CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The main goal for many businesses' enterprise is to strengthen its market position among its competitors and maximize their profit. However, this major goal is difficult to achieve if social and ecological requirements are ignored. A business can improve profitability if they take into consideration community, society, and environment. This is due to the global demand for sustainable products is rising significantly which drive the company to comply with the legal regulations and growing environmental awareness to find solution. For this reason, the primary goal for business owners is to achieve maximum profit is impossible without achieving superior environmental performance that will lead to achieve competitive advantages and improve social performance.

The trend for manufacturing firms towards superior environmental impact has been at the centre of interest for researchers and scholars (Bacallan, 2000; Jia & Wang, 2019). Tan & Shaharudin (2016) prove that practices of GSCM play important role in boosting environmental performance through business integration that is considered to remove negative environmental impacts from normal supply chain management. This practise will enable the company to achieve competitive advantages and improve social performance. However, green practices are one of the strategies and methods for environmental improvement and it is an operational initiative where many companies are adopting to address such environmental issues, including corporations in the South East Asian region (Rao & Holt, 2005).

In the past decades, the continuous increase of environmental concerns, government regulations and stronger public awareness to protect the environment it leads firms to take serious action regarding the environmental issues that happening in our world (Taseer et al., 2018). In reality, organizations generally are using resources and generate emissions of toxic waste to function their products into the environment during product manufacturing (Ahmed et al., 2018). The term of green it has been used to reflect and represent the view of environmental, economic and social impact on the organization's activities (Rasit et al., 2019). However, green supply chain management (GSCM) is an emerging field propelled by the need to be environmentally conscious.

In general, green or sustainable business will be defined as any firm that influences the green actions to be environment friendly to generate that each product, process and manufacturing activity sufficiently deal with existing environmental issues besides retaining its profit (Khairani, 2012). In recent days, scholars and researchers make developed of interest in the science behind GSCM (Shafique et al., 2017). These practitioners are utilizing the knowledge of GSCM to minimize waste and preserve the quality of life of the product and the natural resources around the company's premises (Tseng et al., 2019). Hence, these emissions are not highly important compared to the generation of product emissions during the life cycle (Farabi et al., 2019). Thus, it is important to reduce the negative impact of the activities on the environment by reconsidering its traditional supply chain management practices. Hassan (2016) claim that environmental degradation has become a significant concern to the enterprises as their unsustainable strategies created damage to the environment raising social awareness.

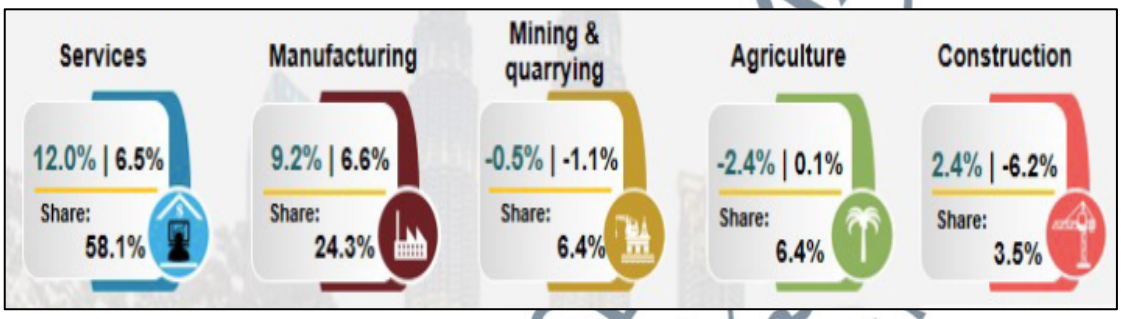
The increase in the regulations of international environmental and consumer concern toward the protection of the environment has proved the significance of

environmental management in the manufacturing process (Taseer et al., 2018). Due to these pressures, manufacturing enterprises are impelled to actively take part in environmental management to fulfil the necessity of sustainable development (Shafique et al., 2017). Besides that, the manufacturing industry is considered as one the places, which employs a large workforce and ranking as the highest footprint and affects the community. Attribute to the consequence of the manufacturing industry to the society, the industry participated in contributing and promoting sustainability (Çankaya & Sezen, 2019).

The implementation of GSCM is gaining popularity in the Asian region through external pressure from the European region. In addition, both customers and general public's demand for green products have driven Malaysian manufacturing industry to turn in this direction. For instant, major market players are demanding more sustainable products which drive world's largest manufacturers such as Nestlé, Unilever, Pepsico and Danone to move away the use of disposable plastic and promise their customers recyclable, compostable or reusable products by 2025 (Keating, 2022). These brands are united behind a set of principles for safe and environmentally responsible chemical recycling of plastic waste, arguing that such methods have a role to play in combatting the global plastics pollution crisis. In this case, manufacturing firms in Malaysia are in need to shift their traditional supply chain to green supply chain in order to increase their involvement in protecting the environment and that will result in improving company position among competitors and enable them to improve social performance.

Therefore, green supply chain management (GSCM) has recently emerged to respond and have a solution to the issues with the regulation for environmental protection, economic development and social development in the supply chain process with the adoption of green procurement, green manufacturing and green distribution

thereby launching the green supply chain to ensure sustainable performance at the organization (Çankaya & Sezen, 2019; Khan, 2019; Luthra et al., 2016; Naway & Rahmat, 2019). Wyawahare and Udawatta (2018), defined GSCM as the incorporation of environmental thinking into SCM which include material sourcing and selection, product design, manufacturing practices, delivering the final product to the consumers and end life of life management of the product after its intended life.



Source: DOSM (2022)

Figure 1.1: Gross Domestic Product Second Quarter 2022

Referring to Figure 1.1 in 2022 the numbers and figures have changed compared to the past 50 years until today where the total GDP growth was 8.9% in the second quarter. In addition, the decline of Mining and quarrying and agriculture sectors affect the overall performance of GDP. Nevertheless, the service sector is contributed to the economy by 58.1 % with 12% growth in the year 2022. Followed by the manufacturing sector that also made a good impact on economic growth with percentage share to GDP of 24.3% and growth rate of 9.2% compared to agriculture, constructor and mining and quarrying sector with only 16.3% of GDP share and decline in growth rate by 3.8% with total GDP value of RM366.2 billion (DOSM, 2019). However, the current Malaysian economic statistics review reported by the (Department of Statistics Malaysia, 2022) with the happening crisis of Covid-19 all the figures have been changed dramatically

where all growth percentage is declining for all sectors as with Malaysia's GDP by -3.4% for the fourth quarter of 2020. Nonetheless, the manufacturing sector is the only sector that recorded a positive increase compared to other sectors with 3.0%. In line with this, sales of the manufacturing sector sustained positive growth, driven by electrical and electronics products, food, beverages and tobacco products and transport equipment and other manufacturing products.

