

## Development on the Strategic Plan of Lean Accounting and Cost Management for Small and Medium Enterprises in Thailand

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### ABSTRACT

The objectives of this article are to develop the strategic plan of lean accounting and cost management for Small and Medium Enterprises in Thailand. It is the qualitative research using the in-depth interview. The three key informants are lean professionals, accounting professionals, and SMEs entrepreneurs. The interview result was found to be consistent with the 4 dimensions of balance plan concept consisting of (1) learning and development perspective, (2) internal process perspective, (3) customer perspective, and (4) financial perspective. The researchers then applied the calculation method formula to analyze the production cost for achieving the efficiency of the lean production process through the accounting adjustment to reflect the actual costs raised in a production cycle. This can be used to analyze which cost of production process should be improved from the inefficiency or which cost does not create value but waste. The mentioned calculation formula was shown in Microsoft Excel in order to be easy-to-use for cost calculation and fractionation.

### Keywords:

Account management, lean accounting, strategic plan, Small and Medium Enterprises

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### Introduction

For the changes under the PDCA (Plan-Do-Check-Act) operation, lean accounting was designed to improve the adopted reporting model with an emphasis on reducing the complexity and complication in the implementation in order to be suitable for being disseminated in the organizations to be easily perceived as well as being used for maximum benefits. The Lean concept combined with accounting concept creates an accounting that focuses on correctness, accuracy, and timeliness or the need for application to improve the continuous production process (Abolhassani, Layfield & Gopalakrishnan, 2016) The time competition, the speed in the management, and the decision making can affect business enormously. As the environment is constantly changing, the lean accounting thus promotes appropriate timely adaptation. In addition, lean accounting will utilize the

production management tools to improve or to be applied in solving production problems in order to elevate the operational efficiency while maintaining the effective cost control. This can be considered in various sub-units of the production process for the advantages in the decision making for the investment in machinery, labor and production line systems ( Madsen, Risvik & Stenheim, 2017).

Accounting has always been a vital part of any decision making. As businesses try to find many strategic approaches to build their competitiveness, the lean production concept developed by an organization like Toyota that has the potential to produce and reduce the losses that occur then has been widespread and delivered to other organizations around the world. The Lean Manufacturing focuses on improving the production processes or internal operations to reduce the internal system losses such as the loss

of time, loss from production process, loss from employee's operations, etc. These were designed and modified through the process known as Toyota Waste Management or developed as "Lean" as today. The Lean Manufacturing clearly focuses on reducing waste costs. This includes continuous improvement with a number of processes or methods (Al-Matari, Al-Swidi & Fadzil, 2014) to improve production operation by creating optimal cost value to achieve efficiency and effectiveness in the production process costs. It also upgrades the work to increase the quickness and capacity or productivity. The Lean Manufacturing has been upgraded and used around the world leading to a number of Lean operations (Medeiros, Santana & Guimarães, 2017) such as Lean Transportation to comply with optimal production processes and be able to deliver to the market or destination effectively. The Lean Accounting plays an important part and is consistent with the lean production process to support production operations and accounting records to be able to create a lean system throughout the organizations. When the production process is adjusted to reduce waste, the work in the production process is shortened and the work is divided into smaller steps or processes focusing on the period communication as a working style called Agile to improve work to be quickly. Thus, the Lean Accounting has become the key driver of business processes, especially in today's manufacturing category. The Lean Accounting is popular and widespread abroad whereas Thailand has received Lean Accounting approaches and policies for some time. However, no model is suitable for business in Thailand or the context of doing business in Thai society.

