company policies with a commitment to carry out all business activities. This process is a strategy that connects the company's vision and mission (Niven, 2006). Therefore, at this stage is a process is generated in the form of a policy.

Step 3: The next stage is to explain the company's goals. According to Kaplan (2009), the process is carried out by defining the strategy into strategic objectives. This stage breaks down the goals more specifically into a certain period so that what the company wants to achieve is clear and measurable. Determining the strategic plan to be one of the factors of success in implementing the BSC will facilitate the evaluation of achievements and perfor-

Table 6. Basic Framework of LM

| Lean Manufacturing Implementation | Definition |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | |
| Vision | This is a future corporate identity described through a vision that leads to the company's strategy (Dombrowski <i>et al.</i> , 2010). |
| Policy | The determination of LM as a lean policy shows a solid commitment to determine the basis for implementation (Belhadi <i>et al.</i> , 2016). |
| Objectives | Determination of Lean Goals/Targets in line with the company's global policies (Belhadi <i>et al.</i> , 2016). |
| Lean Identification | Identification of waste that affects target achievement by measuring operational performance and determining the lean indicators (Belhadi <i>et al.</i> , 2016; Bhamu and Sangwan, 2016). |
| Planning | Planning for the improvement process by selecting and determining the right tools (Karim and Arif-Uz-Zaman, 2013). |
| Implementation | According to the set plan, implementation of improvements using the tools and techniques from the determined lean (Bhamu and Sangwan, 2016). |
| Monitoring / Assessment | The process of monitoring and measuring the implementation of lean activities (lean assessment) affects performance, efficiency, effectiveness, value-added time ratio, and defect level (Karim and Arif-Uz-Zaman, 2013). |
| Next action and Standardization | The following process is to standardize, refine actions, or determine a new plan for the next lean implementation, affecting the total goal setting (Belhadi <i>et al.</i> , 2016). |

mance (İbiş *et al.*, 2014).

Step 4: The next stage is to describe strategic objectives into four BSC perspectives, namely finance, customers, internal business processes, and learning and growth (Kaplan, 2009). This stage is adopted from the BSC approach because it is the main principle of the BSC. The goal is that companies can achieve economic goals in the long term through sequential actions, starting with employees and systems, then internal processes, and finally customers that lead to financial success (Kaplan and Norton, 2004; Kaplan and Norton, 2008). The relationship between the four perspectives is described in a linear strategy map that has a causal relationship. In particular, only the primary and essential linkages are included in the strategy map to prevent a confusing network of causal relationships (Ahn, 2001). The connection in this strategy map is carried out subjectively by the company's management as the primary decision holder (Lueg and Vu, 2015).

Step 5: Based on these four perspectives, Key Performance Indicators (KPI) were built as parameters for achieving strategic goals. KPI is defined as the standard used in the process of assessment and decision-making (Kong *et al.*, 2012). Each perspective has a KPI, at least one KPI as an indicator that reflects the strategic objectives. The number of KPIs is not fixed on a certain number but adjusts to the needs of each company. Determination of KPI accompanied by quantitatively define targets

within a specified period (Niven, 2006). There must be indicators that make it easier to monitor the achievement of the intended target (Kong *et al.*, 2012).

Step 6: The next stage of this framework is to plan for achieving the target, which is referred to as an initiative. Here, BSC and LM have their respective roles so that there are initiatives carried out based on LM principles and strategic initiatives that are usually carried out in BSC. The initiative is divided into LM initiatives and non-LM initiatives. The non-LM initiative process is an activity or action that ensures compliance with the target KPI-based process operation and precise control. Examples are benchmarking initiatives undertaken to improve asset utilization, new pricing programs created to increase revenue, and maintenance improvement programs implemented to reduce machine downtime (Niven, 2006). Meanwhile, the LM initiative is determined based on the LM principle with certain stages to minimize waste.

Step 7: Furthermore, the initiatives that have been made are realized in the form of actions. This action is carried out by certain departments that have been appointed or by all parties involved because to achieve the target the activities carried out are usually interrelated so that all of them have their respective roles. Meanwhile, the action to achieve the KPI target carried out on the initiative of the LM is to eliminate waste. The process begins by identifying eight types of waste that affect the achievement of KPIs. Then, implement the right LM tools

to reduce the waste.

Step 8: Once the plans are implemented, the monitoring and assessment process is carried out by a superior part. In SMEs, it usually does not have many departments so that the monitoring process can be carried out by managers responsible for all departments. At this stage, the monitoring process is carried out directly in the field, whether the implementation should be done. Then, compare the field results with a predefined KPI target, whether the results have been hit the target or not when it is reached, then how great its achievement should be calculated, and if not achieved, the need to know how big the gap is.

Step 9: The next stage is to follow up on the results of the monitoring and assessment process. This stage re-plans for targets that have not been achieved. For targets that have been met, the process of determining new targets is carried out. Meanwhile, a standardization process is carried out to achieve the target to maintain consistency

in the operating process.