Hence, we can understand that in recent years Malaysia is moving forward to be an industrialized economy where they moved from material production to manufacturing. Then, the manufacturing industry is one of the main economic sources of growth and with this fast-growing of industrialization. For instance, Malaysia's manufacturing sector continued to be resilient throughout the year despite the various headwinds in its way that attracted more foreign companies to invest in Malaysia. For instance, throughout 2021 the foreign investors contributed mostly to the total new investments of RM153.4 billion (MIDA, 2021). On the other hand, it has a negative impact on the environment due to the increase of waste, pollution, and the huge consumption of natural sources. Industry or individual corporations are one of the most important sources of the bad influence on the environmental problems due to the human society which mostly depends on industrial products to sustain its living standard. These corporations are consuming the resources and emit environmental emissions because of the manufacturing of products.

Respectively, the Malaysian government plays a significant role in the development of green industrialisation in the process of preparation for the latest Twelfth Malaysia Plan, 2021-2025 (12MP) by the Malaysian government through the Ministry of Economic Affairs (MEA) which was supposed to be presented to the public in August 2020, but due to the Covid-19 pandemic, it has been delayed to September

2021. However, this plan aimed to encompass three dimensions, namely environmental sustainability, economic empowerment and social re-engineering which will be supported by governance and policy tools. Therefore, under the dimension of environmental sustainability, the 12MP will discuss and investigate various issues such as climate change mitigation and adaptation, green technology as well as renewable energy. Thus, all of these dimensions are involved in the Sustainable Development Goals (SDGs) under the 2030 agenda by the United Nations. Therefore, the 12MP indicate that Malaysia is aiming to go green in the coming years to improve the economy, environment and social performance.

The manufacturing companies in Malaysia are encouraged to continue improving its commitment and ability to mitigate environmental impacts (Masrom et al., 2018). One of the most popular initiatives is the adoption of the ISO 14001 Standard which is recognised for its environmental management system practices on tracking, managing and improving organisational performance according to environmental goals and targets (Goh and Nabsiah, 2018).

Table 1.1: ISO 14001 Certification in Malaysia

ISO 14001 – East Asia and Pacific										
Year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Malaysia	1,906	2,244	2,284	2,402	2,325	2,258	2,137	2,308	2,392	2,560

Source: ISO (2021)

Referring to Table 1.1 for the last 10 years ISO 14001 certification in Malaysia it indicates that in the year of 2012 the number of certified ISO 14001 companies in Malaysia was only 1,906 and it increased by 34% with 2,560 in the year of 2021 (ISO, 2021). Therefore, the ISO 14001 certification in Malaysia has shown a significant

increase in interest over the years which indicate Malaysia's strong performance and improvement in rankings demonstrate the nation's competitiveness as the preferred location for high-value-added manufacturing and global services hubs, buoyed by its strong presence in the ASEAN region and its vibrant, sustainable post-pandemic economic recovery.

As Malaysia has become one of the largest manufacturing bases in South- East Asia (Eltayeb et al., 2011), is certified with ISO 14001 guides environmental management with the controls necessary to address increasing environmental issues. The EMS of ISO 14001 has become an important practice to meet the new global environmental demands for environmentally friendly products, processes, systems and technologies (Mohamad et al., 2018).

Nevertheless, manufacturing companies are required to implement green practices in the supply chain management activities such as, green purchasing, eco-design, reverse logistics, green marketing, green technology and green manufacturing practices that aimed to implement environmentally and socially accountable practices to reduce the harmful impact of manufacturing companies and increased profitability (Khan, 2019). However, green practices in production activities will improve the efficiency of the process in SCM which consist of green resources that lead to competitive advantage in the industry by reducing the cost of the product and improving the quality of products (Handfield et al., 1997). These practices are working both to eliminate waste and improve the efficiency of manufacturing processes in the company and that will have a positive influence on social aspects and impact on firm's competitive advantages (Vanalle et al., 2017).

In this issue, technology and its innovation capabilities will enhance and improve in every field of life in various aspects and methods. innovation capabilities

will provide better knowledge from the entire globe. Many individuals, governments and organizations are applying the knowledge to improve their performance to gain a competitive advantage in their field (Geffen & Rothenberg, 2000). However, most of the companies believe that the use of traditional methods in their operation and production activities is not very effective and not able to make the company survive in the competitive market. Therefore, companies are in need to implement changes in their process and production to follow up with the rest of the world and enable the company to join the competition worldwide (Jakobsen & Clausen, 2016). On the other hand, GSCM generally focuses on the economic, financial, environmental and operational aspects and fails to address the social concerns, which is one of the main objectives of sustainable development goals addressed by the United Nation (2019), such as good health and well-being, clean water and sanitation, climate change and life on land.

In this matter, studies that are mentioned above examined the effects of GSCM on economic and environmental performance. However, social performance was generally neglected among the topics related to GSCM (Eltayebet al., 2011; Rajeevet al., 2017). Therefore, raising awareness on corporate social responsibility requires equal consideration of social issues in managing a supply chain. Green supply chain practices will allow firms to have more positive images in the eyes of stakeholders, society, customers, personnel and the government by decreasing damages on the environment. This positive image is highly important for both customer and personnel satisfaction and loyalty (Hoffman, 2001). Testaand Iraldo (2010) and Xie and Breen (2012) asserted that GSCM could result in improved brand image, better relations with stakeholders and improved personnel motivation. In summary, successful environmental practices may strengthen firms' relationships with all stakeholders.

The Malaysian government aiming to engage innovation and technology in the manufacturing industry. For instance, in 2018 the Malaysian Investment Development Authority launch Industry4WRD initiative that provides advice and facilitation to businesses so they may adopt digital technology more quickly and become the engine that propels the country's digital economy. The Industry4WRD Intervention Fund is one of the efforts; it provides financial assistance to Malaysian SMEs in the manufacturing and related services sectors so they may adopt Industry 4.0. In other words, to enhance the innovation capabilities, gain competitive advantage and improve social responsibilities, manufacturing firms are required to join the competitive war in the global market or else their rivals will win the war (Shafique et al., 2017). Therefore, organizations are required to pay more attention to the latest technologies to improve and change their traditional process in the implementation of GSCM practices to improve innovative and effective production and process to achieve higher performance than other competitors.

