Supplier development practices for corporate sustainable development: A case study of Ericsson

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Pingping Xu

Abstract

Background: Sustainability is the need of the time, everyone in the society should play a role in making a more sustainable environment. Organizations as demanded by the whole society need to be more sustainable in order to achieve survival and success. The sustainable development of a company is inseparable from a sustainable supply management. Supplier development is one of the critical parts in supply management which can contribute to the buying firm and its suppliers' sustainable development. With different strategies in supplier development life-cycle stages and the sustainability considerations in supplier development practices are significant in corporate sustainable development.

Purpose: The intention of this thesis is to empirically study what strategies in supplier development practices are implemented in Ericsson and how sustainability is taken into consideration. By studying supplier development practices in Ericsson empirically, this thesis intended to deepen knowledge of supplier development practices in the telecommunications industry.

Method: This thesis is a qualitative research study which utilizes the single-case study method with multiple interviews. The empirical findings were supported by both primary and secondary data. The interviews were conducted with semi-structured ways under the framework of the interview's ethical considerations and interview guide.

Conclusion: There are different strategies which include both direct and indirect strategies in different supplier development life-cycle stages in Ericsson. Sustainability is taken into consideration in designing, recruiting, implementing, evaluating and rewarding stages of supplier development life cycle. The findings have contributed to deepen the knowledge of supplier development practices empirically in the telecommunications industry.

Keywords: sustainable development, supplier development, sustainability, supplier development strategies, supplier development life cycle, corporate sustainable development.

List of abbreviations

5G	5th generation wireless communication system
6G	6th generation wireless communication system
BF	Buying Firm
CFI	Corporate Finance Institute
CIPS	Chartered Institute of Procurement & Supply
CP	Competitive Pressure
CSR	Corporate Social Responsibility
EA	Evaluation and Assessment
IC	Incentive
ICT	Information and Communication Technology
IoT	Internet of Things
ISO	International Organization for Standardization
KT	Knowledge Transfer
MI	Management Involvement
ROI	Return on Investment
SC	Supply Chain
SCM	Supply Chain Management
SD	Supplier Development
SDG	Sustainable Development Goal
SM	Supply Management
SME	Small and Medium Enterprise
SRI	Socially Responsible Investing
SSC	Sustainable Supply Chain
SSCF	Sustainable Supply China Foundation
SSCM	Sustainable Supply Chain Management
SSM	Sustainable Supply Management
TBL	Triple-Bottom-Line
Telecom	Telecommunication

Contents

List of Figures

List of Tables

Chapter 1. Introduction

This chapter will provide an outline of this thesis, starting by the background of this thesis' topic. It will follow with the research aims and the discussion of research problems and questions. Moreover, this chapter also contains the scope and delimitations as well as the structure of the thesis.

1.1. Background

Sustainability as a mainstream concept in every business sector becomes increasingly clear since last century under the promotion of the United Nations (UN) (McWilliams & Siegel, 2001). The demands from the public, governments and stakeholders are developing as the major pressure for organizations to take sustainability into consideration. As Thompson (1967) described in his organizational environment theory that organizations must accept and adapt themselves to the internal and external uncertainties for long-term survival and success. Sustainability is the external demand and uncertainty. Organizations in every industry need to accept and adapt themselves to this external uncertainty for their long-term survival and success (Ageron et al., 2012). In 1987, the commonly referred definition of sustainable development was proposed and it defined sustainable development to be "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland report, 1987). Organizations must adapt their business strategies into this sustainability required direction. As Hueman and Silvius (2017) stated, the process of pursuing sustainable development is a procedure of transformation from unsustainability into more sustainability in the whole business process. However, the resistance to change is extant constantly in companies and the challenges always exist partly due to the fear of change as well (Ageron et al., 2012). According to Schaltegger and Csutora (2012), there are six major sustainability challenges today which include: deforestation, loss of biodiversity, population growth, poverty, scarcity of drinking water, and climate change.

Since there are more sustainability challenges being discovered, there are more demands and requirements from both external and internal sides for organizations to take sustainability into their business considerations regarding economic, environmental and social aspects. The external side as mentioned above include stakeholders, markets, industry and governmental demand and regulations, competitors and the type of business which is sensitive to the demand

of sustainability. The internal factors include an organization's long-term business vision and internal sustainable initiatives from top management, employees or suppliers. Since the business environment has changed for organizations over the years, it is no longer the environment as Milton Friedman (1970) believed that the "business' business is business". Instead, organizations are also expected by the scholars and the public to take more of their corporate social responsibility (CSR). Carroll (2015) believes that CSR is not a new thing in the modern times but rather has a long history and it has optimistic prospects for further development as well. The environment also requires organizations to operate their business within the triple-bottom-line (TBL) which include economic prosperity, social justice and environmental quality bottom lines as Elkington described (1997). Since the UN (2015) adopted 17 sustainable development goals (SDGs) as the 2030 agenda for sustainable development, countries, organizations as well as individuals are more specifically working towards these directions.

As Glover et al., (2014) described, the external pressure which could be social, political, environmental and economic, can have a deep impact on organization's strategies and decision-making. Under the situation of external sustainability pressure demands, organizations must change their business strategies accordingly for pursuing better market competitive advantages. Nevertheless, organizational market competitiveness is not only dependent on their own business performance but also highly related to their supply chains (Li et al., 2006; Chen et al., 2018). To emphasize the importance of suppliers, Handfield et al. (2000) stated that "20 percent of suppliers are responsible for 80 percent of the poor performance". With the development of work division since the theory from Adam Smith in 1776, there are rarely any organizations that can operate their whole business process independently without relying on any sort of supply chain, especially with the development of globalization. By contrast, businesses in modern times rely highly on supply chains both locally and globally.

With the importance of sustainability growing in the supply chain, sustainable supply chain management becomes one of the key components in organizational business strategies. Among supply chains, suppliers are the foremost actors in the whole chain. For sustainable development, supply chains need all actors in the chain from upstream to downstream to commit to take their responsibilities in line with the TBL (Malviya, Kant & Gupta, 2018; Ha-Brookshire, 2017). Among all three aspects of the TBL in sustainable supply chain management, social responsibilities have largely been neglected (Seuring & Müller, 2008). Instead, the environmental and economic aspects are more emphasized in the firm's strategies.

Panigrahi, Bahinipati and Jain (2019) think that a socially responsible organization should not only focus on their own CSR and TBL but also need to extend their social values to its suppliers and guide them to be more socially responsible and more sustainable. Supplier development which is an effort of the buying firms to improve supplier's performance for satisfying the needs of the buying firm's supply needs (Krause & Ellram, 1997a; Krause, Scannell & Calantone, 2000). Since organizations are facing demands and requirements to adopt sustainability in their supply management, they must extend their sustainability values to their suppliers and guide them to be more sustainable, which is one of the big parts of their social responsibility as well. Supplier development is critical for the success of sustainable supply management (Yawar & Seuring, 2020). Adopting supplier development is one of the most important ways for organizations to achieve their sustainability goals in supply management, as well as an effective way to extend a buying firms' sustainability values to their suppliers.

From previous research studies, there are different strategies for supplier development to be effective. Besides, supplier development has its own life cycle as well which includes four stages 1) designing, 2) recruiting and engaging, 3) implementing, 4) evaluation and rewarding, as well as different necessary and efficient strategies in different life-cycle stages (Liu et al., 2018). According to Krause, Handfield and Tyler (2006); Krause (1998), supplier development could contribute to sustainable development for buying firms, suppliers and to the stakeholders on the supply side. It is an incentive for companies on the supply side when the correlations between supplier development and organizational business performance is positively related (Krause, Handfield & Scannell, 1998). Thus, organizations have both external pressure and demand from external stakeholders and internal incentives for improving their business performance for corporate sustainable development. Due to the need and demand of sustainability, sustainable development has been integrated into its supplier development practices. This leads to and constructs sustainable supplier development. Sustainable supplier development which is in line with the needs of TBL is explained as the effort of buying companies to improve supplier's performance for satisfying buying companies' short-/long-term sustainable development needs (Ghayebloo et al., 2015). The impact of supplier development life cycle on improving the performance of the buying firms and the suppliers in supply management is considerable. However, there may be different evaluation systems about the impact of supplier development practice among the buying firms and the suppliers. Supplier development practices are conducted by the buying firms and also it is initiated because of the needs of the buyers with the intentions of satisfying the buyers' business needs. If it is not the

buying firm's commitment for more business cooperation in the long-run to participate in supplier development practices or programs, suppliers of the buying company may be reluctant to change their current business operations to meet the requirements of the buying company's sustainability requirements (Wen-li et al., 2003). Therefore, it is important for the buying firms to have a more complete understanding about supplier development.

The telecommunication (telecom) industry which is the industry of the case company in this thesis is filled with organizations such as internet service providers, satellite companies, telephone companies as well as cable companies. The basic meaning of telecom can be interpreted as communicating over space (Corporate Finance Institute [CFI], n.d.) Telecom companies play an especially vital role in the modern people's lifestyle. Without the products of telecom companies, people's lives may not be as convenient as it is nowadays or may even be paralyzed. The world would not be a "global village" as it is now, especially under the COVID-19 pandemic when people had restrictions to travel physically but could still meet anyone in the world freely anytime without restrictions by using products from the telecom industry. All of this demonstrates the popularity and necessity of the products from the telecom industry in modern people's life. The wide tele-products coverage and usage in the world indicates the big part of it in the supply chain both locally and globally. Because of its significant role in the supply chain, it could have an extensive impact on the sustainable supply chain.

1.2. Research aims

This thesis focuses on supplier development practices for corporate sustainable development. The definition of supplier development is the effort of the buying firm on improving suppliers' performance and capabilities with the aim of meeting the needs of the buying firm's short-/long-term supply. (Krause & Ellram, 1997a; Krause, 1999). Corporate sustainable development in this thesis is explained as the development of delivering goods or services of corporate business which is in line with the three aspects of TBL in economic, environmental and social aspects (Bansal, 2005).

The theories in the supplier development field indicate the importance of implementing supplier development practices into corporate sustainable supply management for sustainable development (Humphreys, Li & Chan, 2004). Due to the need of buying firms which initiate supplier development ideas and take them into practice for sustainable development

(Humphreys et al., 2004), this thesis, therefore, will focus on studying the supplier development from buying firms' sustainability perspectives. This thesis is intended to find out what strategies that Ericsson is adopting in their supplier development practices for the sustainability of their business and how Ericsson is taking their sustainability concerns into its supplier development practices so that it contributes to corporate sustainable development.