The researchers focused on the development and application of lean accounting for small and medium enterprises in Thailand. According to literature review, it was found that for lean accounting, the accuracy of data sources plays a key role in building lean accounting to be efficient and effective operational in the operation and the cost control. Regarding the corporate financial

management and lean accounting building, the organization must strive to improve the work structure by reducing complexity and difficulty for the workflows or operations to be transparent and verifiable (Du, 2018). This will enable everyone in the organizations to have access to important production and cost information for use in accounting according to lean concept properly. The transparent information with clear disclosure of all levels of information will enable accurate examination and improvement of information leading to an effective enhancement of lean accounting functionality. As the transparent and accurate data (Loubnan, 2018) allows the accountants to be able to design the lean accounting that optimizes the process of manufacturing operations proportionally or in sub-units appropriately. The researchers used the qualitative research process with the Focus Group to develop a practice guideline for Lean Accounting for SMEs in Thailand to help promoting the development of approaches for accounting operation in line with lean production strategies that has been widely accepted and used to enhance competitiveness of Thai businesses in competitive low-cost production including the ability to compete in the world market.

## **Literature Review**

### ***Lean Accounting***

Lean Accounting is the concept of accounting integration in the modern era that focus on the operations consistent with the production process or business operations focusing on lean management by reducing operating costs through the approach in reducing or eliminating the waste that occurs in the organizations. As a result, the cost of production or operation in various parts of the organizations is reduced resulting in the need to improve the accounting process based on the same principles or methods of working as lean management. Thus, lean accounting is significant and essential in the present and future where it is focused on the operations that promote process waste reduction and value addition (ABHA, 2013). Lean accounting management is the waste

disposal by identifying the source and presenting it in a simple way. All costs in the value stream that is beneficial for the customers regarding the products or packages will be managed. The lean accounting is the concept focusing on the waste reduction and improvement on the operational efficiency. Reducing waste in the production process helps the organizations increase overall profits and able to maintain or increase productivity using less capital. The operators will find that reducing waste can improve product quality and corporate image of the organizations. In addition, using lean accounting can also improve employee productivity, efficiency enhancement to enable the organizations to produce products or services with fewer employees. It also helps reducing the labor cost which is the highest cost of the organizations. The improvement on the efficiency can enable the competitive advantage in the business environment for the organizations to produce products more efficiently than their competitors. Schonberger, (2019) proposed that the lean accounting must begin with the placement or assignment of personnel roles including the corporate executives in all positions. Since Lean Accounting occurs to support Lean Manufacturing, when the organizations have improved the production process to reduce waste, based on the principle, the structure of work, production or activities will be improved for the entire organization to be faster, more compact, and reduce the steps that do not create value. When the work processes of the entire organization are changed, the general accounting or bookkeeping system may not be able to support or be a leader in the accounting management effectively.

### ***Accounting Information System***

The Accounting Information System is very important for accounting work as it is the system to connect all organizational functions together with necessary information for the corporate accounting of the organizations (Meiryani & Syaifullah, 2015). Regarding the Accounting

Information System as the foundation of various sub-systems in the processing of accounting data, commerce, or the sub-systems for individual transaction processing, trading processing system or sub-accounting information system include components such as hardware, software, Procedures, Databases, and communication networks. This includes the essential information technology infrastructure including computers, peripherals and network communication devices used in the Accounting Information System (Romney & Steinbart, 2015) .

In addition, the commitment is an important factor in long-term management and is also essential for the operation of accounting information system. As the operation of the accounting information system requires the integration of information together, the vision of the management plays an important role in driving the operation process to achieve the goals through the cooperation and willingness of human resources in conjunction with technology or computers to achieve the perfect integration of information. Meanwhile, the quality accounting information system must consist of the simplicity in using, the system flexibility, the ease of learning with realistic quality and integration that is accessible and timely.

Therefore, the accounting information system is the process in processing and producing the information that the user needs (Bagranoff, Mark & Norman, 2010). Based on the technological advances in designing to be suitable for the user, the quality information system provides users with accurate and timely information for the decision making in allocating appropriate and sufficient resources to meet the demands ( Loudon & Laudon, 2012) .