This research attempted to examine the level of implementation of GSCM practices and innovation capabilities in manufacturing companies in Malaysia at the operation of the business. Particularly, this study aimed to examine the relationship between GSCM practices, innovation capabilities, competitive advantages, and social performance in the Malaysian manufacturing industry. Besides that, the study investigated this relationship whether it has a direct or indirect impact on competitive advantage and social performance through innovation capabilities.

1.2 Problem Statement

The study of green practice has begun in the year 2000 in the Asian region (Khan, 2019; Mehrizi, 2014). According to Rao (2019), researched greening the supply chain as a new initiative in the South East Asia Region which involved Indonesia, the Philippines, Thailand, Malaysia and Singapore whereby from there many researchers start taking over the place to bridge the gap in this new area of green supply chain at the South Asia east region. However, in the growing competition of the current global market, firms are required to look into modern strategies manners to assist them to achieve sustainable organization and competitive advantage. Martusa (2013), indicate that GSCM becomes the potential valuable way of improving organizational performance and securing competitive advantages in the industry. However, GSCM can be used as a strategy to achieve competitive advantages and improve social performance which creates interest among companies to act to reduce their environmental impact and achieve innovation capabilities standards.

In the past decades, traditional supply chain management (SCM) has been viewed as the transforming of raw materials into final products and distributing them to the final users to be consumed. In this case, it is very important to realize that we are living in the current years when environmental sustainability is perceived as a significant issue in the practices of business (Fernando & Saththasivam, 2017). However, the consequences of the traditional supply chain activities are leading to the major impact of waste and emission with serious environmental problems such as acid rain and global warming. In this matter, the policies and practices of green supply chain management are gaining attention due to the reactive regulation, proactive strategies and competitive advantages which could be improved through the level of innovation capabilities in the organization (El-Kassar & Singh, 2019; Kim & Chai, 2017).

However, companies need to integrate the green practices in the supply chain in all the activities from green purchasing to integrating lifecycle management, through manufacturers, consumers and closing the loop with investment recovery.

The aim of adding value to the business and minimizing costs in the overall production system has been identified as the drivers key to increasing competitiveness in the global market (Moori et al., 2018). Many firms agreed that the common manufacturing objectives such as delivery, cost and flexibility are no longer enough to stay competitive in the market and be innovative in terms of technology implantation when external stakeholders require an increased focus on sustainability (Pinto et al., 2019). In this case, manufacturing companies are required to make an effort due to the growing number of government policies which force companies to go green. For instance, in March 2022, the US Securities and Exchange Commission proposed new environmental rules. They would require US companies to list their green gas emissions. Such transparency may affect companies' reputations and investors' decisions. As a result, companies can't ignore environmental regulations (Hofer, 2022). Hence, this could be applied to manufacturing industry in Malaysia and it will lead for further investigating environmental sustainability which can be integrated to gain competitive advantage and improve social performance in the production system and close the loop.

However, many issues lead the researchers to investigate the implementation of GSCM in Malaysian manufacturing industries to gain competitive advantages and improve social performance. The impact from the manufacturing firms' operations will affect the environment, economy and society. The issues of the environment are Malaysia becomes more challenging and complex (Shamsuddin et al., 2017; Suryanto et al., 2018; Vaghefi et al., 2015). Various factors lead to affect the environment

including implementations of new technologies for products, the development of new types of products, the transformations in manufacturing processes, degree of cleaner technology use, level of housekeeping, capability in managing environmental issues, regulations have not been revised and old environmental issues yet not appropriately addressed (Khan & Qianli, 2017; Mohamad et al., 2018; Suryanto et al., 2018). Therefore, these factors cause an increase in environmental problems such as water pollution, air pollution and solid waste.

The Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC), in their report about the use of plastic which argues that Malaysia plays a big role in the plastic industry which now have around 1,300 manufacturers. In the year 2016, Malaysia exports amounted to RM30 billion which saw 2.26 million metric tons of resin utilized to produce plastics. Hence, the mentioned Figures will indicate Malaysian manufacturing industry is one of the main contributors to the consumption of plastic materials which has a negative impact on the environment and social aspects. According to the Department of Statistics Malaysia (DOSM) in 2019, the first quarter of Malaysia GDP, it grew by 4.5% in the year 2019 with a value of RM341.7 billion. The manufacturing sector is the second contributor to Malaysia GDP with a 22.1% share and 4.2% growth which contributed about RM232.9 billion and a total of 18.2% of the total employment by the year 2020.

The most challenging issue in Malaysia is the environmental pollution that is due to industrialization activities and export activities which increase the damage to the economic, social and environmental performance (Vaghefi et al., 2015). According to the Environmental Quality Report in 2020 published by the Department of Environment, the rise in air pollution is driven by the increasing number of motor vehicles and industrial sources (Department of Statistics Malaysia, 2020). In addition,

air pollution can be in the form of solid particles, liquid droplets or gases. However, the year of 2015 the total emission of pollutants to the air was 30.70 million tons and is increased by 12.6% in 2019 by 34.58 million tons which shows that Malaysia is experiencing high air pollution that can be harmful to human beings and the environment. On the other side, the pollution of water from household wastewater makes a huge problem to the urban areas that have been impacted negatively by this problem. The rest of the environmental problem in Malaysia is haze came from oil pollution of the sea, forest fires and deforestation (Chaturvedi, 2022).