Step 10: After various initiatives and measures have been implemented, the next step is to evaluate the entire process management system to measure progress and the expected target performance (Alamoudi and Alandijany, 2017). This evaluation process is carried out for both types of initiatives, both LM and non-LM initiatives. Finally, the evaluation results will determine the new strategic objectives so that the cycle back to the stage of determining the strategic objectives. The BSC and LM approach separately has many studies that prove the benefits of both to improve company performance from different scopes. To meet the SMEs, it has been stated previously that a combination of these two approaches is necessary. Several previous studies by Duarte and Cruz-Machado (2015).

Chiarini and Vagnoni (2016), Thanki and Thakkar (2018) have used these two approaches simultaneously, but the use of the BSC is only used to divide the objectives into four perspectives, not integrated into a single systematic framework. Discussions on each of the BSC and the LM stages into the base were used to establish an integrated framework for Lean-Scorecard in this study.

The framework produced in this research can be applied to various business scales. However, because large companies have a broader scope and more significant volume than SMEs, their implementation requires a more complex and detailed systematization. Meanwhile, this paper is more aimed at SMEs with a simple character, so simplifying the framework is needed for SMEs to make it easier to apply. Once the framework has been established, SMEs can apply this approach based on their respective business sectors. A critical factor for the successful implementation of the framework is the commitment and readiness of the company to run all these steps consistently. If management has decided to run it, the monitoring process during implementation must be carried out correctly. In addition, the need for socialization on the importance of implementing this framework for the company's development. The aim is to provide an understanding and awareness for the team that runs that business systematization is necessary.

5. CONCLUSION

The SMEs need to develop an efficient and effective management system to achieve their various predetermined goals. The integration of the BSC and LM frameworks is an approach expected to facilitate SMEs in carrying out their management steps. BSC is an approach designed to facilitate the strategic planning process to produce strategic initiatives. However, the resulting initiatives have not considered efficient implementation. Therefore, the LM approach is combined into a frame-

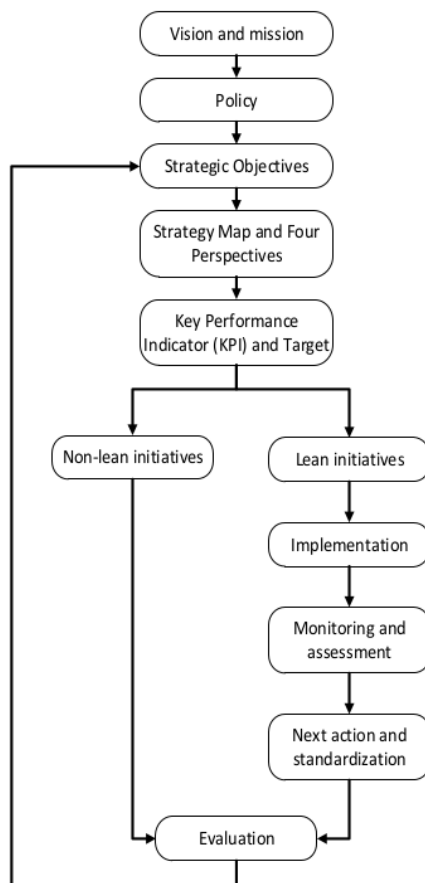


Figure 2. BSC-LM integration framework for SMEs.

work that aims at operational implementation by minimizing waste. Combining these two frameworks is expected to be the right solution for SMEs to face the challenges they have experienced. This research encourages practitioners to adopt the BSC and LM integration framework by understanding the implementation steps that are integrated comprehensively.

Furthermore, these research results are developed to be more straightforward and more effective in responding to the needs of SMEs to enhance their performance. For SMEs, this facilitates them to reduce waste and implement strategies relevant to company goals. This research utilizes insights to strengthen the knowledge base towards improving the performance and competitiveness of SMEs through the adoption of the BSC and LM frameworks.

This research shows that the BSC is an effective tool in translating the business strategy of SMEs into a multi-dimensional matrix through four perspectives. According to Dror (2008), this tool directs how activities are carried out to fulfill customer desires. Therefore, it indirectly makes SMEs easier to minimize unnecessary actions to save time, costs, and other resources. The increasingly dynamic business environment and high levels of competition require every business to make efforts on ways to stay competitive, survive, and win. With the limitations experienced by SMEs, it becomes a solid challenge to survive in this environment. Therefore, this research presents a performance management system implementation framework tailored to the needs of SMEs, which is still efficient in achieving company goals. The addition of LM to this framework contributes to planning more efficient action efforts to achieve the main targets and objectives.

Furthermore, this framework is expected that readily accepted and implemented by SMEs. This research can then be used as a basis for developing future studies, especially the implementation process and the appropriateness of its use in SMEs. Furthermore, this can also be continued by developing LM tools suitable for application to the management system to obtain more precise results.

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