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Lean Accounting and Manufacturing Performance: The Contribution of Lean Management Accounting Practices

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ABSTRACT

Introduction: Manufacturing companies operating within dynamic and intensely competitive markets have a mindset that concentrates on continuous improvement processes. The management efforts have focused on enhancing quality, flexibility, and customer response time through the application of Lean thinking principles. For an organisation to realise its full potential of lean application, lean manufacturing organisation must embrace a comprehensive business strategy, rather than being confined to a singular focus within operations. The lean manufacturing organisation necessitates the incorporation of lean approaches throughout operations and various business functions. Management accounting practices (MAP), and lean accounting serve as crucial elements in attaining higher performance improvement and align with the requirements and goals of lean organisations. This study aims to investigate the relationship between lean accounting components and the manufacturing performance of Malaysian manufacturing companies.

Methods: The survey data collected from 282 Malaysian manufacturing firms was utilised and develop a structural equation model of lean accounting and manufacturing performance.

Results: The findings show that the implementation of lean accounting is directly related to manufacturing performance. Specifically, the elimination of transactions (ELT), performance measurement (PFM), financial benefits (FNB), and value stream management (VSM) have direct effects, while value stream costing (VSC) indirectly impacts manufacturing performance in Malaysia.

Conclusion: The results of our research align with the perspective that lean thinking constitutes a comprehensive business strategy. To achieve the most significant effect on performance, our findings suggest that operations management must across the departments and areas to maximizse its efficiency. Operations and accounting personnel must collaborate to ensure that lean accounting is strategically integrated into the lean manufacturing organisation. This study assists both researchers and practitioners in comprehending how lean accounting can facilitate operations personnel in their internal decision-making processes, as well as support operations executives and business leaders in their goal of enhancing lean operations performance within the framework of a comprehensive lean manufacturing strategy.

Keywords: Lean accounting, lean manufacturing, survey, structural equation modeling

INTRODUCTION

The foundation of lean is the elimination of waste and the fulfilment of customer needs across all dimensions of operations, manufacturing, and administration (Elbert, 2012; Womack et al., 1991, 2007). This

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encompasses streamlined structures, processes, adaptability, and methodologies to capitalise on emerging opportunities. Achieving a lean enterprise requires a culture built on lean thinking, which involves eliminating wasteful activities while increasing the value of a process or function (Malik, 2016; Maskell, 2000). Lean accounting emphasises the examination and quantification of customer value through accounting practices, thereby improving customer relationships, product design, and pricing strategies and fostering continuous improvement (Maskell & Baggaley, 2006). The effective application of lean accounting generates significant advantages for an organisation by providing accurate, timely, and understandable information, motivating lean transformation, and facilitating decision-making processes (Maskell, 2009; Maskell et al., 2017). This, in turn, contributes to increased customer value, growth, profitability, and cash flow (Fullerton et al., 2013; Malta & Cunha, 2011). Lean accounting promotes the application of lean tools to eliminate waste from accounting processes while ensuring robust financial control (Maskell et al., 2017; Maskell & Baggaley, 2006) and supports a lean culture by motivating investment in people, providing relevant and actionable information, and empowering continuous improvement at every organisational level (Elbert, 2012).

It is essential to integrate lean accounting concurrently for the efficiency of business processes (Maskell & Baggaley, 2006) and the improvement of operational and financial performance (Kennedy & Widener, 2008). Lean accounting integrates lean philosophy into every aspect of accounting processes and describes how accounting, control and measurement can be employed to facilitate lean manufacturing organisation (Kocamiş, 2015; Malik, 2016; Maskell et al., 2017). Lean accounting aids management in better decision-making by identifying and removing non-value-added processes within product costing, inventory, and production control activities (Liu et al., 2024). Therefore, this study is essential in addressing the research gap within lean management literature by emphasising the role of lean accounting (Maskell, 2000) and its impact on manufacturing performance in Malaysia. The transformation to lean accounting has the potential to increase companies' performance through the elimination of waste and unnecessary processes, drive towards better quality, and the enhancement of customer value (Womack et al., 2007; Womack & Jones, 1997) while compliance to Generally Accepted Accounting Principles Generally (GAAP) (Maskell, 2000; Maskell & Baggaley, 2006).

