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**THE MEDIATING EFFECT OF LEAN ACCOUNTING  
ON THE RELATIONSHIP BETWEEN SUPPLY  
CHAIN AND MANUFACTURING COMPANIES  
PERFORMANCE IN MALAYSIA**



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**MASDIAH BINTI ABDUL HAMID**

**UNIVERSITI PENDIDIKAN SULTAN IDRIS**

**2025**



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**THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE OF DOCTOR OF PHILOSOPHY**

**FACULTY OF MANAGEMENT AND ECONOMICS  
UNIVERSITI PENDIDIKAN SULTAN IDRIS**

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## ABSTRACT

The main objective of this research is to examine the effect of the supply chain and lean accounting on manufacturing performance. This research also aims to investigate the mediating role of lean accounting in the relationship between the supply chain and manufacturing performance. Additionally, this research seeks to develop a model of manufacturing performance specifically for the Malaysian context. Based on the list of manufacturing companies registered at the Federation of Malaysian Manufacturers as of 2020, a simple random sampling method was employed. Questionnaires were distributed through email to selected manufacturing companies, and responses were collected using a 7-point Likert scale. A total of 282 completed questionnaires were analysed using Structural Equation Modelling. The findings indicate that supply chain has a significant effect on manufacturing performance. However, each component of supply chain which is measured by strategic supplier partnership (SSP), customer relationship (CUR), information sharing (ISH) and information quality (INQ) shows a weak direct effect. Further, supply chain constructs also significantly related to lean accounting. Furthermore, lean accounting which measured by eliminating transaction (ELT), performance measurement (PFM), financial benefits (FNB) and value stream management (VSM) has a strong and significant effect on manufacturing performance, while value stream costing (VSC) was found to be insignificant. ELT also emerges as a crucial factor for lean accounting through its focus on waste elimination. The results also confirmed that lean accounting partially mediates the relationship between supply chain and manufacturing performance in Malaysia. This research concludes that implementing lean accounting is essential to support lean manufacturing and to enhance manufacturing performance. Moreover, the structural model indicates that the manufacturing performance has 59% of the total variance explained by supply chain and lean accounting. This model can serve as practical guideline for industry practitioners pursuing lean accounting transformation, and a useful reference for future research.





## KESAN PERANTARA PERAKAUNAN LEAN TERHADAP HUBUNGAN ANTARA RANTAIAN BEKALAN DAN PRESTASI SYARIKAT PEMBUATAN DI MALAYSIA

### ABSTRAK

Objektif utama kajian ini adalah untuk mengkaji kesan rantaian bekalan dan perakaunan lean terhadap prestasi syarikat pembuatan. Kajian ini juga bertujuan untuk mengkaji peranan perakaunan lean sebagai perantara dalam hubungan di antara rantaian bekalan dan prestasi syarikat pembuatan. Selain itu, kajian ini juga bertujuan untuk membangunkan sebuah model prestasi syarikat pembuatan di Malaysia. Berdasarkan senarai syarikat pembuatan yang berdaftar di Persekutuan Pengilang Malaysia sehingga tahun 2020, kaedah pensampelan rawak mudah telah digunakan. Soal selidik diedarkan melalui e-mel kepada syarikat pembuatan terpilih, dan responden memberikan maklum balas menggunakan skala selang 7 mata. Sebanyak 282 soal selidik lengkap telah dianalisa menggunakan Pemodelan Persamaan Struktur. Dapatan kajian menunjukkan bahawa rantaian bekalan mempunyai kesan yang signifikan terhadap prestasi syarikat pembuatan. Walau bagaimanapun, setiap komponen rantai bekalan yang diukur melalui perkongsian strategik dengan pembekal (SSP), hubungan pelanggan (CUR), perkongsian maklumat (ISH) dan kualiti maklumat (INQ) hanya menunjukkan kesan langsung yang lemah. Namun begitu, kesemua komponen tersebut menunjukkan hubungan yang signifikan terhadap perakaunan lean. Seterusnya, perakaunan lean yang diukur melalui penghapusan transaksi (ELT), pengukuran prestasi (PFM), faedah kewangan (FNB) dan pengurusan aliran nilai (VSM) menunjukkan kesan yang kukuh dan signifikan. Sebaliknya, kos aliran nilai (VSC) tidak menunjukkan kesan yang signifikan. Komponen ELT turut dikenalpasti sebagai faktor penting dalam perakaunan lean melalui pendekatan penghapusan pembaziran. Dapatan kajian turut mengesahkan bahawa perakaunan lean bertindak sebagai perantara separa dalam hubungan di antara rantaian bekalan dan prestasi syarikat pembuatan di Malaysia. Kajian ini merumuskan bahawa pelaksanaan perakaunan lean adalah penting bagi menyokong amalan pembuatan lean dan meningkatkan prestasi syarikat pembuatan secara keseluruhan. Model struktur yang dibangunkan menjelaskan bahawa prestasi syarikat pembuatan mempunyai 59% daripada jumlah varians yang diterangkan oleh rantaian bekalan dan perakaunan lean. Justeru, model ini boleh dijadikan sebagai garis panduan praktikal kepada pengamal industri yang sedang melaksanakan transformasi perakaunan lean serta rujukan berguna untuk penyelidikan pada masa hadapan.



