

The Effects of Supply Chain Integration on Firm's Supply Chain Performance



# UNIVERSITI TEKNIKAL MALAYSIA MELAKA

I hereby acknowledge that this project paper has been accepted as part of fulfilment for the degree of Bachelor of Technology Management (Supply Chain Management And Logistics) With Honors

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# THE EFFECTS OF SUPPLY CHAIN INTEGRATION ON FIRM'S SUPPLY CHAIN PERFORMANCE

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The thesis is submitted in partial fulfilment of the requirements for the award of Bachelor of Technology Management (Supply Chain Management and Logistics) with Honors

**Faculty of Technology Management and Technopreneurship** UNIVERSI Universiti Teknikal Malaysia Melaka

Jan 2022

# **DECLARATION OF ORIGINAL WORK**

I hereby declare that this project thesis is my own original work, and it has been written by me in its entire. I have duly acknowledged all the sources of information which have been used in the thesis

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#### **DEDICATION**

I would like to appreciate the dedication of my cherished family members's commitment in helping me completing my degree. Without them, it will be not easy for my completion in FYP. And I express a deep sense of gratitude to my lecturer whom also my supervisor for my final year project, Dr. Nusaibah Binti Mansor and my fellow friends. They have given me their assistance and advice throughout this research. With their support, I was able to complete this research report smoothly. Thank you for their encouraging and guiding with their knowledge throughout this whole research.



#### ACKNOWLEDGEMENT

I would like to thank everyone who has assist me along the path of my research journey. First and foremost, I would like to thank my family and friends for their compassion, tolerance, emotional and financial support throughout the research. They play a important role in my life as they provide me with mental support whenever I faced challenges and difficulties.

My completion of this project could not have been accomplished without the support of my beloved supervisor Dr Nusaibah Binti Mansor. Thank you for helping, teaching, monitoring, and supporting me during the whole research. I sincerely appreciate all her effort throughout the years. The knowledge and experience from her assist me in completing this research paper smoothly. I also sincerely thank all my fellow course mates, seniors, junior and friends from other course who had been helping me in this research

Lastly, I would like to express my appreciation to all respondents who had responded to the questionnaire. Their effort provides me valuable feedback which has assist me in completing this research paper without any trouble.

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#### ABSTRACT

Integration of the supply chain is the most notable factor in order to establish sustainable competitive advantage in the manufacturing sectors. Despite large numbers of studies related to SCI concept and its dimension have been done, empirical studies by using the data from Malaysia manufacturing firm to investigate the connections between supply chain integration and company supply chain performance SCP received little attention. The goal of this research paper is to determine the impact of SCI towards SCP. This study was conducted using quantitative methods. 129 respondents who work for Malaysia manufacturing company is chosen to complete the questionnaire. The data is collected on a five-point Likert scale. This study will be carried out in Melaka where there are located plenty of manufacturing SMEs. Findings from this research indicated that Supplier integration and Customer integration contributes significantly to SCP, while Internal integration were not drivers of SCP. Manufacturer should establish collaboration on all member of supply chain to improve their supply chain performance. Managers should also focus a lot on customer integration.

Keywords: Supply chain integration, Supplier integration, Customer integration, Internal integration, Supply chain performance

#### ABSTRAK

Penyepaduan rantaian bekalan SCI ialah salah satu dimensi yang paling tersendiri dalam mencapai kelebihan daya saing jangka panjang dalam industri pembuatan. Walaupun banyak kajian berkaitan konsep SCI dan dimensinya telah dijalankan, kajian empirikal dengan menggunakan data daripada firma pembuatan Malaysia untuk mengkaji hubungan antara integrasi rantaian bekalan dan prestasi rantaian bekalan firma SCP menarik perhatian sedikit. Tujuan kajian ini adalah untuk menyiasat kesan SCI terhadap SCP. Kaedah kuantitatif telah digunakan dalam menjalankan penyelidikan ini. Data dikumpul pada skala Likert lima mata melalui soal selidik daripada 129 responden yang merupakan pekerja firma pembuatan di seluruh Malaysia. Pakej Statistik untuk Sains Sosial (S.P.S.S) versi 29 digunakan untuk menganalisis data. Kajian ini akan dijalankan di Melaka di mana terdapat banyak PKS pembuatan. Dapatan daripada penyelidikan ini menunjukkan bahawa integrasi Pembekal dan integrasi Pelanggan menyumbang dengan ketara kepada SCP, manakala integrasi Dalaman bukan pemacu SCP. Pengilang harus mewujudkan kerjasama dalaman dan luaran untuk meningkatkan prestasi rantaian bekalan mereka. Pengurus juga harus memberi perhatian yang besar kepada integrasi pelanggan

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Kata kunci: Penyepaduan rantaian bekalan, Penyepaduan pembekal, Penyepaduan pelanggan, Penyepaduan dalaman, Prestasi rantaian bekalan

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# LIST OF ABBREVIATION

## ABBREVIATION MEANING

- SME Small and Medium Enterprise
- SCI Supply Chain Integration
- SCP Supply chain performance



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# THE EFFECTS OF SUPPLY CHAIN INTEGRATION ON FIRM'S SUPPLY CHAIN PERFORMANCE

#### **CHAPTER 1**



#### **1.1 Introduction**

In this chapter, researcher will cover the background of the study as the effect of Supply chain integration (SCI) on organization Supply Chain Performance SCP. The problem statement, research question and research objective was presented. Besides the chapter will also explains the scope of study, research significance and its limitations.

#### 1.2 Background of the study

Globalization pushes firms to expand their resources in order to improve internal and external practises and reach higher goals and competencies. Internal capabilities are no longer the most important factor to increase their competitiveness. As a developing country, Malaysia has shift form an economy based on agriculture to an industrialized economy. (Atikah Shamsul et al,2018) In most developed and emerging countries, SMEs are now essential for the economic growth. Firms used to compete on price and quality. However, to be competitive and

thrive in the global economy, they must compete across all competitive characteristics within their supply chain operations (Molokomme, 2019).

It was seemingly and frequent mention in previous studies that many firm may not be able to enhance their competitiveness if there is isolation within firm's internal process and structure with their external supply chain members. The Competition between the entire supply chain of the operation with another supply chain entities will become the factors that affects the firm's Supply Chain Performance SCP the attention to supply chain practices is becoming more and more sensible especially as companies expand their networking and collaboration outside the boundaries of the organisation. As a result, organization have to explore innovative strategies to accomplish and maintain their competitive advantages when facing new era intensive competitors.

For firms to remain competitive, supply chain management should be focused while seeking to improve organisational productivity and profitability through Supply Chain Management SCM. It has recently gotten a lot of attention because of its position in industrial organisations, which includes everything from raw material acquisition through final product delivery. Growing competitive pressure, on the other hand, has prompted many companies to use their supply chain as a competitive instrument to achieve operational and financial success. (Eva liljeblom, et al, 2020)

Supply chain integration SCI which involving coordination and alignment of all parties in making firm's SCM a source of sustainable competitive advantages. In a more conventional manner, SCI is often linked with manufacturing process and the aim is for making the manufacturing process as productive as possible with the resources available. For instance, SC integration can help companies to react and counter strategic, operational and technological obstacles effectively. This is the reason why SCI has received significant interest of researchers from both developed and developing market. (Kalyar et al, 2019). SC in the manufacturing industry considered complex in terms of information exchange, it is complicated because it entails various interactions between supply chain participants including raw material suppliers, manufacturer, various distribution channels and finally customer in the SC system. in addition, problems regarding resources supplies and demand uncertainty have partially added to the complication of the SC system

Companies in such industries frequently face changing client needs, new competitors, and rapid change of the environment. They need to counter difficulties to maintain their advantage and adapting their business model to the current trend. It enhances the development of SCI and SCP as organisation changes in their operation process. Innovativeness may mature and improve as organization builds inter-relationships with customers and SC partners. It enables firms to become more integrated internally and externally to develop high productivity and cost-effective supply chain.

#### **1.3 Problem statement**

Since organizations are interconnected, firms need to ensure that there is a strong bond throughout all processes from upstream to downstream. This network creates greater value for organizations and for end customers (Marcelo Martins de, et al 2019). There are several evidences that support the relationship between SCI between the SCP. Many of these applications have occurred within the developed world with only very limited range of example from the developing world.

Malaysia's importance as a global hub has been bolstered by the trend of supply chain convergence. Many MNC including Volkswagen, Nestle, IDT, IKEA are moving their SC activities to Malaysia. Malaysia's strategic position and efficient trade infrastructure will help them service their expanding in Asian market. This transformation results in the creation of high-skilled jobs as well as the transfer of knowledge and technology to Malaysian businesses. (MIDA, 2021)

Traditional management approach has become rather inefficient or insufficient to outperform competitors and add value to final customers. (Turkulainen et al 2018) This situation has grown the significance of supply chain management for Malaysia SME and manufacturing industries to adapt in this competitive environment. However, failing to conduct comprehensive planning and integration on the who supply chain, most of the firms are unable to properly monitor their supply chain and improve their decision-making service from their overall operations. (Zahra Lotfi, 2013). Therefore, it is important to improve the awareness of SCI within Malaysian SME to increase competitiveness of their business. Thus, this study will be conducted on what is the factors that affects SCI in Malaysia and the role SCI towards firm's SCP.

To enhance the performance of manufacturing companies through SCM, firms have to design the integration of internal cross-functional activities and efficiently link them the supply chain processes of their business partners, suppliers and customers in the supply chain The SCI strategy adds value to a company's customers by involving suppliers and customers in the process.

The link between SCI and company performance has been verified by a growing body of empirical evidence. However limited success of integration in SC were identified in literature and its contributing factors towards firm's SCP are not fully understood (Zurita Mohd Saleh, et al, 2014). This study will be conducted on what does SCI improve in firm's SCP. The next question is to what extend that the Integration process can facilitate the external process integration (customer and suppliers) and internal process integration (cross functional operations to deliver better SCP. (Tharaka de Vass, Himanshu Shee, Shah Miah , 2018) Thus, this study aims to investigate the effects of SCI that turn in enhancing both SCP and firm performance

#### **1.4 Research Question**

This study aims to answer the following research questions:

- i. What are the factors that contributes to SCP?
- ii. What is the relationship between the SCI on firm SCP?
- iii. What are the significant impactful contributing factors toward SCP?

#### **1.5 Research objective**

The objective of the research was to determine the effects of integration towards firms' SCP. The research objective was designed as a guide through this research in order to fulfill the study goal. Below is the research objective of this research:

- i. To determine the factors that contributes to SCP.
- ii. To analyze the relationship between and SCI on firm SCP.
- iii. To determine the significant impactful contributing factors towards SCP.

#### **1.6 Significances of Study**

Firms in emerging economies are required to restructure their SCM that suites their relationships with suppliers, producers, logistic provider to end customers. They also need to rethink in terms of the market they are in and the technology advancement provided. In order to attain a higher level of integration that will improve the competitiveness, innovation, and performance of the company

Only few studies and research have looked into SCI in specific content of emerging countries (Alsadi Amin K et al, 2021). However, in a totally different environment, some enablers of integration might be different. These difference in the environment may have influence how a company strategic planning and ability could affect its SCP. This emphasized the importance of conducting more research on emerging countries such as Malaysia. More research is demanded to include SCI with others factors to help SME in Malaysia to identify and understand the role of SCI and the real value from firms in different business environments.

The result of this research will facilitate many SMEs in Malaysia that are trying to implement new supply chain approaches. The result of this study will allow company to gain better understanding about the supply chain orientation and the factor that enable or affects SCP. It may help firms to set up future plan for their supply chain investment and reduce risk and unnecessary loss. If the result of innovativeness and integration are not favorable, company does not need to invest heavily in this area

#### **1.7** Scope and Limitation

The scope of the research is to determine the effects of SCI towards firm's SCP. The survey / questionnaire will mainly at targeted manufacturing companies in Malacca This is because in Malacca have a lot of industry that operating supply chain related operations. However, the study was majoring focus in this state only. Therefore, some limitations had appeared due to the time limit and restricted location in this research paper. The researcher had only three months to complete the data gathering, therefore time was very limit throughout the research. Honesty of the respondent will also become the limitations for conducting this study. This is because the research might include some of the confidential information of the firms or their own experience.