As stated by Mallak et al. (2014), solid waste can be divided into eight categories which are industrial waste, household waste, garden waste, imported solid waste, construction and demolition waste, institutional solid waste, public solid waste and commercial waste and solid waste it may be prescribed from time to time. This will prove that manufacturing companies are one of the main contributors to the increase of solid waste in Malaysia (Masrom et al., 2018). The increase of waste becomes a huge problem around the globe which have a bad impact on the environment and economy. The lack of an efficient and effective municipal waste management system leads to having a negative impact on the environment (Masrom et al., 2018). In Malaysia, the increase of solid waste has a bad experience with the increase of Malaysian population which currently is 32 million this also led to an increase in Malaysian industry to fulfil the needs and the waste generate more than 3500 metric ton each day (Zaipul & Ahmad, 2017). Between the years 2000 and 2015, the quantity of municipal waste collected in Malaysia grew substantially from 6,377 thousand tons to 14,075 thousand tons. According to the Department of Environment, Malaysia the scheduled waste recorded an increase by 37.5% in the year 2019 by a total of 40.13 million tons of scheduled wastes as compared to 29.18 million tons reported in 2015 that caused by industries,

agriculture, workshop, scheduled waste contractors, domestic activities and clinical waste from hospitals (Department of Statistics Malaysia, 2020). However, the management of municipal waste is one of the challenging issues in Malaysia. In this case, many people in main cities are seeking to reduce the negative impact of waste by adopting a better waste management system to have a better result (Masrom et al., 2018).

According to mainstream economic theory, companies have no incentives to minimize the negative impact on the environment and increase pollution unless they are forced to. To prevent pollution negative impact on the environment and pollution is required additional cost which does not help the organization bottom line. This view, however, was challenged by (Hart, 1995) and (Porter & Linde, 1995). This case has been argued by Porter and Linde (1995), to improve the environment which may represent "missed opportunities" to increase profit. Based on the theory of resource-based view Hart (1995), highlight a natural resource-based view a theory of competitive advantages that are based on a company related to the natural environment. The author suggested that "through pollution prevention, companies can realize significant savings, resulting in a cost advantage relative to competitors." Zeng et al. (2010), highlight the benefits of using environmentally friendly it will affect the firm's business performance to achieve competitive advantages. Moreover, relying on production with high-cost scheme clean activities will lead to a significant contribution to non-financial performance, compared to financial performance. On the other hand, clean production activities with a clean and low-cost scheme will lead to having a significant contribution to financial performance compared to non-financial performance. Afroz et al. (2019), state that, there is a lack of implementing green practices in Malaysia and to overcome

these challenges and obstacles, suggested that the government could make additional benefits to organizations that follow green practices.

The latest incident of pollution on September 4th 2020 at Selangor River led water supply to be cut to millions of people in 1,292 areas in Kuala Lumpur and Selangor (Bakar, 2020). According to Selangor Chief Minister, Datuk Seri Amirudin Shari, the ongoing water disruption will need to wait for a minimum of four days before regular supply resumes to ensure the water is clean and safe for consumption (Daud, 2020). The driver for this pollution is due to one of the factories behind the cause of contamination in Selangor River where the Human Rights Commission of Malaysia (Suhakam) calls for effective enforcement of the laws, including stiffer penalties for perpetrators of water pollution in order to protect the people's right to clean water (Suhakam, 2020). A possible explanation for these actions which results in a negative impact on society is may be due to the heavy industries, and oil palm storage and distribution which lead to the lack of adequate social awareness. Another possible reason is the capacity of manufacturing companies to save costs and neglect the issue of society. However, this incident will be listed against the environmental quality act 1974 (act 127) under restrictions on pollution of inland waters of section 25 (1) which state "No person shall unless licensed, emit, discharge or deposit any environmentally hazardous substances, pollutants or wastes into any inland waters in contravention of the acceptable conditions specified under section 21".

Recently, Le (2020), criticized that many scholars face challenges in addressing the social responsibilities which few empirical studies associated with GSCM practices and social sustainability compared to other performance such as economic, financial, environmental and operational performance getting more attention. For example, (Pinto, 2020; Sundram et al., 2017) negligent the social performance by conducting

their study on the impact of green supply chain practices on environmental and economic performance which indicates that social performance is gaining less attention in company performance examination. Esfahbodi et al. (2016), approve the positive relationship between GSCM, cost and environmental performance while social performance did not support it. However, social performance is measured in terms of increasing health care facilities to the local community. GSCM looks to improve the social performance of companies in the supply chain (Wang & Dai, 2018). This positive image is highly important for both customer and personnel satisfaction and loyalty (Hoffman, 2001). Hassan (2016), and Zampese et al. (2016) asserted that GSCM could result in improved brand image, better relations with stakeholders and improved personnel motivation.

Manufacturing companies is been recognized as one of the largest contributors to environmental pollutants and this issue is influenced by the involvement of many companies in the whole manufacturing process and acquiring of raw material to fashioning and the movement and process of products to be ready to be consumed by the final user which invariably led to the production of waste materials or other substances that can be harmful to the environment (Hassan, 2016; Ho et al., 2015). Therefore, the Malaysian government is trying to preserve, maintain and enhance its manufacturing sector through various initiatives and greener products. The direct and indirect consumption of energy from manufacturing will mainly contribute to the carbon dioxide (CO2) emission that will negatively impact the environment. However, the damage of carbon dioxide (CO_2) is one of the examples of pollutant forms of manufacturing industry that can be related to the trend of GDP growth (Islam et al., 2017; Shafique et al., 2017). In this matter, the manufacturing sector is one of the main contributors to influence the economic, social and environmental aspects.

On the other hand, the Malaysian government establishing special incentives to manufacturing companies that implement green practices in their operation will be able to get tax incentives such as Pioneer Status (PS) and Investment Tax Allowance (ITA) (Singh, 2017). Therefore, the Malaysian Investment Development Authority (MIDA) provides incentives in the form of income tax exemption or income tax exemption equivalent of Investment Tax Allowance (ITA) for a period of five or ten years to companies that implement green practices and technology in the field of renewable energy, energy efficiency, green building, green data centre and waste management to attract more green investments (MIDA, 2020). In details of ITA, the organization granted an allowance of 60% on its qualifying capital expenditure such as factory, plant, machinery or other equipment used for the approved project which incurred within five years from the date the first qualifying capital expenditure is incurred (MIDA, 2021). However, the implementation of GSCM practices will drive manufacturing companies to enjoy the benefits of tax allowance supported by the government.