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## APPENDIX

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## LIST OF ABBREVIATIONS

ABC	Activity-Based Costing
BTOS	Bartlett's Test of Sphericity
CF	Conceptual Framework
CFA	Confirmatory Factor Analysis
CI	Continuous Improvement
CIMA	Chartered Institute of Management Accountants
CSF	Critical Success Factors
CT	Contingency Theory
CUR	Customer Relationship
CVI	Content Validity Index
DEL	Delivery
EBIT	Earnings Before Interest and Taxes
EFA	Exploratory Factor Analysis
ELT	Eliminating Transaction
FLX	Flexibility
FMM	Federation of Malaysian Manufacturers
FNB	Financial Benefit
FNP	Financial Performance
GAAP	Generally Accepted Accounting Principles
I-CVI	Item Content Validity Index





IFAC	International Federation of Accountants
INQ	Information Quality
ISH	Information Sharing
JIT	Just-In-Time
KMO	Kaiser-Meyer-Olkin
LAC	Lean Accounting
LAD	Lean Accounting Diagnostic
LM	Lean Manufacturing
LMP	Lean Manufacturing Practices
LP	Lean Principles
MA	Management Accounting
MAP	Management Accounting Practices
MAS	Management Accounting System
MD	Mahalanobis Distance
MFP	Manufacturing Performance
MFRS	Malaysian Financial Reporting Standards
MLE	Maximum Likelihood Estimator
NEM	New Economic Model
PCA	Principal Component Analysis
PFM	Performance Measurement
QLTY	Quality
QMP	Quality Management Practice
R&D	Research and Development
RDT	Resource Dependence Theory





RF	Research Framework
ROA	Return on Assets
SC	Supply Chain
S-CVI	Scale Content Validity Index
SD	Standard Deviation
SDGs	Sustainable Development Goals
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Science
SSP	Strategic Supplier Partnership
STC	Standard Costing
TAC	Traditional Accounting Method
TF	Theoretical Framework
TIME	Time
TQM	Total Quality Management
VSC	Value Stream Costing
VSM	Value Stream Management
VSMF	Value Stream Mapping
WIP	Work In Progress



## LIST OF APPENDICES

- A Questionnaire
- B Content Validation Form
- C Sample of Appointment Letter for Instrument Validation
- D Approval Letter of Human Research Ethics
- E List of Publications, Awards and Intellectual Property



## CHAPTER 1

### INTRODUCTION



#### 1.1 Introduction

This chapter outlines an introduction to the research and an overview of the background of the research. Issues for the subject matter will be clarified, this is to highlight the problem statement that motivates this research, followed by the identification of the knowledge gap in the field of study. The ensuing section of this chapter will justify the research questions that have arisen from the addressed problem statement. This will be then followed by an outline of the research objectives that are to be accomplished through this study. Subsequently, it will also detail the research boundaries, defining its scope and limitations. Followed by a discussion of the significance of the study based on the findings obtained throughout the research process. The last section is the operational definition of terms within the context of this study and, finally, this thesis's organisation and conclusion.





## 1.2 Research Background

Since the 1970s, Malaysia has strived to attain sustainable development and ensure prosperity for the country through series of national policies and master plans. In 2009, the goals were further executed by way of adopting the Sustainable Development Goals (SDGs) 2030 in the New Economic Model (NEM) which encompasses the three pillars of sustainability; namely economic, social and governance (ESG) (Michael & Salleh, 2023; Report, 2017). In line with the 2030 Agenda, the manufacturing sector must undergo significant transformation to improve its competitive edge (Belhadi et al., 2021) and contribute to the country's progression in reaching developed country status (Lani, 2019; Michael & Salleh, 2023). Manufacturers can significantly advance the national vision by empowering leadership and efficiently utilising resources through cost reduction. The success of manufacturing firms are key drivers of growth in developing nations and offers potential for numerous opportunities for future business expansion (Federation of Manufacturing Malaysia, 2020). Consequently, the manufacturers are obligated to find a management system to transform their manufacturing companies to be more competitive, efficient in resource utilisation, and at the lowest cost possible (Miao & Xu, 2011). A lean environment could provide the solution for manufacturing companies to transform their production system to enhance business performance beyond the traditional manufacturing practices (Nordin et al., 2014; Sheridan, 1990).

The idea of lean stresses the importance of systematically organising and empowering management at all levels of the organisation. This approach aims to eliminate all forms of waste throughout the entire business value stream. By doing so, it optimise resources and maximise value delivered to customers (Wilson, 1997;





Womack et al., 1991, 2007; Womack & Jones, 1997, 2005). Besides enhancing customer value, another fundamental goal of lean is to sustain profitability by continuously striving for perfection in quality, cost-effectiveness and the timely delivery of products. It extends across multiple functions; from supply chain management, product design, logistics, manufacturing etc to administrative functions (Koskela, 2004; Osman et al., 2020; Womack et al., 2007; Womack & Jones, 1997). Thus, the strategic implementation of lean practices in manufacturing businesses is a valuable initiative for potentially achieving higher profit levels (Chavez et al., 2013; Iranmanesh et al., 2019; Vanichchinchai, 2020). The success of lean manufacturing has led to its application in other areas such as the supply chain (Miao & Xu, 2011), engineering (A. C. Alves et al., 2016; Black & Philips, 2013; J. D. Wisner et al., 2021) and accounting (DeBusk, 2015).