#### **CHAPTER 2**

#### LITERATURE REVIEW

#### **2.1 Introduction**

The problems, issue, idea, point of view, and other research results in the field of study was addressed in this section. It intended in providing some knowledge related to this study to the reader. SCI and the definition of firms' SCP was discussed in this section. It will then be followed by the explanation of four independent variables. It aims to provide an in-depth discussion on these variables from other researchers to identify relevant theories and missing links in the research. The theory of other significant variables and how they were related were outlined in the research framework. Lastly, the hypothesis were developed based on the prediction of the research outcomes.

## 2.2. Supply chain management (SCM)

Supply chain management is described as an integrated management system for Implementing the process of material procurement and selection, product development and production from the producers to the final customers. (Roh, Taewoo, et al, 2022). SCM approaches has been used to achieve organization long term and short-term goals. For example, SCM is used to improve the effectiveness and efficiency of the production process, inventory control, reduces waste and leads to improve in market share and sustain organization growth (Shahbaz et al, 2019).

A number of methodologies and strategies that have a good effect on a firm's SCP, such as just-in-time, lean, flexibility, and supply chain collaboration, have been developed and confirmed in several SCM literature. However, Globalization leads to more complicated supply chain operations and is hard for the organization to sustain their operations alone. The current challenge is Integrating firm's capability to enhance their sustainable competitive advantages under supply chain disruption and ambidexterity (Geyi et al, 2020). Therefore, supply chain collaborations with all member of supply chain have been essentials for firms to be more competitive internally and externally. (Shahbaz et al, 2019).

#### **2.3 Supply Chain Integration SCI**

SCI is recognized as a significant powerful tool for enhancing an organization's efficiency. SCI is also described as the level to which a firm strategically collaborates with its main SC partners and in managing joint internal and external process (Flynn, et al. 2010). The main aim of the partnership is to make sure information flow through the process efficiently as well and material and products to provide the greatest value to consumer at higher spend and at lowest cost possible (Almestarihi, et al 2018). It is more likely a company's SC performance will improve is increased when they integrate both internally and externally and work together to form one entity. As a result, it implies a higher level of integration in order to achieve better performance. (Ataseven, C. and Nair, A., 2017) In contrasts, if firms have low level of SC integration, It may leads to high inventory costs and process delayed and lack of productivity. Moreover, low product quality and inaccurate product and demand forecasts will also harm the firm performance by lowering customer satisfactions.

SCI is being built with several dimensions which focuses on internal and external integration. Nevertheless, past research has demonstrated discrepancies in the dimension of SCI depending on different operations and locations. For example, (Kaylar, et al, 2019) has consider customer integration and supplier integration and the dimension of SCI. According to (Lau, et al, 2019) they considered that information sharing, product co-development and firm coordination as the dimension of SC integration. According to (Pakurár et al, 2019) the researcher has suggested that there are 2 major definitions of SCI which are external integration which includes customers and supplier and internal integration. These dimensions integrate all potential approaches and efficient process and strategies to firm's SC to fulfil customer's needs.

According the first few researchers who researched the impact of the integration on company performance, they have assumed that SCI as a single dimension (Errassafi, Mohamed, et al 2019). Past research regarding SCI as a construct of several dimension and prioritise significance of exploring SCI dimension when measuring its impact on firm's performance

(Cao et al, 2011). Recent research has identified the SCI impact is to understand it from every angle and dimension (Huo, B et al 2015). They think that integration research should include few levels which supplier integration is, customer integration and internal integration. SCI through integrating firm's key information and operations, it ensures seamless transfer of information across the SC. Internal integration is the process of breaking down cross-functional boundaries within a firm through coordinated processes that allow for real-time data sharing across all departments in a company. (Tharaka et al 2018). Supplier and customer integration in managing synchronised processes, refers to mutual coordination, exchange of strategic information, and cooperation between the focal organisation and its upstream and downstream partners. The goal of SCI is to attain cost-effectiveness and efficiency throughout the SC while adding value throughout the value chain

As SCI is both internal and external (Kalyar et al, 2019). suggest including external integration orientation EIO into the dimension of integration. External integration orientation is a set of behaviours that encourage and support external integration. It includes integrating customer and supplier in the SC recognizing a solid cooperation will aid in firm financial and operation performance. According to (Kalyar et al, 2019), External integration orientation is described as a deep a commitment to fostering cooperative connections such as essential suppliers and consumers other than combative ones.

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#### 2.4 Dimensions of SCI

#### **2.4.1 Supplier integration**

According to (Kalyar et al, 2019), supplier integration is defined as the degree to which firms collaborates with their suppliers to develop inter-organizational strategies, approaches and process into coordinated, interactive operations. Regardless of the various term that is used to quantify integration with supplier, the basic goals of supplier integration is to go beyond the limit of a single company in order to easily coordinate its operations. (Flynn, et al. 2010)

(Miklós et al,2019) outlined a SCI measuring approach for determining the level of supplier and customer integration. In this model, supplier integration defined as a company

process of buying firm and supplier sharing the knowledge of operations, finances, and strategy with its suppliers to achieve mutual advantages.

According to (Miklós et al,2019), supplier integration includes the knowledge sharing between organizations and its supplier's in several areas such as production plan, quality, design and direct quality development program. It also aims for a smooth and efficient flow of material along the supply chain network in order to avoid problems in the process of purchasing and manufacturing. The information sharing creates better confidence while decreasing dysfunctional conflicts between buyer and suppliers. It also allows upstream partners to communicate effectively.

Firms aims to receive material on time so that they can complete the work according to their production schedule. Integration with supplier enables firms to discuss information such as stock availability and manufacturing progress with their suppliers. Which, as a return, it will help suppliers in ensuring materials and components are delivered on time and in sufficient quantities. Supplier integration refers to its collaboration in creation and design of new product, as well as sharing of information that manufacturer can use to better direct the manufacturing process and provide better service at a reduced cost (Delic, Mia et al, 2019). This is because if the procurement process is unplanned, it may cause increased material costs as well as increased warehousing costs. Furthermore, by exchanging information, communicating, and collaborating with suppliers, companies can better control upstream supply complexity. (Migdadi et al., 2018)

There is no specific form that supplier partnership must follow, the partnership can be flexible depending on the firm nature and objective of the collaborations. With supplier integration and collaboration among organizations, wasted effort and time will be significantly decreased or removed. In this aspect, many studies have highlighted the significance of integration with supplier in enhancing overall competitive advantage and gain improvement in SCP. This research suggests that supplier integration is positively related with SCI to improve firm's performance.

#### 2.4.2 Customer integration

(Zhu et al 2018) states that customer integration is the level which an organization collaborate with their customer to create inter-organizational strategies, procedure, and process. According to, (Miklós et al,2019) customers are the only party that has the authority to make decisions and have the potential to review a product. In terms of the marketing perspective, customer has the potential and the purchasing power, they act as a decision maker in the SC process. Customer integration is the process of a company's collaboration and information sharing with its customers to enhance transparency and joint planning (Wong, et al 2011). Customer integration allows manufacturers to better understand the customer demand and requirements and to leverage the capabilities of customers to strengthen firm's capabilities and competencies. It also allows companies to evaluate market opportunities and expectations. As a result, it contributes to timely and accuracy in responding to the customer's demand by matching supplies and customer needs (Ngo, et al,2018)

(Stank et al, 2001) describe customer integration as a competency owned by firms to create unique product and service that is demanded by customers and the market. This is because the process of customer integration consists of processes such as interaction and engage with customers. Market information and inventory information is also shared with customers. Customers are usually contacted for comment on the items and services given. Additionally, it will give manufacturers the chance to form enduring relationships with their clients and enable their manufacturing system to create innovative items that their clients recommend. (Birasnav et al 2019)

According to (Kalyar et al 2019), Customer integration is an organisational practise that involves detecting, describing, and using customers to generate certain products in response to customer demand to optimise their expectations and satisfaction. In the studies of (Miklos et al, 2019), they consider on information sharing through integration and communication with customers. Customer integration is improved by sharing information based on interactions between customers and the enterprise. Additionally, the connection between customers and organisations helps the latter improve its degree of competence. (Miklos et al, 2019). For example, the responses acquired by the organization from customers provide them with all the data regarding with their operations such as inventory. Therefore, A solid relationship between firm's and customer will be significant to improve SC management strategies.

Customer views being included in the manufacturing process will contribute to better relationship between manufacturer and customers. Clearly knowing the firm's objective, goals, supply chain strategy and integration can reduce the uncertainty. The loss of intimacy and flexibility in more codified structure types may counteract the advantages of clarity. If the integration is not aligned with the recent consumer demand and expectations, company are more likely to produce strategy which may achieve internal efficiency but are not externally productive.

Researchers have discovered that integration with customer is positively connects with firm's achievement (Ataseven et al, 2020) Strategic alliances with clients that work well may not be as valuable if a company cannot change its processes and goods to satisfy customer demand. (Hosam et al 2019). This study proposes that customer integration is positively associated with SCI to in order to improve firm's performance.

## 2.4.3 Internal integration

Internal integration in supply chain is the extent where a firm's vital functional operations which includes purchases, manufacturing and sales cooperate actively and cogently collaborate in a systematic manner, performing their respective tasks successfully and efficiently to produce a result that satisfies client requirements. (Shah et al 2020). According to (Miklós et al,2019), internal integration can be described as all the internal operation cooperate and develop a system where internal data, resources and knowledge which can be access by every member within the company.

Besides, effective cooperation between the factory and supplier that is accomplished through internal process and activities to meet consumer demand is also considered as internal integration (Miklós et al,2019). The performance of businesses and their internal integration are boosted by collaborative planning, functional collaboration, information sharing, and teamwork to guarantee that customers' expectations may be met and deliveries are made on schedule.

Internal integration is described as the degree to which a company structures its own organizational strategies, activities and operations into collaborative, synchronized processes, in order to meet the needs of its consumers. (Ganbold et al 2020) Information sharing and strategic cross-functional collaboration are both parts of internal integration amongst internal functions. The goal of internal integration is to facilitate cost-effective resource, financial, product, and information flow within the internal of the organisation.

(Miklós et al,2019) highlight that integration within a company is the integration among the department and procedure within the firm to fulfil and satisfy customer expectations. therefore, firms need to put in more afford in functional department such as sales, warehouse and distribution. Internal integration is viewed as a distinct higher-order organisational competence in recent studies (Barua et al., 2004). According to the research done by (Perdana et al, 2019) the resource-based view suggests that hat internal integration based on communication, knowledge exchange, and cross-functional cooperation.

Complex organisations are made up of numerous, diverse, and interrelated components. Complexity thus restricts the ability of organisations since it makes it difficult for members to recognise and respond on issues regarding strategis significance. Information barriers are just a few of the potential drawbacks of structural complexity. It atcs as a challenges to establish alliances, knowledge exchange and decision making consensus (Miklós et al,2019) This study suggests that customer integration is has a positive relationship in improving firm's performance.

#### 2.5 Firm's Supply Chain Performance (Non-financial)

There is several definitions and constructs in previous literature that determine the concept and measure of SC performance. these metrics are divided into four categories which is strategic, financial, operational performance. Choosing metrics to measure business performance is more difficult because of SC's complexity. (Kalyar et al 2019). According to the (Eva et al, 2019), the studies consider two newly developed SCP measures which is SC

efficiency and effectiveness which indicates the SCP rather than firm financial performance. these matrices capture the operational aspects of SCP and have more advantage compared to using only financial, strategic or agility elements.