In conclusion, the aim of this paper is therefore to deepen the knowledge of what supplier development practices are adopted and how to integrate sustainability into practices from the telecom industry. Specifically, the empirical findings could stimulate inspirations for the academics about the buying firm's perspective of adopting and implementing sustainable supplier development in its business strategies.

1.3. Research problems and questions

1.3.1. Research problems

The prior research indicates the importance of extending organizations' sustainability values through supplier development practices. However, not all organizations are willing to do so due to reasons such as the buying firm's size, the buying firm's resources in human assets and finance, the amount and diversity of the buying firm's suppliers. Furthermore, previous research studied the necessity of adopting supplier development practices for maximizing the benefits of the buying firm, such as studies from Handfield and Tyler (2006); Krause (1998); Krause, Handfield & Scannell, (1998); Li et al., (2007). However, how supplier development practices are implemented empirically in different industries are insufficiently studied (Wagner, 2006b). According to Wagner (2006b), the current research studies of supplier development focused on industries, such as machinery; food or tobacco; chemicals and pharmaceuticals; automotive; metal and fabricated metal; construction. There is a lack of empirical studies in the telecom industry.

Sustainability as the demand and requirement for both for-profit and nonprofit organizations need to be adopted in organizations' every business practice or process. Supplier development is one of the ways that organizations extend their sustainability concerns to their suppliers. What strategies of supplier development are adopted for sustainable development, how buying firms integrate sustainability into its supplier development practices are various and are dependent on the perception of buying firms on sustainability. Thus, there needs to be more empirical

evidence from organizations of different industries showing their intention on supplier development practices with regards to sustainability.

Ericsson which claims itself as the industry leader (Ericsson, 2020) is gradually taking sustainability in its business. However, with about 18,000 suppliers globally, Ericsson has challenges in how to align all its suppliers on the same sustainability level. By integrating supplier development practices, which strategies are efficient in different life-cycle stages are challenged as well.

1.3.2. Research questions

Based on the discussion above, this paper plans to cover the unclear problems, convert them into two specific research questions and contribute to the academic needs of different industries' empirical studies from the telecom industry. The research questions are generated from the inspirations of theories in sustainable supply management and supplier development which are in line with the research aims of this paper. The research questions will focus on what strategies are adopted in supplier development life cycle which could contribute to the sustainability of Ericsson's business. After that, this thesis will keep studying on how Ericsson empirically integrates sustainability into its supplier development for corporate sustainable development. In summary, the research questions (RQs) are as in below:

- RQ1: What strategies do Ericsson implement in supplier development life cycle?
- RQ2: How does Ericsson integrate sustainability into its supplier development practices?

1.4. Scope and delimitations

To have a holistic understanding about supply chain management is difficult when there are so many different stakeholders involved in the supply chain. Supply chain management is supposed to manage the whole chain in order to make it run as efficiently and smoothly as possible from upper stream to the end users. Supply management which is mainly focusing on the upper stream suppliers instead of the whole supply chain has much smaller focus than supply chain management. Supplier development as one of the key components in supply management which is the focus of this paper has limited perspective and has difficulty shedding light on the complexity of the whole supply chain management. The scope is limited to this paper which will focus on the strategies that are adopted in supplier development life cycle and

how to integrate sustainability in supplier development practices. However, the limitation of this thesis is that it does not contain what improvement on the case buyer company and its supplier's performance on supply cooperation as well as what the impacts are on business performance. Besides, this study is a single-case study about the telecom company Ericsson and the empirical findings are mostly used for theory application and strengthening not research gap-spotting which could bring more value to academic research (Alvesson & Sandberg, 2011). The research method is designed as a single-case study which has limitations in generalizing the empirical findings.

1.5. Thesis structure

The structure of this paper is designed as the diagram as below (*Figure 1*):

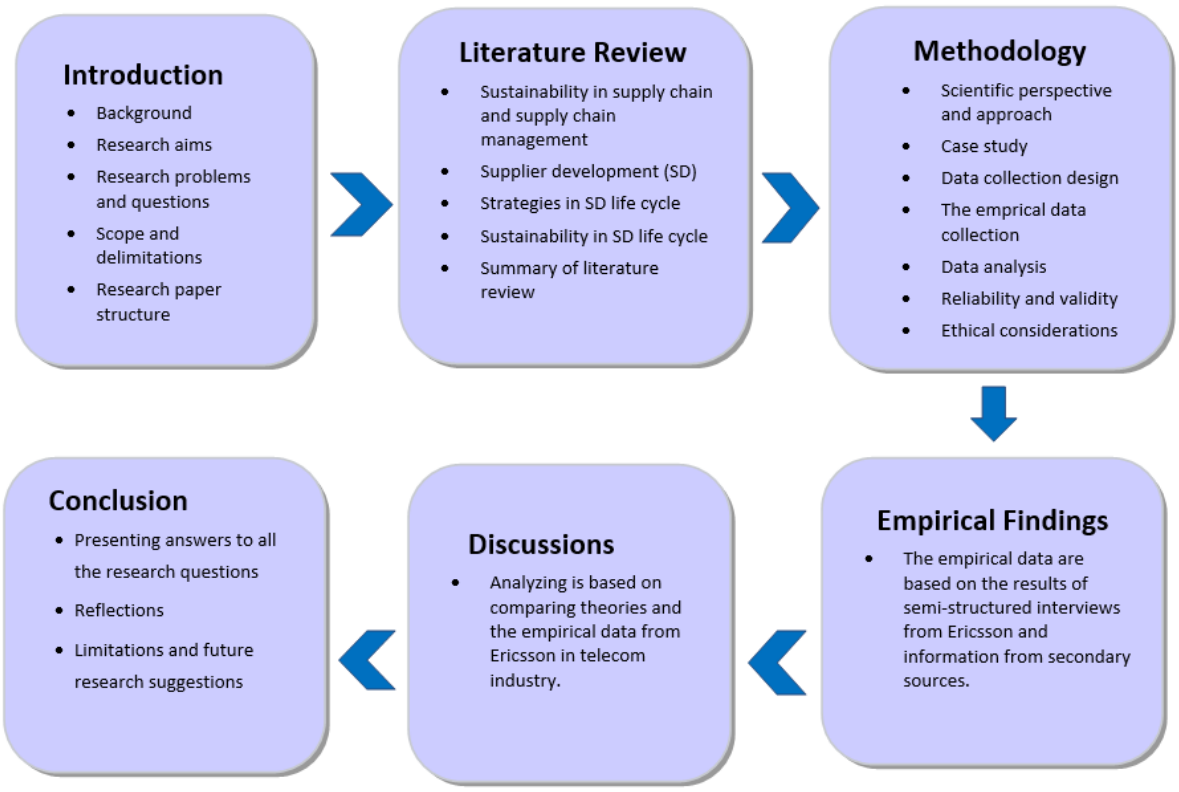

Figure 1. The thesis structure

Chapter 2. Literature Review

This chapter will introduce the supplier development related theories which will provide the theoretical basis for the empirical study. The literature review will start by explaining different concepts in supply chain and supply management with sustainability. Then, it will focus on the theories in supplier development which will include the strategies, life cycle and sustainability in supplier development practices.

2.1. Sustainability in supply chain and supply management

Supply chain (SC) as described by Kozlenkova et al., (2015), is a system within organizations that involves the transformation of resources into final product/service which are delivered to the end customer. Supply chain is one the most important parts in the organizational business process for delivering goods or services from manufacturers to their customers (Chartered Institute of Procurement & Supply [CIPS], 2021). In the age of globalization, supply chain on the global level is increasingly essential for organizations to do successful business (Kannegiesser & Günther 2013). Supply chain management (SCM) is defined as the management of the transformation process of resources to final product/service to the end customers and it commonly is designed to include planning, controlling, knowledge management, communication structure and monitoring for supply chain activities (Preuss, 2005). SCM has characteristics as practitioner-led and cross-functions which covers business practices such as planning, purchasing, manufacturing, and distributing (Council, 2008).

According to Ahi and Searcy (2013), Linton, Klassen and Jayaraman (2007), Gracia and Quezada (2016), sustainable supply chain (SSC) involves sustainability into the whole supply chain lifecycle which includes product design, material selection, manufacturing, recycling, distributing, storing, warehousing, usage and disposal. Sustainable supply chain management (SSCM), according to Panigrahi et al., (2019) has various academic definitions from different researchers in this field due to SSCM still being a relatively new field. However, practically, the most commonly accepted description about SSCM is that it is a managerial process that integrates economic, environmental and social concerns into the whole SCM (Touboulic & Walker, 2015; Seuring and Müller, 2008). The findings from Gold et al., (2009, 2010) suggests that the adoption of sustainability in SCM is influenced by external demand and pressure. The Sustainable Supply Chain Foundation (SSCF, n.d.) thinks that sustainable supply chain management not only could help organizations in achieving their CSR but also in optimizing

their business performance. The priorities of SSCM includes three parts in TBL which are 1) economic efficiency, 2) environmental & resources management, reducing carbon footprint and 3) availability, and social responsibility (Touboulic & Walker, 2015; SSCF, n.d.). Adopting sustainability into supply chain management is not just a burden but also a great driving force to achieve better business performance (Ahmed, Montagno & Firenze, 1998; Ameer & Othman, 2011; Kemp & Oltra, 2011; Eccles, Ioannou & Serafeim, 2014).

Supply management (SM) has a smaller scope than SCM which is focusing on the whole chain from manufacturing to the end customer. SM is mainly focused on the upstream of the supply chain. According to Johnson, Leenders & Flynn (2021), supply management is interchangeable with purchasing and procurement. SM is the managerial activity for managing resources and suppliers. SM is a systematic business process which mainly includes purchasing and the preparation of pre-purchasing, providing information & serving, coordinating & controlling, developing & maintaining the relationship with suppliers with the intentions of controlling the cost (Kenton, 2021).