This study is organised in the following manner: Section 2 provides an overview of the literature review, while Section 3 outlines the research methodology employed in this study. Section 4 provides an analysis of the findings, whereas section 5 emphasises the discussions and implications derived from the study. The study culminates in a series of recommendations for prospective research agendas.

LITERATURE REVIEW

Lean Principles

The concept of lean emerged in the early 1990s with the publication of The Machine That Changed the World: Based on the Massachusetts Institute of Technology of the Toyota Production System by Womack, Jones & Roos. The foundation of lean philosophy focuses on value creation through waste elimination, with seven types of waste identified during the development of the Toyota Production System. The principles of lean emphasise the importance of delivering value to the customer, improving the flow of products or services, and eliminating waste and non-value-added activities based on customer value, creating a more efficient operation that delivers faster, more dependable, and higher-quality products and services at a lower cost (Womack et al., 1991; Womack & Jones, 1997, 2005). Womack and Jones (1997) identified the fundamentals of lean are Value, Value Stream, Flow, Pull, and Perfection.

The first principle of lean is specifying value, which revolves around the customer's use of a product and is used as a foundation for developing the production process. The definition of value should be determined by the customer, taking into consideration the product's features and pricing (Koskela, 2004). The second principle of lean focuses on providing value to the customer effectively, identifying the value stream of the

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product and ensuring consistent production processes. The organisation must recognise the value of each process to ensure that the end-to-end process delivers value to the customer and meets their expectations (Hines et al., 2020). The fourth principle of lean focuses on aligning production with customer needs and demands, enabling the firm to pull value from the customer rather than push it onto the customer (Osman et al., 2020; Tillema & Van der Steen, 2015). This principle involves planning production to optimise the quality and efficiency of the final product. The fifth principle of lean is to pursue perfection, meeting customer needs and continuously improving processes to achieve zero defects (Malik, 2016; Netland et al., 2021; Ruiz-De-Arbulo-Lopez et al., 2013; Womack & Jones, 1997). The principles of lean are a systematic technique to validate, recognise, and eliminate waste and non-value-added activities through continuous improvement through production activities of material, work-in-process and output, and information using a pull system (Dieste et al., 2021; Kamble et al., 2020; Lee & Chang, 2010; Osman et al., 2020; Womack & Jones, 2005).

Research on Lean Accounting

Research in lean accounting varies and emphasises the potential positive implications of new accounting methods and suggests performance and competitive improvement. There is the notion that lean accounting is the most suitable method for lean companies (Alves et al., 2022; Kennedy et al., 2012). Malta and Cunha (2011) posit that effective value stream management (VSM) and a different approach in cost modelling systems are required to demonstrate operations planning improvements. A new approach in cost modelling and performance evaluation systems can be implemented to improve global value streams within collaborative networks. Fullerton et al. (2014) reveal that the extent of lean manufacturing implementation is associated with the use of lean MAP, which positively influences the use of value stream costing and visual performance measures. Ali et al. (2021) assert that a successful system requires a strong commitment from top management, consistent accounting methods, a lean manufacturing system, and effective collaboration with value-stream teams and not functioning effectively with a traditional accounting system (Kennedy et al., 2012; Sitoresmi & Eksandy, 2018; Teklay & Bobe, 2024). The implementation of a quality MAP suggests that personal values and commitments to modernising the business drive change (Teklay & Bobe, 2024). Valmohammadi and Dadashnejad (2021) investigate the operational principles of lean production using the value stream mapping (VSM) and Kaizen approach, showing an increased value-added, improved production, reduced lead time, and improved value-creating time. Kennedy et al. (2012) assert the essential of value stream costing (VSC) in a lean environment to facilitate the managers differentiate between value-added and non-value-added activities, reducing waste and saving resources (Almusawi et al., 2019).

Despite lean accounting transformation being acknowledged as medium of continuous improvement (Bhasin & Found, 2021; Maskell, 2006; Maskell & Baggaley, 2006; Maskell & Kennedy, 2007; Stenzel, 2007) and contributing to the economy and fostering beneficial socio-economic developments (Sitoresmi & Eksandy, 2018), VSC show a negative effect and Just-In-Time (JIT) did not influence in the implementation of lean accounting in Indonesian firms.