According to (Eva et al, 2019) the researcher suggest that SC operation should be used appropriately as a metrics of SCP. SC efficiency and effectiveness represents internal and external outcome of SC management. For example, SC flexibility and SC cycle efficiency are included in SC efficiency, where SC flexibility evaluate the time taken to react to sudden supply chain changes with the lowest possible cost. SC cycle efficiency, on the other hand, refers to the amount of time spent on value-adding activities during a Supply chain process. Besides that, the lead time and precise order fulfilment are two aspects of SC effectiveness. Order lead time is the shortest period between receiving an order for a product or service and having it delivered, whereas perfect order fulfilment is having the order delivered, finished, and on schedule and in perfect conditions.

Manufacturers have been looking for ways to establish SC objectives with clear KPIs to enhance SCP. However, the supply chain's complexity and frequency make selecting appropriate SCP indicators difficult. Seo 2014 proposed a comprehensive framework for performance measures which divided into strategic, tactical, and operational processes. Matrices such as planning, supply chain evaluation, delivery efficiency and customer satisfaction are measured in the framework. (Seo et al 2014)

Firm involved in the manufacturing of tangible item usually encounter problem in ensuring on-time delivery. This is because certain firm have limitations in production capacity in achieving market demand. They must manage their capacity in such a way that they can adapt to the uncertainty in demand at a lowest cost possible. Firms must receive the material on time in order to meet the production schedule. This issue can be solved through integration with suppliers and inventory information sharing. Internal integration increases efficiency, demand management, and material management, as shown by several studies. (Zhao et al 2013). Through cross functional cooperation and manufacturing planning, it helps firm in meeting the requirement of the production schedule. Lastly, previous studies show that integration with customers helps firms to improve the knowledge an information on the customer interests (Miklós et al,2019). Close connections between customers and organisations offer chances for them to foster mutual tolerance and raise the accuracy of information.

#### 2.6 Manufacturing industries in Malacca Malaysia

This research selected Malaysia as a research location due to its rapid in manufacturing and supply chain activities. Malaysia manufacturing results sales rose by 6.5 percent year-onyear to RM124.4 million in June 2021 according to department of statistics Malaysia. The expansion also attributed to the F&B and tobacco products subsectors (9%) and electrical and electronics subsectors (2.2%). The increment leads to increase of number of employees in the electrical and electronics products and petroleum, chemical, rubber and plastic products (3.8%) (MIDA 2022)

(The Sun daily 2022) states that Malacca ranks fifth among the states in Malaysia in investment received for manufacturing. According to (The Star 2022), Malaysia government are planning to establish a top-notch industrial region in Alor Gajah to attract investment from foreign companies. The amount of the investment approved by Malaysian Industrial Development Authority (Mida) accumulated RM3.24 billion to facilitate the growth of Melaka manufacturing industry. As a result, manufacturing industry in Malacca is contributing 37.3% to the state's GDP. Since the manufacturing sector contributes to both national and economic growth and has significantly increased employment in Malacca, its importance to the Malaysia economy cannot be understated. Increase industrialization improve the importance of strategic actions across member of the supply chain in manufacturing SMEs in terms of SCI, flexibility, reliability, effectiveness, and efficiency Therefore, manufacturing supply chain and to be competitive in the global industrial environment. This makes an developing region like Malaysia and Malacca an excellent choice for future research and study.

#### 2.7 Research framework

Figure 2.1 illustrates the research framework investigated in this research. The model shows the relationship between the independent variables and the dependent variable, which describes the relationship of the dimensions of SCI and firm's SCP. the dependent variable in this study are the firm's SCP. there are three independent variable which are Supplier integration, Customer Integration and Internal integration. These variables lead researcher to study regarding the effect of SCI towards firm's SC performance. the research framework is illustrated as follows:



Independent Variable

#### 2.8 Hypothesis Testing

There were 3 hypothesis which could be constructed according to the proposed framework in figure 2.1 Which is

## Hypothesis 1

Internal integration

Ho: There is no significant relationship between internal integration and Firm's SCP

H1: There is a significant relationship between internal integration and Firm's SCP

## Hypothesis 2

#### **Supplier integration**

Ho: There is no significant relationship between supplier integration and Firm's SCP H1: There is a significant relationship between supplier integration and Firm's SCP

#### Hypothesis 3

Customer integration

H<sub>0</sub>: There is no significant relationship between customer integration and Firm's SCP H<sub>1</sub>: There is a significant relationship between customer integration and Firm's SCP

#### 2.9 Summary

In conclusion, previous studies show possible dimensions in SCI such as supplier integration, customer integration and internal integration is elaborated in this chapter. The researcher discussed about the possible effects of the independent variables above towards Firm's SCP. The research framework has discussed the independent variables and dependent variables. Finally, by using hypothesis testing, the link between independent and dependent variables has been evaluated.

## **CHAPTER 3**

## **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter of methodology deliberated more concerning the method used in carrying out this study. For example, the research strategy and the research design. Via the primary and secondary sources of collecting data, information related to the research are collected. Apart from this, the aim of research methodology is to define the research design used in the process. Data analytic tool were used in appraising the relation between the dependent and independent variable to enhance the research's precision

#### 3.2 Research Design

The research study deliberate relationship between SCI towards SCP. To establish a suitable framework for researching research, the research design is applied. In research design, it can be considered as a framework that used to identify and describe the link between independent and dependent variables in the research. The researcher combined different methods and techniques in data collection and analyse the data which lead to the success of the study. This is considered to be the set of some of the process and approaches utilized with gathering and assessing the variable measures in investigating the issue and seeking for the resolutions. The research design were contributed in reducing research question error. Descriptive research, explanatory research and exploratory research are the three major types of research design. However, for the case of this study, Explanatory research design was chosen. This design shows that the secondary as well as primary data were examined from past studies and in the end explore the effects of SCIs towards firm's performance.

#### **3.2.1 Explanatory Research**

Explanatory research was used in the study. Explanatory research method explores why something occur when there is limited information provided. Explanatory research can help researcher to get a comprehensive understanding of the research topic and ensure high quality and accurate data. When it comes to explanatory design, the scholars are required to search for the primary data in order to gain thoughts from the present view of the SCI towards firm's SCP to come up with the questions for the research. It assists the investigator in observing the relation to gain better comprehension of the study. In conducting this research, the survey may be better suited to the topic of effects SCI towards firm's SCP. In general, the research design process requires much decision making in constructing the ideal research framework. The quantitative research method was used in determining the relationship between the dependent and independent variables in this study.

# 3.3 Quantitative Method

There are three category of research methodology including qualitative, quantitative, and mixed method. The quantitative method will be applied to conduct the research methodology. Quantitative method is usually defined as logical because the meaning of statistical hypothesis testing as it can help the researcher identify data in more scientific manner. (Saunder et al 2016) highlight that quantitative research generally connected with positivism especially used with planned and highly structured data collection technique.

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To carry out statistical analysis, the quantitative technique is utilised to ascertain the correlations between the independent and dependent variables by gathering quantifiable data in the form of numbers. It seeks to compile pertinent numerical data and extrapolate it to populations. The data obtained must be objective, measurable, and statistically sound data, which is mostly in the form of numbers, graphs, and tables. it requires large number of respondents compared to the qualitative method. By using the quantitative method, the relationship between dependent and independent variables is easier to identify and determine by the researcher. The other advantage of adopting the quantitative method is that it can provide a large volume of data from selected respondents in a short period.
For the case study, the scholars utilized the quantitative method in investigating the effect of SCI on firm's SCP. Saunders (2016) suggested that the goal of a quantitative study is to analyse the relationship between the variables that are quantitatively measured and examined using a variety of measuring techniques. The scholar found how the impact of contributing factors on SCI using 3 independent variable which is supplier integration, customer integration and internal integration. A dependable survey was utilized in collecting the data in order to attest that this study is fully quantitative in a form of closed-ended questions. Likert scale rating is used in which respondents respond to question on a scale of 1 - 5 indicating strong disagreement and strong agreement. As a result, the quantitative method is highly beneficial to business organizations since it allows them to make key decisions and gain insights from numerical data.

# 3.4 Sampling Design

#### **3.4.1 Target Population**

(Creswell, 2014) explain that the target population refers to a group of individuals or organizations with some similar defining properties that the researcher is interest to study for generalizing the findings. In other words, a group of individuals with similar characteristics is identified in conducting the study.

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In this research, the target population is the manufacturing companies involving supply chain management in Malacca. According to MSME Statistics 2021, there are 1226494 SMEs are established in Malaysia. HRDF report 2019 states that Malacca has 31361 SMEs which is 3.5% of the total population. Manufacturing establishments are estimated to be 5.3% from the total population. Since the research location chosen in Malacca. The estimated population for this research is 1662 manufacturing companies. Every respondent was offered sufficient duration in order to complete the questionnaire and maximizing the possibility of the sampling to avoid errors.

#### 3.4.2 Sample Size

Sample size refers to the number of participants or observations included in a study in order for the researcher to obtain accurate results. In statistics, the sample size is commonly denoted by the letter n. It permits researchers to comprehend and extrapolate a particular population from a collection of samples. The statistical analysis is more accurate the larger the sample size. However, researcher will need to spend more time when the population size is large. Therefore, sample size should be as large as possible in relation to target the population to increase the validity of the research. In this study, a minimum of 210 respondent is needed according to 95% confidence level and 5% margin of error referring to the Krejcie and Morgan sample size table

Ν	s	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	- 617	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382

 Table 3.1: Krejcie & Morgan Table

(Source: Krejcie & Morgan Table)

#### **3.4.3 Sampling Technique**

Sampling techniques could be divided into two wide categories, namely non-probability and probability. In non-probability sampling, the researchers pick individuals from the population based on their judgement, whereas probability sampling refers to samples that are chosen in a random manner so that Every person in the population has a known chance of being chosen. (Siah et al, 2014) For this research, non-probability sampling is used based on the objective and some limitations of the study. In this study the most suitable sampling technique are convenience sampling. For the case of this study, the investigator had selected convenience sampling as the best approach since its result are accurate and easily accessible. The obtained data will next be subjected to statistical analysis, and a statistical inference were made. As a result, the quantitative method is highly beneficial to business organizations since it allows them to make key decisions and gain insights from numerical data.

#### **3.5 Data sources**

In statistical analysis, data collecting is vital. Primary and secondary data are the two types of information that can be gathered in various methods for study.

#### 3.5.1 Primary Data

Primary data is considered as the information obtained by the researcher for a specific goal in the studies. This is known as the first-hand information as well as initial sources of the data gathered. The collecting of primary data basically involved methods such as surveys, interview or experiments. In this research, primary data were obtained via distribution of questionnaires to respondents mainly via emails. Nonetheless, the respondents were required to respond to the questions that have been prepared of which this questionnaire have some of the statements that are used in measuring numerous independent variables for the research from a Likert-type scale. As shown below.

1	2	3	4	5
Strongly	Disagree	Neutral/ Neither	Agree	Strongly Agree
Disagree		Agree nor		
		Disagree		

#### Table 3.2: Five-Point Likert Scale

#### 3.5.2 Secondary data

Secondary data is the data that others have already collect for other purposes and can be reanalysed by other researcher working on different project objectives. In this case, the approach of gathering secondary data was utilized by the researcher.

Inquiring about information that has already been obtained and is accessible to researchers is known as secondary data. Secondary data may be stated to be the data used in the past research. The secondary data was crucial to use in facilitate the primary data to attain the objective of the research.

In brief, secondary have played a supporting role in research progress. The researcher analysed relevant research topic via articles, government publication and journal done by other researchers. Secondary data are best for revealing background and historical information about a theme or topic and broadening the understanding of a point by exposing to others' points of view, interpretations and conclusions. By using secondary data, most of the scholars may gather numerous info and gain knowledge over that. This is done by Google Scholar, Emerald Insight

and ProQuest to support the objective of the research.

#### 3.6 Location of the research

Malacca has been selected to conduct this research. This is due to the fact that Malacca have a lot of manufacturing organizations that implement supply chain management in their daily operation. The firms selected may be in different industries. They helped researcher to analyse and make valuation easily on their SCI implementations and firms' operational performance. The data collected based on this study allows researchers to make accurate analyses and achieve research goals.