In manufacturing, the supply chain plays a crucial role in ensuring that activities are carried out efficiently, thereby providing a significant competitive edge. Over the last two decades, the success of companies has largely depended on the effective management of the supply chain to secure competitive advantages in their sector (S. Li et al., 2006; Um & Kim, 2019). Supply chain is primarily made up of a multitude of activities such as procurements, purchasing, transportation, production, inventory management, warehousing, as well as consumer sales and services (Habidin, Hudin, et al., 2018). Supply chain in manufacturing companies aims to facilitate improvements in the flow of raw materials from the suppliers, streamline the various stages of production processes and timely delivery of finished products to end customers (Ateke & Didia, 2017). For the supply chain to function more effectively and to utilise resources more efficiently, all major processes should be aligned with reduced life





cycles. The goal should be to achieve the least cost in productivity while simultaneously providing greater value to customers (Boateng, 2019).

Although effective supply chain management can enhance manufacturing activities and operations, it is crucial to acknowledge that an over-dependence on supply chain activities could adversely affect the business sustainability in the long run, while simultaneously reduce market competitiveness. Consequently, this leads to negative impact on the operational efficiency of manufacturing companies. Therefore, it is imperative to establish and implement effective practices to complement the existing supply chain to achieve business sustainability. In this respect, the integration of effective accounting systems with supply chain management has the potential to maximise resource utilisation, reduce costs, meet customer demands more effectively, and ultimately improve the overall performance of the company.

The evolution and advancement of management accounting methods has significantly influenced companies to incorporate lean accounting into their manufacturing processes (Ahamadzadeh et al., 2011; Al-Omiri & Drury, 2007; Pickering & Byrnes, 2016). Implementing lean accounting means aligning business accounting systems and operational processes with lean principles while ensuring compliance with Generally Accepted Accounting Principles (GAAP) (Maskell & Baggaley, 2006). Management Accounting (MA) highlights the significant impact of lean accounting in supporting lean manufacturing practices, by improving the company's accounting management, control and measurement process (Kennedy & Widener, 2008; Maskell & Kennedy, 2007). Aside from effectively overcoming the limitations associated with traditional accounting method (TAC) (Johnson & Kaplan,





1987), lean accounting specifically targets on performance improvement and value creation throughout lean manufacturing operations (Fullerton & Kennedy, 2011; Maskell, 2000).

In today's uncertain and ever-changing global market, manufacturing companies face the ongoing challenge of meeting customer needs while striving to reduce costs. This is similar with the basic lean principles of maximising value for customers and minimising waste. Therefore, lean accounting potentially eliminates large amounts of waste from accounting processes and systems within a manufacturing environment. This, in turn, enables management make better decisions (Singhania, 2024), which ultimately leads to higher manufacturing performance.



### 1.3 Problem Statement

Manufacturing industries plays a pivotal role in driving economic development, particularly in emerging economies (Attiah, 2019; Michael & Salleh, 2023). However, there are findings that show manufacturing companies struggle with low productivity and excessive waste, often due to inadequate strategic integration suffer from low productivity levels and excessive waste (Adeodu et al., 2021) due to lack of vital strategies (Oyewo et al., 2019). The most effective implementation strategy for manufacturing companies is to place a strong emphasis on cost reduction initiatives to enhance efficiency across operational processes (Gukasyan et al., 2022; Stenzel, 2007).





The supply chain plays a crucial role in facilitating the integration of internal functions within an organisation while also establishing connections with external resources, including customers, suppliers and various channel members (Belhadi et al., 2021; S. W. Kim, 2006). The task of improving efficiencies within the supply chain is a complex process that involves multiple activities and interactions (S. W. Kim, 2006). However, improving supply chain efficiency remains complex and the empirical evidence supporting its performance impact is multifaceted and inconclusive (Kaliani Sundram et al., 2016; Vafaei-Zadeh et al., 2020). For instance, businesses have made significant investments aimed at enhancing the effectiveness of their supply chain management practices. However, despite these efforts, the anticipated outcomes in terms of increased profitability and improved overall performance have not materialised as expected (Kamble, Gunasekaran, & Gawankar, 2020). There are limited studies that focused on supply chain constructs that could enhance the performance of manufacturing companies (Hussain et al., 2018). An important consideration is the aspect of the evolutionary traits of supply chains, which has resulted in a conceptual ambiguity that significantly affects the comprehension of supply chain theory and its practical applications (Al-Shboul et al., 2017). These conflicting results have significantly contributed to the persistent debate surrounding the impact of the supply chain on companies' performance in manufacturing settings. The perceived discrepancies in the results, which in turn create uncertainty about the true nature of the relationship between the supply chain and corporate performance suggest missing variables.