Recently, the Department of Statistics Malaysia reported on the survey of Environmental Protection Expenditure in 2019, Malaysia expenditure to protect the environment has been increased for the year 2018 registered an annual growth of RM2.7 billion in 2017 as compared to 2014 with 2.24 billion (Uzir, 2018). Following that the waste management expenditure with RM1.8 billion or 68.1% of the total expenditure and the rest of environmental protection expenditure RM72.7 million. This was followed by waste management expenditure of RM726.1 million (26.9%) and environmental assessment and charges of RM91.6 million (3.4%). Nevertheless, the manufacturing sector is taking the biggest place in overall expenditure on environmental protection expenditure in 2018 with RM1.8 billion or 67.5%

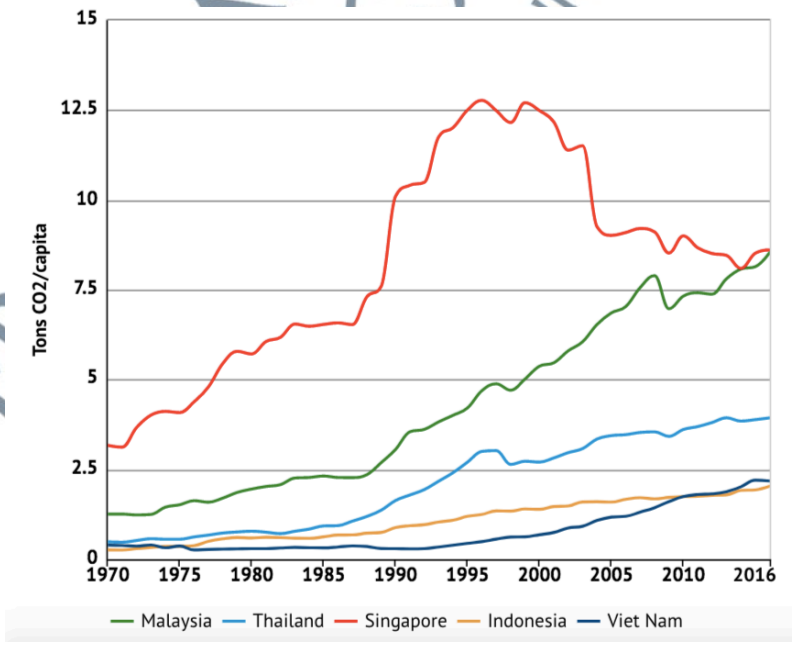
(Department of Statistics Malaysia, 2020). Moreover, The Ministry of Natural Resources and Environment launched the program in 2013 called "E-waste Alam Alliance Malaysia". The program estimation shows Malaysia generate more than 53 million pieces of household E-waste in 2020 which is 3.5 times higher than 1995 which in long term will lead to harm the environment (Department of Environment Malaysia, 2020). Therefore, Malaysia spends a huge amount of money to protect the environment which will lead to having a negative impact on the economic performance in the long term.

However, these manufacturing companies are impacting the economic, social and environment negatively with plastic waste which becomes a major problem in Malaysia where it has been ranked as 8th among the top countries with mismanaged plastic waste in the world. According to Chen et al. (2021) and Khairuddin et al. (2015), it estimated that Malaysia had produced 0.94 million tons of mismanaged plastic wastes. Moreover, the main source of ocean pollution is from the direct coastal population in the globe. However, this issue is concerned in Malaysia which has been estimated to be the 8th largest producer of mismanaged plastic waste worldwide with 140 to 170 million kg of plastic wastes entering the ocean every year, of which from Malaysia 0.14 to 0.37 million tons may have been washed into the oceans.

Meanwhile, Reuters (2020), stated that carbon emissions associated with plastic from production to burning reached 860 million tons in 2019, greater than the annual emissions of Thailand, Vietnam and the Philippines combined, hence, it will impact the social performance. Moreover, Malaysia ranked highest among the six countries analysed in terms of annual per-capita plastic packaging consumption, at about 16.8 kg per person, followed by Thailand at 15.5 kg. However, Malaysia needs to work with businesses and green groups in order to introduce a system encouraging consumer

goods firms to use less plastic packaging and fund better recycling schemes that can assist manufacturing firms to achieve competitive advantages and improve social performance.

According to the government report "Green Technology Master Plan Malaysia, 2017-2030 carried by the Ministry of Energy Green Technology and Water (2017), highlighted the challenges and issues with the manufacturing sector to adopt green supply chain practices is still very low. Furthermore, based on the Malaysian law in terms of environmental quality act 1974 under power to control the use of substance and product and to state environmental labelling section 30 (1). "The prescribe any product as a prescribed product for sale and that the product shall contain a minimum percentage of recycled substances and carry an appropriate declaration on its recycled constituents, method of manufacture and disposal" this will prove that Malaysia government is pressuring manufacturing companies to reduce the negative impact to the environment.



Source: Knoema (2018)

Figure 1.2: CO2 Emissions Per Capita

Referring to Figure 1.2 shows the result of CO2 emission per capita (metric tons) steadily increased in Singapore, Malaysia, Thailand, Indonesia and Vietnam over the past 50 years. The emissions of CO2 are mainly from the burning of fossil fuels and cement manufacturing directly and indirectly. Nevertheless, Figure 1.2 indicates a significant increase of CO2 per capita in Malaysia from the year 1970 which shows 1.2 tons CO2 per capita whereas the year 2016 shows 8.53 tons CO2 per capita. In the same year, Thailand had 3.93 tons CO2 per capita, Vietnam 2.18 tons CO2 per capita and Indonesia 2.03 tons CO2 per capita. These numbers indicate that Malaysia is facing a high impact of CO2 emission toward the environment as compared to other neighbour countries such as Thailand, Indonesia, Vietnam and Singapore. As a result, the issue of CO2 emission has become an important factor that affects the country's environment which led to environmental degradation (Farabi et al., 2019; Gill et al., 2018; Rambeli-Ramli et al., 2018).

According to Ahmadi et al. (2017), state that a truly sustainable firm is required to take the economic, environmental and social dimensions of sustainability into account. Although the economic, environmental and operational dimensions of performance have been examined by many scholars and researchers, thus far, the social dimension has been received less attention in the literature and practice, in particular in developing countries. For instance, Ganeshkumar and Madan (2015) examine the dimensions of GSCM practices towards company environmental, economic and operational performance and negligent social performance. In this matter, manufacturing companies are required to consider the social responsibilities that will reflect in improving employment and business opportunities to the community that measured in terms of increasing health care facilities to the local community which will

be taking part in this study to investigate the relationship of between GSCM and social performance.

Hamel and Prahalad (1990), state that core competency is the main source of a firm's competitive advantage in the marketplace that will drive the company to improve business strategies. Hence, firms will be able to implement many greater ways of distributing, production, distributing even selling the goods with a better aim to rebuild the value chain to achieve cost advantages (Jia & Wang, 2019). In this matter, the implementation of GSCM practice will raise the core competence for the company also bring corresponding advantages such as cost, innovation and impact on the social aspects.

