


# The Effect of Lean Accounting Implementation on Organizational Performance

Kanthana Ditkaew, Rajamangala University of Technology, Lanna, Thailand\*

 <https://orcid.org/0000-0003-1723-0657>

## ABSTRACT

This study aims to examine the effect of lean accounting implementation on organizational performance through the mediating effect of strategic decision-making and continuous improvement. Five hundred and five executives in the medical device manufacturing industry's organization were chosen as the sample, and the data were collected. The results of the structural equation model (SEM) of the analysis model's fit index of conceptual model are indicated by the index examining the absolute quality of fit measure. Additionally, the results of ordinary least squares (OLS) regression analysis and path coefficients and hypothesis testing show that lean accounting implementation plays a positive, significant role in determining and driving strategic decision-making and continuous improvement. Strategic decision-making and continuous improvement positively affect organizational performance. Therefore, firms with lean manufacturing must focus lean accounting to lead to information for decision making and revenue improvement and to increase the profit for firms.

## KEYWORDS

Continuous Improvement, Lean Accounting, Organizational Performance, Strategic Decision-Making

## INTRODUCTION

There has recently been a growing interest among both large and small foreign companies in establishing a manufacturing production base in Thailand. Approximately 138,807 vehicle, electronic, textile, and food factories are registered with the Department of Industrial Works in the country (Department of Industrial Works, 2022). Most of them operate as industrial estates spread across Thailand. Each industrial estate has different production goals depending on its business objectives. Thailand's readiness to develop the manufacturing industry is crucial to its economic development, and therefore, a master plan for the development of the manufacturing industry, in accordance with the volatile global economic conditions, is necessary and urgent. To achieve sustainable development, it is essential that production problems are minimized and resolved. Further, manufacturing organizations

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\*Corresponding Author

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must undergo continuous development to enhance their efficiency to increase the industry's competitive strength against both domestic and international competition.

Among Thailand's manufacturing industries, health and medical-related industries have shown a continuous growth trend. The global medical device market's rapid growth rate of over 6.4% per year indicates a great growth potential for the Thai medical device manufacturing industry. Although the Thai medical device market has a tendency to grow according to market demand, medical device sales in the country was predicted to grow by 3.0% in 2020, slowing down from 5.5% in 2019, according to the medical consumables group that has received a factor (Tunpaiboon, 2020). Moreover, given the demand for medical devices in the fight against COVID-19, their domestic sales are expected to grow at an average of 6.5% per year. This optimism is supported by three factors. First, morbidity, especially from heart disease, stroke, cancer, and diabetes, as well as the number of elderly people, is increasing, resulting in a demand for more technologically advanced diagnostic medical equipment. Second, rising hospital investments, in both rebuilding and expanding service areas, are increasing the demand for medical equipment and tools. Third, the government has a support policy concerning granting investment privileges to the medical device and parts manufacturing industry. However, due to raw material imports, the profitability of local medical device manufacturers and importers is low. Advances in innovation and technology, in particular, are increasing the cost of imports, putting pressure on the local medical device parts and equipment industry (Tunpaiboon, 2020).

To increase profits and add value, as well as to reduce costs and increase competitiveness, manufacturing companies must improve their processes by managing waste generated during the manufacturing process, develop their own production systems to expand their potential, and implement lean manufacturing practices. Efficiency cuts down waste in the workplace; for this reason, the lean manufacturing system, which makes such waste reduction possible, has received a lot of attention. Lean manufacturing is a management philosophy that attempts to maximize the potential of industrial operations to deliver high-quality products on time and at low cost. Many firms utilize lean manufacturing as a strategy to boost their competitiveness, which is widely and highly regarded as ensuring high production efficiency standards (Čečević & Đorđević, 2020). Accounting information should thus be able to support management's needs for planning, regulating, and assessing performance in an effective and efficient manner.

When an organization adopts lean production techniques in the production process, accountants, particularly executive accountants, are tasked with modifying the presentation of information to ensure consistency with lean production. The motivation to implement the "lean" concept in the accounting department emanates from two perspectives. First, if the organization wants to be a fully lean organization, all departments must apply the lean concept. It is not only the production department that must use the lean concept to eliminate waste at work, but also the accounting department. Second, the presentation of accounting information to management must be modified, essentially leading to the implementation of lean accounting to support lean manufacturing applications. However, extant literature mainly deals with the application of lean manufacturing systems to production, as reflected in AlManei et al. (2017, 2018) and Kafuku (2019), who studied factors for effective lean manufacturing implementation, based on selected industries in Tanzania. In addition, extant research is concerned with the application of lean concepts to improve accounting department work processes, but there are few studies on lean accounting such as that of Maskell and Kennedy (2007). DeBusk (2015) too, mentions the use of lean accounting to add value to an organization. However, little research is available on the use of accounting in strategic decision-making or the concept of continuous improvement for organizational performance.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

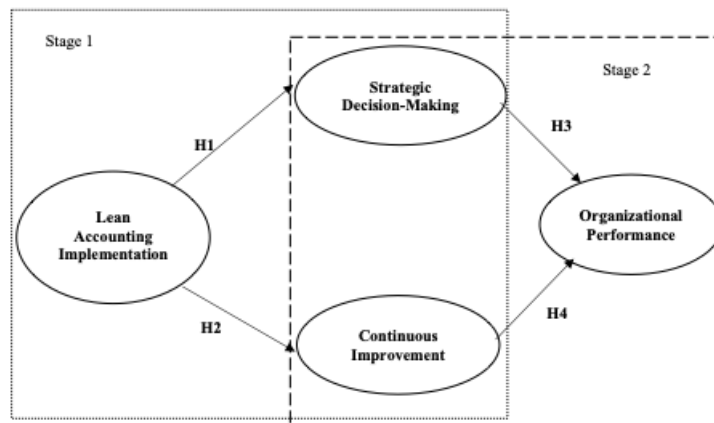
### Resource-Based View of the Firm (RBV) Theory