Lean manufacturing has been advocated for its potential to enhance performance, however the evidence suggests that lean manufacturing does not





invariably lead to improved profitability outcomes (Chavez, Yu, Jacobs, et al., 2015; Hines et al., 2020; Pearce & Pons, 2019). The literature points to the considerable challenges, especially when it comes to the practical execution of lean manufacturing initiatives. They have highlighted instances where the implementation of lean manufacturing does not lead to successful outcomes (Bhasin, 2008; Bhasin & Found, 2021; Pearce & Pons, 2019). The successful adoption and execution of lean manufacturing methodologies have been documented in fewer than ten percent of cases (Bhasin, 2012; Čiarnienė & Vienažindienė, 2012). Maskell et al. (2017) noted that the failure of lean manufacturing initiatives often stems from a company's insufficient understanding of essential business and managerial accounting principles. Other research has identified challenges in sustaining lean manufacturing, including traditional accounting practices that hinder continuous improvement over the long term (Ansari et al., 1997; Cooper & Maskell, 2008; Liker, 2004; Maskell, 2000) such as the inability to track the improvement of the production process.

Traditional accounting methods have long been critiqued for their misalignment with lean manufacturing principles, resulting in operational inefficiencies and misleading financial reporting (Ansari et al., 1997; Maskell, 2000). These methods, originally developed to meet external financial reporting requirements, often fail to reflect internal operational improvements. As a result, companies may misinterpret lean initiatives as financially detrimental, particularly in early implementation stages, leading some to abandon lean practices prematurely (Baggaley & Maskell, 2003; Meade et al., 2010). This situation can largely be attributed to the limitations of traditional accounting methods, which fail to translate operational improvements into tangible financial gains (Cooper & Maskell, 2008). The lack of accurate and relevant





information for management may distract the managers from making the right decisions, distort production costs, and lead to potential errors in decision-making.

Scholars have debated the inadequacy of traditional accounting in supporting lean strategies, particularly its inconsistency with Generally Accepted Accounting Principles (GAAP) and its failure to provide timely and relevant information for internal decision-making (Ismail et al., 2018; Kennedy & Brewer, 2006; Maskell, 2006, 2016). Lean accounting is regarded to achieve optimal cost efficiency, as this method is particularly effective in eliminating inefficiencies in financial reporting and management. Lean accounting can be described as an advanced management accounting technique that systematically addresses the various shortcomings present in traditional accounting methods (Fullerton et al., 2014) by providing accurate information for strategic decision-making (DeBusk, 2015; Maskell et al., 2017).

Despite the recognised potential benefits of lean accounting, there is still a lack of insight into how lean accounting can effectively integrate with lean manufacturing to foster improvements in overall performance of manufacturing companies. In addition, the scarcity of empirical research on lean accounting and manufacturing performance significantly constrains the ability to assess the actual impact of performance enhancements in the context of Malaysian manufacturing companies. Research on lean accounting has primarily focused on literature analysis (R. F. Alves et al., 2022; Valmohammadi & Dadashnejad, 2021), case studies (Lermen et al., 2018), and the application within lean manufacturing or lean management (Achanga et al., 2006; Habidin, Hibadullah, et al., 2018; Iranmanesh et al., 2019). There is a pronounced lack of studies that focused on the exploration of the connection between supply chain,





lean accounting, and the impact on the performance of manufacturing companies. Furthermore, the existing literature that specifically addresses the role of lean accounting as a mediating variable in the relationship between supply chain and manufacturing performance is also considerably limited.

Complementing a lean foundation within a manufacturing environment (Womack & Jones, 1997, 2005), this research includes lean accounting as mediator to improve manufacturing performance. Therefore, this research is vital in bridging the research gap in the existing literature by explicitly focusing on supply chain (S. Li et al., 2005, 2006), lean accounting (Maskell, 2000; Maskell et al., 2017) and manufacturing performance in Malaysia. Chenhall and Langfield-Smith (1998) also suggest to include modern management accounting practices for the potential impact on organisational performance. Considerably, the optimum strategies to maximise manufacturing performance in Malaysia are through strategic development of external resources through suppliers, business partners and customers, information sharing and information quality in supply chain practices, as well as the strategic business strategy facilitated by the implementation of lean accounting. It is important to note that effective implementation of lean accounting within manufacturing operations could serve as a critical tool for the management team, allowing them to make better decisions which ultimately contribute to the enhancement of the overall performance of manufacturing companies.





#### 1.4 Research Questions

This research seeks to examine the effects of supply chain and lean accounting on manufacturing performance of Malaysian manufacturing companies. Lean accounting is identified as a mediating variable that influences the relationships between the supply chain practices and manufacturing performance outcomes. Hence, five research questions were constructed for this research as below:

1. Does supply chain (SC) have a significant effect on manufacturing performance (MFP)?
2. Does supply chain (SC) have a significant effect on lean accounting (LAC)?
3. Does lean accounting (LAC) have a significant effect on manufacturing performance (MFP)?
4. Does lean accounting (LAC) mediate the relationship between supply chain (SC) and manufacturing performance (MFP)?
5. What is the model for manufacturing performance for manufacturers in Malaysia?

#### 1.5 Research Objectives

The specific objective of this research is to examine the causal and effects of an independent variable of supply chain and lean accounting in explaining the manufacturing performance of manufacturing companies in Malaysia. Moreover, this research intends to determine the extent to which lean accounting, as a mediating variable influences the manufacturing performance of manufacturers in Malaysia. This





research also aims to develop a model of manufacturing performance for manufacturers in Malaysia.

The objectives of this research are as follows:

1. To examine the effect of supply chain (SC) on manufacturing performance (MFP).
2. To examine the effect of supply chain (SC) on lean accounting (LAC).
3. To examine the effect of lean accounting (LAC) on manufacturing performance (MFP).
4. To investigate the mediating role of lean accounting (LAC) in the relationship between supply chain (SC) and manufacturing performance (MFP).
5. To assess the proposed conceptual model of manufacturing performance for manufacturers in Malaysia.