### ***Firm's Financial Performance***

Firm's Financial Performance is an important factor in assessing business success (Chetthamrongchai & Jermisittiparsert, 2019; Pamornmast, Sriyakul, & Jermisittiparsert, 2019; Wongwanich, Jermisittiparsert, & Chienwattanasook, 2020). Whereas the business

goals or objectives are to create the most profitable for shareholders and the organizations, Lean Accounting is the working process recognized as a standardized approach in the accounting, control and measurement by eliminating unnecessary steps to reduce time and costs, for example, by reducing inventory costs, reducing the production cost, reducing the cost in waiting, reducing the opportunity cost, as well as increasing the quickness in responding to customers.

At the same time, using lean accounting tools can also add value, revenue and profits to the organization based on the principle, practical approaches, and tools of lean accounting to assist in making the right decisions (Kocamiş, 2015). At present, many organizations are adopting lean accounting concepts to drive their accounting operations into strategy and improve their reporting efficiency in accounting and finance to provide the executives or decision-makers with realistic information that can create value for the organizations and the customers. Such information is also used to make more correct and accurate decisions. The good decisions of the executives incentivize improvements in all operational processes within the value stream to achieve accurate and clear cost and profit calculation. Therefore, it can be concluded from the literature review that the measure of financial performance or organizational efficiency requires lean accounting concepts in determining asset utilization capacity, profitability, ability to utilize available capacity, etc. The costs and results of opportunities arising from process improvements can be properly identified.

Firm's Financial Performance is the most popular business performance measurement or evaluation measure as it can be measured in numerical values and compared with competitors in the industry. The Firm's Financial Performance of business is a measure to reflect the performance that occurred at a certain time in the business, for example, the performance in the past one year or performance measurement in certain investment activities or

new arising projects (Walker, 2019). Stefenoni (2018). proposed that the firm's financial performance is a key variable in describing the ability of business operation. As the goal of the business is the pursuit of profits, the positive result will show that the business is on the right track with the goals set forth.

From further literature review, the researchers found that Firm's Financial Performance is an important measure such as a measure of organizational achievement. Kaplan & Norton (1992) proposed in the past and is used until today. It refers to the Balanced Scorecard which has a measurement that is consistent with the vision and strategy of the organization with 4 perspectives; Financial Perspective, Customer Perspective, Internal Business Process Perspective, Learning and Growth Perspective. Kaplan & Norton (1992) proposed the following financial perspective as the answer to the question in measuring the business operation quality reflected in financial numbers through accounting and financial reports. The most commonly used indicators are return on investment, return on total assets. They are used for measuring the entity's potential to profit from investment in total assets, shareholder's value, and profitability. In addition, amidst the intense competition condition, in order to financially measure in more detailed, more granular data may be considered in activities such as the increasing income, cost per unit of production, cost utilization, etc.

### **Methodology**

The qualitative research process was used to analyze and develop the lean accounting model for small and medium enterprises in Thailand using the In-depth Interview as the research tool with the details of the qualitative research process as follows:

### **Key Informant**

The researchers divided the Key Informants into three groups of triangulation type. The 1<sup>st</sup> group consisted of the lean experts. The 2<sup>nd</sup> group consisted of the accounting experts whereas the 3<sup>rd</sup> group consisted of the SMEs entrepreneurs.

The interview was done until the data was saturated (Saunders, Lewis & Thornhill, 2015). The literature review revealed that the in-depth interview gave the best results.

### **Data collection**

The qualitative research process was carried out using a semi-structured In-depth Interviews research tool. The model obtained from the quantitative research was used to conduct the interview for furthering the results in the confirmation and development of lean accounting in order to design the lean accounting model for small and medium enterprises in Thailand that was appropriate and in line with the context of Thailand. It consisted of 3 parts of interview questions; Part 1 : Basic information of the interviewees, Part 2 : Comments on the interview issues of the information about factors affecting the approaches in developing the strategic plan on the Lean Accounting of small and medium enterprises in Thailand consisting of: 1 ) Accounting Information System, 2 ) Accounting Information Transparency, 3) Lean Accounting, 4) Firm's Financial Performance, Part 3 : Other suggestions.