The key role played by the resource-based view (RBV) in business activity in competitive markets is that any organization can use its resources efficiently, effectively creating greater competitive advantage than its competitors. Barney's (1991) study on business resources and sustainable competitive advantage offers a perspective on the source of competitive advantage. It illustrates the key characteristics of strategic resources in each organization needed to carry out business activities. Specifically, the resource: (1) must create value within the organization, (2) must be scarce, (3) should not be replicable or have capital that is high in imitability, and (4) must have irreplaceable abilities or be non-substitutable (Barney, 1991; Barney et al., 2001). The RBV theory has influenced how people think about competitive strategies by changing the focus from the results to the source of competitive advantage, which is an organization's internal resource (Forsman, 2013). The disparities in the performance of each organization can be explained by internal causes. Information, which builds collaboration management knowledge, has been mentioned among such internal resources in prior. Organizations can establish a long-term competitive edge if they have effective information (Tarafdar & Gordon, 2007). The RBV describes a conceptual framework (Figure 1) in which the lean accounting concept for organizational application aids in the presentation of usable accounting information for those in the company to make decisions. Management of resources and continuous improvement to decrease waste, which is viewed as a resource and a capacity concept for industrial enterprises, with the goal of employing lean production systems to improve customer service efficiency, build relationships with internal and external customers, and add value to the company, is the foundation of corporate growth. Such growth occurs at a rapid pace owing to various variables, all of which contribute to organizational success.

### LEAN ACCOUNTING AND CONSEQUENCES

The concept of "lean" allows for a value identification method to prioritize the best value creation action to help oversee activities, not to interrupt it. It is called "lean" because it helps manage more resources with less force, less equipment, less time, and less space, while at the same time helping to produce only more of what the customer wants. The lean concept also allows for a more responsive working approach by helping to reflect on the results of change efforts. This is the opposite of process reengineering, as lean thinking is about creating new jobs rather than dismantling work processes

Figure 1. Conceptual model



for efficiency. Therefore, the lean approach helps respond to changing circumstances (Kafuku, 2019). However, the success of the lean production system does not rest only on the application of production tools. Rather, the effective implementation of a lean manufacturing system involves many factors, including manufacturing planning and control, new product development, process, equipment, concurrent engineering, workforce management, and customer and supplier relationships (Kafuku, 2019). The manufacturing industry can be more sustainable if it focuses on these elements, as it can lower production costs and eliminate non-value-added operations (Nordin et al., 2010).

In addition, a study by Abernathy et al. (2000) suggests that the success of a lean manufacturing system depends on the management of employee planning and the availability of appropriate resources and tools. Likewise, Liker (2004) states that long-term production planning is essential to the success of lean-systems-based production. Uhrin et al. (2017) showed improvement in an engine accessory line operating according to the lean concept, resulting in reduced workforce, while Suhardi and Laksono (2019) investigated the Indonesian furniture sector to improve competitiveness and customer satisfaction using the lean manufacturing approach, to shorten lead times. The researcher's literature review found that lean manufacturing could be used to examine waste and solve production problems. Thus, the efficient implementation of lean manufacturing—which results in lower production costs, increased customer value, and increased productivity—contributes to achieving a competitive advantage for the firm in the market.

As mentioned, in organizations that adopt lean manufacturing systems for their production process, executive accountants have to modify the presentation of information to ascertain its consistency with lean production. This involves: (1) applying the lean concept in the accounting department and, (2) applying the lean concept across the board, which is necessary if an organization wants to be a fully lean organization in all departments. In this case, the lean concept must be applied to accounting functions to decrease waste. Additionally, this involves and requires the ability to change how information is presented to the management, giving rise to lean accounting. Lean accounting refers to a broad range of changes in a company's management, evaluation, control, and accounting processes resulting from implementing lean methodologies. In the mid-1990s, lean accounting was established to aid in the management of lean processes and production. It entails gathering and processing data at the value stream level, using simpler ways to value inventory and using non-financial measures in addition to financial ones to evaluate performance (Brosnahan, 2008). By slightly simplifying and reducing the amount of detail, as well as customizing it to the particular organization, lean accounting allows for successful integration of activity-based cost accounting for indirect cost allocation (Gündüz, 2015; Obara & Wilburn, 2012). It provides the most accurate picture of a company's performance when it employs lean manufacturing techniques.

The fundamental goal of lean accounting is to overcome problems caused by traditional management accounting systems. The three key ideas in this respect are visual management (box score reporting), value stream management, and continuous improvement (Monroy et al., 2014). Visual accounting refers to the reporting of financial outcomes in the form of graphs, graphics, and tables in color rather than the traditional weekly, monthly, or quarterly statements. Value stream management refers to the process of presenting financial results by identifying the things that generate value. Gündüz (2015) suggests utilizing non-financial metrics such as sales per person, average cost per unit, dock-to-dock day, and first time through for this analysis. The organization must map value streams to use lean accounting. Value streams create revenue, and all costs must be allocated to their respective value stream for a meaningful display of corporate performance. Value stream costing is a method that connects all costs to the value stream (Baggaley & Maskell, 2003). Managers and direct staff can provide a suitable information foundation for strategic decision-making and assessment of continuous improvement and performance with the support of lean accounting and value stream costing (Čečević & Đorđević, 2020). The implementation of lean accounting can be used to help manage the costs for strategy, decision-making, and continuous improvement of, for example, the medical device

manufacturing industry to keep up with the changes in the current business environment. Based on this information, the following research hypotheses were proposed.