## 1.6 Research Scope

The research scope provides a comprehensive understanding of the research context and the unit of analysis. In the research context, this research aims to develop a model that can effectively explain manufacturing performance. This study focused on the supply chain and lean accounting and investigated its impact on the manufacturing performance of manufacturers in Malaysia. In addition, this research examined the extent to which lean accounting can shed light on the relationship between the supply chain and manufacturing performance.





In the form of the unit of analysis, this research focuses on the performance achievement of manufacturers. Manufacturers are classified as manufacturing companies, organisations, distributors, or retailers of goods and services. This research considers the appraisal of a person who holds a managerial position in a manufacturing company. These positions include the director, manager, head of department, management accountant, or other positions that were familiar with manufacturing activities, supply chain, accounting, business operation, and manufacturing performance. In addition, this research is conducted within a specific time frame.

### **1.7 Research Significance**

In recent years, the manufacturing environment has become highly competitive, with a strong focus on continuous improvement. This research provides a valuable opportunity to enhance the understanding of manufacturing performance among manufacturers in Malaysia. The analysis of manufacturing performance suggests that the improvement in this area is fundamentally dependent on the degree to which lean initiative programs are effectively implemented within the companies. From a theoretical standpoint, the findings of this study contribute to the existing body of knowledge of academic literature surrounding supply chain, lean accounting and manufacturing performance. From a practical perspective, the research findings could serve as a valuable resource for manufacturers, in formulating effective business strategies and making the right decision. It is essential to highlight the valuable insights of this research, as they substantially contribute to both theoretical frameworks and practical applications.





### 1.7.1 Theoretical Significance

Theoretically, this research contributes to the academic literature by expanding the existing body of knowledge in supply chain, lean accounting and manufacturing performance. The findings provide valuable insight into the effect of the supply chain and lean accounting towards manufacturing performance, and the role of lean accounting in influencing the relationship between the supply chain and manufacturing performance in Malaysia.

This research also contributes to the academic theory verifying the theoretical framework derived from the lens of lean principle (LP), contingency theory (CT) and resource dependence theory (RDT). Next, it develops a research framework by integrating the perspectives of lean principles, contingency theory and resource dependence theory. Then it highlights the effect of the supply chain on manufacturing performance, lean accounting on manufacturing performance and the mediating role of lean accounting in the relationship between supply chain and manufacturing performance.

This research offers an alternative view on how advanced management accounting techniques can improve manufacturing performance by implementing lean accounting. The findings of this research serve to help researchers understand the relationship between supply chain and lean accounting towards performance and the role of lean accounting within the manufacturing industry. Furthermore, this research obtained its empirical data and evidence from manufacturing companies across Malaysia, ensuring that the findings reflect the realities of the local industry. Finally, this research is one of the relatively few studies that have reported lean accounting and





its significant effects on manufacturing performance through structural equation modelling (SEM), thereby enriching the existing academic literature.

### 1.7.2 Practical Significance

This research provides practical contributions to all manufacturers in Malaysia. By implementing relatively small changes coupled with targeted strategies and practices, significant performance improvements can be achieved. Given the crucial role of the manufacturing industry in driving Malaysia's economic growth, this research could serve to be an invaluable resource for manufacturers within the country. It aims to present insightful findings and potential solutions for lean accounting transformation, thereby paving the way for future improvements in performance and the achievement of competitive advantages in the industry. In addition, this research provides management accounting information that is beneficial for managers since they rely heavily on such data to facilitate strategic decision-making and to foster innovation via various management accounting techniques. It is also important to recognise that a major barrier to the successful implementation of lean manufacturing methodologies stems from the lack of understanding and support from management. Therefore, this research could give management a deeper understanding of how lean transformation through implementing lean accounting can motivate people and enhance manufacturing performance.

From the perspective of supply chain management, this research brings to light the significant role of customer relationships, recognising them as an essential factor





for achieving success in supply chain operations. The finding suggests the importance of aligning supply chain practices with lean principles, particularly by focusing on the delivery of customer value. Additionally, the research stresses the necessity for manufacturers to develop strong relationships with their customers, which facilitates a deeper understanding of customer preferences and desires for products and services. Overall, it is worth noting that this research significant contribution to the manufacturing industry by thoroughly analysing its impact on the economic growth in Malaysia.

### 1.7.3 Methodology Significance



This research makes a significant methodological contribution by enhancing the understanding of quantitative research in the context of lean accounting through the application of a comprehensive research methodology. The integration of correlational-causal and descriptive research designs emphasises methodological robustness. The correlational-causal design facilitates the researcher to examine the relationships and potential causal effects among independent (exogenous), mediating, and dependent (endogenous) variables. This approach is crucial for validating the theoretical model and hypotheses development. Moreover, a descriptive design is utilised to comprehend the characteristics of the units of analysis.