In terms of innovation, it plays an important role in the growth of the economy. Many scholars argue that utilization and implementation of the product, process, marketing and organization innovation can create competitive advantages to the company in terms of price, quality and delivery (Bhushan et al., 2017; Kafetzopoulos & Psomas, 2015; Wang et al., 2019; Yang & Roh, 2019). However, the shift of value area of organization the technological to non-technological activities such as introducing and developing new technologies is required in the fast-growing economy in south-east countries specifically Malaysia. While the non-technological strategies such as changing the organizational method, re-establishing business strategies and external network, marketing, and customer interaction are also needed to utilize and implement in the manufacturing companies to gain competitive advantages among other rivals in the market (Seman et al., 2018; Zailani et al., 2015; Zaipul & Ahmad, 2017).

Initial observations agreed that there is a link between innovation and industry revelation which led to embracing Industry 4.0 technologies and processes will gain over global competitors. The Malaysian government is ambitious to become a digitally-

driven, high-income nation and a regional leader in the sector with the National Fourth Industrial Revolution (4IR) Policy, Industry4WRD, a Digital Investment Office, the National Digital Network (JENDELA), and Malaysia's Lighthouse Program are among the other major projects in cooperation with the Malaysian Investment Development Authority. These seek to accelerate the adoption of technology, alter the workforce, and scale an end-to-end supply chain in order to enhance the manufacturing industry's transition to the future of manufacturing (MIDA, 2021).

The link will enable the competitiveness to transform by reacting to the shift of the market and the current trend of technology and innovation (Menon & Shah, 2019). However, the Malaysian Ministry of International Trade and Industry (MITI) draw attention to the national policy of industry 4.0 where it leads to making changes in the global landscape of manufacturing competition and making significant improvement in the quality of higher productivity instead of having low-cost labours and less effective and efficient that will be the new source of competitive advantage to the company (MITI, 2018). However, this indicates that Malaysia is in need to improve their innovation capabilities level in the manufacturing industry in order to gain a better outcome in this field on innovation and competitiveness.

Furthermore, the area of innovation capabilities it becomes a hot topic to debate and investigate where in developing countries such as Malaysia there are few studies has been conducted. In developed countries such as the United States and Sweden, they have done significant research in innovation capabilities (Calza et al., 2017; Rozar et al., 2015; Seman et al., 2018; Tan, Zailani, Tan, & Shaharudin, 2016). Furthermore, there are limited studies that discuss innovation capabilities as a mediating the relationship between GSCM practices, firms' competitiveness and social performance (Khan et al. 2022; Moori et al., 2018; Xu et al., 2019; Z. Yang et al., 2019). Thus, the

medicating effect of innovation capabilities on other GSCM practices namely internal environmental management, green purchasing, eco-design and packaging, investment recovery and cooperation with customers which in turn effects of competitive advantages and social performance that will be explored in detail and clarity. For these reasons, this research tries to extend the mediation model and to fill this gap. However, some previous studies failed to highlight the multidimensionality of innovation capabilities and only examined the concept of innovation capabilities in general (Camisón & López, 2010; Camisón & Villar-López, 2014; Lee et al., 2018; Nuryakin, 2018; Raymond et al., 2013).

However, previous studies have generally linked GSCM practices, innovation and competitive advantage by concentrating on environmental performance, green process, green managerial innovation, operational performance and financial performance (Abdullah et al., 2017; Abu Seman et al., 2019; Bhushan et al., 2017; Martínez-Ros & Kunapatarawong, 2019; Sundram et al., 2017; Verma et al., 2018). In this particular case, the proposed model of this study will illustrate the usefulness of applying SPSS and PLS-SEM methods when modelling a second-order latent construct and testing higher-order mediating effects which will be applied to the concept of GSCM and innovation capabilities due to the greater reflect such multidimensional constructs (Zhu et al., 2017). Lastly, this research has significant value to explore the relationship between GSCM practice, innovation capabilities, competitive advantage and social performance in manufacturing firms. Innovation capabilities will play a role as a mediator that provides the mechanism through which GSCM practices influence a firm's competitive advantage and social performance.

1.3 Research Questions

1. Does GSCM practices influence firm's competitive advantages in the Malaysian manufacturing industry?
2. Does GSCM practices influence social performance in the Malaysian manufacturing industry?
3. Does GSCM practices influence innovation capabilities adoption in the Malaysian manufacturing industry?
4. Does innovation capabilities adoption influence a firm's competitive advantages performance in the Malaysian manufacturing industry?
5. Does innovation capabilities adoption influence a firm's social performance in the Malaysian manufacturing industry?
6. Does the effect of innovation capabilities practices mediate the relationship of GSCM practices on a firm's competitive advantages in the Malaysian manufacturing industry?
7. Does the effect of innovation capabilities practices mediate the relationship of GSCM practices on a firm's social performance in the Malaysian manufacturing industry?

1.4 Research Objectives

1. To investigate the influence of GSCM practices on firm's competitive advantages in the Malaysian manufacturing industry.
2. To investigate the influence of GSCM practices on social performance in the Malaysian manufacturing industry.
3. To investigate the effect of GSCM practices on innovation capabilities in the Malaysian manufacturing industry.

4. To investigate the effect of innovation capabilities on the firm's competitive advantages in the Malaysian manufacturing industry.
5. To investigate the effect of innovation capabilities on the firm's social performance in the Malaysian manufacturing industry.
6. To determine the mediating effect of innovation capabilities in the relationship between GSCM practices and firm's competitive advantages and social performance in the Malaysian manufacturing industry.

1.5 Significance of The Study

This study contributes to the existing body of knowledge by introducing several variables and relationships. This study offers a number of insights into supply chain managers and environmental management representative can successfully integrate their supply chain by implementing green supply chain management practices and using innovation capabilities to achieve competitive advantages and improve social performance. The importance of this study is in the comprehension of the strength of the link between variables (green supply chain management, innovation capabilities, competitive advantages and social performance). Notably, the aforementioned link was explored separately, and not in combination, as can be observed in numerous past studies in numerous countries. On the other hand, the present study will be focusing on the manufacturing industry in the Malaysian context.