**Hypothesis 1:** Implementation of lean accounting positively affects strategic decision-making.

**Hypothesis 2:** Implementation of lean accounting positively affects continuous improvement.

## **STRATEGIC DECISION-MAKING, CONTINUOUS IMPROVEMENT, AND ORGANIZATIONAL PERFORMANCE**

Strategic planning, according to Mitchell et al. (2018), can connect strategic objectives and related performance outcomes by monitoring and measuring their coherence or attainment. Likewise, Jung and Lee (2013) asserted that strategic planning and the establishment of clear goals are key public manager activities linked to improving organizational performance. They found that strategic planning capacity has a positive impact on public sector performance. Furthermore, Elbanna (2012) found that the comprehensiveness of strategic decision-making has a positive impact on organizational performance, while Pollanen et al. (2017) found a significant positive relationship between the use of performance data for strategy implementation decisions and organizational performance. Continuous improvement techniques have evolved from systems primarily focused on production lines that reduce losses and enhance the quality of the finished product, to hybrid techniques that focus on all parts of the organization. Continuous improvement strategies target a variety of organizational factors and provide a variety of benefits, the majority of which can be measured in terms of quality, efficiency, and speed (quality, cost, time) (Ghicajanu, 2018). Continuous improvement has also been developed and recognized as making a significant contribution to improving organizational products and processes, as well as increasing efficiency and economic performance in an industry, particularly in the areas of production management and quality management (Ghicajanu, 2018). Doolen et al. (2008) presented a method for evaluating the impact of Kaizen (continuous improvement) events on business performance and human resource outcomes, while Agmoni (2016) presented unique insights into the consequences of Kaizen in achieving dramatic performance gains in a service organization and with its customers. The time spent bringing Kaizen into a service organization improves connections and the bottom line considerably, both qualitatively and quantitatively, including satisfaction and productivity. Based on this information, the following research hypotheses were proposed:

**Hypothesis 3:** Strategic decision-making positively affects organizational performance.

**Hypothesis 4:** Continuous improvement positively affects organizational performance.

## **RESEARCH METHOD**

### **Population and Sample**

This research is a quantitative survey wherein the sample size was determined via observation research. Typically, a variable ratio of 1 to 20 was observed. In this study, the observed variables equaled 15. Therefore, the study targeted a sample size of 505 executives from companies in the medical device manufacturing industry (The Office of Industrial Economics, 2021). The reason for choosing medical device manufacturing companies is that projects in this industry have received an investment from the Board of Investment totaling 1,933 million baht from January to June 2020.

Data collection for this study was approved by the Human Research Ethics Committee at Rajamangala University of Technology Lanna (RMUTL-IRB) based on the criteria of the Declaration of Helsinki and International Conference on Harmonization in Good Clinical Practice (ICH-GCP).

## Variables and Measures

The measurements of this study's constructs were developed based on the current literature. Each construct was measured with multiple items. Despite the fact that all constructs were clearly stated, due to the abstract nature of the construct, it was difficult to directly express or witness the scale (Lohapan, 2021). Variables are, without a doubt, estimated scales based on their definitions, and here, they were applied based on relevant accounting research and other related publications. They were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The sources of all the variable measurements (success of lean accounting implementation, strategic decision-making, continuous improvement, and organizational performance) are presented in Table 1.

The control variables were evaluated empirically to corroborate the research findings. In a research project, a control variable is anything that is kept constant or constrained, and has no bearing on the study's objectives; nonetheless, it is kept under control because it could affect the results. "Years in business" and "firm size" were considered control factors in this study. Next, "years in business operation" (YO) was calculated using a dummy variable with the following values: fewer than 15 years = 0 and equal to or higher than 15 years = 1. Finally, "firm size" (FS), representing the amount of money a firm has invested in doing business, was calculated using a dummy variable where less than 10,000 million baht = 0 and equal to or greater than 10,000 million baht = 1.

This study's questionnaire was created with the aim of assessing the quality of the measures in two areas: content validity and reliability. Content validity involved checking language for consistency, accuracy, appropriateness, clarity, comprehensiveness, completeness, and appropriateness by employing item-objective congruence (IOC). This is an individual conformity index requiring that the IOC value is not less than 0.5 to demonstrate that the measuring instrument meets the measured objectives (Polit & Beck, 2012). Three experts chose questions that had an IOC value greater than 0.5 for the questionnaire. The IOC analysis equaled 1.00.

For reliability are presented in Table 2, a questionnaire was first used to conduct a 50-set pilot test with non-target sample groups to check and ensure the relevance and appropriateness of the questions. The questionnaire's confidence was then tested with the questionnaire confidence test package, which involved applying the Cronbach's alpha coefficient formula and the alpha criterion. Cronbach's alpha can be used to calculate the instrument's confidence level (Cronbach, 1990, p. 204)

**Table 1. Sources of all variable measurement**

| Variables                                 | Definition   | Items | References  |
|---|--|-------|---|
| Success of lean accounting implementation | The successful implementation of lean accounting that provides accurate, timely, and understandable information that can be used to generate lean performance measurement charts, box score reporting, value stream costing, lean decision-making by transaction elimination and the financial impact of lean improvement. | 10    | Monroy <i>et al.</i> (2014)<br>Stonciuviene <i>et al.</i> (2020)                      |
| Strategic decision-making                 | Undertaking decisions regarding resource investments, involving significant competitive performance. Given that rivals can directly affect firm profitability and indirectly affect their financing, the inclusion of competitive issues is paramount.   | 4     | Leiblein <i>et al.</i> (2018)<br>Arend (2020)   |
| Continuous improvement                    | A method by which people work together to improve the performance of their processes, match performance to benchmarks levels, and continuously meet the needs and requirements of customers.   | 5     | Pinto (2009) Belekoukias <i>et al.</i> (2014)<br>Ferreira and Ramos (2019)            |
| Organizational performance                | The actual outputs of firms, which can be measured against the intended outputs, goals, and objectives.  | 6     | Teru <i>et al.</i> (2017)<br>Alaaraj <i>et al.</i> (2018) Hilton <i>et al.</i> (2021) |

and the result should be greater than 0.7 to suggest that the questionnaire used is reliable and capable of measuring the variable. In this study, Cronbach's alpha coefficient was between 0.841 and 0.936, and was thus regarded to have met the required standard.