The research makes a significant contribution methodologically by employing the Structural Equation Modelling (SEM) through IBM SPSS AMOS 29.0 for the primary data analysis. SEM is particularly appropriate for this research, as it facilitates





the simultaneous analysis of the measurement model, through Confirmatory Factor Analysis (CFA), and the structural model. This capability is crucial for evaluating intricate relationships among multiple variables. The measurement model is evaluated with respect to unidimensionality, validity which encompasses both convergent and discriminant validity, reliability, and data normality. The analysis of the structural model subsequently enables the testing of direct, mediating, and moderating effects, thereby enhancing the comprehension of the causal effect of the research framework.

## **1.8 Operational Definition of Terms**

It is necessary to clarify what is meant by the terms used in this research. The operational definition of terms refers to a comprehensive explanation of terms and measurements used in this research. The following definitions of terms are used throughout this research.

### **Lean Accounting**

Lean accounting is an approach to managing financial transactions and processes efficiently and effectively while complying with Generally Accepted Accounting Principles and supporting lean manufacturing initiatives.





## **Eliminating Transaction**

Eliminating transactions refers to the process of removing or removing a transaction from a system or organisation. The lean accounting approach emphasises the reduction of transactions involved in the accounting process to enhance efficiency.

## **Value Stream Costing**

Value stream costing is a method used to calculate cost and track costs throughout the entire flow of a product. The lean accounting approach involves value stream costing, which is a method of reducing costs by focusing on the most efficient use of resources.

## **Performance Measurement**



Performance measurement refers to the practice of evaluating the efficiency and effectiveness of processes and procedures in lean accounting.

## **Financial Benefits**

Financial benefits refer to financial advantages or benefits to the manufacturer.

## **Value Stream Management**

Value stream management refers to the process of generating, distributing and utilising the resources to maximise the value of organisation resources.





## **Supply Chain**

Supply chain refers to the process that integrates all supply chain members, from the acquisition of raw materials with suppliers to the delivery of goods and services to customers.

## **Strategic Supplier Partnership**

Strategic supplier partnership refers to collaboration between manufacturers and suppliers to ensure the smooth functioning of the supply chain activities.

## **Customer Relationship**



Customer relationship describes the interactions and value exchanges between manufacturers and customers.

## **Information Sharing**

Information sharing is the degree to which the information is effectively communicated among members of the supply chain.

## **Information Quality**

Information quality is described as the timeliness, accuracy, completeness, adequacy and reliability of data exchanged among members of the supply chain.





## **Manufacturing Performance**

Manufacturing performance is described as the ability of manufacturing companies to achieve their goals effectively.

## **Quality**

Quality is the degree of excellence in services.

## **Time**

Time is the duration of processes.



## **Delivery**

Delivery is the process of delivering products or services.

## **Flexibility**

Flexibility refers to the ability to adapt and change in response to changing circumstances.

## **Financial Performance**

Financial performance refers to the ability to generate revenue and manage finances effectively.





The summary of the operational definition of key terms and acronyms used in this research is presented in Table 1.1.



**Table 1.1**

*Operational Definitions of the Key Terms*

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Lean Accounting (LAC)	Lean accounting is an approach to managing financial transactions and processes efficiently and effectively while complying with Generally Accepted Accounting Principles (GAAP).	(Maskell, 2000; Maskell et al., 2017)	Lean accounting is an advanced management accounting technique used to oversee financial transactions and processes, aiming to enhance both efficiency and effectiveness in organisational operations. It is based on the principles of lean management, focusing on the reduction of waste and the improvement of value-added activities. By adhering to Generally Accepted Accounting Principles (GAAP), lean accounting ensures that lean transformations are both effective and compliant with the established accounting standards and regulations governing financial reporting and organisational accountability.
Eliminating Transaction (ELT)	Eliminating transactions refers to the process of removing or removing a transaction from a system or organisation. The lean accounting approach emphasises the reduction of transactions involved in the accounting process to enhance efficiency.		Eliminating transactions is a key component of lean accounting. It refers to the deliberate act of removing or excluding unnecessary transactions from a system or organisation. Lean accounting aims to optimise accounting processes by reducing the volume of transactions through various strategies, such as standardising processes,

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Value Stream Costing (VSC)	Value stream costing is a method used to calculate cost and track costs throughout the entire flow of a product.		<p>automating or utilising technologies, consolidating similar transactions et cetera, thereby establishing a more efficient, transparent, and economical accounting system that aligns with the strategic goals of a lean manufacturing organisation.</p> <p>Value stream costing is a component of lean accounting. This methodology is to meticulously track and monitor costs throughout the entire lifecycle of a product. Value stream costing focuses on understanding the flow of costs, beginning from the initial acquisition of raw materials and extending all the way to the final delivery of the finished product to the customer. By adopting value stream costing, organisations gain a comprehensive perspective on the various costs involved in their operations, thus provides timely and accurate information to the management.</p>
Performance Measurement (PFM)	Performance measurement refers to the practice of evaluating the efficiency and effectiveness of processes and procedures in lean accounting.		Performance measurement is a component of lean accounting. It is utilised to systematically evaluate an organisation's efficiency and effectiveness, thereby facilitating the identification of specific areas that require improvement and enabling the optimisation of resource allocation. Performance measurement encompasses both the financial dimensions and the qualitative aspects of