### **Tool development**

The researchers developed the tool with the test on the content validity using the semi-structured In-Depth Interview questions. 5 experts were assigned to assess the appropriateness and give the recommendations for improving the questions.

### **Data Analysis**

The Qualitative Research used the content analysis process to summarize the issues from the in-depth interviews and present them in numbers and percentages leading to the development of a lean accounting model for small and medium enterprises in Thailand.

### **Data Analyses**

#### ***Accounting Information System influences the Lean Accounting***

The literature review revealed that Lean Accounting is necessary to be supported by the Accounting Information System (AIS) in order to link all organizational functions in conjunction

with the connection of information necessary to the organizations for accounting (Meiryani & Syaifullah, 2015) as it is the basis for use in other subsystems such as accounting processing or transactions that occur. Nden's study (2019) stated that the Accounting Information System is a system that gathers financial information, collects data for processing and presents the results of accounting information to the accountants, the executives, or related persons to be used in making decisions on the management, strategies, organizational development and improvement. Therefore, it is essential to support the concept or operation of Lean Accounting.

The study found that Accounting Information System (AIS) influences the Lean Accounting. The opinions of experts or important informants were found from the interview and were presented in a way that the Accounting Information System (AIS) affected Lean Accounting. The Accounting Information System was very important for accounting work as it was the system that connected all organizational functions along with the information necessary for the accounting of the organizations. The Accounting Information System was a basis for integrating various subsystems in processing the accounting and commercial data or subsystems for each transaction processing. The trade processing system or the sub-accounting information system contained various components because the target group of SMEs paid attention to the Accounting Information System used in connecting work activities in the organizations such as connecting marketing and sales with warehouse and production management resulting in the optimal planning and cost allocation in each activity or batch production cycle to occur efficiently. This results in Lean Accounting with good results for the current business operation that is the supply chain competition having other businesses or partners in the production of products and services. However, most SMEs are found to be able to link their Accounting Information System (AIS) with their trading partners or partners



properly. The information to support decision-making or cost improvement possibly affects the Lean Accounting.

In addition, people or personnel also play an important role. The quality of personnel in SMEs is seen to have potential in the large organizations or even SMEs, Small and Medium. There are a lot of differences in organizations, people, funds and capacities. This is another issue that contributes to the efficiency of the accounting system. Personnel who have knowledge and understanding of Lean Accounting and the proper use of Accounting Information System (AIS) are the factors that the organizations must focus on formulating policies to enable the organizations to be competitive effectively.

#### **Lean Accounting influences the operational performance of the organizations**

According to the literature review, the Lean Accounting is found to play an important role in the efficiency of the organization's operations to support the manufacturing and service sectors of businesses to be operated efficiently. For example, a study by Vintila & Nenu, (2016) found that good cost decisions lead to reasonable cost improvement and resulted in financial results for the business both the Return on Assets (ROA) and the Net Profit Margin. This reflected the appropriate cost management that lead to the efficiency of the organizations. Current studies such as Arneson (2018); Fidias (2018) and Ogland (2019) discuss the operational performance beyond ROA or Net Profit Margin as well as Capacity Utilization which is an important measure to reflect production efficiency during production capacity and capacity utilization in each batch cycle of production. It also reflects the operating costs that will be decreased due to the efficiency in capacity utilization resulting in the gap in the increasing Net Profit Margin.

The application of Lean Accounting in the organizations will help SMEs to see the unit cost accurately and precisely. This enables the cost improvement of the business to be planned appropriately through the correct assessment and

allocation of costs for each task, activity or production cycle. Therefore, Lean Accounting can improve the accounting flexibility and integrate operational activities in various parts until the costs incurred can be clearly identified and adjusted accordingly. By improving accounting in accordance with the Lean concept, it will help creating the improvement decisions on operational activities of business effectively in eliminating waste from work and creating value under the right resources.