Structure equation model (SEM): The results of the analysis model's fit index are indicated by the index examining the absolute quality of fit measure (Hair et al., 2014) using specified criteria. The results of the research framework's model of fit analysis are presented in Table 3. Considering the criteria of every key performance indicator, the empirical data and the factor analysis model have a perfect goodness-of-fit.

Furthermore, the software application was used to analyze the data collected from the questionnaire. To distribute the variables investigated, the data analysis was divided into descriptive statistics, including mean and standard deviation, and a fundamental data analysis of the respondents. In sum, the study of the association between the empirical factors—success of lean accounting implementation, strategic decision-making, continuous improvement, and organizational performance—was conducted by regression analysis to determine the relationship between dependent and independent variables. Ordinary least squares (OLS) regression analysis was used to test the hypotheses. Several equations were formulated to examine all relationships related to the hypotheses on each sub-model.

## RESULTS AND DISCUSSION

The respondents' characteristics are presented in Table 4. It includes the demographics of the accounting directors representing their respective firms who returned the questionnaire. Of the 505 participants who answered, approximately 80.79% were male. In terms of age, 42.57% were more than 40 years old and 29.11% were 30–40 years old. The most common education degree was a bachelor's degree at 62.57%, followed by a master's at 35.84%. Regarding work experience, 56.63% had 11–15 years and 35.84% had more than 15 years. The majority (45.74%) operated with a capital

**Table 2. Results of measure validation**

| Variables                                       | Factor Loadings | Item-Total Correlation | Cronbach's Alpha |
|---|-----------------|------------------------|------------------|
| Success of lean accounting implementation (SLA) | 0.43–0.88       | 0.43–0.77              | 0.907            |
| Strategic decision-making (SDM)                 | 0.66–0.97       | 0.65–0.90              | 0.841            |
| Continuous improvement (CI)                     | 0.74–0.88       | 0.70–0.79              | 0.923            |
| Organization performance (OP)                   | 0.63–0.76       | 0.59–0.73              | 0.936            |

**Table 3. Results of the analysis of the conceptual model's goodness-of-fit**

| Quality of Fit Measure | Model's Fit Based on Criteria | Statistics | Results |
|------------------------|-------------------------------|------------|---------|
| Chi-square/df          | Less than 3.00                | 1.900      | Passed  |
| p-value of Chi-square  | More than 0.05                | 0.107      | Passed  |
| GFI                    | More than 0.90                | 0.997      | Passed  |
| NFI                    | More than 0.90                | 0.998      | Passed  |
| CFI                    | More than 0.90                | 0.999      | Passed  |
| RMR                    | Less than 0.05                | 0.003      | Passed  |
| RMSEA                  | Less than 0.05                | 0.046      | Passed  |

**Table 4. Demographic characteristics of the respondents**

| Descriptions                 | Categories                           | Frequencies | Percent (%) |
|------------------------------|--------------------------------------|-------------|-------------|
| Gender                       | Male                                 | 408         | 80.79       |
|                              | Female                               | 97          | 19.21       |
| Age                          | 30–40 years old                      | 147         | 29.11       |
|                              | 41–50 years old                      | 215         | 42.57       |
|                              | More than 50 years old               | 143         | 28.32       |
| Education level              | Bachelor's degrees                   | 316         | 62.57       |
|                              | Master's degree                      | 181         | 35.84       |
|                              | Higher than Master's degree or Ph.D. | 8           | 1.59        |
| Work experience              | 5–10 years                           | 38          | 7.53        |
|                              | 11–15 years                          | 286         | 56.63       |
|                              | More than 15 years                   | 181         | 35.84       |
| Current operating capital    | Less than 10,000,000 baht            | 17          | 3.37        |
|                              | 10,000,000–25,000,000 baht           | 231         | 45.74       |
|                              | 25,000,001–35,000,000 baht           | 119         | 23.56       |
|                              | 35,000,001–45,000,000 baht           | 138         | 27.33       |
| Years in business operations | 5–10 years                           | 93          | 18.41       |
|                              | 11–15 years                          | 144         | 28.52       |
|                              | More than 15 years                   | 268         | 53.07       |

**Table 5. Descriptive statistics and correlation matrix analysis**

| Variables                                       | SLA     | SDM     | CI      | OP   |
|---|---------|---------|---------|------|
| Mean  | 4.45    | 4.52    | 4.48    | 4.36 |
| Standard deviation                              | 0.37    | 0.35    | 0.46    | 0.44 |
| Success of lean accounting implementation (SLA) |         |         |         |      |
| Strategic decision-making (SDM)                 | .726*** |         |         |      |
| Continuous improvement (CI)                     | .644*** | .659*** |         |      |
| Organization performance (OP)                   | .571*** | .622*** | .629*** |      |

\*\*\*p < .01

of 10,000,000 to 25,000,000 baht, and most (53.07%) of the respondents' businesses had been in operation for more than 15 years.

The results of the descriptive statistics statistical analysis and the correlation matrix analysis of the variables are presented in Table 5. According to Hair et al. (2010), multicollinearity might occur when the intercorrelation in each predicted variable is greater than 0.80, which is a strong relationship. There are no significant multicollinearity issues in this study.