It is important to note that lean accounting information can enhance financial performance, have better returns on net operating assets, cash flows, and cash ratios (Harris & Cassidy, 2013), cost dimensions, and competitive performance (DeBusk, 2015; Rosa & Machado, 2013; Vesty et al., 2023). The application of lean accounting is not limited to manufacturing industries as the implementation of lean accounting is extended to non-manufacturing industries (Almusawi et al., 2019; Malik, 2016; Sitoresmi & Eksandy, 2018; Teklay & Bobe, 2024). Table 1 presents the summary of research related to lean accounting across countries and disciplines.

Hypothesis Development

A survey literature related to research on lean accounting in Malaysia was scarcely reported. Most studies in the field of lean have focused on lean manufacturing and other factors in the adoption of lean accounting.

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However, the study conducted by Harris & Cassidy, 2013 on a comparative study of Lean operations and Lean accounting adoption on the profitability and cash flows found that Lean companies performed better performance than their counterparts of UK companies. Iranmanesh et al. (2019) examine the impact of lean manufacturing practices on sustainable performance in 187 manufacturing firms in Malaysia. Results show that process and equipment, product design, supplier relationships, and customer relationships positively affect sustainable performance. Lean culture moderates these effects, suggesting that lean manufacturing practices can enhance sustainable performance in manufacturing firms.

The investigation into lean accounting within the Malaysian context has been relatively limited (Hamid & Habidin, 2023; Shokri, 2017), with the majority of existing studies focussing primarily on lean manufacturing and the determinants affecting the implementation of lean practices. It is important to note that the existence of a robust lean culture significantly enhanced these beneficial effects, thereby supporting the assertion that lean practices can facilitate improved long-term results within the Malaysian manufacturing industry. In light of these findings, this study hypothesises that the implementation of lean accounting is a primary drive in lean manufacturing organisations, which could substantially enhance overall manufacturing performance. Support the foundation of lean manufacturing, this study develops the hypothesis as follows:

H1: Lean accounting (LAC) has a significant effect on manufacturing performance.

H1a: Eliminating Transactions (ELT) has a significant effect on manufacturing performance.

H1b: Value Stream Costing (VSC) has a significant effect on manufacturing performance.

H1c: Performance Measurement (PFM) has a significant effect on manufacturing performance.

H1d: Financial Benefits (FNB) has a significant effect on manufacturing performance.

H1e: Value Stream Management (VSM) has a significant effect on manufacturing performance.

Table 1: Research Related to Lean Accounting across Countries and Disciplines

Author (s)	**Research Type**	**Country**	**Methodology**	**Analysis**	**Results**
Fullerton et al. (2014)	Empirical Research	USA	Survey	Structural Equation Modeling (SEM)	Lean manufacturing significantly impacts operations performance, as does lean MAP.
Ali et al. (2021)	Literature Review	-	Literature Review	Descriptive Analysis	Key factors of lean accounting implementation include top management's commitment, accountants" understanding of lean philosophy, the selection of value stream costing method, and the method's effectiveness in value streams.
Teklay and Bobe (2024)	Case Study	African	Semi-structured interviews and secondary sources	Direct content analysis	Personal values and commitments are the main contributors to management accounting practice changes.

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Alves et al. (2022)	Structured Literature Review (SLR)	European countries	Literature review on empirical case study	Content Analysis	Enhanced definition of LA, combining lean manufacturing practices with management accounting to convert operational inputs into actionable accounting information.
Valmohammadi and Dadashnejad (2021)	Single Case Study	Iran	Principles of VSMP and Kaizen approach	Formula based	VSMP and Kaizen practices increased value-added, improved production, reduced lead time, and improved value-creating time.
Kennedy et al. (2012)	Empirical Research	USA	Survey	Structural Equation Modeling (SEM)	Top management support, lean initiatives, employee empowerment, visual performance measures, simplified accounting practices, and reduced traditional management accounting practices are important factors in the adoption of VSC.
Malik (2016)	Empirical Research	India	Survey	Exploratory Factor Analysis	The evaluation of a company's performance is primarily based on Time and Inventory Management, Machine Maintenance, Value Stream Costing and Analysis, and the Just in Time Approach for Manufacturing.
Almusawi et al. (2019)	Case study	Iraq	Semi-structured Interviews, APH documents and hospital database	Formula based	Value stream mapping improved financial performance by identifying the real costs of APH services and eliminating waste. The lean accounting tool, VSC improved healthcare processes efficiency and quality, enabling management to evaluate current operations and identify critical processes for corrective actions.
Sitoresmi and Eksandy (2018)	Empirical Research	Indonesia	Questionnaires	Regression Analysis	Balance Scorecard and Continuous improvement have a positive effect on lean accounting. Value stream cost has a negative effect on lean accounting, while Just In Time does not affect lean accounting.