#### **3.7 Questionnaires Design**

Questionnaire is the main approach that has been used for collecting data for research. In this study, Researcher created a questionnaire form and distributed to potential respondent. The questionnaire question mainly focus on closed-ended questions. In the questionnaire, the closed-ended survey with Likert Scale was used. Likert scale questions are a form of closedended questions and one of the most widely used tools for studying popular ideas. The questionnaire uses a statement that respondents can indicate to what extent they agree or disagree with that statement. The questionnaire is designed based on 5-point Likert scale. The scale displays, 1: 'Strongly disagree', 2: 'Disagree', 3. 'Neutral', 4. 'Agree', 5. 'Strongly Agree'. The following table show Questionnaire Design for the research.

In the questionnaire, it consists of three sections. Firstly, demographic information, company name and position of respondents is study in section A, In section B, researcher emphasized on the independent variable which is the dimension of SCI. Section C showed the assessment of the dependent variable which is the firms SCP measures.



 Table 3.3: Questionnaire development

# 3.8 Reliability and Validity

The reliability and validity of Likert scale item should be pay attention as every researcher need to collect accurate data when conducting research. SPSS program has been used for the research in ensuring the consistency of the outcome. The reliability and validity is measured using Cronbach Alpha which is developed by Llee Cronbach in year 1951 in order to offer a tendency of the interior reliability of scale used in testing.

Cronbach's Alpha is used in finding the measurement of several variables used for the research in interior consistency. In In this study, the Cronbach's alpha method was employed to evaluate the validity and reliability of the questionnaire. Cronbach's Alpha is between 0 and 1, with higher values indicating more reliable surveys or questionnaires. If the Cronbach's Alpha reliability coefficient in the range between 0.6-0.7, it is acceptable. If it is greater than 0.7, the reliability is considered good

Cronbach's Alpha Coefficient Range	Strength of Association
$\alpha \ge 0.9$	Excellent
$0.9 > \alpha \ge 0.8$	Good
$0.8 > \alpha \ge 0.7$	Acceptable
$0.7 > \alpha \ge 0.6$	Questionable
$0.6 > \alpha \ge 0.5$	Poor
$0.5 > \alpha$	Unacceptable

# Table 3.4: Cronbach's Alpha Values

#### **3.9 Pilot Test**

A pilot test is also one of the procedures that need to be measured by a researcher in collocating quantitative data as it may assist in the improvisation of the actual questionnaires. Many authors have emphasized the importance of pilot test which it can help to detect any possible deficiency at early stage. It identifies problems and areas that may require adjustment to the questionnaires (Abd Gani et al., 2020). In pilot test, researcher can modify the questionnaires to ensure that the questionnaires are effective before sent out to respondents. Due to time limitations, a minimum of 30 respondents is selected

#### **3.10 Data analysis method**

#### **3.10.1 Descriptive Analysis**

Descriptive analysis is a type of data analysis that helps to describe, display and summarize data in constructive manners. It uses statistical techniques to describe and summarize a set of data in order to get accessible insights from uninterpreted data. Descriptive analysis defines the basic and associate factors for measurement. This investigation method empowers the scholar in understanding the numerical data and the variables that emphasizes on demographic data. The vast amount of data that has been compiled into numerical values is described through descriptive analysis. Descriptive statistics of a set of data, i.e, mean, median, mode, standard deviation, and variance score are determined using the Statistical Package for the Social Sciences (SPSS). descriptive statistics were rationally synthesis or describe a set of quantitative data from a large amount of data.

#### 3.10.2 Pearson's correlation coefficient

Pearson's correlation coefficient is used to quantify the strength of the linear relationship between two numerical variables. It involves measuring the association between two variable and determine whether the variables are positively or negatively correlated, or not correlated. The sample correlation coefficient, r can indicate a number from -1 to 1. The larger the variation in the data to the best fit line, if the closer the value or r is to zero. The smaller the variation in the data and the best fit line, the closer the value of r is to +1 or -1.



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Figure 3.1: Pearson's Correlations Coefficient

#### 3.10.3 Multiple Regression Analysis

Reason of using MRA is to examine the relation between independent variable and independent variables. MRA assist researcher in interpret what independent variables have got the much impact of the dependent variable which in this study is SCP. The one single independent variable using by the regression is called univariate regression analysis while more than one independent variable using the regression is called multiple regression analysis. In this research, multiple regression analysis is used for researcher to predict the value of one variable based on the values of two or more other variables. This suggest several regressions have been utilized in forecasting which of the independent variables are investigating the reversion that consists of three contributing factors to SCP. After that, the several regression formulas proven in order to reveal the results of the finding related with the study independent variables in relation to the predictors. The multiple regression analysis evaluates the relative impact of these explanatory or independent variables on the dependent variable when all other variables in the model are held constant. Below is the equation of multiple regression used. Equation: Y = a + bX1 + cX2 + dX3



Table 3.5: Equation of Multiple Regression Analysis

#### **3.10.4 Statistical Package for Social Science (SPSS)**

SPSS was used in scaling the relation of the model proposed. This is centered on the assumption of the study. SPSS is a computer software used to arrange the data which is complex into ample pie chart, graphs and for to discover the questionnaire answer. Nonetheless, demographic part, the empirical stat was used to define the characteristics of the data in detail. It will presume the stricture summary concerning the measures as well as the test. In any case, MRA is a strategy for assessing the relations between the variables as well as analyzing which independent variables have the greatest impact on the other variables (independent variables

#### 3.11 Summary

All along the method of the research, the scholar have shown the method was used to arrange all data collected which are associated to the variable used. The first thing that the researcher did is to select quantitative method and explanatory design. At the moment, primary and secondary are collected as the sources of the studies. In this case, survey method was used which encompasses questionnaires in a form of google form was used to collect responses from the respondents regarding SCI and SCP in Malaysia. Besides that, convenience sampling was chosen as the sampling method for this research. In analysing the data collected, the scholar used SPSS in appraising the information and used MRA in investigating the relation exist between dependent and independent variables. Numerous strategy is utilized to ensure the reliability and validity of this research.



#### **CHAPTER 4**

# DATA ANALYSIS

#### 4.1 Introduction

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In this chapter, the results of the research conducted using quantitative approach were discussed. The data collected by questionnaires involving manufacturing firm's representative in Malacca area. This chapter discussed the result of questionnaires which is the effects of Internal integration, Supplier Integration and Customer Integration towards firms supply chain performance. The quantitative research that has an impact on supply chain performance had found out by researcher. In this chapter, the contributing factor towards SCP were discussed. SPSS software was used to coded and key in all the result that received from the questionnaires. The data is then analysed and interpreted. Researcher has ensured that all the question in the questionnaire is fully responded by the respondents without any blanks in the questionnaire. The validity of questionnaires had been tested through a pilot test involving 30 respondents to ensure that there are no mistake or errors occur in the questionnaire. After that, the data analysis was followed by hypothesis testing, Pearson Correlation and Multiple Regression Testing. All the data collection was analysed in table form by windows software version SPSS.

#### 4.2 Pilot Test

Pilot test is characterized as a form of software testing that verifies in real time a component of the system or the entire system. A A small-scale experiment or collection of observations is done as a pilot test to help decision-making and determine how and when a larger project should be started. Pilot test also known as pretest which is organized based on

30 questionnaires with a sample size of 210 the sample of the test sample should be a population of more than 10% from the actual sample size. In the pilot test, researcher can determine as if the questionnaire is correct to capture the required data. Therefore, the effectiveness of the pilot test and the reliability of the questionnaire are tested. In pilot test, we check the internal reliability using Cronbach's Alpha. All the association between all independent variables and dependent variables demonstrated with pilot test. Table 4.1 shows the Cronbach's Alpha of the pilot test.

### Table 4.1: Reliability Statistic of overall pilot test

Reliability Statistics					
Cronbach's	Cronbach's Alpha Based				
Alpha	on Standardized Items	N of Items			
.935	.933	29			

(Sources: SPSS Output)

Cronbach's Alpha was 0.935 which were obtained from reliability statistics. (Saunder'et al 2016) stated that the values of 0.7 or above indicate that the question are being measured in the same scale. The Cronbach's Alpha value of 0.935>0.7 illustrates that the all the variable in the questionnaire have relatively internal consistency.

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#### Table 4.2: Reliability Statistic of Variables

Variable	Cronbach's	N of items	Strength of
	Alpha		Association

Independent Variables			
Internal integration	0.916	5	Excellent
Supplier integration	0.881	5	Good
Customer integration	0.811	5	Good
Dependent Variables			
Supply chain performance	0.913	9	Excellent

Table 4.2 illustrates the Cronbach alpha value of which all is above 0.7, therefore it can be concluded that all variables have relatively internal consistency. The Cronbach's Alpha for internal integration is 0.916 measured by 5 items. Then, the Cronbach's Alpha for the Supplier integration is 0.881 measured by 5 items. Next, the Cronbach's Alpha for the Customer integration is 0.811 measured by 5 items. Lastly the Cronbach's Alpha for the Supply chain performance is 0.913 measured by 9 items. To conclude, all the variable having good correlation within all item of each variable.

# **4.3 Reliability Test**

Cronbach's Alpha is used to calculate the internal consistency or average correlation of items for each of independent variables which internal integration, Supplier integration and Customer integration. In this case dependent variables supply chain performance are also measured. Nunnally (1978) stated that of Cronbach Alpha value is more than 0.7, the reliability is accepted.

Reliability Statistics				
	Cronbach's Alpha			
Cronbach's Alpha	Standardized Items	N of Items		
.932	.933	29		

# Table 4.3: Reliability Statistic of Overall Variables Source: SPSS Output

Variable	Cronbach's Alpha	N of items	Strength of Association
Independent Variables			
Internal integration	0.818	5	Good
Supplier integration	0.848	5	Good
Customer integration	0.877	5	Good
Dependent Variables			
Supply chain performance	0.926	9	Excellent

#### Table 4.4: Reliability Statistic of Variables

#### (Source: SPSS Output)

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According to table 4.3, the overall variables of Cronbach Alpha is 0.932 measured by 29 item and which is greater than 0.7. Hence it can be concluded that the item has relatively internal consistency

Table 4.4 illustrates the Cronbach alpha value of which all is above 0.7, therefore it can be concluded that all variables have relatively internal consistency. The Cronbach's Alpha for internal integration is 0.818 measured by 5 items. Then, the Cronbach's Alpha for the Supplier integration is 0.848 measured by 5 items. Next, the Cronbach's Alpha for the Customer integration is 0.877 measured by 5 items. Lastly the Cronbach's Alpha for the Supply chain performance is 0.926 measured by 9 items. To conclude, all the variable having good correlation within all item of each variable.

# 4.4 Descriptive Data Analysis

# 4.4.1 Sosio-demographic

Descriptive statistics has been implemented to illustrates the data collected such as respondent basic characteristics through the questionnaires. It provides a brief overview of the

of the sample and the measured output. the below data shows the socio-demographics of the data collected from the 129 respondents as well as the result of the questionnaire that led to the firm's supply chain integration (internal integration, supplier integration, customer integration) and the firm's supply chain performance

Demographic	Demographic Details	Frequency	Percentage (%)
Gender	Male	56	43.4
	Female	73	56.6
Age Group	Below 30	35	27.1
	30-40 years old	41	31.8
	40-50 years old	33	25.6
at l	50 years old and above	20	15.3
Education level	SPM	26	20.3
T	Diploma	30	23.4
Field	Degree	55	43
191	Master	8	6.3
KE	PHD Januar Since	1	0.8
	Other	8 . 9.	6.3
Type of industry	Automotive / automotif	ALAYSIA	MILAKA
	Chemical / Bahan kimia	10	7.8
	Electrical & electronic /	24	18.6
	Elektrik & elektronik		
	Medical product / Produk	21	24.0
	perubatan		
	Food and beverage /	45	27.1
	Makanan dan minuman		
	Other	25	19.4
Position	Supervisor / Penyelia	30	23.3
	Assistant manager /	30	23.3
	Penolong pengurus		

 Table 4.5: Summary of Socio-demographic of respondent

Manager / pengurus	41	31.7
Managing director /	7	5.4
Pengarah Urusan		
Other	21	16.3

# 4.4.1.1 Gender

# Table 4.6: Gender of Respondent

Source: SPSS Output

	Frequency	Percent
Male	56	43.4
Female	73	56.6
Total	129	100.0



# **Figure 4.1: Gender of Respondent**

In the sample of 129 respondents shown Table 4.5 and Figure 4.1 above, there are a total of 56 (43.4%) male respondents and 73 (56.6%) male respondents. According to the proportion, there are significantly more female respondents than male respondents.