Table 6 presents the OLS regression analysis results of the effect of successful lean accounting implementation, showing a positive and significant influence on strategic decision-making and continuous improvement. Thus, Hypotheses 1 and 2 were strongly supported. Table 6 also shows



**Table 6. Results of regression analysis used to test hypotheses 1–4**

| Independent Variables                           | Dependent Variables |                   |                   |
|---|---------------------|-------------------|-------------------|
|   | SDM                 | CI                | OP                |
| Success of lean accounting implementation (SLA) | .694***<br>(.035)   | .775***<br>(.031) |                   |
| Strategic decision-making (SDM)                 |                     |                   | .764***<br>(.031) |
| Continuous improvement (CI)                     |                     |                   | .828***<br>(.027) |
| Firm size (FS)                                  | .313<br>(.051)      | .264<br>(.049)    | .639<br>(.642)    |
| Years in business operation (YO)                | -.283<br>(.082)     | -.287<br>(.063)   | -.197<br>(.064)   |
| Adjusted R <sup>2</sup>                         | .480                | .600              | .716              |
| SEE   | .720                | .632              | .716              |
| Sig. of F = .000, ***p<.01                      |                     |                   |                   |

**Table 7. Results of the relationship among the variables in the conceptual model**

| Dependent Variable              | R <sup>2</sup> | Effect | Antecedent |        |        |
|---------------------------------|----------------|--------|------------|--------|--------|
|                                 |                |        | SLA        | SDM    | CI     |
| Strategic decision-making (SDM) | 0.63           | DE     | 0.80***    | N/A    | N/A    |
|                                 |                | IE     | 0.00       | N/A    | N/A    |
|                                 |                | TE     | 0.80       | N/A    | N/A    |
| Continuous improvement (CI)     | 0.89           | DE     | 0.94***    | N/A    | N/A    |
|                                 |                | IE     | 0.00       | N/A    | N/A    |
|                                 |                | TE     | 0.94       | N/A    | N/A    |
| Organizational performance (OP) | 0.63           | DE     | 0.00       | 0.16** | 0.66** |
|                                 |                | IE     | 0.75       | 0.00   | 0.00   |
|                                 |                | TE     | 0.75       | 0.16   | 0.66   |

\*\*\*p < .01 (DE = Direct Effect, IE = Indirect Effect, TE = Total Effect, N/A = Not Applicable)

that strategic decision-making and continuous improvement have a positive and significant effect on organizational performance. Thus, Hypotheses 3 and 4 were also fully supported.

Table 7 shows the degree of influence of both exogenous and endogenous variables. It reveals that lean accounting implementation had a positive direct effect on continuous improvement (DE = 0.94), followed by strategic decision-making (DE = 0.80). The model explains 89% of the relationship between lean accounting implementation and continuous improvement and 63% of that between lean accounting implementation and strategic decision-making. Further, continuous improvement and strategic decision-making had a direct influence on organizational performance, with continuous improvement (DE=0.66) showing greater influence than strategy decision-making (DE=0.16). Moreover, continuous improvement and strategic decision-making explained organizational performance equally at 63%.

The research results show that when the organization is lean, its accounting, control, and measurement systems need to change, failure of which may render lean manufacturing and lean concepts unsustainable in the long term. Lean accounting helps management provide better information for decision-making and leads to higher revenue and profitability. It also reduces time, costs, and waste by eliminating wasted transactions and systems, and creating value directly from the customer's perspective. This is consistent with Maskell and Kennedy (2007), who state the key point that "lean accounting methods and tools support key aspects of lean organization." As DeBusk (2015) confirms, management accountants must change their accounting systems to support new approaches to decision-making and performance measurement, and use lean accounting to add value to organizations. Customer value, just-in-time delivery, the elimination of all forms of waste from production and all business processes in the company, etc., are the basic characteristics of a lean business. Lean accounting describes the characteristics, principles, and tools of approach because the main purpose of lean accounting is to favor lean strategies and solve problems caused by traditional accounting systems (Cesaroni & Sentuti, 2014). In addition, these results are consistent with Pozesky and Stoner (2017), who state that lean accounting monitoring operational performance will help improve the average cost of production and help capture relevant operational data consistently, routinely, and in time. Further, it provides a tool to improve operations and share good data on operational efficiency, production capacity, staff and machine utilization, as well as shipment accuracy and timeliness, enabling managers to be more effective.

Thus, lean accounting provides the most accurate picture of the performance of a company employing lean manufacturing techniques. Managers and direct staff can provide a suitable information foundation for strategic decision-making and assessing continuous improvement and performance with the support of lean accounting and value stream costing (Čečević & Đorđević, 2020). Additionally, this study's finding that strategic decision-making has a positive impact on organizational performance is consistent with Elbanna (2012) and Pollanen et al. (2017), who found a significant positive relationship between the use of performance data for strategy implementation decisions and organizational performance. Furthermore, continuous improvement strategies target a variety of organizational factors and provide diverse benefits, the majority of which can be measured in terms of quality, efficiency, and speed (quality, cost, time) (Ghicajanu, 2018); that is, it has a positive impact on organizational performance. Doolen et al. (2008) presented a method for evaluating the impact of Kaizen (continuous improvement) events on business performance and human resource outcomes. In addition, Agmoni (2016) provides unique insights into the consequences of Kaizen in achieving dramatic performance gains in a service organization and its customers. In sum, all the hypotheses in this study were strongly supported (see Table VIII).

## IMPLICATIONS AND DIRECTIONS FOR FUTURE RESEARCH

### Theoretical Implications

This research backs up the RBV theory and confirms lean accounting efficacy. RBV (Barney, 1991) is a management framework used to determine the strategic resources a company can leverage to

Table 8. A summary of the hypotheses testing

| Hypotheses | Relationship   | Results   |
|------------|--|-----------|
| H1         | <i>Successful lean accounting implementation positively affects strategic decision-making.</i> | Supported |
| H2         | <i>Successful lean accounting implementation positively affects continuous improvement.</i>    | Supported |
| H3         | <i>Strategic decision-making positively affects organizational performance.</i>                | Supported |
| H4         | <i>Continuous improvement positively affects organizational performance.</i>                   | Supported |

achieve a sustainable competitive advantage. It focuses management's attention on the company's internal resources in an effort to identify those assets and capabilities that have the potential to create a superior competitive advantage. For resources to be potential sources of sustainable competitive advantage, they should be valuable, scarce, not easily replicated, and not substitutable. Thus, for a firm to have competitive advantage, it should consider its resources, especially its information and core competencies, rather than competing on product costs to differentiate itself from its competitors. This research shows that lean accounting implementation will provide management with information useful for strategic planning and continuous quality improvement, contributing to enhanced organizational performance and greater competitive advantage over basic abilities. However, future research would need to examine the antecedent of lean accounting implementation in the context of different accounting methods (process costing versus standard costing). Furthermore, another statistical tool, such as partial least squares regression, may be required to test the research relationships.