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Harris and Cassidy (2013)	Empirical Research	USA	The EDGAR database 10-K Annual Report	Comparative Analysis	Organisations (Lean companies) that implement lean operations and lean accounting are likely to attain superior profitability and cash flows compared to comparable organisations (Non-Lean companies) that do not engage in these practices.

RESEARCH METHODOLOGY

This study employed quantitative data collection methods through the administration of survey questionnaires with a 7-point Likert scale (Awang et al., 2016). The 7-point scale offered a broader spectrum of response options for participants to articulate their views, thereby enhancing the reliability of the measurement (KORKUT ALTUNA & ARSLAN, 2016). The survey is based on a lean accounting framework (Maskell, 2006; Maskell et al., 2017) and performance improvement measurement (Cunningham et al., 2011; Habidin et al., 2016) and modified accordingly to suit the current setting in the Malaysian context. The survey was subjected to a validation process by academicians and practitioners specialising in lean practices and lean accounting. Content analysis ensures that each construct and item is accurately addressed. A simple random sampling method is employed to select the manufacturing companies across the state, resulting in a total of 480 manufacturing companies designated for survey distribution. This study conducted a pretest activity to comprehend the feedback from several accountants and operation managers working in manufacturing companies. They are required to evaluate the survey instrument for readability, completeness and clarity. The survey is improved accordingly based on their response and feedback. The final responses obtained from 282 manufacturers were utilised for analysis using Structural Equation Modeling (SEM). The field data is subjected to rigorous data screening and cleaning processes to ensure the integrity and accuracy of the results. The analysis reveals that the dataset is complete, with no instances of missing data identified. The range of values derived from the descriptive statistics results consistently falls between 1 and 7. The results demonstrate that participants provided responses to all data enquiries within the questionnaire for further analysis. Missing data arises when participants in a study choose not to answer specific questions within the questionnaire (Acuña & Rodriguez, 2004; Kline, 2016).

FINDING AND DISCUSSION

Demographic Characteristics

This study gathered demographic data on respondents, including gender, age, ethnicity, education level, position, working experience, and company profile. Table 2 presents that the majority of respondents were aged 30 to 49, with a majority from the Malay ethnic group (82.3%) and the remaining Chinese group (17.7%). The majority were senior managers or directors, with 27.3% and 23.4% respectively. Most respondents had 5 to 14 years of experience in manufacturing activities, with 115 having 25 years or more. The majority of manufacturing companies had been incorporated for over 15 years, with 39% implementing lean manufacturing.

Table 2: Demographic Profiles

Profile	**Frequency**	**Percent**
Gender		
Male	257	91.1
Female	25	8.9

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Age		
Under 30 years old	69	24.5
30 to below 40 years old	114	40.4
40 to below 50 years old	72	25.5
50 years old and above	27	9.6
Ethnicity		
Malay	232	82.3
Chinese	50	17.7
Qualification		
Master's Degree	41	14.5
Bachelor's Degree	154	54.6
Diploma	87	30.9
Position		
Senior Manager/Director	77	27.3
Manager/Executive	66	23.4
Lean Manager/Lean Operation Manager/Quality Manager	46	16.3
Accountant/Management Accountant	22	7.8
Financial Controller	19	6.7
Financial Analyst	52	18.4
Under 5 years	27	9.6
5 to below 15 years	131	46.5
15 to below 25 years	97	34.4
25 years and above	27	9.6
Accounting Experience		
None	115	40.8
Under 5 years	74	26.2
5 to below 10 years	66	23.4
10 to below 15 years	27	9.6
Year Incorporated		
Under 10 years	19	6.7
10 to below 20 years	112	39.7
20 to below 30 years	72	25.5
30 years and above	79	28.0

Confirmatory Factor Analysis (CFA)

The Confirmatory Factor Analysis (CFA) is used to measure latent constructs, ensuring their unidimensionality, validity, and reliability. The CFA process evaluates the significance of each item in measuring the associated constructs. Items with a factor loading below 0.60 should be removed from the model. However, the construct fails to reach validity if the removal of the item exceeds 20 percent. The validation of constructs is essential prior to the establishment of causal relationships within the structural model (Awang, 2015; Yusof et al., 2017; Asnawi et al., 2019; Afthanorhan et al., 2020). Five components measure lean accounting; eliminating transaction (ELT), value stream costing (VSC), performance measurement (PFM), financial benefit (FNB) and value stream management (VSM). Figure 1 displays the results of the CFA procedure for the lean accounting construct with a total of 19 items. These results include