The operation managers of an organization are continuously challenged to achieve competitive advantages and improve social performance. By adopting GSCM practices successfully anticipates the appropriate utilization of organizational complementary resources to develop innovation capabilities to obtain competitive advantages in terms of cost efficiency, quality and delivery. The results of this study are

significant to operation managers and supply chain managers in decision making benchmarking the organizational progress in collaborating the green practices in their production process.

Up to this date, in the context of Malaysia, there is a gap in developing countries, studies that investigate the impact of GSCM practices towards innovation capabilities, competitive advantages and social performance are mostly carried out in developed countries (Geng et al., 2017). This issue is still new and is in the stage of development. Thus, further studies need to provide more information on this topic where Malaysian companies still learning how to implement GSCM practices in their manufacturing process and activities in the business. Moreover, very few studies applied innovation capabilities as a mediator variable that influences the relationship between GSCM practices, firm's competitive advantages and social performance. However, adopting green practices in the process of supply chain management will motivate businesses to lead them in overall cost reductions, satisfy the needs and demand of customers, improvement in risk management and ISO14001 certification that concentrate on the standers and systems required to achieve environmental goals (Younis et al., 2019).

By reviewing the current literature associated with the role of GSCM practices, firm's competitive advantages and social performance, the study can provide support for operation managers and supply chain managers in implementing green supply chain management practices that will result in better outcome. This study is aimed to fill the gap by contributing to the researchers on GSCM practices and the firm's competitive advantages with the improvement of social performance in the context of Malaysia, more specific in the green supply chain in the manufacturing industry. This research leads to have a significant development on the research models in the area of GSCM implementation, firm's competitive advantages and social performance by providing

useful data to test the relationship between GSCM practices and competitive advantages and social performance; second the mediating effect of innovation capabilities in the relationship between GSCM practices and firm's competitive advantages and social performance among Malaysian manufacturing industry.

The findings of this study will be useful in helping manufacturing firms to determine the effectiveness indicators of GSCM practices that can contribute to achieve competitive advantages. Furthermore, an appropriate combination of existing sets of indicators of green practices and its potential performances can help manufacturing firms gain a more comprehensive picture of environmental effects across their value chain and its product lifecycle which improve its social performance. The firms along the supply chain can make use of the comprehensive and consistent green supply chain practices developed by this sustainable research framework. Closer integration of the supply chain management could benefit policy makers and accelerate the efforts towards firm's competitiveness and social performance. In addition, by highlighting the impact of Malaysian Green Supply Chain practices on firm's competitive advantages and social performance of ISO 14001 manufacturing firms in Malaysia, the research framework proposed is expected to help managers to recognize and control the impact of GSCM practices towards firm's competitive advantages and social performance. All in all, this study seeks to ease the issue of implementing green practices in the manufacturing industry.

In addition, there have been limited studies discussing innovation capabilities mediating the relationship between GSCM implementation, competitive advantages and social performance (Khan et al. 2022; Moori et al., 2018; Xu et al., 2019; Z. Yang et al., 2019). But those empirical researches do not consider the mediating effect of innovation capabilities. The findings of this study could also provide additional

evidence on the related mechanism needed to strengthen the relationship between GSCM practices, competitive advantages and social performance through the mediation role of innovation capabilities. The studies on the mediating of green innovation between the relationship of GSCM competitive advantages and social performance are less debated. The proposed structural paths of this study model were underpinned by integrating Resource Based View theory (Grant, 1996; Hart, 1995; Porter & Linde, 1995) and Institutional Theory (DiMaggio & Powell, 1983; Hoffman, 2001; Meyer & Rowan, 1977), this study offers a new angle to study green supply chain management practices. A single theory may have very limited explanatory power. Instead, combining the doctrines from different theories can generate a thorough understanding and a more complete idea that can improve theoretical rationale for existing linkages among variables of the study.

The findings from the current study could also provide guidelines to government's decisions in providing any incentives or specific training to manufacturers in order to enhance their active participation in the GSCM as a part of the green technology within their operations. The research findings will also lead to a better understanding and provide new insights for sustainability management area where GSCM practices and innovation capabilities are important to achieve competitive advantages and improve social performance, which can directly offer great benefits for both researchers and practitioners.

Finally, this research is important to explore the relationship among GSCM practices, innovation capabilities, competitive advantages and social performance in Malaysian manufacturing firms. Innovation capabilities acts as a mediator that provides the mechanism through which GSCM practices impact companies' competitive advantages and social performance. This research also emphasizes the significance of

utilizing PLS- SEM for modelling latent constructs in this study. Enlarging this conversation into the discussion about sustainable practices, it is thus essential to comprehend the association between GSCM practices and innovation capabilities process more closely to well recognize their relationship and influence on firm's competitive advantages and social performance.

1.6 Scope of The Study

To achieve the objectives of the present study, the study focuses on the manufacturing firms certified with ISO 14001 in Malaysia and extending the knowledge in the GSCM literature. The reason of selecting this type of firms is because the certified ISO 14001 certified firms are expected to be equipped with environmental attributes to seek more comprehensive green initiatives within their operations and are more likely to extend these to their supply chain partners; this argument is also supported by Zhu, et al. (2008) and Sorooshian & Ting (2018). Also, ISO 14001 certified firms are more likely to adopt GSCM practices and waste management practices.

Another reason why manufacturing industry is selected is because the industry is found to be the main contributors to environmental deterioration (Rao, 2019; Wyawahare & Udawatta, 2018) and the fact that the manufacturing industry constitutes the largest sector on the basis of sales, employment and economic contribution and a tremendous contribution to the quality and environmental problems in Malaysia. Therefore, any effort to improve the green practices of this sector can also provide significant benefits to achieve competitive advantages and improve social performance. The method of data collection used for this study is quantitative approach.

1.7 Operational Definitions

1.7.1 Supply Chain

The term of supply chain has been defined by Christopher (1999) as a network of the firms that have been involved in the upstream and downstream linkages in various activities and processes that produce value in the form of products and services that will be delivered to the end-users. In this present study, the researcher defines supply chain as the action of individuals and companies to create a product from raw material and delivering finished product to the end users.

1.7.2 Green Supply Chain

Green supply chain is defined as incorporating environmental considerations into SCM consisting of product and service design, procurement, manufacturing processes, distribution, and end of life product after its useful life (Srivastava, 2007). GSC refers to the idea of merging sustainable environmental processes into the traditional supply chain which will influence the society and economy (Beamon, 1999; Kadier et al., 2018). In the current study, the researcher defines green supply chain as adding value by integrating of sustainable environmental processes into the traditional supply chain that will include product design, material sourcing and selection, manufacturing process, distribution and end-of-life management which result in mitigating the harmful impact to the environment.