Sustainable supply management (SSM) is to bring the TBL concerns into the SM managerial activities and strategies (Shou et al., 2019). Suppliers are one of the key components in a SC. For sustainable development, the supply chain needs all actors in the chain from upstream to downstream committed to take their responsibilities in line with TBL (Malviya et al., 2018). In SSM, organizations need to evaluate the suppliers with the criteria from economic, environmental and social aspects to meet their sustainability goals (Faisal, Al-Esmael & Sharif, 2017). The reason that organizations must carefully select their suppliers is mostly because the decision of choosing what kind of suppliers could have a direct impact on organizations' market competitiveness and positively impact their sustainability performance (Gualandris, Golini & Kalchschmidt, 2014). Besides, as the discovery after the literature review from Panigrahi, et al (2019) stated, the academic and empirical research emphasized too much on economic and environmental performance in SSM and the social perspective of SSM has been largely neglected. For an organization to be sustainable in SSM, it must consider the three aspects (economic, environmental and social aspects) into its business strategies, not just two of them (economic and environmental aspects). As Panigrahi, et al (2019) described, a socially responsible organization must also extend its social sustainability values to its suppliers through collaboration. Therefore, sustainably collaborating with suppliers is also part of the organization's social and sustainability responsibilities. In SSM, there are mainly two parts of work regarding supplier management which are supplier evaluation/assessment and supplier

collaboration. After supplier evaluation/assessment, organizations need to manage their relationship with the selected suppliers for collaborations. Positive supplier collaborative relationship is vital in improving the quality and productivity for organizations to strengthen their business competitiveness and also sustainability performance (Gimenez, Sierra & Rodon, 2012). Additionally, stable long-term supplier relationship effectively helps organizations to mitigate their risks in SC (Faisal, Banwet & Shankar, 2006).

2.2. Supplier development (SD)

Salimian, Rashidirad and Soltani (2017) claimed that the term "supplier development" was first applied by Leenders (1966) when Leenders was describing how organizations should develop a number of reliable suppliers. Krause and his colleagues made great contributions in enriching and further developing the theory of supplier development and their studies have provided valuable understandings and inspirations to further develop the nature of supplier development and connection between supplier development and performance outcomes (Humphreys et al., 2004). Krause and Ellram (1997a) noticed that the factors for the buying firms (BF) to be successful are varied but the successful buying firms are more satisfied with their supplier through supplier development, such as supplier evaluation, supplier training or supplier rewarding. With further studies of supplier development, Krause and Ellram (1997a) defined the concept of supplier development which is the effort of the buying firm on improving suppliers' performance and capabilities with the aim of meeting the needs of the buying firm's short-/long-term supply needs. Krause and Ellram (1997b) also made aware when buying firms emphasize the importance of supplier development, they perceive suppliers as strategic partners and pay more attention on some critical elements which includes communication, top management support, purchase strategy, internal cross-functional team, supplier evaluation and recognition, long-term perspective other than short-time price level. In the deeper study, Krause (1999) found out the prerequisite for buying firms to adopt supplier development depends on the evaluation of supplier's commitment for business cooperation, the expectation of the long-term relationship continuity and the possibility of effective two-way communication between the buyer and supplier. The theories from Krause and its colleagues are intensively adopted by this thesis which can be collected from the literature in *Table 1*:

Table 1. Main supportive literature in this thesis for explaining the theory of Supplier Development (SD).

No.	*Main supportive literature of Supplier development (SD) in this thesis*
1	The relationships between supplier development, commitment, social capital accumulation and performance improvement. (Krause, Handfield & Tyler, 2006).
2	An empirical investigation of supplier development: Reactive and Strategic Processes. (Krause, Handfield & Scannell, 1998).
3	A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance. (Krause, Scannell & Calantone, 2000).
4	The antecedents of buying firms' efforts to improve suppliers. (Krause, 1998).
5	Critical elements of supplier development the buying-firm perspective. (Krause & Ellram, 1997a).
6	Success factors in supplier development. (Krause & Ellram, 1997b).

Furthermore, Watts and Hahn (1993) believe that the supplier development should focus more on future supplier capabilities and flexibility development instead of short-term cost and quality. Once buying firms accept and adopt a supplier development program in their business strategy, it is important to involve suppliers to participate in the SD program with full commitment. Because the SD program requires the agreement from both parties (the BF and its suppliers), especially in financial and resource input. Before embarking on the SD program, BFs and its suppliers need to reach an agreement in budget, time and personnel input, availability of the level of sensitive information in business practices (Handfield et al., 2000). When both parties reach a consensus for embarking on a SD program, there are several most commonly adopted methods in supplier development to improve supplier's performance and capabilities which are summarized by Humphreys et al., (2004) based on the extant literature as 1) helping suppliers set higher performance goals in supply operations; 2) offering training; 3) supporting with equipment, technology or investments directly or indirectly; 4) evaluating suppliers' performance, progress with the prize of awarding.

In the later study of Krause (2006), he stated that the intentions of SD are to build stable and mutual trust relationships between the BF and suppliers and contribute to solving the insufficient communication and complicated coordination problems in SSM. However, to adopt SD in SSM, the mutual foundation for both of the BF and suppliers are the high market competition, technological changes and respect of each other's business strategies (Li et al., 2007; Mahapatra et al., 2012). Without the mutual foundation, SD will have limited impact on both of the BF and its suppliers. CIPS, which is short for Chartered Institute of Procurement & Supply and is a UK-based industry institute with global members (CIPS, 2021), believes that

SD is closely related to supplier relationship management and partnering and it needs mutual benefits and sound reasons for embarking on the SD program. The needs and objectives which are aligned with the organizational long-term business strategy should be clear and the benefit of conducting an SD program should be quantifiable (CIPS, 2013). Furthermore, as stated by Watts and Hahn (1993), supplier development needs to focus more on future supplier capabilities and flexibility development. Why SD programs need to be embarked on should be fully prioritized and evaluated by the professionals in procurement and supply management because triggering SD programs should be sound and with purpose, such as reducing cost, improving lead time, resolving quality problems, improving supplier's business alignment with the BF in sustainability level. SD needs to be designed to increase the total added value from participated suppliers in terms of product, cost, lead time, service, business process and performance impairments (Mahapatra et al, 2012). Due to the demand of sustainability in SSM, SD needs to take sustainability into the considerations and thus the SD practices will not only include suppliers' sustainability management but also be interrelated with supplier selection and evaluation even though there is limited research about selection and evaluation (Zimmer, Fröhling & Schultmann, 2015). However, supplier selection for SD does not necessarily select "the best of best" instead it can choose "less than best" with the most potential (Wen-li et al., 2003). Since the best suppliers are already having "good" supply performance from the BF's perspective, SD should focus more on the suppliers that are not the best but with enormous potential to be improved in the SD program.

There are mainly four focus parts in SSM which includes sustainable supplier selection, supplier monitoring, supplier development and supplier collaboration (Yang & Zhang, 2017). SD as one the big parts in SSM is closely related with supplier evaluation/assessment. While collaborating with suppliers through SD, BF could extend its sustainable vision to its suppliers and take it into practices which is also one of the BF's social and sustainability responsibilities. BFs are taking it to meet their supply needs in sustainable business growth by improving supplier's performance or capabilities. Adopting SD is not just benefiting the BF but also helps suppliers to improve their performance and it can bring significant effect on long-term relationships and collaboration.

2.2.1. Supplier development or supplier switching

In purchasing literature, BFs aim to pursue cost minimization which can easily result in switching suppliers for obtaining lower cost and higher quality when there are many alternative

suppliers (Dastyar et al., 2020). Handfield et al (2000) pointed out that they minimize the cost of switching suppliers only when the suppliers are low-value-added, non-strategic, low-cost changing suppliers. Otherwise, it is high-cost and not optimal for BFs to switch suppliers. With the development of supplier development, many BFs are facing options in whether to switch suppliers when the incumbent supplier cannot meet the requirement of BFs' needs or further develop the current suppliers to improve their performance so that to meet the BFs' needs (Friedl & Wagner, 2012). Generally, BFs are using purchasing portfolio models which contain both qualitative and quantitative criteria and assessment approaches to decide whether or not to switch suppliers (Cole & Aitken, 2019). However, Heijboer (2003, pp. 150–152) thinks the sourcing recommendations generated from the qualitative criteria from purchasing portfolio models is insufficient for making a thorough strategic sourcing decision. Talluri and Narasimhan (2004, p. 236) also pointed out that the methodologies in strategic sourcing in reality are "too subjective" and the objective decisions in strategic sourcing are restricted to supplier evaluation. Therefore, Talluri and Narasimhan (2004), developed a strategic sourcing framework which recommended the BFs to adopt effective management of suppliers by establishing strategic supplying partners and involving supplier development practices. In the strategic sourcing framework from Talluri and Narasimhan (2004), BFs can classify its suppliers into distinct groups and apply accordingly to strategic sourcing decisions. The suppliers can be classified as partnership suppliers who don't need further improvement in the current situation, underdeveloped suppliers who need further involvement in the supplier development program, competitive suppliers and suppliers that need to be changed. Similarly, the classification for suppliers can be based on the nature of the supplied commodities. According to Handfield et al (2000), there are four types of supplies which include "noncritical supplies", "bottleneck supplies", "leverage supplies" and "critical strategic supplies". The four types of supplies can be explained in the below *Figure 2*.

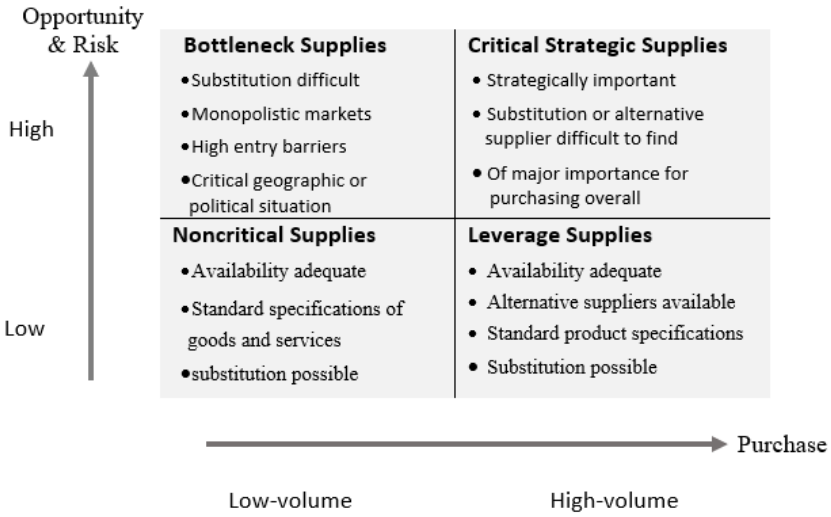

Figure 2. Four types of suppliers. Adopted from Handfield et al. (2000), pp,39.