# 4.4.1.2 Age Group

# Table 4.7: Age Group of Respondent

	Frequency	Percent	Valid Percent
18-25 Years old	35	27.1	27.1
26-33 years old	41	31.8	31.8
33-40 years old	33	25.6	25.6
40 and above	20	15.5	15.5
Total	129	100.0	100.0



Table 4.7 shows the age group who took part in answering the questionnaire. In this study, most of the respondents are from the age group 30-40 years old, with 41 respondents (31.8%), followed by the age group of below 30 years old, with 35 respondents representing 27.1% of the study. The minority of the respondents are from the age groups, 40-50 and 50 years old and above with 33 and 20 respondents, 25.6% and 15.3%, respectively.

# 4.4.1.3 Education Level

# Table 4.8: Educational Level of Respondent

	Frequency	Percent	Valid Percent
Spm	26	20.2	20.2
Diploma	30	23.3	23.3
Degree	55	42.6	42.6
Master	8	6.2	6.2
Phd	2	1.6	1.6
Others	8	6.2	6.2
Total	129	100.0	100.0



Figure 4.3: Educational Level of Respondent

Table 4.8 shows the respondents educational level who took part in answering the questionnaire. In this study, most of the respondents are at Degree level, with 55 respondents (42.6%), followed by the Diploma, SPM, Master and Others with 30, 26, 8, 8 respondents 23.3%, 20.2%, 6.2%, 6.2% respectively. PHD level is the minority in this study which only have 2 respondents representing 1.6%

# 4.4.1.4 Type of industry

Table 4.9: Type of industrySource: SPSS Output

	Frequency	Percent	Valid Percent
Automotive	4	3.1	3.1
Chemical	10	7.8	7.8
Electrical and electronic	24	18.6	18.6
Medical	31	24.0	24.0
Food and beverage	35	27.1	27.1
Others	25	19.4	19.4
Total	129	100.0	100.0



Figure 4.4: Type of industry

Table 4.9 shows the type of industry which the respondent who took part in answering the questionnaire currently serve in. In this study, most of the respondents are in food and beverage industry with 35 respondents (27.1%). The data followed by Medical with 31 respondents (24.0%), others with 25 respondents (19.4%), electrical and electronics with 24 respondents (18.6%) and chemical with 10 respondents (7.8%). Automotive industry have the least percentage with only 4 respondents representing (3.1%) from 129 respondents

#### 4.4.1.5 Job title



Table 4.10: Job title of RespondentSource: SPSS Output

**Figure 4.5: Job title of Respondent** 

Table 4.10 and figure 4.5 illustrates Job title of the respondent who is participating in answering the questionnaire. In this study, most of the respondents are in manager position industry with 41 respondents (31.7%). The data followed by assistant manager with 30 respondents (23.3), supervisor with 30 respondents (23.3%) and other position with 21 respondents (16.3. Managing director position has the least percentage with only 7 respondents representing (5.4%) from 129 respondents.

#### 4.4.2 Independent variables

Source. Si SS Output						
	N	Minimum	Maximum	Mean	Std. Deviation	
Internal	129	1.40	5.00	3.84	0.934	
integration	- MAGING	40				
Supplier	129	1.40	5.00	4.00	0.936	
integration		K.A.				
Customer	129	1.20	5.00	3.97	1.025	
integration					1	
Valid N (listwise)	129					

 Table 4.11: Descriptive Statistics on Each independent variable
 Source: SPSS Output

The descriptive statistics in the table 4.11 showed internal integration, supplier integration and customer integration as the independent variable to contributing the supply chain performances within a firm. The table illustrates that supplier integration has the highest mean value of 4.00 followed by customer integration and internal integration contributing to the supply chain performance with the mean value of 3.97 and 3.84 respectively.

Besides that, standard deviation indicates the dispersion of a set of value and how close the gathered data. In this research, customer integration has the highest standard deviation value of 1.025 while internal integration has the lowest standard deviation. Furthermore, customer integration standard deviation value is positioned at 0.936. All the standard deviation value showed that the respondents are not deviated from the mean value.

#### Table 4.12: Descriptive Statistics on Each dependent variable

	N	Minimum	Maximum	Mean	Std. Deviation
Supply chain	129	1.11	4.89	3.9655	.986
performance					
Valid N (listwise)	129				

Table 4.12 illustrates the descriptive statistics of dependent variable which is firms supply chain performance with mean at 3.97 and standard deviation 0.986

# 4.4.2.1 Internal Integration in Supply Chain

	MALATSIA	6.				
	Table 4.13: Int	ernal I	ntegration in	Supply Chai	n (IV)	
	K	Sourc	e: SPSS Outr	out		
	F	N	Minimum	Mayimum	Mean	Std
	Ka.	14	Iviiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Iviaximum	Ivican	Deviation
	We are very attentive in	129	1	5	3.81	1.38
II1	our plant to the needs of other departments.	کل ہ	کنید	ىسىتى تىچ	اونيوم	
	We offer a functionally	129	1	5	3.72	1.24
II2	integrated system for	EKN	IKAL MAI	LAYSIA M	ELAKA	
	plant control.					
	Within our facility, we	129	1	5	3.88	1.18
	place a strong emphasis					
	on communication					
II3	between the divisions of					
	purchasing, inventory					
	management, sales, and					
	distribution.					
	Our company's	129	1	5	3.85	1.16
	divisions and					
II4	departments work					
	together to resolve					
	disputes when they					
	occur.					
115	The company's	129	1	5	3.93	1.19
115	departments and					

	divisions are actively collaborating with one another.					
Over	call	129	1	5	3.84	1.23
Valie	d N (listwise)	129				

The table 4.13 above showed that the internal integration factor in the firm which affects supply chain performance from 129 respondents. The overall mean value for internal integration is 3.84 with standard deviation of 1.23. Through the table above it showed the highest mean value is question 5 with the mean value of 3.93 and standard deviation of 1.19. This is because most of the respondents agree that their firm have their departments and division working interactively with each other's. It can make supply chain more effective and then leads to better supply chain performance. The second highest statement which agreed by the respondents is question 3 "Within our facility, we place a strong emphasis on communication between the divisions of purchasing, inventory management, sales, and distribution." with the mean value of 3.88 and standard deviation of 1.18. It followed by statement agreed most is the item II4 with the mean value of 3.85 and standard deviation of 1.16 where the statement states that "Our company's divisions and departments work together to resolve disputes when they occur."

4.4.2.2 Supplier Integration in Supply Chain

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 Table 4.14: Supplier Integration in Supply Chain (IV)
 Source: SPSS Output

		Ν	Minimum	Maximum	Mean	Std.
						Deviation
	Through digital	129	1	5	3.85	1.232
ST1	technologies, we					
511	communicate with our					
	principal suppliers.					
	Our strategic partnerships	129	1	5	4.09	1.135
SI2	with suppliers are quite					
	strong.					
SI3	With suppliers, we prepare	129	1	5	4.03	1.192
	extensively together to					

	achieve rapid response					
	ordering processes					
	(inbound).					
	Information on the	129	1	5	4.13	1.122
SI4	production and procurement					
514	processes is given to us by					
	our vendors.					
	We involve our supplier in	129	1	5	3.92	1.260
SI5	product development					
	process					
Over	all	129	1	5	4.00	1.188
Valid	N (listwise)	129				

The table 4.14 above showed that the supplier integration factor in the firm which affects supply chain performance from 129 respondents. The mean value for internal integration is 4.00 with standard deviation of 1.188. According to the table above it showed the highest mean value is question 4 with the mean value of 4.13 and standard deviation of 1.122. This is because most of the respondents agree that their suppliers provide information to them about manufacturing and purchasing processes. It can make supply chain more effective and then leads to better supply chain performance. The second highest statement which agreed by the respondents is question 2 "Our strategic partnerships with suppliers are quite strong." with the mean value of 4.09 and standard deviation of 1.135. It followed by statement agreed most is the item SI3 with the mean value of 4.03 and standard deviation of 1.192 where the statement states that "With suppliers, we prepare extensively together to achieve rapid response ordering processes (inbound)".

# 4.4.2.3 Customer Integration in Supply Chain

		Ν	Minimum	Maximum	Mean	Std.
						Deviation
CI1	With major customers, we have	129	1	5	3.87	1.301
CII	a high level of information					

#### Table 4.15: Customer Integration in Supply Chain (IV)

	exchange regarding market					
	information.					
	We communicate with major	129	1	5	3.91	1.302
CI2	customers through information					
	technology.					
	We also have a high level of	129	1	5	3.98	1.186
	collaborative planning and					
CI3	forecasting with major					
	customers in forecasting					
	demand.					
	Customers provide us with	129	1	5	4.11	1.134
CI4	feedback on our performance in					
	terms of quality and delivery.					
	We involve our key customers	129	1	5	3.96	1.325
CI5	in the process of creating new					
	products.					
Over	all	129	1	5	3.96	1.250
Valid	N (listwise)	129				

The table 4.15 above showed that the supplier integration factor in the firm which affects supply chain performance from 129 respondents. The overall mean value customer integration is 3.96 with standard deviation of 1.250. Through the table above it showed the highest mean value is question 4 with the mean value of 4.11 and standard deviation of 1.134. This is because most of the respondents agree that their customers give us feedback on our quality and delivery performance. The feedback directly improves supply chain more efficiency and then leads to better supply chain performance. The second highest statement which agreed by the respondents is question 3 "We also have a high level of collaborative planning and forecasting with major customers in forecasting demand." with the mean value of 3.98 and standard deviation of 1.186. It followed by statement agreed most is the item CI5 with the mean value of 3.96 and standard deviation of 1.325 where the statement states that "We involve our key customers in the process of creating new products".

#### 4.4.3 Firms supply chain performance (DV)

# Table 4.16: Firms supply chain performance (DV)

		N	Minimum	Maximum	Mean	Std. Deviation
	Our supply shain system are	120	1	5	3.01	1 225
SCD1	Our supply chain system are	129		3	3.91	1.333
SCP1	capable in lowering product					
	cost to final customer	100	1		2.00	1 102
C C D 2	Our supply network can easily	129		5	3.99	1.183
SCP2	change products to satisfy the					
	demand of our consumers.	100			2.00	1.005
acro	Our supply chain enables us	129	1	5	3.89	1.207
SCP3	to quickly launch new					
	products onto the market.					
	Our suppliers can quickly	129	1	5	3.95	1.292
SCP4	alter products to meet our					
	supply chains requirements					
SCP5	Our supply chain has a short	129	1	5	3.84	1.184
5015	production lead time					
	Our business has an excellent	129	1	5	4.06	1.210
SCP6	track record of providing on-					
	time deliveries to consumers.					
	In our supply chain, the	129	1	5	3.95	1.181
SCP7	percentage of perfect fulfilled					
	order is high					
	The delay between receiving	129	1	5	4.04	1.216
SCP8	customer's order to delivering	,	1 0			
	the item is minimal	2	u Charles	, min	اوىيۇ،	
	We recorded a small	129	1	5	4.05	1.377
SCP9	percentage of return product	IIKA	L MALA	<b>YSIA MEI</b>	AKA	
	by our major customer					
Overa	11	129	1	5	3.96	1.243
Valid I	N (listwise)	129				

The table 4.16 above showed the metrics of measuring firm's non-financial supply chain performances. The overall mean for non-financial supply chain performances is 3.964 with standard deviation of 1.243. According to the table above, question 6 has recorded the highest mean value with the mean of 4.06 and standard deviation of 1.210. This is because most of the respondents feels that their business has an excellent track record of providing on-time deliveries to consumers. The second highest statement which agreed by the respondents is question 9. "We recorded a small percentage of return product by our major customer" with the mean value of 4.05 and standard deviation of 1.243. It followed by statement agreed most

is the item SCP8 with the mean value of 4.05 and standard deviation of 1.377 where the statement states that "The delay between receiving customer's order to delivering the item is minimal". Lastly "Our supply chain has a short production lead time" recorded the least mean value which is 3.84 with standard deviation of 1.184.