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the fitness indexes for the entire construct and the factor loadings, both for each component and for every item. The result for the model fitness indexes was achieved in the measurement model (Chisq/*df* = 2.291 < 3.0, RMSEA = 0.068 < 0.08, CFI = 0.948 > 0.90, TLI = 0.939 > 0.90). Hence, the validity and reliability of the lean accounting construct could be assessed, as shown is Figure 1.

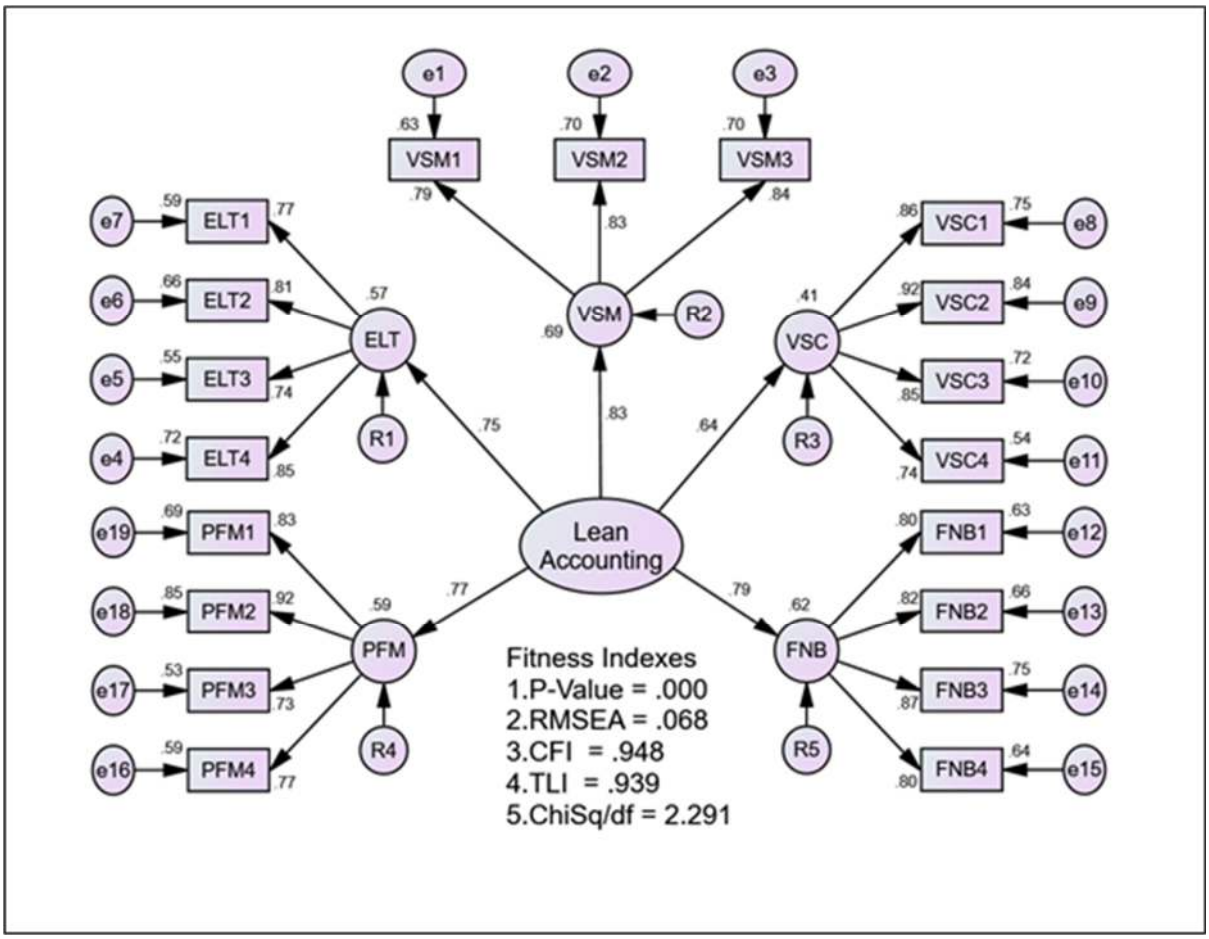

Figure 1: Measurement Model for Lean Accounting Construct

Structural Equation Model (SEM)

Structural Equation Modelling (SEM) constitutes a methodological approach that integrates both the measurement model and the structural model. It is vital to evaluate the model's fitness to ensure that the structural model aligns with the prescribed fitness criteria and is adequately capable of representing all causal relationships within the study. This study aims to investigate the causal effect of lean accounting on manufacturing performance.