#### **Development on Lean Accounting Model and Performance of Small and Medium Enterprises in**

##### **Thailand**

This issue involves expressing opinions and approaches of experts or key informants in enhancing the effective and efficient application of Lean Accounting for SMEs in the production sector.

The key to proper Lean Accounting is to focus on the production processes that have to clearly separate activities and design the accounting system in correspondence with various activities in the reasonable cost storage. The operational performance of each activity or point in the business process should be measured and evaluated continuously in order to be improved in a timely manner. Moreover, the human resource development should be ready with the knowledge and understanding on the Lean Concept and Lean Accounting. The personnel must be developed to work under the lean concept for the business operation to be performed efficiency. It is also found that the subject of the Lean concept and Lean Accounting is the Trade-Off between costs and the presentation of value to the customer, for example, the customer needs to get the quick production delivery while the businesses needs low cost. The Lean-based Trade-Off concept considers the business to incur costs in certain activities to meet customer demands more efficiently. For increasing the productivity to shorten the delivery time for customers, the organizations may have incremental costs while

the customers have lower waiting costs. What the organization has received is the customer's satisfaction which can yield huge positive impact on referrals, repeat purchases, etc. The development and promotion in various areas make the organizations reach the financial performance goals appropriately.

The interview results revealed to be consistent with the Balanced Scorecard concept of Kaplan & Norton (1992) describing the four dimensions of the Balanced Scorecard, including:

(1) The Learning and Growth Perspective is the dimension that corresponds to the development of personnel in the organizations to be ready to work in various fields appropriately. In this study, personnel need to consider the development in line with Lean concept and Lean Accounting.

(2) The Internal Process Perspective focuses on the management of internal business processes. When there is a full development on personnel, the next issue is to develop the streamlined work process clearly in various functions with the clear separation of activities and structure resulting in the cost allocation in accordance with the incurring activities.

(3) The Customer Perspective is the customer management responding to the customer demand to achieve maximum satisfaction. The Learning and Growth Perspective along with the Internal Process Perspective must be developed

and improved appropriately together in order to carry out activities that enhance customer satisfaction through creating value in the perception of each customer or group. The organizations are required to trade-off costs or to execute certain activities in order to maximize value for the customer.

(4) The Financial Perspective is to answer the questions in measuring the quality of business operations reflected in financial figures through accounting and financial reports. The most commonly used indicators are Return on Investment. Return on Total Assets. These are the indices used to measure an entity's potential to profit from investment in total assets, shareholder's value, and profitability.

From the additional literature review of Kaplan & Norton (1992) on the Balanced Scorecard concept, the strategies are gathered to formulate the equation of equilibrium to get a picture of cause and effect factors promoting efficiency in different dimensions leading to the effectiveness of the organization's operations. The arrangement is in the form of Strategy Map to make it easy to be applied with the indicators in monitoring and evaluating the results.

The researchers have developed strategic plans based on lean accounting and operational performance of small and medium enterprises in Thailand using the Strategy Map as shown in the figure.