For BFs, it costs money regardless of switching or developing suppliers. However, it is important that the BFs could realize which is the profit-maximize way for the BF's long-term business development. Friedl and Wagner, (2012) have conducted an in-depth quantitative analysis and they draw four situation scenarios for helping BFs when they decide to adopt a supplier development program instead of switching suppliers. The four situation scenarios can be summarized from Friedl and Wagner, (2012) as in below *Table 2*.

Table 2. SD scenarios. Combined information from Friedl and Wagner (2012), pp,3075.

Scenario	Strategic recommendation for BFs
When the cost of changing the current suppliers is higher than switching	• Should adopt supplier development program for the current supplier. o Can sign a fixed-price contract with the entrant suppliers for a certain period of time due to cost consideration
When it is negatively correlated between the uncertain maximum demand and the uncertain incumbent supplier's cost	
When the cost of switching, the price of the entrant supplier and the cost difference of expected value of the maximum demand and the current supplier's cost are high	
When the total supply chain-spanning (i.e., supplier–buyer–customer) welfare can be improved through developing the current supplier.	

Handfield et al (2000) also gave their suggestions on when BFs should adopt SD programs. They pointed out that the BF should emphasize on suppliers in critical strategic supplies for further development based on supplier performance evaluation (as in below *Figure 3)*.

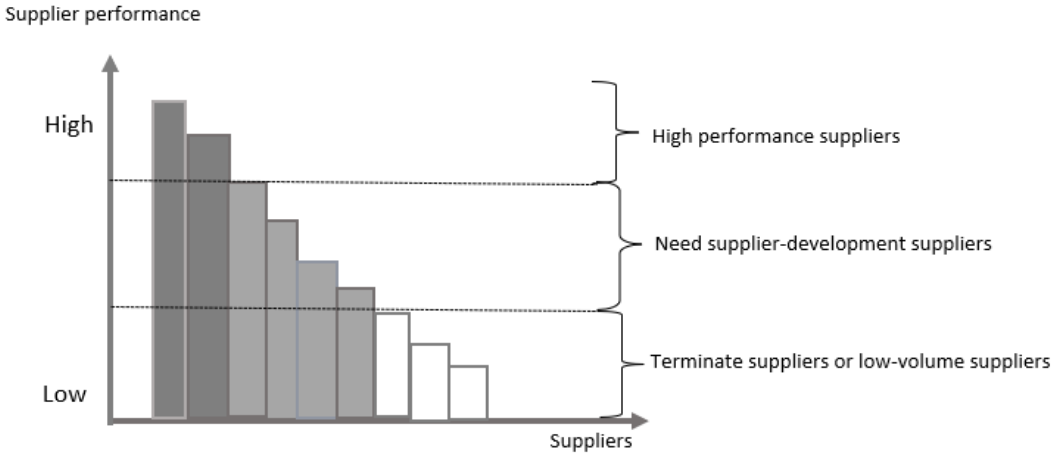

Figure 3. Optimal target suppliers for SD. Adopted from Handfield et al (2000), pp,40.

2.2.2. Enabling and hindering factors for supplier development

Once BFs are in the situation of wanting to adopt SD, SD is prompted by a variety of enabling factors. According to the conclusions of Cox et al., (2004) and Krause et al., (2006), the main enabling factors of SD are the asymmetries between the BF and its suppliers such as different trust levels, information sharing, resources availability and power mechanisms. The asymmetries between BFs and their suppliers make SD as one of the necessary processes for both parties' corporate sustainable development. The study of Yawar and Seuring (2020) shows that there are several important reasons for organizations to adopt SD in their SSCM. Firstly, SD should not be a pressure for the BF but rather more as the incentive driving force for the BF to improve their market competitiveness (Jajja et al., 2016; Dalvi & Kant, 2017; Dalvi & Kant, 2018). Secondly, SD helps organizations to develop long-term buying-supplying relationships and thus helps organizations reduce the risks of unstable suppliers (Friedl and Wagner, 2012; Routroy and Pradhan, 2013). The long time stable cooperative relationship also reduces the transaction cost in supplier replacement. Thirdly, supplier loyalty with the interaction between BF and suppliers are cultivated through SD practices (Ghijsen et al., 2010). The communications and interactions between BFs and suppliers could help them know more about each other and learn from each other while growing. As the empirical finding from Lintukangas, Hallikas and Kähkönen (2015) demonstrates that stronger and stable buying-supplying relationships promote the implementation of sustainability in the whole supply chain. From the findings of Yawar and Seuring (2020), the enablers in SD include trust, commitment, information sharing, communication and top management support. To explain these enablers, the definition can be adopted from Yawar and Seuring (2020), which can be seen in *Table 3*. Besides, the technology development in IT capabilities is also very vital to the SD practices for

on-line and cross-geographical connections between BFs and their suppliers (Norrman & Wieland, 2020).

Table 3 .Definition of enablers. Adapted from Yawar and Seuring (2020), pp, 2573 – 2574.

Enablers	Definition
Trust	The level of confidence during business transactions between BF and suppliers
Commitment	The degree of volunteering pledge or obligations to keep business through loyalty, willingness during long-term relationship
Information sharing	Sharing the information do practices and knowledge to improve performance between BF and suppliers
Communication	The communications of some specific business transactions between BF and suppliers
Top management support	The level of involvement of upper rank managers from BF and suppliers in SD

In the situation of implementing SD there are hindering factors. In the study of Bai and Satir (2020), the main barriers of implementing SD may both come from the BF and its suppliers' side which include lack of willingness to change, lack for knowledge and specialists, lack of top management commitment and long-term strategies in sustainability and lack of motivation and incentives due to the weak regulations regarding sustainability in local places. But the BF are facing problems in carrying out SD practices, such as high-cost, lack of motivation, insufficient knowledge and information (Bai & Satir, 2020). Besides, Dalvi and Kant (2016) also identify that the lack of mutual trust between BF and suppliers and also the lack of reliability and capability from the supplier side are two significant barriers for implementing SD. Furthermore, because of the fast-changing market demand for organizations to quickly transform their business into being more sustainable, SD in lots of cases is being treated as the tool of supplier selection and evaluation (Wagner, 2011). Some BFs are simply treating SD as a tool to select or evaluate a better supplier so that they can increase profits or develop a deeper business relationship with the suppliers who have obtained better results in the evaluation. This oversimplified concept of SD ignores the importance of knowledge and information transfer and thus will hurt the motivation of some suppliers' motivation to join in SD practices and thus limit the impact of SD. Moreover, as Humphreys et al., (2004) noticed, the cultural context is also one of the biggest barriers for implementing SD with suppliers who have distinct cultural backgrounds due to the geographical dispersion of suppliers and BFs. The diverse cultural background could deeply affect the mutual trust of suppliers and BFs which increase the risk of uncertainty for achieving high quality by implementing SD.

2.3. Strategies in the SD life cycle

Strategy is generally denoted as a pattern of actions to achieve short-/long-term goals with limited resources under the situation of uncertainties (Freedman, 2015; Bradley, 2011). The importance of adopting strategy in the activities lies in that it can help achieve the intended outcomes with limited resources. When organizations are having only limited resources but facing high competition in the globalization situation, strategies are vital for their survival and success. To achieve sustainable goals of improving supplier cooperation in sustainable supply chain management through SD, various strategies are needed and necessary in different SD life-cycle stages. The strategies of SD theoretical framework which are commonly accepted are proposed by Krause et al., (2000) which includes competitive pressure (CP), incentives (IC), evaluation and assessment (EA) and management involvement (MI). Another element which was added to the SD strategies later is knowledge transfer (KT) (Modi & Mabert, 2006; Dou et al., 2014). The definitions of these strategies can be adopted form the work of Liu et al., (2018) as in *Table 4* below:

Table 4. SD strategies. From Liu et al. (2018), pp,102.

Strategies	Definition and typical activities	Examples of sustainability context
Competitive pressure	suppliers with better performance obtain higher volumes of business	Take environmental or social performance into consideration; this performance can be part of core competitiveness when related to quality and stability.[3]
Incentives	profit-sharing, long-term commitment, recognition and reward, etc.	Give recognition and reward when suppliers have high performance on sustainability[4]; co-design green products with suppliers as a win–win solution (Lee and Kim, 2011); promote recycling practices to reduce supplier costs.
Evaluation and assessment	monitoring, reporting and verification, so that both parties are aware of the performance	Implement environmental and social metrics/indicators on a regular basis; sharing information among partners (Vachon and Klassen. 2008); create contractual requirement and code of conduct for sustainability purposes to rule out suppliers with poor performance.
Management involvement	make capital, human, organizational or equipment investments	Building suppliers' top management support for the improvement of supplier performance on sustainability; invest in on-site pollution control facilities for suppliers; invest in robotic facilities to replace human operators and eliminate risks of occupational hazards.
Knowledge transfer	direct interaction between knowledge giver and recipient	Training programs that provide sustainability-related knowledge at individual or organizational level (Lewis *et al.*, 2015); organizational knowledge transfer activities (Modi and Mabert, 2007) might not be sufficient if the buying firm itself does not have enough knowledge of sustainability.

To enable the stable, long-term and reliable relationship with suppliers, the strategies can also be divided into two types of interactions between BF and suppliers in SD practices which are direct and indirect (Yawar & Seuring, 2020). Direct strategies require the BF to spend sufficient resources to ensure the SD practices whereas indirect strategies require relatively limited resources to facilitate the SD practices. Both the effort of direct and indirect strategies are contributing to improving supply chain performance for both the BF and suppliers because of the sustainable collaboration and engagement by sharing risks and awards (Krause et al., 1998; Wagner, 2006a, b). Yawar and Seuring (2020) categorized direct and indirect SD strategies after reviewing substantial amounts of SD literature and theories. According to them, direct SD strategies are mainly training, education, knowledge transfer, investment (technical, financial and logistical) and supplier monitoring. Whereas, indirect SD strategies include supplier visits, supplier evaluation, supplier auditing, supplier rewards and supplier certification. Combined with the summarized strategies from Liu et al (2018), the direct and indirect strategies can be categorized as in below *Table 5*.

Table 5. Direct and indirect SD strategies. Information combined from Yawar and Seuring (2020), pp, 2573 – 2574 and Liu et al. (2018), pp, 102.