### **Managerial Implications**

The implementation of lean accounting offers businesses accurate and useful information, as well as enough data for cost control and operations. It can also adapt the operating process to align with the company's policies and strategic goals, as well as display financial and internal reports to make operations and decision-making easier to understand. Organizations can gather data through lean accounting to consistently and effectively improve operations in response to a situation, resulting in creative improvement, capacity expansion, efficiency planning, and production control. In a fierce and unstable competitive environment, lean accounting can empower firms to properly examine scenario-based solutions. It can also provide alternatives for maximizing the advantages of the organization's goals swiftly and in a timely manner from an information system that supports decision-making reliably. It is important to ensure that the planning and implementation of the work plan are standardized when applying lean accounting to achieve the organization's objectives. The company can adopt an appropriate approach to reduce waste and save costs in workflow management, focusing on ways to improve workflows in order to make managing work easier and more efficient. Organization with data an operational continuous improvement will can increase productivity and build organizational potential. The company's performance on target and operational plans are managed with efficiency and effectiveness in line with the planned strategy, which it is able to maintain an old customer database and add new customer databases. Customers and the market also praise firms that respond quickly to individual needs and stay on top of the situation, continuously develop and expand products, as well as acquire a net profit from operations and a reasonable growth rate.

In summary, lean accounting is an important part of an organization's lean and just-in-time manufacturing. Firms must adopt lean accounting to generate information instrumental for decision-making and revenue improvement to help increase firm profitability. By reducing time, costs, and waste by eliminating wasteful transactions and systems, it demonstrates the financial possibilities of continuous improvement initiatives and underscores the strategies necessary to achieve organizational goals. Most importantly, lean accounting emphasizes creative value for customers, allows for a better way to understand product costs and stream costs, and helps firms use that cost information to continuously improve management's decision-making concerning profitability and competitive advantage. The results of this study demonstrate that firms adopting lean production must simultaneously implement lean accounting to assist in securing optimal information and ensuring strategic long-term and future business performances.

### **CONCLUSION**

The past years have been marked by a significant business environment transformation from domestic to global competition. This radical and rapid change has resulted in production innovations and progress. Technological advancements have resulted in a large number of products and services becoming more

competitive in the market in terms of availability and prices, placing pressure on businesses to deliver high-quality products or services. Because of such changes, business executives have had to remodel their management style in accordance with the competitive environment. Lean manufacturing is a customer-centric approach wherein businesses try to eliminate or minimize waste through continuous improvement, and operations are driven by customer orders. Such a process management tool could help empower organizations as it considers operational values to meet customer needs, continually creates value for products and services, and eliminates losses throughout the process, thereby reducing costs and ultimately improving business results, while also placing importance on turning out quality products. As management concepts change in today's highly competitive business environment, accounting information should be able to meet managerial needs in order for management to plan, control, and evaluate performance effectively and efficiently. In organizations that have adopted lean production and processes, accountants, especially executive accountants, have to modify the provision of information, ensuring consistency with the lean production operations. This study confirmed that lean accounting methods and tools support key aspects of lean organization by providing information for strategic decision-making, driving continuous improvement, and enhancing firm performance. As a related strategy to align the financial side of an organization with its overall lean manufacturing approaches, this study testifies to the importance of lean accounting implementation in improving operations and firm performance.

## REFERENCES

- Abernathy, F. H., Dunlop, J. T., Hammond, J. H., & Weil, D. (2000). Retailing and supply chains in the information age. *Technology in Society*, 22(1), 5–31. doi:10.1016/S0160-791X(99)00039-1
- Agmoni, E. (2016). The role of Kaizen in creating radical performance results in a logistics service provider. *Logforum*, 12(3), 225–245. Advance online publication.
- AlManei, M., Salonitis, K., & Xu, Y. (2017). Lean implementation frameworks: The challenges for SMEs. *Procedia CIRP*, 63, 750–755. doi:10.1016/j.procir.2017.03.170
- Armstrong, J. S., & Overton, T. S. (1977). Estimating non-response bias in mail survey. *JMR, Journal of Marketing Research*, 14(3), 396–402. doi:10.1177/002224377701400320
- Baggaley, B., & Maskell, B. (2003). Value stream management for lean companies, Part II. *Journal of Cost Management*, 17(4), 24–30.
- Barney, J. B. (1991). Firm resources and sustainable competitive advantage. *Journal of Management*, 17(1), 99–120. doi:10.1177/014920639101700108
- Barney, J. B., Mike, W., & David, J. (2001). The Resource-Based View of the Firm: Ten Years After 1991. *Journal of Management*, 27(6), 625–641. doi:10.1177/014920630102700601
- Brosnahan, J. (2008). Unleash the Power of *Lean Accounting*. *Journal of Accountancy*, (July), 60–66.
- Čečević, B. N., & Đorđević, M. (2020). Lean accounting and value stream costing for more efficient business processes. *Economic Themes*, 58(4), 573–592. doi:10.2478/ethemes-2020-0032
- Cesaroni, F. M., & Sentuti, A. (2014). *Implementation a lean accounting system in a lean enterprise. In 18th International Academy of Management and Business*. Università Roma.
- Cronbach, L. J. (1990). *Essentials of psychological test*. Harper Collins.
- DeBusk, G. K. (2015). Use lean accounting to add value to the organization. *Journal of Corporate Accounting & Finance*, 23(3), 29–35. doi:10.1002/jcaf.22047
- Department of Industrial Works. (2022). *Data of Factory in Thailand*. <https://www.diw.go.th/webdiw/>
- Doolen, T. L., Van Aken, E. M., Farris, J. A., Worley, J. M., & Huwe, J. (2008). Kaizen events and organizational performance: A field study. *International Journal of Productivity and Performance Management*, 57(8), 637–658. doi:10.1108/17410400810916062
- Elbanna, S. (2012). Slack, planning, and organizational performance: Evidence from the Arab Middle East. *European Management Review*, 9(2), 99–115. doi:10.1111/j.1740-4762.2012.01028.x
- Forsman, H. (2013). Environmental innovations as a source of competitive advantage or vice versa? *Business Strategy and the Environment*, 22(5), 306–320. doi:10.1002/bse.1742
- Ghicajanu, M. (2018). Techniques to continually improve business quality and performance (II). *Annals of the University of Petrosani. Economics*, 18(1), 77–84.
- Gunduz, M. (2015). Value stream performance measurement in LEAN manufacturing business. *International Business Management*, 10(3), 40–47. doi:10.3968/7128
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). SEM: An introduction. *Multivariate Data Analysis: A Global Perspective*, 629–686.
- Jung, C. S., & Lee, G. (2013). Goals, strategic planning, and performance in government agencies. *Public Management Review*, 15(6), 787–815. doi:10.1080/14719037.2012.677212
- Kafuku, J. M. (2019). Factors for effective implementation of lean manufacturing practice in selected industries in Tanzania. *Procedia Manufacturing*, 33, 351–358. doi:10.1016/j.promfg.2019.04.043
- Liker, J. K. (2004). *The Toyota way*. McGraw Hill.