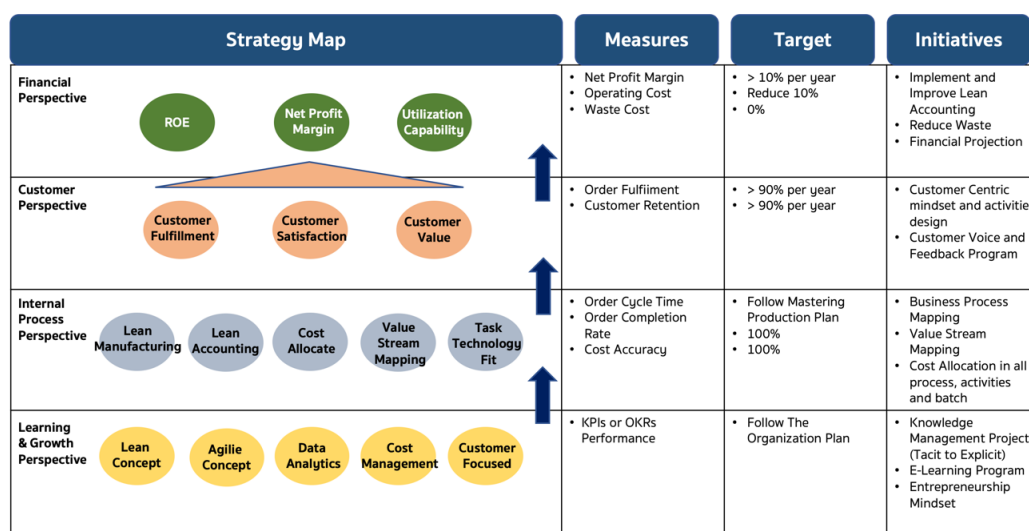


Figure 1: Strategy Map

The Strategy Map was designed and built from the in-depth interviews with experts and key informants as detailed below.

(1) The Learning and Growth Perspective is necessary to develop with regards to the Lean Concept, Agile Concept, Data Analytics, Cost Management, and Customer Focused.

The activities that should be initiated in this dimension are to promote knowledge management, drawing the internal knowledge of various personnel outward or in the media that can be touched, learned, or used. In addition, the online learning or E-Learning should be promoted. Currently, there is the Cloud system that can be used online at low cost. This includes the development on entrepreneurial ideas for all employees or personnel to think and work like an entrepreneur to achieve operational efficiency.

The effectiveness of the Learning and Growth Perspective should be measured based on the KPIs or OKRs of each organization with the measurement goals assessed according to each organization.

(2) Regarding the Internal Process Perspective, the operational process of the organizations is an extremely important dimension for effective Lean Accounting. It starts with designing value stream mapping that divides various activities appropriately including cost allocation consistent with the actual activities. All of them contribute to efficient lean manufacturing causing the Lean Accounting to be managed properly. This should include the Task-Technology Fit or organizations to provide technology to help supporting effectively.

The measurement of competence in this dimension focuses on the Cost Accuracy which must be 100% because it is the core of Lean Accounting. This includes the Order Completion Rate. The Order Cycle Time should also be measured and managed from the execution of the first order until the completion and starting the next order. These must be achieved according to the standard goals of the main production plan of the organizations.

The activities that should be undertaken at this stage are to clearly design and identify business processes including value stream mapping and clear cost allocation in all areas of activities of business operation.

(3) The Customer Perspective focuses on the activities of Order Fulfillment. The current standards must be achieved for more than 90% per year in the demand management and customer response. It is a measure of the flexibility of work and the focus on customers to create value. This includes the activities to create satisfaction and value for customers through business process design and customer-centric thinking to listening to customers' opinion to result in at least 90% repeat purchases.

(4) Regarding the Financial Perspective, the financial performance that can be measured are the three components studied in this research; Return on Assets (ROA), Net Profit Margin, and Capacity Utilization. The activities to be operated are the continuous improvement on the lean accounting, financial planning, and reduction of waste incurred in the organizations to create profit margins by 10% per year, to reduce operating costs by 10% per year, and to have a waste cost of 0%.

From the interview, the researchers summarized and analyzed the details from interviewing the informants and found that the development on lean accounting model and the performance of small and medium enterprises in Thailand from the Strategy Map were designed and built from the in-depth interviews with the experts and key informants. In terms of financial perspective and financial aspects, the consideration was on the income, production cost, administrative expenses, and retained earnings of the business. The researchers applied the lean concepts and lean accounting regarding production costs which was the activity that must be performed with financial planning and reduction of wastes incurring in the organizations. Therefore, the researcher applied the formula of calculation method to analyze the production cost in order to achieve the efficiency



of the lean manufacturing process through the accounting adjustment showing the actual cost raised in the on production cycle. It was used in analyzing the cost of manufacturing process that should be improved due to inefficiency or it was the cost that did not create value but waste. The mentioned calculation formula was shown in Microsoft Excel in order to be easy-to-use for cost calculation and fractionation. The researchers applied from the Lean Accounting of Maskell et al. (2011) to classify the costs incurred for each production cost to effectively use that information in the cost analysis in the administrative area for small and medium community enterprises.