Strategies		
Direct		
	KT	knowledge transfer, training, education.
	MI	management support, investment (technical, financial and logistical), support in equipment and human assets
Indirect		
	EA	supplier evaluation, supplier monitoring, supplier auditing, supplier certification
	IC	supplier rewarding and recognizing

Chavhan, Mahajan and Sarang (2012) classified three levels of SD based on different strategies that are adopted in the SD practices which are so-called the basic SD, the moderate SD and the advanced SD (see *Table 6*). The basic SD involves limited BF's resources input that will mostly use EA strategies and limit the level of MI. The moderate SD should be more complicated than basic SD where it requires more involvement and input from BF which will use both EA and IC strategies and also higher levels of MI. The advanced SD is the highest level which will use all the strategies in the whole SD process.

Table 6. SD levels. From Chavhan, Mahajan and Sarang, (2012), pp,40.

Basic Supplier Development	Moderate Supplier Development	Advanced Supplier Development
• Evaluation of supplier's performance and feedback to suppliers. • Sourcing from a limited number of suppliers. Parts standardization. • Supplier qualification.	• Visiting suppliers' plants. • Awards and approval of supplier's performance improvements. • Collaboration with suppliers in materials improvement. • Supplier certification.	• Training to suppliers. • Collaboration with supplier. • Involvement of suppliers in the buyer's new product development process. • Intensive information exchange with suppliers.

2.3.2. Strategies in different stages of SD life cycle

As Liu et al (2018) indicates, SD has its own life cycle which includes many distinct stages. In the study of Liu et al (2018), there are four different stages in SD life-cycle that are managed by the BF for its suppliers for sustainability which include: 1) designing (the structure, duration, and the way of SD practices), 2) recruiting and engaging (the relevant and qualified suppliers

to the SD program), 3) implementing (the progress of SD practices), and 4) Evaluation and rewarding (the effective of SD practices) (see *Figure 4*).

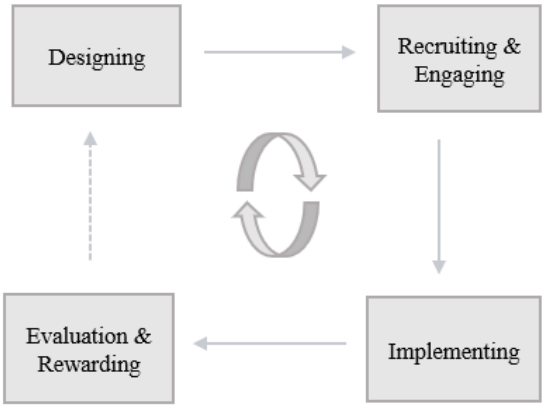

Figure 4. SD life-cycle stages. Adopted from Liu et al (2018), pp,103.

Different strategies can be applied in the distinct stages of SD life-cycle. In the conceptualized strategies in SD life-cycle theory according to Liu et al (2018), Hahn, Watts and Kim, (1990), Giannakis (2008) and Dou et al., (2014), it is very important for the BF to make the right decision about how and when these strategies should be used in different stages of the SD life cycle, and they have theoretically mapped up what strategies should be adopted in different life cycles. They believe that in the designing stage the strategies of management involvement (MI) and Incentives (IC) need to be adopted. In the first stage, the top management support from both the BF and suppliers are fundamental and it is the prerequisite for the SD program to start. IC is needed for both the BF and suppliers to be motivated to involve themselves in the program after realizing the importance and benefits of adopting SD for their business performance. In the second stage, IC strategy is still important in motivating the suppliers to participate and also take it seriously not just as paperwork. Besides motivation, the competitive pressure (CP) is a strategy to motivate suppliers about the better performance and higher volumes of business and also to keep the participants alert about the ambitiousness of the SD program quality. When in the implementation stage, it is the time to help SSM about the problems of insufficient communication and coordination complexity. In this stage, the BF needs to adopt knowledge transfer (KT) and MI strategies to improve the mutual understanding and share knowledge between the BF and suppliers which can directly contribute to improving the problems of insufficient communication and complicated coordination between the BF and suppliers in SSCM. In the last stage, both the BF and suppliers need to evaluate the effect of the SD program by adopting EA strategies since both sides pursue impactful SD practices. While evaluating,

the rank of different scores between different suppliers by the BF will generate peer pressure among the participated suppliers. This peer pressure can help the BF make better choices with higher ranked suppliers. The promise of IC needs to be implemented and the better performing suppliers in SD programs need to be rewarded. The strategies in each stage can be visualized as in *Table 7*.

Table 7. Strategies in each SD life cycle. Adopted from Liu et al. (2018), pp,103.

SD life-cycle stages	***Strategies***
Designing	MI, IC
Recruiting & engagement	IC, CP
Implementing	KT, MI
Evaluation & Rewarding	EA, CP, IC

2.4. Sustainability in the SD life cycle

2.4.1. Sustainability in the designing stage of the SD life cycle

For supplier development, the most commonly focused topics are quality, cost, lead time and flexibility (Coşkun et al., 2022). However, in sustainable supplier development, the focus criteria will be divided into three aspects which are in line with TBL's economic, environmental and social aspects (Coşkun et al, 2022; Ghayebloo et al., 2015). In the first stage of sustainable supplier development, which is the designing stage, BF needs to design content, extent, structure, strategies, format and duration based on the previous supplier evaluation and assessment results. The designing in sustainable supplier development will depend on the sustainability criteria which are summarized by Coşkun et al (2022) as in below *Table 8*.

2.4.2. Sustainability in the recruiting stage of SD life cycle

In the recruiting stage, as Handfield et al., (2000) described, the common practice is to adopt Pareto analysis of the BF's suppliers' performance. Pareto analysis is about making the most optimal choices that bring higher investment returns than the investment cost (Handfield et al, 2000). BFs use Pareto analysis to decide which suppliers should be involved in their supplier development practices. For example, a BF can choose to only focus on suppliers in the middle part for involvement in supplier development as in *Figure 3* because the high-performance suppliers are already performing well in business. As for the low-performance suppliers, who have only exceptionally low business volume, are too risky for BFs in terms of the ratio of

investment costs and returns. By doing that, BFs could have high possibilities to achieve the optimal higher investment returns with lower investment costs.

Table 8. SD performance evaluation indicators. From Coşkun et al. (2022), pp,7.

Clusters	Criteria	Definitions	Indicators	Materiality	References
1. Economic sustainability	1.1. Quality management systems	Implemented rules based on quality management via policies, processes, documented procedures, and records, tracked by audits and action plans.	Certificate, action plan, audit	Eco, CusSat	Govindan et al. (2013b); Hsu and Hu (2009); Kannan et al. (2015b)
	1.2. Information security management systems	Implemented rules based on information security management via policies, processes, documented procedures, and records tracked by audits and action plans.	Certificate, action plan, audit	BusEth, AntCor	Contributed by authors
	1.3. Quality	A level of high-standard, a property of excellence in terms of customer's expectations	Rejection/acceptance rates, scrap rates, number of supplier claims	Eco, CusSat, Inno	Amindoust et al. (2012); Chan (2003); Fallahpour et al. (2016); Sarkis and Talluri (2002)
	1.4. Cost evaluation	A monetary valuation of material, resources, time, and utilities consumed and delivery of a good or service.	Price of products, supplier payment terms	Eco, EnrCon, RenRaw, Rev	(Amin and Zhang, 2012; Amindoust et al., 2012; Bai and Sarkis, 2010; Büyüközkan and Çifçi, 2011)
	1.5. Innovation & technical solutions	Application and service of better solutions that meet new requirements and needs, or existing market needs	Innovation & technical cooperation, lead time, communication & service level, production technology & capacity	Inno, Rev	(Amin and Zhang, 2012; Gunasekaran et al., 2004; Tseng and Chiu, 2013)
	1.6. Delivery & compatibility	The process of transporting goods with continuity or good fit of the material	On-time delivery, quantity	Eco, PerMan, SupCha	(Azevedo et al., 2011; Gunasekaran et al., 2004; Sarkis and Talluri, 2002)
	1.7. Financial sustainability	The ability to start, grow and maintain short and long-term business with suppliers	Financial audits, loyalty	SupCha, Eco	(Bai and Sarkis, 2010; Gauthier, 2005; Govindan et al., 2013; Labuschagne et al., 2005; Presley et al., 2007)
2. Environmental sustainability	2.1. Environmental management systems	Implemented rules based on environmental management via policies, processes, documented procedures, and records tracked by audits and action plans.	Certificate, action plan, audit, written documents	Was, Emis, Wat, CliCha	(Carter and Carter, 1998; Dou and Sarkis, 2010; Gauthier, 2005; Klassen and Whybark, 1999; Melnyk et al., 2003; Zhu and Sarkis, 2006)
	2.2. Energy management systems	Implemented rules based on energy management via policies, processes, documented procedures, and records tracked by audits and action plans.	Certificate, action plan, audit	EnrCon	Contributed by Authors
	2.3. Environmental compliance	Conformity to environmental laws, regulations, standards, and other requirements	Permits, transportation of dangerous goods	Was, Emis, Wat, CliCha, Bio	(Bai and Sarkis, 2010; Gazdar et al., 2018; Handfield et al., 2002; Kannan et al., 2015; Lee et al., 2009; Punniyamoorthy et al., 2011)
	2.4. Supplier eco-efficiency	Creating value with limited use of supplier resources in an efficient way	Emissions, water withdrew, energy, recycle	Was, SupCha, Eco, PerMan	(Amin and Zhang, 2012; Amindoust et al., 2012; Bai and Sarkis, 2010; Kuo et al., 2010; Lee et al., 2009; Shen et al., 2013)
3. Social sustainability	3.1. Social management systems	Implemented rules based on social management via policies, processes, documented procedures, and records tracked by audits and action plans.	Labor standards, OHSman sys certificate, OHSman sys plan, OHS man sys audit, product safety	OHS, ComInv	(Huang and Keskar, 2007; Kannan et al., 2015; Lee et al., 2009; Punniyamoorthy et al., 2011)
	3.2. Human & labor rights	Rights that all human beings have no matter which nationality, place of residence, sex, national or ethnic origin, color, religion, language, or any other status	Child labor, forced and compulsory labor, discrimination, working hours, minimum wages, training	BusEth, HumRig, PerMan, OHS	(Bai and Sarkis, 2010; Gauthier, 2005; Labuschagne et al., 2005; Presley et al., 2007; Shen et al., 2013)
	3.3. Corporate governance & compliance	Conformity to structured rules, policies, standards, or laws	Privacy & intellectual property, fair competition, business integrity	EmpEng, CorGov	(Azevedo et al., 2011; Gauthier, 2005; Labuschagne et al., 2005; Presley et al., 2007; Zhu et al., 2007)

However, in sustainable supplier development, BFs will focus on the sustainability returns compared to its costs under the frame of TBL (Handfield et al., 2000). For example, when suppliers need to be further developed about social sustainability compliance, BFs could only focus on some specific suppliers' social performance by only focusing on one supplier or many suppliers at the same time. Sustainable supplier development needs to put the same focus on each of sustainability aspects (economic, environmental and social) not just economic.