# 4.5 Result of Measurement

Researchers were supervised by this section to examine the relationship between the dependent variable and the independent variable used in the study. Connection was rendered by validity and reliability of dependent variable and independent variables that had been used

# 4.5.1 Pearson Correlation Coefficient Analysis

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<b>Table 4.17: P</b>	earson Correla	ntion Coe	efficient .	Analysis
UNIVERSITI	TEKNIKAL	MAL/	AYSIA	MELAKA
	Source: SPS	5 Outpu	l	

	Internal	Supplier Integration	Customer
	Integration (IV1)	(IV2)	Integration (IV3)
Supply Chain	0.662	0.690	0.699
Performance (SCP)			
N	129	129	129

**Remarks: correlation is significant at the 0.01 level (2 tailed)** 

# Table 4.18: Strength of Pearson's Correlation Coefficient

Source: Developed form research

Independent Variables	Pearson's	Association Strength
	Correlation	
Internal integration	0.662	Strong relationship

Supplier integration	0. 690	Strong relationship
Customer integration	0. 699	Strong relationship

The table 4.17 shows the correlation value between all Independent Variables (IV1: Internal integration, IV2: Supplier integration IV3 Customer integration) and Dependent Variable (: Firm supply chain performance). Saunders et al, (2012) stated that correlation coefficient may describe the strength of the relationship between independent variables and dependent variables The correlation of Internal integration, supplier integration and customer integration were categorized as positive relation towards firm supply chain performance as correlation value are 0.662, 0.690, 0.699 respectively.

The first independent variable was Internal integration with the 0.662 correlation coefficient (r) value. The correlation between the supplier integration and firms supply chain performance was 0.690. The correlation of third independent variable was the Customer integration with 0.699 correlation coefficient (r) value. All three independent variable had strong positive relationship with dependent variable because the results showed the correlation coefficient (r) value were between 0.5-0.69

Based on the table below, the relationship between the three independent variables and dependent variable were positive strong relationship. It showed that all the independent variables were associated with the dependent variable of the firm supply chain performance.

Pearson Coefficient(R)	Strength of relationship
0.70-1.00	Very strong relationship
0.50-0.69	Strong relationship
0.30-0.49	Moderate relationship
0.10-0.29	Weak relationship
0.01-0.09	No relationship

LIMIVED CITI TE	ZAUZAL M	AL AVOLA	
Table 4.19: Value of Pearson	Coefficient (R)	and the Stre	ngth of Relationship

#### 4.6 Hypothesis Testing

The research need hypothesis testing to determine whether this research could accept or reject the constructed hypothesis. The multiple regression analysis used as hypothesis testing of the research. To evaluate the relation between a dependent variable and independent variables, MRA was used. The significant level was resulting from MRA. The significant level of the research was presented by a range of value. Meaning it was important if the mean value was below 0.05. The mean level is not relevant if the mean level is above 0.05. The most significant level of the variable was 0.00.

#### 4.6.1 Multiple Regression Analysis

In order to test the hypotheses in this research, multiple regression analysis was conducted. Multiple regression analysis is an extension of linear regression for examining the relationship between two or above independent variables (Alistair, K.Hall, and A.Kzub 2002). There are three independent variables which are Internal integration, Supplier Integration, and customer integration at the same time the dependent variable supply chain performance. Therefore, the analysis results showed as below tables.



Source: SPSS Output

Model	<b>B</b> INI	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736a	.542	.531	.67493
			· · · · · · · · · · · · · · · · · · ·	

a. Predictors: (Constant) internal integration (IV1), Supplier integration (IV2), Customer integration (IV3)

b. Dependent variable: Supply chain performance (DV)

#### Table 4.21: ANOVA

Model		Sum of	df	Mean	F	Sig.
		Squares		Square		
1	Regressio	67.423	3	22.474	49.336	<.001b
	n					

Source: SPSS Output

Residual	56.942	125	.456	
Total	124.365	128		

a. Predictors: (Constant) internal integration (IV1), Supplier integration (IV2), Customer integration (IV3)

b. Dependent variable: Supply chain performance (DV)

Table 4.20 and 4.21 above indicates the results of multiple regression from SPSS software which presented as a model summary and ANOVA. R is the measurement of quality for the dependent variable and R square is the variance's proportion which can be found in the dependent variable. The value of R=0.736 and the coefficient of determination (R square) is 0.542. The suggested that supply chain performance got 54.2% that influence by the supply chain integration contributing factor. The rest (100%-54.2%=45.8%) was influenced by other factors. the adjusted R square value is 0.531, which is shown as 53.1% of the variance of dependent variable and which is the supply chain performances can be demonstrated by the three independent variables.

Based on table 4.18 ANOVA, the overall results show that F-test value is 49.336 with a significant level of <0.001. A p-value is smaller than 0.05 (p < 0.05), a significant relationship was presented between internal integration, supplier integration and customer integration towards the firms supply chain performances.

Mo	del	Unstandardized		Standardized	t	Sig.
		Coeff	icients	Coefficients		
		В	Std. Error	Beta		
1	(Constant)	.804	.272		2.961	.004
	Internal	.217	.112	.205	1.943	.054
	Integration					
	Supplier	.269	.125	.255	2.144	.034
	integration					

# Table 4.22: Coefficients

Source: SPSS Output

Customer	.316	.111	.329	2.854	.005
integration					

According to table 4.22, there are three independent variables including. Each of the independent variables provides a contribution which is used to determine supply chain integration dimension towards SCP. First, the strongest predictor is Customer integration,  $\beta = 0.329$ , t (129) = 2.854, p<0.05 (0.005). This is because the unstandardized beta,  $\beta$  of Customer integration has the highest influence of positive relationship with the supply chain integration towards the firms supply chain performances

Then, the second strongest predictor is Supplier integration,  $\beta = 0.255$ , t (129) = 2.144, p<0.05 (0.034). This is because the unstandardized beta,  $\beta$  of length or Supplier integration is the second highest positive value compared to other independent variables and it also has the second highest influence of positive relationship with the supply chain integration towards the firms supply chain performances

Finally, the lowest predictor is the Internal Integration,  $\beta = -0.205$ , t (129) = -1.943, p>0.05 (0.054). This is because the unstandardized beta,  $\beta$  of congruence between the company's products and the cause is the lowest positive value compared to other independent variables. Thus, Internal integration can be assumed that it has no significant relationship with firm supply chain performance.

From the result above, although each of the independent variables has different value and rank of influence towards the dependent variable, each of them has developed different contribution and provide a significant prediction towards the firm supply chain performance. Based on the following multiple regression equation, the relationship between the dependent variable and the three different independent variables can be determined. The multiple regression of this study is:

$$Y = a + bX_1 + cX_2 + dX_3$$
$$Y = 0.804 + 0.217X_1 + 0.269X_2 + 0.316X_3$$

Where:

# Table 4.23: Equation of Multiple Regression Analysis

Source: (Saunders, Lewis & Thornhill, 2016)

a	Constant/Other influences
b	Influence of X1 (Internal integration)
С	Influence of X <sub>2</sub> (Supplier integration)
d	Influence of X <sub>3</sub> (Customer integration)
Y	Dependent Variable (Firms supply chain performance)
X1, X2, X3	Independent Variables

Based on the linear equation above, all the independent variables had a positive relationship which were Internal integration, Supplier integration and customer integration as the supply chain integration contributing factors towards Firm's supply chain performance



# Hypothesis 1

Hypothesis 1 is testing internal integration and Firm's supply chain performance

# **Internal Integration**

Hol: There is no significant relationship between internal integration and Firm's SCP

H11: There is a significant relationship between internal integration and Firm's SCP

Based on table 4.21, the result of regression to support internal integration against supply chain performance was shown. The significant value for Internal integration is 0.54 > 0.05. The result from MRA demonstrate that Internal integration has no significant relationship with firm's supply chain performance. As conclusion, researcher rejected the alternative hypothesis H<sub>1</sub>1and accepted the null hypothesis H<sub>0</sub>1

# Hypothesis 2

Hypothesis 2 is testing supplier integration and Firm's supply chain performance

# **Supplier integration**

Ho2: There is no significant relationship between supplier integration and Firm's SCP

H<sub>1</sub>2: There is a significant relationship between supplier integration and Firm's SCP

From the table above, the result of regression for supplier integration towards firm's supply chain performance was showed. The significant value for supplier integration was 0.034 < 0.05. The result from MRA demonstrate that supplier integration had significant relationship with Firm's supply chain performance. As conclusion, the alternative hypothesis (H<sub>0</sub>2) is accepted while null hypothesis (H<sub>1</sub>2) is rejected

# Hypothesis 3

#### **Customer integration**

Ho3: There is no significant relationship between customer integration and Firm's SCP

H<sub>1</sub>3: There is a significant relationship between customer integration and Firm's SCP

From the table above, the result of regression for customer integration towards firm's supply chain performance was showed. The significant value for supplier integration was 0.005 < 0.05. The result from MRA demonstrate that supplier integration had significant relationship with Firm's supply chain performance. As conclusion, the alternative hypothesis (H<sub>0</sub>3) is accepted while null hypothesis (H<sub>1</sub>3) is rejected

#### Table 4.24: Hypothesis Testing

Source: Developed form research

Hypotheses	P-Value	Result
H1: There is no significant relationship	0.054	0.054 Rejected
between internal integration and Firm's SCP	0.054	

H2: There is a significant relationship between supplier integration and Firm's SCP	0.034	Accepted
H3: There is a significant relationship between customer integration and Firm's SCP	0.005	Accepted

To conclude, table 4.24 above indicated H1 is rejected where H2 and H3 are accepted. This research stated that there is a significant relationship between the supply chain integration variables and Firm's Supply chain performance.

# 4.7 Summary

The overall finding of this study through the SPSS source showed that the effect of supply chain integration on firm's supply chain performance. The data obtained in this chapter had been analysed using reliability testing, descriptive statistics, and hypothesis testing. The overall results revealed that the relationship between the independent variables and dependent variable had been analysed, revealing that one of the factors was rejected and accepting two of the factors. The rejected hypothesis was internal integration and another two of accepted hypothesis which were Supplier integration and customer integration.

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# **CHAPTER 5**

# DISCUSSION, CONCLUSION AND RECOMMENDATION

#### 5.1 Introduction

This chapter reviews the results of this study were discussed. In this section, all the issues of research objectives, literature review, and research methods were briefly discussed. Following this, a discussion of the study was discussed. In this chapter, the tests results of data analysis are introduced. Next, the implications of this research are discussed. This follows with some recommendations for further research. Finally, followed by the conclusion of the thesis.

#### **5.2 Discussion of Major Findings**

#### 5.2.1 Research Objective 1: To identify the factors that contributes to SCI towards SCP.

To achieve the first research objective, researcher had found out the factors contributing to employee mental health which is explained in chapter two. Researcher had also explained the relationship between the dependent variable which is supply chain performance and independent variables which is supply chain integration. The independent variables such as Internal integration, Supplier integration and Customer integration was presented as the most determinants from previous research, (Ganbold, et al,2020) the researcher examines the different supply chain integration dimensions mentioned which affects the supply chain performance within a firm through several literature review. Therefore, objective Research objective 1 had been achieved

### 5.2.2 Research Objective 2: To analyze the relationship between and SCI on firm SCP.

To achieve the research objective 2, SPSS software was used by the researcher to validate the result of the explanatory factor. In the study, there are 3 different independent variables related with supply chain integration which is Internal integration, Supplier integration and Customer integration. Through the hypothesis testing with the effects of the independent variables towards firm's non-financial supply chain performances, there were one supply chain integration measures was rejected. In this study, supply chain integration measures that been accepted were and Customer integration and supplier integration. The supply chain integration measures that been rejected is Internal Integration.