Hypothesis Testing on Lean Accounting and Manufacturing Performance

This study examines the effects of lean accounting as an exogenous construct in explaining manufacturing performance, the endogenous contruct, of Malaysian manufacturing companies. The structural model of causal relationship testing is presented in Figure 2, and the output of the hypothesis testing is in Table 3. The path coefficient derived from this analysis is 0.680. The value implies that a one-unit increase in lean accounting (LAC) correlates with a 0.680 increase in manufacturing performance (MFP), a standard error 0.081, the regression weight is estimated at 0.680. The probability of getting a critical ratio as large as 8.428 in absolute value is less than 0.001. The regression weight for LAC in the prediction of MFP is highly significant at the 0.001 level.

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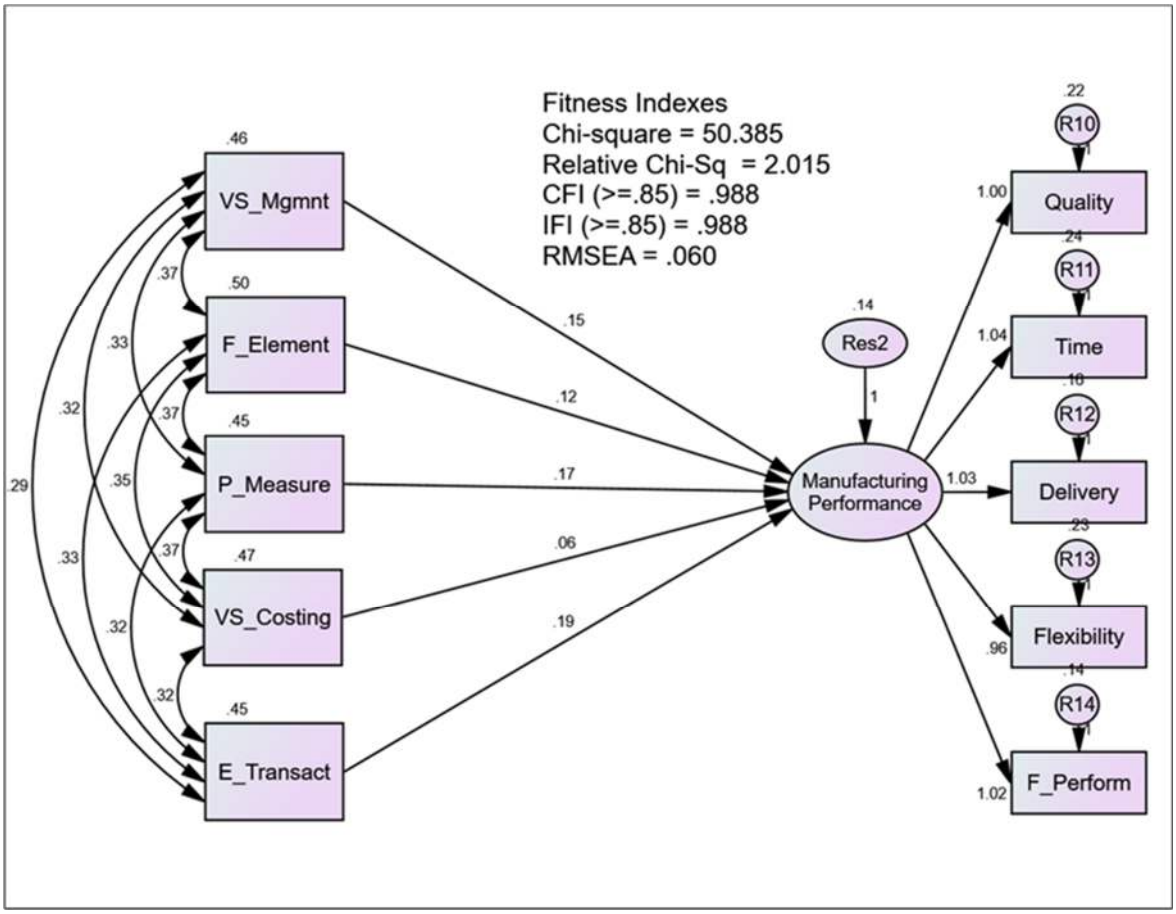