2.4.3. Sustainability in the implementing stage of SD life cycle

In the common implementing stage of the SD life cycle, BFs adhere to the topics of cost, quality, lead time and flexibility (Chen et al., 2018). For sustainable supplier development, BFs need to pay equal attention to the three topics (economic, environmental and social) (Ageron, Gunasekaran & Spalanzani, 2012). In this stage, BFs need to monitor the progress and quality of supplier development practices for preparing implementation data to better evaluate SD practices in the next stage.

2.4.4. Sustainability in the evaluation and rewarding stage of SD life cycle

The evaluation traditionally will focus on the improvement of supplier performance in cost, quality, lead time and flexibility (Liu et al., 2018). In sustainable supplier development, evaluation will not just focus on economic results of supplier improved performance, but also focus on the three TBL aspects as the benchmark for evaluating suppliers' improvement in their performance (Coşkun et al., 2022). Awards will accordingly be given to the most improved suppliers according to the TBL framework.

2.5. Summary of the Literature Review

The chapter has reviewed different concepts in supply chain and supply management in relation to sustainability. These concepts provided the basis for further study on SD. The literature review chapter mainly focused on the theory of supplier development in regard to the research questions. After introducing the definition and the development history of SD, the chapter discussed the options for buying firms (BF) either to do supplier development or do supplier switching. Through reviewing various literature, this chapter provided the conditions for BFs when they should adopt supplier development practices and when they can switch suppliers for the purpose of maximizing the benefits. Furthermore, the chapter also reviewed the enabling and hindering factors, direct and in-direct strategies, four different life-cycle stages in SD theory will provide the theory base for research question 1. The literature of sustainability in each of the SD life-cycle stages aim at providing the framework in relation to research question 2.

Chapter 3. Methodology

In order to conduct this empirical research study in a scientific approach, this chapter explained the scientific perspective and approach. Then, it described the case study, explained why this method was suitable for this thesis as well as why the case company was selected. It followed by the data collection design which contains the interview design and data sources. This chapter also presented the empirical data collection, data analysis, reliability and validity as well as ethical considerations for interviews.

3.1. Scientific perspective and approach

This paper followed the qualitative research methods from a scientific perspective and approach. Due to the research design of this paper, it followed the scientific positivism method to conduct the empirical case. Positivism is a way for scientific philosophy to apply theories into practice and gather facts to test the theories through observations or other social scientific methods (Bryman & Bell, 2015).

Furthermore, this paper adopted scientific deductive reasoning in the method. Deductive reasoning is one of the most common ways of studying the connections between theories and reality. Deductive reasoning is a "top-down logic" whereas inductive reasoning is "bottom-up logic" (Sternberg, 2010). The "top-down logic" can be interpreted as a way how cognition can be applied from the "top" which is the theories or the accepted premise to a specific thing that is existing in the reality or environment which is in contrast with the "bottom-up logic". This study carried out by accepting the premise of theories in the supplier management field and in the meanwhile it was also a study to shed light on how organizations integrate sustainability.

3.2. Case study

The design of this research was to conduct an empirical study in the form of a case study. According to Gerring (2017), a case study is the small number of cases or a single-case study with the intentions to shed light on the larger population of cases by the observational data and promises. There are mainly four different case-study types which include descriptive type, case explaining or theory applying, theory developing and theory testing. This paper was designed to perform single-case study in order to get in-depth understanding. Single-case study is to study a single-case in depth to get deep insights about the empirical practices. Single-case study can provide greater and more intensive in-depth knowledge and flexibility and have more

observations of the interviewee's reactions or responses from their verbal language and also non-verbal language compared with surveys (Gerring, 2017).

3.2.1. Selection of the case company

Due to the need for more empirical evidence from different industries, this thesis aimed to do in-depth research on different industries other than the industries mentioned above in chapter 1.3.1. from Wagner (2006b). Considering that the telecom industry is so vital and inseparable for modern life, the study of the telecom industry is necessary. The case company Ericsson as one of the biggest telecom multinational companies in terms of turnover and company size (Fortune, 2021), plays an especially significant role in the supply chain. As claimed by Ericsson, sustainability is central to their business and Ericsson also believes that "sustainability is a value creator" (Ericsson, n.d.a). With the intention of achieving sustainable development, Ericsson is demanding a sustainable way of supplier development in supply management. The value of studying Ericsson, which is regarded as one of the most important representatives in its industry, is to bring an in-depth understanding of what strategies are adopted in its SD life cycle and how Ericsson takes sustainability into their supplier development. Through studying Ericsson's supplier development strategies and life cycle, empirical understanding about the sustainability business operations and strategies in the telecom industry be deepen.

As one of the biggest telecom companies in the world, Ericsson has more pressure to publish its information compared to small companies due to the requirements from governments, industry, stakeholders, investors and so on. The high transparency of Ericsson's supply information provided this thesis convenience of extracting data from this company for research purposes. Lastly, due to the limited time, energy, resources and support both from school and the case company, the author of the thesis decided to do single-case study on Ericsson instead of multi-case study which reduced the external validity of the findings but it contained research values for providing empirical insights and deepening the academic knowledge.

3.2.2. Description of the case company

Ericsson is a multinational company in the telecom industry which was founded in 1876 by Lars Magnus Ericsson in Sweden (Ericsson, n.d.b). The business of Ericsson started from repairing telegraph instruments and mechanical equipment and then Ericsson followed the time and technology changes by putting focus on telephone business manufacturing and sales (Ericsson, n.d.b). After more than 140 years, Ericsson has become one of the global leading

companies in providing Information and Communication Technology (ICT) and their product or service range across Networks, Digital services, 5G, 6G and IoT platforms (Internet of Things) as well as managed and emerging business services (Ericsson, n.d.c). Around 40% of the world's mobile traffic is enabled by Ericsson's network (Norrman & Wieland, 2020). Ericsson has business in over 180 countries in the world with more 101,322 employees globally (Ericsson, n.d.d). The headquarter of Ericsson is located in Stockholm Sweden. The company's net sales in 2021 were SEK 232.3 billion. From hardware to software, Ericsson is devoted to being one of the industry leaders to enable the connection of the full value chain. The company's purpose and vision is to create limitless connectivity and thus helps the world to be more sustainable (Ericsson, n.d.e). With the big organizational size and business activities, Ericsson has enormous influence in the global supply chain because of its business needs in telecom equipment and networking equipment.

3.3. Data collection design

3.3.1. Interview questions

As described by Bryman and Bell (2015), interview questions should be in line with the research aim(s) and answer the research questions. But there are some rules for designing interview questions, such as, designing the interview questions based on interview types (structured or not), and avoid ambiguous terms in questions. However, in order to answer the research questions sufficiently, one of the most "significant considerations" is the interview questions in an open or closed format (Bryman & Bell, 2015). Both open and closed interview questions have their own advantages and disadvantages. However, it is important to combine these interview question-formats based on the interview type (Bryman & Bell, 2015).

The interview questions of this thesis were generated based on the theories in supplier development and sustainability. The interview questions were designed by combining the research aims, research questions, research design and the theories in supplier development and sustainability. The interview questions formed in both open and closed format due to the semi-structured interview design.

3.3.2. Interview sampling

Interviewee sampling is the process of selecting the population for conducting the designed interview. There are mainly two categories of scientific research sampling (Bryman & Bell,

2015). One is probability sampling which means every unit in the population will have the same opportunity to be chosen. The other one is non-probability sampling which is a sampling that all the members of the population have not the same chance to be selected.

There are four ways of samples in conducting scientific research study in the category of probability samples according to Bryman and Bell (2015) which include simple random sample, systematic sample, stratified random sampling and multistage cluster sampling. In non-probability sampling there are diverse ways as well but the main ways include convenience sampling and snowball sampling (Bryman & Bell, 2015). As it can be seen in the name that convenience sampling is when the researcher has its special convenience because of its position in the context. Snowball sampling is when the researcher has its convenience to access an increasingly relevant population after the first contact.

Due to the specialized topic of this paper, the target group needs to have relevant knowledge or insights and be representative. Meanwhile, the author also needs to be realistic about the limited time, energy and other resources for conducting the empirical study. Thus, the author adopted a simple random sample in probability sampling, which means the author of this thesis needed to contact as many people as possible but has the target of recruiting interviewees who were in the related management level practitioners. Besides, the paper also took advantage of convenience sampling and snowball sampling by using the opportunity that the author has certain contacts in the case company.

3.3.3. Sample size

Due to the limitation in generalization of qualitative methods, the sample size of case study cannot be big. However, it should not be too small to generalize objective conclusions either. According to Bryman and Bell (2015), the sample size in a qualitative method should reach theoretical saturation which means additional data cannot offer latest information and the previous findings are repeating. At a theoretical saturation point, researchers can start seeing patterns in their findings with the obtained data. But researchers have to acknowledge that there are many dualities for predicting the sample size before it is done because of internal and external uncertainties (Yin, 2012).

For this thesis, the plan was to recruit at least five target interviewees who were working in supplier development related positions at management level in Ericsson. But the thesis also took the reality variations into consideration, such as low responses ratio from the target

interviewees due to lack of incentives or motivations, limited time for recruiting targeting interviewees, time or schedule conflicts between the interviewer and the target interviewees and limited energy for the interviewer.

3.3.4. Interview process

The steps of the interview process was divided into few steps as in below:

- Preparing interview questions based on theories and literature' findings and conclusions
- Recruiting the target group for interviewing by sending interview invitations via emails. The target interviewees were the employees who were working in Ericsson's supply chain management and supplier development related positions. The sample of the target group focused on the employees in the headquarters of Ericsson which was located in Kista Stockholm, Sweden but with some international perspectives outside Sweden.
- Recording the interview only if it was agreed by the interviewees.
- Summarizing the data from interviews
- Applying the information and results in the text and analyzing it.