### Discussions and Conclusion

In explaining the possibility that accounting information systems influence lean accounting and from the literature review, it was found that Lean Accounting is necessary to be supported by the Accounting Information System (AIS) to link all organizational functions along with linking information essential to the accounting of organizations (Meiryani & Syaifullan, 2015) as it is the basis for use in other subsystems such as accounting processing or transactions that occur. Ndé-Tchoupé et al (2019) studied and mentioned that the Accounting Information System is a system that gathers financial information, collects data for processing and presents the results of accounting information to the accountants, the executives, or related persons to be used in making decisions on the management, strategies, organizational development and improvement. Therefore, it is essential to support the concept or operation of Lean Accounting.

The Lean Accounting influences the operational performance of the organizations. According to the literature review, the Lean Accounting is found to play an important role in the efficiency of the organization's operations to support the manufacturing and service sectors of businesses to be operated efficiently. For example, a study by Vintilă & Nenu (2016) found that good cost decisions lead to reasonable cost improvement and resulted in financial results for the business both the Return on Assets (ROA) and the Net Profit Margin. This reflected the appropriate cost management that lead to the efficiency of the organizations. Current studies such as Arneson (2018); Fidia (2018) and Ogland (2019) discuss the operational performance beyond ROA or Net Profit Margin as well as Capacity Utilization which is an important measure to reflect production efficiency during production capacity and capacity utilization in each batch cycle of production. It also reflects the operating costs that will be decreased due to the efficiency in capacity utilization resulting in the gap in the increasing Net Profit Margin.

Development on Lean Accounting Model and Performance of Small and Medium Enterprises in Thailand. This issue involves expressing opinions and approaches of experts or key informants in enhancing the effective and efficient application of Lean Accounting for SMEs in the production sector. From the additional literature review of Kaplan & Norton (1992) on the Balanced Scorecard concept, the strategies are gathered to formulate the equation of equilibrium to get a picture of cause and effect factors promoting efficiency in different dimensions leading to the effectiveness of the organization's operations. The arrangement is in the form of Strategy Map to make it easy to be applied with the indicators in monitoring and evaluating the results.

### REFERENCES

- [1] Abha Chopra. (2013). Lean Accounting an Emerging Concept. *International Journal of*