# Table 5.1: Summary of Hypothesis Testing

### (Resources: SPSS Output)

Hypotheses	Sig.	Result
H1: There is no significant relationship between internal integration and Firm's SCP	0.054>0.05	Rejected
H2: There is a significant relationship between supplier integration and Firm's SCP	0.034<0.05	Accepted
H3: There is a significant relationship between customer integration and Firm's SCP	0.005<0.05	Accepted

With the table above illustrating the significant value of Supplier integration and Customer integration were 0.005 < 0.034 < 0.05. Therefore, according to the multiple regression analysis we can conclude that Supplier integration and Customer integration had the significant relationship towards supply chain performance. However, the significant value for Internal integration was 0.054 > 0.05 so the multiple regression analysis can be assumed that Internal integration has no significant relationship on firm's supply chain performance.

#### **Internal Integration**

# Hypothesis 1 There is no significant relationship between internal integration and Firm's SCP

The result above showed that internal integration of the company doesn't affects the firm's supply chain performance in the hypothesis 1. The p-value of Internal integration is 0.054 which is lower than 0.05 according to the MRA result from previous chapter. From the result obtained from chapter 4, we can conclude that there is no significant relationship between internal integration and supply chain performance.

Internal integration includes the collaboration of departments such as production, procurement, sales, distribution, and warehouse in which internal information exchange occur. For instance, better production planning can reduce product costs and inventory levels by using information like sales forecasts. (Anurodsingh, et al, 2020). According to previous research,

The use of IT and business applications enhances an organization's functionality and supports data and information processing. It improves SC planning efficiency and forecast precision as internal integration allows information within organisation to be processed in a structured and organised way.

However internal integration does not always result in optimal performance which is proven by (Zhao et al., 2020). Internal integration requires external interventions. For example, to achieve improvement in firm's supply chain performances, companies are required to invest in physical infrastructure and improve their IT capabilities. It can be useful especially during capacity planning in facing environment uncertainty. This is proven by previous study where supply chain integration is positive related to information system infrastructure and affects manufacturing performances (Verra, et al, 2018). The second possible reason is that Malaysia as a developing country, the manufacturing sector is not developed as quickly as other develop countries such as China and US. Some organizations are still working with old technologies with minimal infrastructure which inhibits the impact of internal integration towards supply chain performance as internal integration are mostly IT-driven (Anurodsingh, et al, 2020).

In conclusion, the significant value of internal integration 0.054 was more than 0.05 so the null hypothesis (H<sub>0</sub>) was accepted, and the alternative hypothesis (H<sub>1</sub>) was rejected. There is no significant relationship between the internal integration towards the firm's supply chain performances **UNVERSITITEKNIKAL MALAYSIA MELAKA** 

#### **Supplier Integration**

# Hypothesis 2 There is a significant relationship between supplier integration and Firm's SCP

The result above showed that Supplier integration of the company has a significant relationship towards firm's supply chain performance in the hypothesis 2. The p-value Supplier integration is 0.034 which is lower than 0.05 according to the multiple regression analysis result from chapter 4. From the result obtained from chapter 4, we can conclude that there is significant relationship between supplier integration and SCP.

Based on previous research, supplier integration serves as a catalyst for the growth of resilience and robustness, which are two crucial qualities every company should possess, especially in disruptive environments like the COVID-19 age. (Hendijani, et al, 2022).
According to (Ganbold, et al,2020). To reduce inventory level, coordinate task and sharing information with suppliers about inventory production planning are likely to be beneficial. Firm's will have more capacity to complete other more important task instead of spending resources in managing inventory. It significantly improves firm's supply chain effectiveness. Moreover, as stated in Ganbolt's studies, if there is good coordination regarding supply activity and production with supplier organization, there is higher chances that a firm will success in on-time and perfect product delivery to customer.

Supplier integration specifically encourages efficient information exchange, prompt production plan modification, and quick material delivery. (Chen, et al, 2022) The degree of supplier engagement and integration in SC may vary depending about every firm. In this case, supplier should involve ion one or more business process to bring improvement to the firm. The involvement might depend on the technical capabilities as well as the supply chain objective of the supplier firm. Past research states that there are several benefits of supplier integration in supply chain. It includes minimizing cost, improved trust, and shared responsibility by taking advantage of supplier technologies skills and knowledge of the supplier. (Abdallah, et al 2019; Abu Nimeh et al, 2018). It helps the firm by improving product design, reduce design cost and eliminate waste. Thus, it can be concluded that supplier integration allows firm to create competitive advantage and improve overall supply chain performance of a firms.

In conclusion, the significant value of supplier integration 0.005 was less than 0.05 so the alternative hypothesis (H<sub>1</sub>) was accepted, and the null hypothesis (H<sub>0</sub>) was rejected. There is significant relationship between the supplier integration towards the firm's supply chain performance

#### **Customer Integration**

# Hypothesis 3 There is a significant relationship between customer integration and Firm's SCP

The result above showed that Customer integration of the company has a significant relationship towards firm's supply chain performance in the hypothesis 3. The p-value Customer integration is 0.005 which is lower than 0.05 according to the multiple regression analysis result from chapter 4. From the result obtained from chapter 4, we can conclude that Customer integration has a significant relationship with firm's supply chain performance.

Based on previous research, customer integration is found to impact operational performance which including product quality, delivery, cost of production, flexibility, inventory level and customer service. (Ganbold, et al,2020). This is because the objective of supply chain integration is to provide maximum value to customer, therefore, integration from customer is crucial in improving customer satisfactions. Previous studies also highlighted that to achieve better customer integration, it is crucial to share information across departments by utilizing latest IT system. One of the many advantages of integration with customer on the business' supply chain performance is lower inventory costs, improved customer satisfaction, and shorter lead times.

Customer integration includes core competencies resulting from coordination with main customers. In this case, frequent communication, information sharing, demand forecast, and collaboration are likely to result in improved firm's supply chain performance in terms of effectiveness and efficiency of supply chain. This result is aligned with the reported rational shift from customer driven supply chain to customer centric supply chain according to (Martinelli, et al,2019). In this study, researcher have proof that the role of customer integration is becoming more and more crucial in the context of supply chain management. Lastly, the result from this research is also aligned with previous research by (Feng et al, 2010) which customer integration is significant to improve supply chain performance. This is because Customer integration resulted in improved quality, innovativeness and speed up the product development process. It led to improve competitive advantage of a firm.

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In conclusion, the significant value of customer integration 0.005 was less than 0.05 so the alternative hypothesis (H<sub>1</sub>) was accepted, and the null hypothesis (H<sub>0</sub>) was rejected. There is significant relationship between the customer integration towards the firm's supply chain performance

# 5.2.3 Research Objective 3: To determine the significant impactful contributing factors towards SCP

For the third research objective, the result from Multiple Regression Analysis showed that the most impactful contributing factors of firm's Supply chain performance was Customer integration. From the result in table 4.21, the standardized coefficients (Beta) value showed that the highest value was 0.329. Among all three supply chain integration measures, the respondent for this research is more agree on Customer integration affected the supply chain

performance in a firm. Therefore, by this study, we can suggest that Customer integration are the most impactful contributing factors towards SCP. To improve supply chain performance, manufacturer and business in Malaysia are recommended to have intense integration with their customers to enable the efficient flow of information and products. Besides, company was benefits from the operational cost reduction and customer value creation.

#### **5.3 Implication of the study**

To discover the relationship between SCI dimensions and company SCP, the research findings are analyzed. The researcher had used SPSS software to analyze the collected data such as pilot test, Cronbach alpha, multiple regression analysis az variable. In conclusion Supplier Integration and Customer Integration have positive relationship to the supply chain performance while Internal integration have negative relationship to supply chain performance.

Besides that, this study had also tested the link between different dimension of SCI towards SCP which previously have been investigate separately in previous literature. It allows future initiatives and studies to understand about SCI and the improvement towards Firms performance This study contributes to knowledge by developing theoretical prediction regarding the relationship between multidimensional variables of SCI and SCP. Furthermore, This study developed a conceptual framework that might be helpful for businesses, particularly those in the manufacturing sector, which are having trouble selecting how much integration and how to allocate resources to important supply chain partners. It enhances the understanding of SCI for managerial practice and implication. This is because SCI may be standard in many organizations, but not all form of integration results in information sharing. Therefore, the success of integration depended on the trust and commitment to the integration of stakeholders which aligned with the firm's operation goals

Besides the result from this study helps to upper managers in manufacturing firm to identify the particular important role of customer integration in effecting supply chain performance over supplier integration and Internal integration. As the latest trend of customer centric supply chain management, this study allows firms to understand the importance of customer integration in creating competitiveness and competencies This makes firms are more flexible in encountering changes and disruption in supply chain. This information is important in decision making of investing time and dedicated resources to build trust relationship with its customer to improve supply chain performance.

This study also revealed that supplier integration was also affecting SCP. This study guides managers to create intense integration with their supply chain partners to improve their supply chain operations performances. Our finding allows business owner and supply chain operator to encourage supplier integration for supply chain performance improvement. While firm realized the importance of supply chain partners in achieving success, they face difficulties in understanding these information and resources. Our result has proof that there is clear advantage of implementing integration practices with major supplier and customers. Managers should improve the collaborative mechanism with supplier so that the firm can reduce procurement cost instead of constantly changing supplier whenever a lower price is offered.

Firms can benefit significantly from improved performance by engaging with significant suppliers and customers on information sharing, collaborative planning, and innovative product creation. Therefore, it is suggested that managers should be more concentrate on creating integrated supply chains to overcome the environment uncertainties. Managers should also invest in information sharing technologies that will enhance supplier and customer integration which will facilitate information exchange with key supplier and customer. Overall, managers of Malaysian manufacturing firms should concentrate on enhancing their SCP by putting into practice on efficient SCI tactics.

#### 5.4 Limitation of the study

There are some limitations in conducting the research. For example, the researcher has only around 4 months to collect information and look for respondent for this research. The duration for the data collection is from November 2022 to January 2023, which in this period, researcher send the questionnaire to the targeted respondents through email. Furthermore, the result from this research may not be applies in other industries in Malaysia. This is because of the study was conducted from manufacturer perspective only. Besides that, the scope of study is limited to the Malaysian contexts only. The geographical location chosen is Melaka which

the result may vary if the suggested framework is tested on other geographical location in Malaysia or other developed countries.

Moreover, the actual data collected is considered as 'fair' in satisfying the requirement of the study. Researcher facing difficulties in collecting sufficient data for the research according to the proposed sample size. Due to time limitation, researcher can only distribute the survey questionnaire by using google form send via email, LinkedIn, WhatsApp, and Facebook to different representative of the company. Some of the respondent refused to spend their time answering the questions which. The honesty of respondents is also one of the limitations in conducting this research.

Lastly this study doesn't consider the latest trend and issue in the business world, this may undermine firm's ability to discover new opportunities and cope with future problems. For the internal integration, there might be other factor that have influence the result of the research such as technological capabilities which were not mentioned in this study which leads to rejected result.

#### 5.5 Recommendation for future research

Due to time constraints, it may be difficult for the researcher to generalize more respondents. Therefore, larger sample size and more respondents should be added to more companies and industries to be collected in wider geographical area. This is because data collected from larger population can generate more accurate and precise result. Besides that, respondents should also be focused on upper management positions such as supply chain manager and director to generate more valid and reliable result representing Malaysia industries. Future research should also include more mediating variables such as innovativeness and supply chain flexibility to measure different dimension and contributing factors of supply chain Integration. This also applies on the performance measures which future study are suggested to include financial performance such as growth in sales and revenue in their studies.