3.3.5. Data Sources

The empirical data came from both primary sources and also secondary sources. The primary source was mainly the interview where the author asked or observed information directly about the published information and unpublished information from the interviewee in the natural settings. To make the primary data be more convincing, the author targeted interviewees who both work in the case company's home country (where the headquarter was in) but also outside of the case company's home country to offer international perspective.

The secondary sources were mainly the published information from the case company's website data, annual reports and also the industry's reports from 2014 -2021 and other secondary related documentaries.

3.4. The empirical data collection

For the empirical case study's data collection, both primary and secondary data had been collected. The primary data were the interviews that had been conducted during the thesis writing. The author conducted six semi-structured interviews with the interviewees who were currently (at least up until the interview date) working in Ericsson in supplier management and

supplier development related management level of positions. To respect all of the interviewees, this thesis decided to use an anonymous method to code the interviewees as A, B, C, D, E and F in the text table. The interviewees' job positions and job locations were transparent to the public. Besides, due to the author of this thesis having the permission from the interviewees to record the interviews, the information, such as how the interview was conducted, recorded or not, interview language and interview durations were permitted to be mentioned in this thesis. Thus, this thesis's empirical interview data collection was summarized in *Table 9*. In the beginning of each interview, the interviewer asked permission to record the interview. Whether or not it was permitted by the interviewees to record the interviews, the interviewer showed the interview ethical considerations (See Appendix 1), explained the appendix 1 to each interviewees and also asked if they had any other ethical considerations regarding the interview. After the agreement of the ethical considerations by both sides, the interviewer started to ask the interviewees to introduce their positions and the prepared questions but not limited on the listed question according to the interview situation. Interviewees were free to offer any relevant information as they wish to share since it was a semi-structured interview.

Table 9. Empirical interview data collection.

No.	Interviewees	Job title in Ericsson	Job Location	Interview Ways	Recorded	Interview Language	Interview Duration (Minutes)	Date of Interview
1	A	Supplier Operations Manager	Stockholm, Sweden	Off-line face-to-face	Yes	English	59,33	March 4, 2022
2	B	Strategic Sourcing Manager	Beijing, China	On-line via teams video meeting	Yes	English	67,28	March 17, 2022
3	C	Strategic Souring Manager	Beijing, China	On-line via teams video meeting	Yes	Chinese	48,02	March 18, 2022
4	D	Strategic Sourcing Manager	Stockholm, Sweden	On-line via teams video meeting	Yes	English	60,33	March 23, 2022
5	E	Socuring Category Manager	Stockholm, Sweden	On-line via teams video meeting	Yes	Chinese	55,37	April 5, 2022
6	F	Supplier Relationship Manager	Stockholm, Sweden	Off-line face-to-face	Yes	English	68,37	April 6, 2022

The secondary data were mostly the information from the case company's website, annual reports in from 2014 to 2021, annually sustainability reports from 2014 to 2021, relevant literatures which studied Ericsson as case study in the research work as well as industry articles which were related to sustainability supply chain and Ericsson's supply chain.

3.5. Data Analysis

Case study analysis requires the interviewer to put more attention on the reaction of interviewees during the interview. This is due to there being hidden information other than oral language sent from the interviewees, such as facial expressions, body language and emotions. To analyze these data, the interviewer is required to be concentrated while interacting with interviewees. During the interview, the concentrated interviewer needs to take a note, highlight some key facts or points or watch or listen to the recorded interviews many times for more details. There are also three types of data analyzing techniques which includes pattern-matching, time-series analysis and explanation-building. Pattern-matching is a technique where you use it to find certain common characteristics among gathered data (Yin, 2012). Yin (2012) further pointed out that for explanation-building techniques, the researcher can look for a robust explanation on why some particular facts keep happening or existing. Time-series analysis is a way to analyze the sequence of data points which is collected at a constant interval, not no pattern random interval (Yin, 2012).

The interviewer of this thesis paid attention to the information from interviewees both verbally and non-verbally and took notes during the interview. The interviewer asked the permission from interviewees for recording the interview. If it agreed, the interviewer checked back about the recorded interviews and tried to find more data. For the primary data, this thesis adopted pattern-matching techniques for finding some common characteristics among interviewees in order to make findings more representative and less subjectivity. For the secondary data, this thesis adopted explanation-building and time-series techniques with the purposes of finding explanations on why the empirical practices were adopted based on the case company's annual reports or industry reports.

3.6. Reliability and validity

To make sure the results of the empirical work is trustworthy, credibility must be considered before the conducting of the empirical work (Creswell & Poth, 2013). There are two important parts to ensure the results are credibility which are reliability and validity (Saunders et al., 2009). Reliability as explained in the academic research field is the degree of consistency of reaching the same or similar empirical results by using different research methods (Kothari, 2007). This indicates that the empirical research study must be replicated and re-conducted with the same methods by different researchers to reach reliability. To achieve reliability,

transparency is one the most important criteria (Bryman & Bell, 2015). To reach reliability, the interview questions of this empirical research study were generated from the findings of theories and literature in the relevant field of supplier development. The interview process and interviewee's position information were provided. The interviewee was also informed with a prepared interview guide (see Appendix 1 and Appendix 2) to make sure that the interviewee did not limit the answers or reactions towards the interview questions and other related information and also prepare before the interview. This practice could release the restrictions of interviewee's worries and reach reliable answers and reactions. Besides, the interview invitations were only sent to professional people who were in the supplier development relevant positions in the case company. The information disclosed from the relevant professional practitioners increased the reliability of the empirical findings.

Validity in academic research studies refers to if the study is achieved or solved what is intended to do (Whittemore, Chase & Mandle, 2001). The main considerations in research validity are if the research study is true and effective (Kothari, 2007). There are two main facets of validity which are internal validity and external validity concerning the integrity of the research findings (Bryman & Bell, 2015). As Bryman and Bell (2015) described, internal validity whether the research findings could integrate a causal relationship between independent variables and dependent variables and also avoided the confounding. Thus, the internal validity is about how confident we are about whether the independent variables are at least part of the reason for the variation of the dependent variable. External validity is the meaning of the research study about the degree of confidence to generalize the research findings to other settings. To reach internal validity, the empirical data was in line with the research subject and recruited as many interviewees as possible in the research subject related field in the case company. The secondary data sources were fully used as well to demonstrate the relationship of dependent variable and independent variable. Due to the designing of the single-case study, the external validity was not as strong as internal validity in this study. However, the weak external validity did not mean that a single-case study has no value. It had value in providing empirical insights and separations to academic studies from the case company's business practices (Bryman & Bell, 2015). The findings from the case company shed light on the causality mechanism in the supplier development field.

3.7. Ethical considerations

Ethical considerations are important and vital for the research study to be successfully and effectively conducted. This paper took ethical considerations very seriously and fully respected every ethical related problem in order to create a safe and free environment for the interviewee in this case study. The interviewee's safety, anonymity and confidentiality were the priorities of the ethical considerations of this study. To ensure the interviewee safety, anonymity and confidentiality, the author explained the goal of the study before the interview and sent the interview guide which included the interview ethical considerations in Appendix 1 and also the interview questions in Appendix 2. Before conducting the interview, the interviewee was informed that he or she had the right to stop the interview at any time and refuse to answer the interview questions whenever. Any tactics that were used in the interview, such as recording the interview, taking note in the interview, were informed the interviewee beforehand and only did it after getting permissions before the actions.

The designed form of interview was a semi-structured interview which started with a list of prepared questions, but also gave flexibility to the interviewees. The interview protocol was based on the general requirement of GDPR where there were clear requirements about confidentiality. Besides, the case company also had rules about their company's business information since the rules were included in their NDA (non-disclosure agreement) contract. Thus, the interviewer fully respected these requirements and rules even though some data may be lost by doing it in this way. The language of the interview was in English or other language only if agreed by both the interviewer and the interviewee. If the interview language was not English, the transcript was translated by Google translate. The time estimations of the interview were around 50 minutes. Each interview only had one interviewee and one interviewer by either on-line or off-line face-to-face talking.

Chapter 4. Empirical Findings

In this chapter, the empirical findings will be presented. To have a clear understanding of the case company, this chapter will introduce more about the case company and the overview of its supply chain from the supply side which are based on the empirical secondary data. Then, it will present the empirical findings based on both primary and secondary data regarding the research aims and questions.

4.1. Overview of Ericsson's supply situation

In supply chain business practices, suppliers are classified into different tiers according to the closeness level to the final product (Yestadt, 2022). According to Yestadt (2022), tier 1 suppliers are the suppliers directly doing business with buying firms. Tier 2 suppliers are the suppliers of tier 1 suppliers and tier 3 are the suppliers of tier 2. The relationships between the buying firm and its different tier of suppliers can be demonstrated as in *Figure 5*.

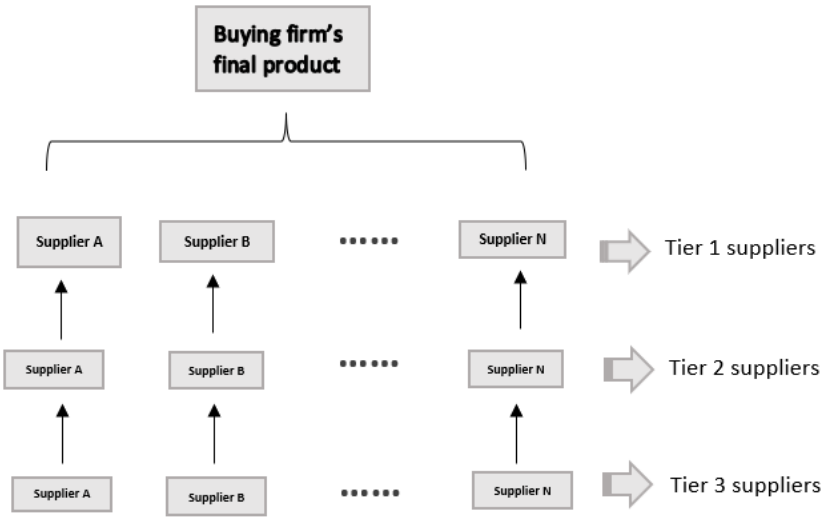

Figure 5. Supplier tiers. Combined information from Yestadt (2022).