- [2] *Marketing, Financial Services & Management Research*, 2 (8), 79-84.
- [3] Abolhassani, A., Layfield, K., & Gopalakrishnan, B. (2016). Lean and US manufacturing industry: popularity of practices and implementation barriers. *international Journal of productivity and performance Management*, 7(65), 875 – 897.
- [6] Al-Matari, E. M., Al-Swidi, A. K., & Fadzil, F. H. B. (2014). The measurements of firm performance's dimensions. *Asian Journal of Finance & Accounting*, 6(1), 24-49.
- [7] Arneson, R. (2018). Four conceptions of equal opportunity. *The Economic Journal*, 128(612), 152-173.
- [8] Bagranoff, Nancy A., Simkin, Mark G., & Norman, Carolyn Strand. (2010). *Core concepts of accounting information systems*. Accounting Information Systems, Oxford Brookes Reading Lists.
- [9] Chetthamrongchai, P. & Jermisittiparsert, K. (2019). Impact of Lean Manufacturing Practices on Financial Performance of Pharmaceutical Sector in Thailand. *Systematic Reviews in Pharmacy*, 10(2), 208-217. DOI: 10.5530/srp.2019.2.29.
- [10] Fidia Farah, Q. (2018). *Essays in expectation driven business cycle and wage polarization* (Doctoral dissertation).
- [11] Kaplan, R. S. & DP Norton (1992): "The Balanced Scorecard: Measures that drive performance". *Harvard Business Review*, 71-79.
- [13] Kocamiş, T.U., (2015). Lean Accounting Method for Reduction in Production Costs in Companies. *International Journal of Business and Social Science*, 6 (9), 6-13.
- [15] Loubnan, G. (2018). *Lean Six Sigma's Impact on Reducing Length of Stay and Readmission in a Pediatric Hospital: A Quantitative Study*. Doctoral dissertation, Northcentral University.
- [16] Loudon, Kenneth C. & Jane P. Loudon. (2012). *Management Information System : Managing*
- [17] *The Digital Firm*. 12Th Edition. NJ: Prentice-Hall.
- Madsen, D. Ø., Risvik, S., & Stenheim, T. (2017). The diffusion of Lean in the Norwegian municipality sector: An exploratory survey. *Cogent business & management*, 4(1), 1411067.
- [19] Maskell, B. H., Baggaley, B., & Grasso, L. (2011). *Practical lean accounting: a proven system for measuring and managing the lean enterprise*. CRC Press.
- [20] Medeiros, H. D. S., Santana, A. F. B., & Guimarães, L. D. S. (2017). O uso dos métodos de custeio nas indústrias de manufatura enxuta: uma análise da literatura. *Gestão & Produção*, 24(2), 395-406.
- [21] Meiryani & Syaifullah, M. (2015). Influence business process on the quality of accounting information system. *International Journal of Scientific & Technology Research*, 4(01), 323-328.
- [22] dé-Tchoupé, A. I., Nanseu-Njiki, C. P., Hu, R., Nassi, A., Noubactep, C., & Licha, T. (2019). Characterizing the reactivity of metallic iron for water defluoridation in batch studies. *Chemosphere*, 219, 855-863.
- [23] Ogland-Hand, J. D. (2019). *Integrated Systems Analyses of Using Geologically Stored CO2 and Sedimentary Basin Geothermal Resources to Produce and Store Energy* (Doctoral dissertation, The Ohio State University).
- [24] Pamornmast, C., Sriyakul, T., & Jermisittiparsert, K. (2019). Can Lean Manufacturing and 4.0 Industry Enhance the Financial Performance of Pharmaceutical Industries of Thailand?

- Mediating Role of Waste Reduction Behavior. Systematic Reviews in Pharmacy, 10(2), 318-327. DOI: 10.5530/srp.2019.2.43.
- [25] Romney, B. & Steinbart, J. (2015). *Accounting Information systems*, 13th Edition, Prentice Hall.
- [26] Saunders, M. N., Lewis, P., Thornhill, A., & Bristow, A. (2015). Understanding research philosophy and approaches to theory development.
- [27] Schonberger, R. J. (2020). Extending the pursuit of flow (lean) management to encompass sales, general and administrative functions. *Production Planning & Control*, 31(13), 1098-1109.
- [28] Stefenoni, J. B. (2018). *Exploration of the Effects of Beginning Debt Levels and Low Crop Commodity Prices on the Post Financial Downturn Financial Performance of Representative Crop, Livestock, and Diversified Farms in Oklahoma* (Doctoral dissertation).
- [29] Vintilă, G., & Nenu, E. A. (2016). Liquidity and profitability analysis on the Romanian listed companies. *Journal of Eastern Europe research in business & economics*, 2016, 1-8.
- [30] Wongwanich, B., Jermstittiparsert, K., & Chienwattanasook, K. (2020). The Mediating Role of Performance Management System in the Relationship of Enterprise Risk Management System and Financial Performance in the Pharmaceutical Industry of Thailand. *Hamdard Islamicus*, 43(S1), 424-438.