Lohapan, N. (2021). Digital Accounting Implementation and Audit Performance: An Empirical Research of Tax Auditors in Thailand. *The Journal of Asian Finance. Economics and Business*, 8(11), 121–131. doi:10.13106/jafeb.2021.vol8.no11.0121

Maskell, B. H., & Kennedy, F. A. (2007). Why do we need lean accounting and how does it work? *Journal of Corporate Accounting & Finance*, 18(3), 59–73. doi:10.1002/jcaf.20293

Mitchell, D., Larson, S. E., Colantonio, C., & Nguyen, C. (2018). Planning for Change: Incorporating Contextual Implementation Design into Strategic Planning. *State & Local Government Review*, 50(2), 110–118. doi:10.1177/0160323X18785695

Monroy, C. R., Nasiri, A., & Pelaez, M. A. (2014). Activity based costing, time-driven activity based costing and LEAN accounting: Differences among three accounting systems' approach to manufacturing. *Annals of Industrial Engineering*, 11–17. doi:10.1007/978-1-4471-5349-8\_2

Nordin, N., Deros, B., & Abd Wahab, D. (2010). A Survey on Lean Manufacturing Implementation in Malaysian Automotive Industry. *International Journal of Innovation, Management and Technology*, 1(4), 374–380.

Obara, S., & Wilburn, D. (2012). *Toyota by Toyota: Reflections from the Inside Leaders on the Techniques That Revolutionized the Industry*. CRC Press. doi:10.1201/b11902

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice*. Wolters Kluwer Health / Lippincott Williams & Wilkins.

Pollanen, R., Abdel-Maksoud, A., Elbanna, S., & Mahama, H. (2017). Relationships between strategic performance measures, strategic decision-making, and organizational performance: Empirical evidence from Canadian public organizations. *Public Management Review*, 19(5), 725–746. doi:10.1080/14719037.2016.1203013

Pozesky, R. E., & Stoner, J. S. (2017). Lean accounting brings focus and direction to company performance. *Pennsylvania CPA Journal*, 88(3), 26–29.

Suhardi, B., & Laksono, P. W. (2019). Minimizing waste using lean manufacturing and ECRS principle in Indonesian furniture industry. *Cogent Engineering*, 6(1), 1–13. doi:10.1080/23311916.2019.1567019

Tarafdar, M., & Gordon, S. R. (2007). Understanding the influence of information system competencies on process innovation: A resource-based view. *The Journal of Strategic Information Systems*, 16(4), 353–392. doi:10.1016/j.jsis.2007.09.001

The Office of Industrial Economics. (2021). *Medical devices intelligence unit*. <http://medicaldevices.oie.go.th>

Tunpaiboon, N. (2020). *Industry outlook 2020-22: Medical devices*. Krungsri Research. <https://www.krungsri.com/en/research/industry/industry-outlook/Other-Industries/Medical-Devices/IO/medical-devices>

Uhrin, Á., Bruque-Cámara, S., & Moyano-Fuentes, J. (2017). Lean production, workforce development and operational performance. *Management Decision*, 55(1), 103–118. doi:10.1108/MD-05-2016-0281

## APPENDIX A: QUESTIONNAIRE

**The title:** “The Effect of Lean Accounting Implementation on Organizational Performance”

**Section 1:** Personal information of executives, directors or managers and companies’ information.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

1. Gender “ 1. Male “ 2. Female
2. Age “ 1. Less than 30 years old “ 2. 30–40 years old  
“ 3. 41–50 years old “ 4. More than 50 years old
3. Education  
“ 1. Lower bachelor’s degree  
“ 2. Bachelor’s degree  
“ 3. Master’s degrees  
“ 4. Higher than master’s degree or Ph.D.
4. Works experience  
“ 1. Less than 5 years  
“ 2. 5–10 years  
“ 3. 11–15 years “ 4. More than 15 years
5. Current operation capital  
“ 1. Less than 25,000,000 Baht  
“ 2. 25,000,000–50,000,000 Baht  
“ 3. 50,000,001–100,000,000 Baht  
“ 4. 100,000,001–150,000,000 Baht  
“ 5. More than 150,000,000 Baht
6. Operational years  
“ 1. Less than 5 years  
“ 2. 5–10 years  
“ 3. 11–15 years “ 4. More than 15 years