Lastly, the coefficient of determination (R Square) is 0.542. This discussed that the supply chain performance in firm in Malaysia is 54.2% influence by the Internal integration, Supplier Integration and Customer Integration. The rest 45.8% was explained by other factors. Therefore, future research are suggested to explore more supply chain performance contributing factors.

#### **5.6 Conclusion**

In conclusion, supply chain performance has received more and more attention from the public and the industries. This study provide support for the positive effect of different SCI dimension and their effects towards SCP. This study extends the literature by indicating the importance of differentiating three types of SCI towards operational performances. Through questionnaire, it was found that Malaysia manufacturer agree that customer integration as the most impactful contributing factors towards SCP. Therefore, investigating the contributing factors for supply chain performance are crucial. Supply chain integration as the factors affecting SCP it is crucial for researcher and managers to understand the how impactful is the supply chain integration dimension towards SCP. Therefore, managers in manufacturing firms who are totally not involved in the initiative of supply chain integration should start aggressively managing SCI Through the finding of this research, most of the respondent agree that customer integration most significant factors in affecting SCP. Communication and trust relationship with customer should be enforced in supply chain to create a customer centric supply chain. Besides, manufacturing companies should also invest in IT and technological capabilities to enhance supplier integration and internal integration.

#### 5.6 Summary

The three-research objective had achieved by the researcher which are to to identify the factors that contributes to SCI towards SCP, analyze the relationship between and SCI on firm SCP and determine the significant impactful contributing factors towards SCP. The implication, limitation and recommendation of the research to guide future researcher about the similar research had been done in this chapter, the overall result of the study had been discussed in the last part of chapter 5

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Appendix 1



### SURVEY QUESTIONNAIRE

The Effects of Supply Chain Integration on Firm's Supply Chain Performance

#### Dear respondents

My name is Khoh Joo Leh and final year student of Universiti Teknikal Malaysia Melaka (UTeM) in Bachelor of Technology Management (Supply Chain Management and Logistics) with Honors. Currently I am conducting research on 'The effects of supply chain integration on firm's supply chain performance'. This survey is a part of research for completing Final Year Project (FYP).

This questionnaire consists of 3 section (A,B,C) and it will take approximately 5-10 minutes to complete the questionnaire. Your participation will greatly be contributed to the findings of the research. I am deeply appreciating your time and help in participating this survey. All the information provided will be confidential and used for academic purposes only

Your cooperation is highly appreciated. Thank you

Sincerely, Khoh Joo Leh Email address: Contact number:



Supervised by,

Dr. Nusaibah Binti Mansor

Email address:

Faculty of Technology Management and Technopreneurship

Universiti Teknikal Malaysia Melaka (UTeM)

**Responden yang dihormati** 

Nama saya Khoh Joo Leh dan saya pelajar akhir tahun dari Universiti Teknikal Malaysia Melaka dalam pengurusan teknologi dalam rantaian belakan dan logistik. Pada masa ini saya sedang menjalankan penyelidikan tentang kesan integrase rantaian belakan terhadap prestasi rantaian bekalan firma. tinjauan ini adalah sebahagian daripada penyelidikan untuk menyiapkan Projek Tahun Akhir (FYP).

Soal selidik ini mengandungi 5 bahagian (A, B, C) dan akan mengambil masa lebih kurang 5-10 minit untuk disiapkan. Peserta anda akan banyak menyumbang kepada penemuan penyelidikan. Saya amat menghargai masa anda dan membantu dalam mengambil bahagian dalam tinjauan ini. Semua maklumat yang diberikan adalah sulit dan digunakan untuk tujuan akademik sahaja.



#### Section A: Demographic Information of Respondent.

#### BAHAGIAN A: LATAR BELAKANG DEMOGRAFI

This section is to collect the information of respondents about the personal background. Please answer the question below by selecting the appropriate option.

Bahagian ini adalah untuk mengumpulkan maklumat responden tentang latar belakang peribadi. Sila jawab soalan di bawah dengan memilih pilihan yang sesuai.

Please tick ( $\checkmark$ ) the appropriate answer in the box provided.



# SECTION B: SUPPLY CHAIN INTEGRAION DIMENSION

### BAHAGIAN B: DIMENSI INTEGRASI RANTAIAN BEKALAN

Please rate and select the satisfying level (1-5) that best reflects your opinions towards the questions.

Sila nilai dan pilih tahap memuaskan (1-5) yang paling menggambarkan pendapat anda terhadap soalan.

Scale / Skala:

1 2 3 4	4 5
---------	-----

Strongly Disagree /	Disagree	/	Neutral /	Agree / Setuju	Strongly Agree /
Sangat Tidak	Tidak Setuju		Neutral		Sangat Setuju
Setuju					

# **Part 1: Internal integration.**

Internal integration can be described as the cooperation of all internal operations such as purchasing, manufacturing and sales and other department in a company. It aims to develop and share the internal resources and information in order to satisfy customer needs

Integrasi dalaman boleh disifatkan sebagai kerjasama semua operasi dalaman seperti pembelian, pembuatan dan jualan serta jabatan lain dalam sesebuah syarikat. Ia bertujuan untuk membangunkan dan berkongsi sumber dan maklumat dalaman untuk memenuhi keperluan pelanggan

No	Statement 1 2	3	4	5
1	We are very attentive in our plant to the needs of other			
	departments.			
	Kami mempunyai tahap tindak balas yang tinggi dengan			
	kilang kami untuk memenuhi keperluan jabatan lain			
2	We offer a functionally integrated system for plant control.			
	Kami mempunyai sistem bersepadu merentas kawasan			
	berfungsi kawalan kilang			
3	Within our facility, we place a strong emphasis on			
	communication between the divisions of purchasing,			
	inventory management, sales, and distribution.			
	Di dalam kilang kami, kami menekankan aliran maklumat			
	di kalangan bahagian pembelian, pengurusan inventori,			
	jualan dan pengedaran			
4	Our company's divisions and departments work together to			
	resolve disputes when they occur.			

	Jabatan dan bahagian dalam syarikat kami bekerjasama			
	untuk menyelesaikan konflik antara mereka, apabila ia			
	timbul			
5	The company's departments and divisions are actively			
	collaborating with one another.			
	Semua jabatan dan bahagian dalam syarikat bekerja secara			
	interaktif antara satu sama lain			

# **PART 2 Supplier integration.**

Supplier integration defined as a process of company and supplier sharing operational, financial, and strategic knowledge in order to achieve mutual benefits. / Integrasi pembekal ditakrifkan sebagai proses perkongsian syarikat dan pembekal pengetahuan operasi, kewangan dan strategik untuk mencapai faedah bersama.

No	Statement	1	2	3	4	5
1	Through digital technologies, we communicate with our		1			
	principal suppliers.					
	Kami berkongsi maklumat dengan pembekal utama kami					
	melalui teknologi maklumat		1.			
2	Our strategic partnerships with suppliers are quite strong.	5				
	Kami mempunyai tahap perkongsian strategik yang tinggi dengan pembekal	IEL/	<b>AKA</b>			
3	With suppliers, we prepare extensively together to achieve					
	rapid response ordering processes (inbound).					
	Kami mempunyai tahap perancangan bersama yang tinggi					
	untuk mendapatkan proses pesanan tindak balas pantas					
	(masuk) dengan pembekal					
4	Information on the production and procurement processes is					
	given to us by our suppliers.					
	Pembekal kami memberikan maklumat kepada kami tentang					
	proses pengeluaran dan perolehan					
5	We involve our supplier in product development processes					

Pembekal kami terlibat dalam proses pembangunan produk			
kami			

## PART 3 Customer integration

Customer integration is the organizational practices of identifying, explaining, and using customers to produce specific products according to customer demand in order to maximize their expectation and satisfaction / Integrasi pelanggan ialah amalan organisasi mengenal pasti, menerangkan dan menggunakan pelanggan untuk menghasilkan produk tertentu mengikut permintaan pelanggan untuk memaksimumkan jangkaan dan kepuasan mereka.

No	Statement	1	2	3	4	5
1	With major customers, we have a high level of information					
	exchange regarding market information.					
	Kami mempunyai tahap perancangan dan ramalan bersama					
	yang tinggi dengan pelanggan utama untuk menjangka					
	keterlihatan permintaan					
2	We communicate with major customers through					
	information technology.	vi	ويب			
	Kami berkongsi maklumat kepada pelanggan utama melalui		. 1.Z. A			
	teknologi maklumat	IEL	AKA			
3	We also have a high level of collaborative planning and					
	forecasting with major customers in forecasting demand.					
	Kami mempunyai tahap perancangan dan ramalan bersama					
	yang tinggi dengan pelanggan utama untuk menjangka					
	keterlihatan permintaan					
4	Customers provide us with feedback on our performance in					
	terms of quality and delivery.					
	Pelanggan kami memberi maklum balas tentang kualiti dan					
	prestasi penghantaran kami					
5	We involve our key customers in the process of creating					
	new products.					

Kami melibatkan pelanggan utama kami dalam peringkat			
reka bentuk dan pembangunan produk			

# SECTION C Supply Chain performance Prestasi rantaian bekalan

No	Statement	1	2	3	4	5
1	Our supply chain system are capable in lowering product					
	cost to final customer					
	Sistem rantaian bekalan kami mengurangkan jumlah kos					
	produk kepada pelanggan akhir					
2	Our supply network can easily change products to satisfy					
	the demand of our consumer					
	Rantaian bekalan kami boleh mengubah suai produk dengan					
	cepat untuk memenuhi keperluan pelanggan ini		1			
3	Our supply chain enables us to quickly launch new products					
	onto the market.					
	Rantaian bekalan kami boleh memperkenalkan produk		ig			
	baharu dengan pantas ke pasaran	0-				
4	Our suppliers can quickly alter products to meet our supply	IEL/	AKA			
	chains requirements					
	Pembekal kami boleh mengubah suai produk dengan cepat					
	untuk memenuhi keperluan rantaian bekalan kami					
5	Our supply chain has a short manufacturing lead time					
	rantaian bekalan kami mempunyai masa utama pembuatan					
	yang singkat					
6	Our business has an excellent track record of providing on-					
	time deliveries to consumers.					
	Syarikat kami mempunyai rekod cemerlang dalam					
	penghantaran tepat masa kepada pelanggan kami					
7	In our supply chain, the percentage of perfect fulfilled order					
	is high					

	Dalam rantaian bekalan kami, peratusan pesanan yang			
	sempurna dipenuhi adalah tinggi			
8	The delay between receiving customer's order to delivering			
	the item is minimal			
	Masa antara penerimaan pesanan pelanggan dan			
	penghantaran barang adalah singkat			
9	We recorded a small percentage of return product by our			
	major customer			
	Peratusan produk yang dipulangkan oleh pelanggan utama			
	kami adalah rendah			



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# **APPENDIX 2**

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WEEK/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1
ACTIVITIES																
FYP talk																
Search for FYP topic									М							
Meeting with supervisor									I D							
Topic discussion																
Title confirmation																
RO & RQ									S							$\vdash$
Construction									E M							
Submission Chapter 1									E							
Submission Chapter 2	1.1.1.1								T T							
Submission Chapter 3		T'A	40.						E R							
First draft of FYP 1			1						ĸ							
Submission of FYP 1	•=			3e*					B R				r I			
Presentation 1									Е		7					
Revised of FYP									A K							
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# Gantt Chart of Final Year Project (FYP) 1

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

# **APPENDIX 3**

# Gantt Chart of Final Year Project (FYP) 2

WEEK/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACTIVITIES																
Create Questionnaire									M							
Distribute																
Questionnaire									D							
Collect Questionnaire									a							
Analysis Data									S E							
Submission Chapter 4									M							
Submission Chapter 5	AYS	4	0.						E S							
Proposal Correction			P.K.A						Т							
Slide Preparation	-								R							
Submission of FYP 2					0				В	7	V					
Presentation 2									R							
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