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Financial Benefits (FNB)	A financial advantage to the manufacturer.		operational activities within a business. By carefully monitoring these various elements, organisations are provided with a comprehensive understanding of their strategic objectives and the extent to which they are being met. It also enhances the ability of decision-makers to make informed choices that align with the organisation's goals.
Value Stream Management (VSM)	The process of managing the flow of goods and services through a series of activities.		Financial benefits are a component of lean accounting. They refer to a situation in which a manufacturer experiences improved financial and economic outcomes as a direct result of implementing lean accounting practices. They play a critical role in motivating and encouraging organisations to pursue continuous improvement within their processes, thus serving as a catalyst for ongoing transformation and development in lean manufacturing contexts.
			Value stream management is a component of lean accounting. Value stream management represents a strategic approach that seeks to optimise the flow of goods and services throughout the various stages of production and delivery. It is specifically designed with the objective of enhancing overall operational efficiency while simultaneously maximising the value provided to customers. By

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Supply Chain (SC)	A process that integrates all supply chain members, from the acquisition of raw materials with suppliers to the delivery of products and services to customers.	(Chavez, Yu, Gimenez, et al., 2015; S. Li et al., 2005, 2006)	<p>focusing on the optimisation of each component within the value stream, organisations can ensure that they not only meet but exceed customer expectations, thereby fostering greater satisfaction and loyalty.</p> <p>A supply chain can be described as a comprehensive system composed of a series of interconnected processes that facilitate the seamless movement of goods and services. It encompasses everything from the initial acquisition of raw materials to the final delivery of finished products to customers. Within this framework, supply chain affiliates include suppliers, manufacturers, distributors, and retailers, all of whom collaborate closely to enhance operational efficiency and reduce costs. The effective management of supply chain practices is crucial for businesses to improve their competitive performance and fulfil customer satisfaction. By optimising these practices, organisations can position themselves more favourably with customers, thereby becoming more competitive.</p>

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Strategic Supplier Partnership (SSP)	Strategic supplier partnership refers to collaboration between manufacturers and suppliers to ensure the smooth functioning of the supply chain activities.		Strategic supplier partnership is a component of supply chain. A strategic supplier partnership represents a collaborative initiative that exists between manufacturers and suppliers, with the primary objective of significantly enhancing the efficiency and effectiveness of the supply chain. This concept transcends conventional transactional interactions, emphasising on fostering a mutually beneficial relationship that serves the interests of both parties involved. The strategies include the selection of suppliers, collaborative problem-solving, and various initiatives aimed at promoting continuous improvement within the supply chain framework. By focusing on these aspects, organisations can cultivate more sustainable partnerships that contribute to operational success.
Customer Relationship (CUR)	The interactions and value exchanges between manufacturers and the customers.		Customer relationship is a component of supply chain. Customer relationship describes the various interactions and value exchanges that occur between manufacturers and their customers, reflecting the dynamic nature of these relationships. This relationship is characterised by diverse modes of communication, feedback mechanisms and ongoing monitoring of customer service. By continuously assess and refine these

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Information Sharing (ISH)	The degree to which the information is effectively communicated among members of the supply chain.	(Cheng, 2011; S. Li & Lin, 2006)	interactions, manufacturers can understand and fulfil the needs and preferences of their customers.  Information sharing is a component of supply chain. Information sharing within the supply chain involves the degree and effectiveness with which essential data, insights, and directives are exchanged among strategic partners actively engaged within the intricate network of the supply chain. By facilitating information sharing, organisations can significantly enhance their collaborative efforts, leading to improved decision-making, greater operational efficiency, and a more agile response to market demands.
Information Quality (INQ)	The timeliness, accuracy, completeness, adequacy and reliability of data exchanged among members of the supply chain.		Information quality is a component of supply chain. It includes the speed at which information is exchanged, which is crucial for timely decision-making and responsiveness to changing market conditions; the precision of the exchanged data, ensuring that the information is accurate and reflects the true state of affairs within the supply chain; the sufficiency of the data refers to the completeness of the information provided to stakeholders, enabling them to make well-informed decisions; the adequacy of the information exchanged, which refers to

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Manufacturing Performance (FP)	The ability of manufacturing companies to achieve their goals effectively.	(Cunningham et al., 2011; Habidin, Mohd Yusof, et al., 2016)	<p>consideration whether the information meets the specific needs and requirements of the users involved; and the reliability of the information exchanged among supply chain members, as it assures supply chain members that the data can be trusted and acted upon confidently. These elements of information quality play a significant role in enhancing collaboration, improving operational efficiency, and driving overall success within the supply chain.</p> <p>The ability of manufacturing companies to effectively meet their ultimate objectives. It is a key indicator of performance improvement, encompassing both financial and non-financial elements that result from the adoption and implementation of lean accounting practices. It is essential for businesses to strategically refine their operational practices in order to enhance overall efficiency, reduce costs, and improve manufacturing performance. By doing so, companies not only optimise their internal processes but also gain a competitive edge in the market.</p>
Quality (QLTY)	The degree of excellence in services.		Quality is a component of manufacturing performance. The level of excellence in service