**Section 2:** Opinion on lean accounting implementation.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions  | Level of Agreement |       |          |          |                   |
|-------|--|--------------------|-------|----------|----------|-------------------|
|       |  | Strongly Agree     | Agree | Not Sure | Disagree | Strongly Disagree |
|       |  | 5                  | 4     | 3        | 2        | 1                 |
| 1.    | The application of lean accounting provides companies with accurate data that can be effectively used.   |                    |       |          |          |                   |
| 2.    | The application of lean accounting provides companies with sufficient information that can be used for cost control.   |                    |       |          |          |                   |
| 3.    | The application of lean accounting provides companies with sufficient information that can be used to control all aspects of their operations.                                 |                    |       |          |          |                   |
| 4.    | The application of lean accounting allows companies to align their operational processes with their goals, policies, and strategies.   |                    |       |          |          |                   |
| 5     | The application of lean accounting allows companies to present financial and other reports within the organization for easier understanding of operations and decision-making. |                    |       |          |          |                   |
| 6.    | The application of lean accounting allows companies to obtain information for continuous and efficient operational improvements.   |                    |       |          |          |                   |

## Section 2 (continued): Opinion on lean accounting implementation.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions   | Level of Agreement |       |          |          |                   |
|-------|---|--------------------|-------|----------|----------|-------------------|
|       |   | Strongly Agree     | Agree | Not Sure | Disagree | Strongly Disagree |
|       |   | 5                  | 4     | 3        | 2        | 1                 |
| 7.    | The application of lean accounting allows companies to obtain information for creative improvement.                             |                    |       |          |          |                   |
| 8.    | The application of lean accounting allows companies to obtain information for potential improvements in the production process. |                    |       |          |          |                   |
| 9.    | The application of lean accounting provides data that can be used to optimize planning and production control.                  |                    |       |          |          |                   |
| 10.   | The application of lean accounting allows companies to provide financial statements with cost-effectiveness and cost savings.   |                    |       |          |          |                   |

## Section 3: Opinion on strategic decision-making.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions  | Level of Agreement |       |          |          |                   |
|-------|--|--------------------|-------|----------|----------|-------------------|
|       |  | Strongly Agree     | Agree | Not Sure | Disagree | Strongly Disagree |
|       |  | 5                  | 4     | 3        | 2        | 1                 |
| 1.    | The company is able to effectively analyze alternatives in various situations under fierce and uncertain competitive environments.   |                    |       |          |          |                   |
| 2.    | The company has a process for comparing the best returns and benefits, and is able to achieve well-established goals.  |                    |       |          |          |                   |
| 3.    | Companies are better able than their competitors to choose the best option or strategy based on the circumstances, making it easier for them to succeed.                   |                    |       |          |          |                   |
| 4.    | Companies can use a reliable information system that supports decision-making to make quick and timely decisions about the optimal options for their organization's goals. |                    |       |          |          |                   |



#### Section 4: Opinion on continuous improvement.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions  | Level of Agreement |       |          |          |                   |
|-------|--|--------------------|-------|----------|----------|-------------------|
|       |  | Strongly Agree     | Agree | Not Sure | Disagree | Strongly Disagree |
|       |  | 5                  | 4     | 3        | 2        | 1                 |
| 1.    | The company focuses on planning and improving the work according to the plan to be the same standard for the success of the organization's objectives. |                    |       |          |          |                   |
| 2.    | The company has a good strategy for reducing waste and saving costs in the management of work processes.   |                    |       |          |          |                   |
| 3.    | The company has improved the work process by following the Kaizen principle.   |                    |       |          |          |                   |
| 4.    | The company focuses on finding ways to improve workflows in order to make work easier and more efficient.  |                    |       |          |          |                   |
| 5.    | The company focuses on continuous improvement to achieve work goals.   |                    |       |          |          |                   |
| 6.    | The company focuses on continuous improvement in its operations to increase productivity and build organizational potential.                           |                    |       |          |          |                   |

#### Section 5: Opinion on organizational performance.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions  | Level of Agreement |       |          |          |                   |
|-------|--|--------------------|-------|----------|----------|-------------------|
|       |  | Strongly Agree     | Agree | Not Sure | Disagree | Strongly Disagree |
|       |  | 5                  | 4     | 3        | 2        | 1                 |
| 1.    | The company's operating results are in accordance with its goals and operational plans.  |                    |       |          |          |                   |
| 2.    | The company's job division is based on a well-planned strategy that takes efficiency and effectiveness into account.                           |                    |       |          |          |                   |
| 3.    | For management purposes, the company maintains the existing database of old customers and adds new customer databases.                         |                    |       |          |          |                   |
| 4.    | The company has been recognized by customers and the market for responding well to individual needs and keeping up with the current situation. |                    |       |          |          |                   |
| 5.    | The company is able to continuously develop and expand its products.   |                    |       |          |          |                   |
| 6.    | The company has continuously increased its market share every year.  |                    |       |          |          |                   |
| 7.    | The company is able to make a reasonable net profit based on the market conditions and its own operating costs.                                |                    |       |          |          |                   |

**Section 5 (continued):** Opinion on organizational performance.

**Instructions:** Please use √ to indicate one choice that is the most accurate according to you.

| Items | Questions   | Level of Agreement |       |          |          |                   |
|-------|---|--------------------|-------|----------|----------|-------------------|
|       |   | Strongly agree     | Agree | Not sure | Disagree | Strongly disagree |
|       |   | 5                  | 4     | 3        | 2        | 1                 |
| 8.    | The company's operations generate a consistent net profit and it grows at a reasonable rate.                      |                    |       |          |          |                   |
| 9.    | The company can provide data as well as perform analysis, planning, control, and reporting for budget management. |                    |       |          |          |                   |

*Kanthana Ditkaew, PhD in Accounting (2010, Mahasarakham University, Thailand), is an Associate Professor in accounting at the Rajamangala University of Technology Lanna Tak (Thailand). She also published quite a number of SCOPUS indexed journals in the field of accounting and business administration in addition to presenting several papers at local and international conferences. Her research interests include accounting, managerial accounting, accounting information system and international business.*