1.7.3 Green Supply Chain Management Practices

GSCM practices defined as the effort undertaken by an organization that aimed to minimize the negative impact to the environment including the entire life cycle of the products or services starting from the design of the product, acquisition of raw materials, product use, up to the final disposal of the product (Khairani et al., 2017). In

this study, the researcher defines GSCM practices as the several potential practices that are believed to reduce and mitigate the problems arise to environment that are possibly occurred during the production process of a final product in an organisation. In this context, the organisation refers to manufacturing firms in Malaysia that are carried most of the responsibilities to be the potential contributor to the environmental problems. The researcher investigates GSCM practices in terms of five components which are internal environmental management, eco-design and packaging, cooperation with customers green purchasing and investment recovery.

1.7.4 Internal Environmental Management

Internal environmental management is the practice in green supply chain management development as a strategic organizational imperative through support and commitment of the imperative from senior and mid-level managers (Seman et al., 2018). In this study, the researcher defines IEM as the emphasis on the encouraging support and commitment from top management of the organization, and the existing of environmental management system or policy in organizing the business operation activities in more environmental manner which plays an important role in improving performance in terms of management commitment and cross-functional cooperation.

1.7.5 Eco-Design and Packaging

Eco-Design and packaging are the requirements of companies in the manufacturing process to design products that reduce the use of energy, materials and energy, that facilitate the recycling, reuse, and recovery of parts and materials in order to reduce or avoid the use of hazardous products in process of manufacturing the product (Zhu, et al., 2008). In the current study, the researcher defines eco-design and packaging as actions taken during product development which aimed to reduce

environmental impact of the products during its whole life cycle from acquiring materialism to manufacturing, consuming and ultimately to its final disposal.

1.7.6 Cooperation with Customers

Cooperation with customers is defined as the required cooperation with the customer to develop and enhance a cleaner manufacturing process that leads to product green products with green packaging in the activities of the manufacturing process (Khan & Qianli, 2017). In this present study, the researcher defines customers cooperation as the collaborations between customers and company in designing and developing environmentally friendly product will contribute to the improvement and enhancement of the company's environmental regulation and requirement in the market.

1.7.7 Green Purchasing

The term of green purchasing is been defined as the purchasing of products or materials even raw materials with the environmentally conscious that aims to ensure these purchase materials are in line with the environmental aims of the corporation such as reducing sources of waste, reducing or eliminating hazardous items and promoting reclamation and recycling of purchased materials (Eltayeb & Zailani, 2010; Umar et al., 2016). In this research, green purchasing refers to the purchasing practice that ensure suppliers that comply with environmental management system and supplier collaboration with organisation in purchasing and acquiring process of environmentally friendly raw materials.

1.7.8 Investment Recovery

Investment recovery is a traditional business practice driven by the different use for inventories, materials or scrap items which aim to minimize the amount disposed of in landfills waste (Zhu & Sarkis, 2004). The objective behind this practice is to recover the greatest value from end-of-life products, obsolete and surplus items. In this research, investment recover is a strategy that encourages the involvement in sales of excess inventories or materials, scrap and used materials, excess capital equipment and product and waste which occurs at the back end of the supply chain cycle.

1.7.9 Innovation Capabilities

The term of innovation capabilities is defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders (Weber and Heidenreich, 2018). This process will involve the practical use of application business product or process of technical methods, device, system, practices and skills (OECD, 2018). In the current study, the researcher defines innovation capabilities the ability of organization to be innovative which enables organization apply requisite and appropriate technologies to develop new products, meet market need and survive competition in the manufacturing industry.

1.7.10 Competitive Advantage

Competitive Advantage defined by Porter (1989), as the heart of the firm's performance in a competitive market. Barney (2014), claim that competitive advantage occurred when an organization experience its actions in an industry or market to create value to the economy and when few other organizations or competitors are involved in similar actions. In present study, the researcher competitive advantage can be achieved by providing low prices, comprehensive services, high-quality products, environmental

improvement, customer satisfaction in the most reasonable time. In short, implementing GSCM practices in manufacturing firms can improve and develop their competitive advantages which will bring superior performance compared to the rivals.

1.7.11 Social Performance

The concept of social performance first was defined by Bowen (1953), while implementing strategies and making decisions towards the organization to take actions to value society. In the 20th century, a further definition of social performance is given by Carroll (1979), who described CSR as a sensitivity of an organization about the stakeholders' expectations on the management of social, economic environmental, ethical and legal issues. In this research, the researcher defines social performance can be achieved by building strong relationships with customers, understanding their priorities and concerns, and managing that impact. In manufacturing industry, it is essential to being a responsible organisation and plays a crucial role in delivering firm's business strategy at the community level which will allow organization to have better images in the eyes of stakeholders, society, customers, personnel and the government by decreasing damages on the environment.

1.8 Organization of the Thesis

This study is compiled with five chapters. Chapter one, the introduction starts with the study background and the problem statement. Next, the research questions and research objectives are outlines. A brief description of the significance and the scope of the study are included and the final part of the chapter presents the definitions of the variables. Chapter two, presents an overview and relevant literature on supply chain management and green supply chain management in Malaysia and examine the definition and concept of GSCM, IC, CA and SP. This chapter tries to identify the

evolution from SCM to GSCM and its benefits. Additionally, this chapter gives a significant attention to the relationship between GSCM, IC, CA and SP. Thus, this chapter reviews the significant description of the underpinning theories related to the study. The chapter concludes by detailing the research hypotheses and research framework.

Chapter three, presents a description of research methodology adapted by the study. The content of the chapter comprises with the research approach, study population, study population, sample and sample size, data collection method and procedures, research instruments, pilot study data analysis. Moreover, this chapter provides explanations on the Statistical Package for Social Science (SPSS) which has been used to analyze the descriptive statistics and the Structural Equation Modelling (SEM) that used to analyze the measurement model and structural model. Chapter four presents the data collected in the study and the results of the analysis and the findings followed by a discussion of the results. The last chapter of the thesis presents the conclusions based on the findings of the study followed by the recommendations, the implications of the findings, the limitations of the study and the suggestions for the future studies.