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Time (TIME)	The duration of processes.		<p>delivery pertains to the quality and performance standards that are consistently achieved during the provision of these services. Quality highlights the importance of maintaining high standards at every stage, from the initial production phase through to the final delivery process. This ensures that the service meets or exceeds expectations, thus enhancing overall customer satisfaction and operational success.</p> <p>Time is a component of manufacturing performance. It plays a critical role in ensuring effective scheduling, optimal allocation of resources, adherence to completion timelines, and the enhancement of overall workflow efficiency. By managing time effectively, organisations are able to streamline operations, minimise delays, and maximise productivity, thus contributing to improved performance outcomes.</p>
Delivery (DEL)	The process of delivering products or services.		<p>Delivery is a component of manufacturing performance. Delivery is associated with the transfer or movement of products from production site to the customer. The delivery process involves a sequence of steps designed to ensure that products or services are transported and handed over to the customer in a manner that is both</p>

Key Terms	Operational Definitions	Author(s)	Elaboration of concept used in this research
Flexibility (FLX)	The ability or readiness to adjust and modify based on the changing circumstances.		<p>efficient and effective and without delays or errors. Therefore, it will enhance overall customer satisfaction and operational success.</p> <p>Flexibility is a component of manufacturing performance. Flexibility refers to the ability of manufacturing companies to swiftly adjust and modify their existing strategies, processes, or methods in response to changing circumstances or market demands in an uncertain business environment. This capability is crucial in today's unpredictable market, enabling companies to remain resilient and continue meeting customer needs despite external or internal challenges. Consequently, it also allows organisations to be more receptive to new opportunities in the market.</p>
Financial Performance (FNP)	The ability to generate revenue and manage finances effectively.		<p>Financial Performance is a component of manufacturing performance. It refers to the capability of manufacturing companies to achieve sustainable financial stability through the effective generation of revenue and management of financial resources. Strong financial performance is crucial for a company to continue developing and evolving, thereby maintaining competitiveness in the market.</p>



## 1.9 Research Organisation

This research is organised into five chapters. Chapter One provides an overview of the study, explaining the background and identifying the key issues to be addressed. In the problem statement, it highlights the specific challenges the researcher aims to pursue. The research questions and objectives help refine the focus of the inquiry and guide the overall direction of the research. The scope of the research is explained to provide overview of the specific boundaries in which this research will be operating. This is subsequently followed by the discussion of the significance of the research to highlight its contributions to the existing body of knowledge and the practical implications it holds for the industry. Then, key terms employed throughout the research are defined within the relevant context to provide clarity. The chapter concludes with a summary that recaps the main points discussed, providing a cohesive conclusion to the section.



Chapter two discusses previous literature for each construct of interest in this research. The constructs to this research are the supply chain, lean accounting and manufacturing performance, along with their respective components. This is followed by a discussion of the theoretical framework that underpins the study, leading to the development of a research framework that outlines the investigative approach. The section concludes with the formulation of hypotheses aimed at guiding the empirical analysis within the research.

Chapter three discusses the research design and methodology employed for this research. This chapter explains the instruments used to measure the identified constructs, placing particular emphasis on expert review for each questionnaire item to ensure quality and relevance. The discussion encompasses a holistic view of the





research process, covering aspects such as the sampling design that was employed, the instruments utilised to measure the constructs, the expert reviews undertaken for the instrumentation, the methods used for data collection, and the detailed data analysis procedures followed. Moreover, the findings from the exploratory factor analysis conducted during the pilot study are discussed, offering valuable insights into the measurement of the constructs.

Chapter four discussed the results of this research. The discussion includes various stages of data preparation, including the processes of data cleaning and the descriptive analysis conducted on the respondents from the field data. To ensure the accuracy and reliability of the constructs being measured, this research explores the unidimensionality of the variables involved. This is to ascertain that each variable truly represents a single underlying concept, thereby confirming that the constructs are valid for the research. The research then progresses with a thorough confirmation of the measurement model through the application of confirmatory factor analysis (CFA). This is followed by analysing the structural model using advanced statistical software, specifically IBM SPSS 29.0 and IBM SPSS AMOS 29.0. This analysis aims to evaluate the proposed hypotheses formed in the research.

Chapter five elaborates on the conclusion reached and recommendations for the future research agenda. In this chapter, the theoretical and practical implications of the research are explored, highlighting its contributions to the field of research. The theoretical implications provide an examination of how the findings contribute to the existing body of academic literature by expanding current knowledge and introducing new perspectives for other researchers to explore. The practical implications





concentrate on the applications of these findings within the manufacturing industry. This chapter discusses how the findings can be translated into strategies and best practices that companies can implement to achieve better performance outcomes. The chapter concludes with recommendations for future research initiatives, aimed specifically to address the research limitations encountered during this research.

### **1.10 Conclusion**

To summarise, this chapter discusses the research background, specifically focusing on the supply chain, lean accounting, and manufacturing performance of Malaysian manufacturing companies. The discussion continues by identifying the key research problems and issues. The researcher identifies that the adoption of lean transformation, along with the implementation of lean practices within manufacturing operations, can provide companies with a considerable competitive edge in the highly competitive and dynamic business environment that characterises today's economy. To address this, the research aims to empirically answer specific research questions. Consequently, the research questions and objectives are formulated, followed by the establishment of the research boundaries. The existing research gap within the scope of this study is clearly outlined, providing a clear justification for the necessity of conducting this study to bridge that gap. Additionally, it offers justification for the research's significance and its contribution to the existing body of knowledge, as well as the potential practical implications for practitioners in the field. This chapter concludes by outlining the structure of the thesis.





The next chapter will review and discuss the existing literature pertaining to the variables of interest in this research.