Figure 2: Unstandardizsed Regression Path Coefficient of Lean Accounting Component and Manufacturing Performance

Table 3: Testing the Causal Effect of the Constructs

			Estimate	S.E.	C.R.	P
Manufacturing_Performance	<---	Lean_Accounting	0.680	.081	8.428	***
E_Transact	<---	Lean_Accounting	1.000			
VS_Costing	<---	Lean_Accounting	1.111	.066	16.868	***
P_Measure	<---	Lean_Accounting	1.127	.064	17.546	***
F_Benefit	<---	Lean_Accounting	1.151	.068	16.905	***
VS_Mgmnt	<---	Lean_Accounting	1.046	.066	15.801	***

Notes: *** indicates *p*-value significance at the 1% level, 5% level

Table 4 presents the output generated for the effect of each component of the lean accounting construct. For each component of lean accounting constructs, the result shows that the components of eliminating transactions, performance measurement, financial benefits, and value stream management are statistically significant, which indicates that these components directly impact manufacturing performance, except value stream costing (*p*=0.378). Eliminating transactions (ELT) is statistically significant at the 0.01 level (*p*=0.002) (Stenzel, 2007; Yu-Lee, 2011). The finding verifies that implementing management accounting practices improved the workflow within manufacturing operations through waste elimination (Čiarnienė & Vienažindienė, 2012; Koskela, 2004; Maskell et al., 2017), thus fostering continuous improvement (BÜYÜKİPEKCİ, 2019; Kennedy et al., 2012; Maskell et al., 2017; Rabe et al., 2023) and improved company performance (Rabe et al., 2023). The result also shows that ELT is the most important factor of lean

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accounting, with the highest estimate value score *(β)* of 0.19. As previously discussed, lean accounting supports the foundation of lean philosophy, which focuses on value creation through eliminating waste (Fullerton et al., 2013; Wilson, 1997; Womack et al., 1991; Womack & Jones, 1997, 2003). The component of value stream management (VSM) shows a statistically significant result at the 0.05 level (p = 0.017) (Malta & Cunha, 2011). This finding indicates that VSM is necessary to demonstrate improvements in the company's performance (Maskell, 2006). The next component of lean accounting is financial benefit (FNB). The result shows that FNB has a statistical significance at the 0.10 level (p=0.078) and indicates that financial benefits directly impact manufacturing performance. The development of business planning from a lean perspective facilitates lean organizsation to visibly the improvement in operational, financial, and capacity changes of lean improvement through box scores, which outline the assessment of financial benefit derived from lean accounting transformation (Maskell & Baggaley, 2006). The component of performance measurement (PFM) shows a statistically significant result, the probability value is p=0.023, with significance at the 0.05 level. The result indicates that performance measurement of lean accounting has a direct impact on the effectiveness and efficiency of manufacturing operations. In line with the foundation of lean accounting on waste elimination, process simplification and providing real-time and actionable insight (Maskell, 2015; Maskell et al., 2017; Maskell & Baggaley, 2006), performance measurement guides lean organisations in aligning with business strategic objectives and goals performance (Maskell et al., 2017). Lastly, the component of lean accounting, value stream costing (VSC), shows insignificant results (p=0.378) with manufacturing performance. This finding indicates that VSC has indirect effects towards manufacturing performance. The finding of this research underscores that the component of value stream costing alone does not directly impact manufacturing performance. The components of lean accounting, ELT, PFM, FNB and VSM (Cunningham et al., 2011; Maskell, 2000, 2006; Maskell et al., 2017), show a direct and significant result toward a company's performance. Therefore, the hypotheses developed (H1, H1a, H1c, H1d and H1e) are supported and H1b is not supported. Accordingly, this study confirmed that LAC has a significant impact on MFP (Ali et al., 2021; Fullerton et al., 2014; Teklay & Bobe, 2024) and the VSC component indirectly impacts company's performance.

Table 4: Testing the Causal Effect of Lean Accounting Constructs

			Estimate	**S.E.**	**C.R.**	**P**	**Result**
Manufacturing_Performance	<---	VS_Mgmnt	.153	.064	2.380	.017	Significant
Manufacturing_Performance	<---	F_Benefit	.119	.067	1.761	.078	Significant
Manufacturing_Performance	<---	P_Measure	.170	.075	2.272	.023	Significant
Manufacturing_Performance	<---	VS_Costing	.061	.069	.882	.378	Not Significant
Manufacturing_Performance	<---	E_Transact	.186	.059	3.149	.002	Significant

Notes: *** indicates p-value significance at the 1% level, 5% level, 10% level

CONCLUSION AND IMPLICATIONS

Strategically aligning management accounting practices through the implementation of lean accounting is crucial for effective decision-making and enhancing company performance. As previously noted, the traditional accounting system focuses on minimising average product cost, which may lead to overproduction and inconsistent decisions with lean manufacturing objectives (Ali et al., 2021; Fullerton et al., 2014; Kennedy et al., 2012; Sitoresmi & Eksandy, 2018; Teklay & Bobe, 2024). Supported by previous studies on the significant influence of management accounting practices on organisational performance (Ali et al., 2021; Almusawi et al., 2019; Fullerton et al., 2014; Harris & Cassidy, 2013; Kennedy et al., 2012; Malik, 2016; Teklay & Bobe, 2024), the empirical evidence of this research confirms that the implementation of lean accounting within a manufacturing operation gives a positive effect on manufacturing performance. It is crucial to note that lean accounting is a critical factor in enhancing manufacturing performance. Lean

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accounting provides simpler financial control and facilitates decisions that reduce inventory, optimise capacity, maximise customer value, and motivate continuous improvement (Fullerton et al., 2014; Maskell et al., 2017). This study provides empirical evidence that lean accounting can affect company's performance of Malaysian manufacturing companies through more relevant, visual, and actionable information. Our findings support major studies in lean manufacturing and lean accounting research (Ali et al., 2021; Fullerton et al., 2014; Kennedy et al., 2012; Mohd Fuzi et al., 2019; Valmohammadi & Dadashnejad, 2021). Lean accounting (LAC) measures, eliminating transaction (ELT), performance measurement (PFM), financial benefits (FNB) and value stream management (VSM) are directly related to operational performance and financial performance, which in turn ultimately positively related to manufacturing performance. ELT seeks to minimise non-value-added transactions, thereby optimising operations and enhancing efficiency. VSC emphasises the allocation of costs in accordance with value streams, as opposed to traditional accounting system, thereby providing a more precise representation of production efficiency. The findings support the notion that lean thinking is a holistic business strategy and suggest that the operations management must partner with accounting personnel to ensure strategic integration of lean accounting into the lean culture (Fullerton et al., 2014). It is important to note that the role of management accounting in global manufacturing companies is essential to comprehend the accounting, control and measurement while adhering to accounting principles (Maskell, 2009; Teklay & Bobe, 2024). This study also confirms and aligns with the foundation of lean principles, as ELT appears to be the key success factor of lean implementation. PFM entails the monitoring of essential performance indicators to guarantee consistency with lean manufacturing objectives. FNB reflects the economic benefits derived from lean accounting transformation and VSM verifies the importance of resource management within value streams to optimise flow and improve decision-making processes. This results in lean manufacturing processes by effectively improving resource allocation, effective cost management, and increased productivity, thereby contributing to superior manufacturing performance thereby promoting sustainable manufacturing industries in Malaysia. This study confirms that lean accounting measures are essential for the sustainability of manufacturing companies. The findings theoretically enhance the existing literature on lean management accounting practices and provide substantial value to the manufacturing sector and stakeholders engaged in the manufacturing environment.

RECOMMENDATION FOR FUTURE RESEARCH

This study investigates the different components of lean accounting that could motivate manufacturing companies to undertake significant modifications to their current accounting systems in alignment with lean manufacturing objectives. Comprehensive case studies are essential for the precise identification of these components and characteristics. Comprehensive longitudinal analyses would be beneficial for assessing the effectiveness of transformation in lean management accounting practices. Lean foundation is a holistic business strategy that should be integrated into other aspects of an organizsation, such as human resources and information technology. The collaboration between accounting and operations researchers in interdisciplinary research has the potential to yield significant benefits, offering additional evidence and deeper insights into the advantages of an integrated strategy.

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