Ericsson has more than 20, 000 suppliers worldwide (Ericsson, n.d.f). According to Ericsson's sustainability report (2021), there are around 18,000 tier one suppliers who are having business with Ericsson directly. Ericsson has committed to lower its carbon emission to net zero for contributing to the 1.5°C target that was agreed by global countries for the climate target in the Paris Agreement (UNFCCC, 2015). To contribute to the climate target, Ericsson, together with Elia, BT Group, IKEA and Unilever, founded a 1.5°C Supply Chain Leaders group in 2020 (Ericsson, 2020). Ericsson is devoted to achieving sustainability by collaborating with its suppliers, especially the tier 1 suppliers. To integrate sustainability into the business practices,

Ericsson has sustainability concerns in sourcing, namely responsible sourcing and also set two special roles which are Sourcing Business Partner role and Supplier Relationship manager role to connect supply and sales as well as initiate sustainability into its supplier development practices.

Ericsson's responsible sourcing has strict processes which conclude sourcing standards which based on the requirements of government, policies, investors, shareholders, stakeholders, industry requirements and standards (such as, ISO 9001, ISO 14001 and ISO 19011); strategic sourcing; alignment requirements (code of conduct, anti-corruption, occupational health and safety, conflict minerals and climate action) and auditing, is the process to select and approve suppliers who has the same target for sustainability as Ericsson (Ericsson, n.d.g).

4.2. The supplier management in Ericsson

4.2.1."Cutting the tail"

As a multinational company, Ericsson's business is all over the world. Therefore, the supply chain is significant to Ericsson's global business. Suppliers are one of the important players in the supply chain. Thus, Ericsson attaches significant importance to supplier management and development. For efficient management of the suppliers, Ericsson divided its tier 1 suppliers into around 300 different categories which will be based on the supplier's capability, scarcity, risk-level, quality and geographical spread. Ericsson's intention to classify these suppliers into various categories is to "cut the tail" which means that Ericsson prefers to work with the larger and global companies instead of the small "tail" suppliers (Ericsson, n.d.g). Through this way, Ericsson claimed that it is due to the purpose of minimizing cost and time investing and achieving the optimal benefit.

4.2.2. Supplier development or supplier switching

Ericsson has a professional team to do risk management in sourcing. To minimize the risks in supplying, Ericsson has a sourcing strategy that would not allow only one supplier for any demands from Ericsson's product or other business. More than two suppliers for each business demand leave the option to Ericsson to either do supplier development or supplier switching when there are any problems about each supplier. This sourcing strategy has been confirmed by all of the interviewees. As the interviewee E said, "*Ericsson would not allow having only*

one supplier for any type of business demand". The reasons are mainly related to the cost, risk and return on investment (ROI). The interviewee B also explained that *"Every business needs to be evaluated about the ROI before starting it. If the cost is higher than the return financially, it means the risk is very high for organizations and they will have very little motivation to do it."* Ericsson has two special roles which are Sourcing Business Partner role and Supplier Relationship manager role to connect supply and initiate supplier development practices. These two roles need to reduce business risks and improve the stability and profitability from the supplier base by "increasing margins and extracting values from suppliers" (Ericsson, n.d.g).

4.3. Supplier development in Ericsson

4.3.1. Business alignment

The most common topics for SD practices are quality, design, cost, lead time, service and alignments with Ericsson's requirements and commercial development strategy. However, the Interviewee D, E and F mentioned that Ericsson does not have so much trouble about quality or service problems with its suppliers since Ericsson mainly works with large and global companies which is due to the "cutting the tail" sourcing strategy in Ericsson. The most SD practices are requirement alignments and future business strategy alignment development. That is due to the changing demand or requirements from internal and external stakeholders, industry standards, policies and legislations. Thus, the supplier development practices are focusing on passing the sustainability requirements to suppliers and help suppliers to be more sustainable by aligning with sustainability qualifications. Due to Ericsson's sourcing strategy of "cutting the tail", the collaborated suppliers of Ericsson are mainly large and global suppliers. Such large and global suppliers have good and professional performance in many aspects, such as in quality, lead time, service, design, equipment and so on. Thus, the SD practices on such large and global suppliers are mainly alignment focused without obvious hindering factors according to interviewee D, E and F. As the interviewee F stated, *"our suppliers rarely have problems in quality, lead time and service since they are strictly selected global and large suppliers. We focus more on business strategy alignment and talk about the future business development directions. We hope our suppliers can keep supporting us in the new and front side".* Besides, to develop suppliers to have clearer business development direction which is in line with Ericsson´s strategy, Ericsson shares business vision about further development direction with suppliers and thus has better collaborations in supply related business.

4.3.2. Digitalization

Due to the business Ericsson is doing, digitalization is widely used in Ericsson's SD practices, especially under the situation of globalization and the Covid-19 pandemic. As the interviewee E stated, *"we have canceled lots of our business trips to visit suppliers due to the pandemic. Our annual suppliers meeting where almost all tier 1 suppliers will join in has been moved to online as well".*

Ericsson offers lots of free of charge supply improvement online courses to all its global suppliers even also to non-suppliers (Ericsson, n.d.g). Knowledge transfer, education and training strategies are widely used in digital ways either free of charge to the public or only targeted to Ericsson's suppliers.

4.4. Ericsson's strategies and life cycle of supplier development

4.4.1. SD strategies in Ericsson

- **Knowledge transfer**

Knowledge transfer, education and training strategies are widely used for Ericsson's suppliers. There are either mandatory or volunteer courses or training for Ericsson's suppliers to participate. For example, there are some mandatory training courses in Code of Conduct for suppliers, Occupational health and safety for suppliers, and anti-corruption for suppliers. The volunteer courses are, such as, climate action, conflict minerals (Ericsson, n.d.f).

- **Top management support**

The top management of Ericsson strongly supports SD practices by creating two special job roles to only focus on collaborating closely with its suppliers which are Supplier Relationship Management and Sourcing Business Partner. These two roles are aiming at extracting maximized values from suppliers, minimizing the cost and risks from suppliers, and improving Ericsson's benefits in the top line. The top management's goal is to be the World Class Sourcing Organization.

- **Technical, equipment and human asset support**

The management support also reflects in supporting technical, equipment and human assets when it is needed in SD practices. However, as all of the interviewees described, technical,

equipment or human assets support rarely happens due to the suppliers being large and global. Still, such support is available and implementable when it is needed and necessary the interviewees think. But the direct financial support is sensitive and risky for Ericsson if it cannot be done transparently, especially after the Iraq scandal of Ericsson's misconduct. Ericsson's misconduct in the Iraq scandal included direct financial support from Ericsson in corruption with its suppliers (BBC, 2022). This scandal caused Ericsson's share price to drop significantly in February 2022 (Wooden, 2022).

- **Competitive pressure**

With more than two suppliers as an option for Ericsson to do business with, competitive pressure is used as a strategy in SD practices as well. The aim of the competitive pressure strategy in SD practices is to give higher business volumes to better performance suppliers through SD. In this way, Ericsson expects to make sure they extract the maximum value from suppliers and also expects to see that higher performance suppliers have higher alignment in Ericsson's sustainability goals and requirements while doing more business with these higher performance suppliers. The interviewee E said that *"the better performance suppliers will of course have higher business volume with Ericsson"*.

- **Evaluation and assessment**

To guarantee compliance with Ericsson's Code of Conduct for suppliers, Ericsson has a separate team who only focus on supplier compliance and evaluate supplier's performance regularly according to the interviewee E. The evaluation and assessment strategy in Ericsson has a list of indicators or metrics which correspond to Ericsson's business development goals and sustainability requirements. As all of the interviewees mentioned, *"the supplier evaluation performance improvement is important in Ericsson"*. There are many different evaluation indicators which cover legitimization, economic, environmental and social requirements from Ericsson for various categories of suppliers with a general internal management system which is called supplier information portal. The interviewee E said, *"for each category of suppliers, Ericsson has supplier status and risk card, supplier performance card"*. Through the performance cards, status and risk card, Ericsson can have a comprehensive evaluation on various categories of suppliers' performance through SD practices.

- **Incentive strategy**

After evaluation, the incentive strategy is a supplier award as a way of recognition of suppliers' improvement and it lays the foundation of long-term commitment and strategic partner relationship building. Ericsson held annual supplier award meetings to incentivize all of its suppliers.

4.4.2. SD practices in different life-cycle stages

- **In designing stage**

The SD practices in Ericsson are a long-term ongoing process rather than a short-term program. Even so, there are still clearly four stages in the SD life cycle in Ericsson. In this stage, Ericsson identifies the necessities of implementing SD practices and coordinates with different departments internally within Ericsson.

- **In engaging stage**

Ericsson communicates with suppliers either individually or through Ericsson's regular supplier meetings. According to the interviewee F, *"Ericsson normally likes to invite suppliers to attend the physical meetings together if without the Covid-19 pandemic in which Ericsson shares information about the new product and business strategy".* Recruiting suppliers who need more information or more support from Ericsson to further development through SD practices. However, the ways to hold supplier meetings have changed to online meetings where the interaction has been influenced due to the pandemic.

- **In implementing stage**

The SD practices include the knowledge transfer through education, training or Ericsson's representative employee directly involved with supplier's staff. *"Sometimes, there is also a case of Ericsson putting some special production equipment in supplier's manufacture in order to reach the improvement targets"*, according to the interviewee E. These strategies in practice can improve the insufficient communications problem when suppliers need the direct support from Ericsson instead of just requirement. For some type of quality, standard or sustainability requirements, the SD practices mainly rely on monitoring, factory visits and assessment rather than being directly involved in the supplier improvement process. With the mutual understanding of the standards, suppliers would likely cooperate with Ericsson proactively. This contributes to making the coordination complexity problem less complicated.

- **In evaluation and rewarding stage**

Ericsson has a very complete and strict assessment system. In the internal process, Ericsson uses supplier performance cards to score the improvement of suppliers based on lists of different requirements, indicators and metrics in economic, environmental and social aspects.

The supplier improvement in performance will be reflected in the rewarding and recognition. *"Ericsson has regular supplier award meetings in which supplier's improvements will be awarded and certified",* said the interviewee A. The higher performing suppliers will accordingly have more opportunity to be involved in more business projects and deeper business collaborations.

4.5. Sustainability in Ericsson's supplier development life cycle practices

4.5.1. Sustainability from internal employee in Ericsson

The interviewees were trained or educated about the importance of sustainability in supplier development and they agreed that all three aspects (economical, environmental and social aspects) are equally important for Ericsson's supplier development practices. The interviewee E said, *"we have some mandatory onboarding courses about well-being, occupational health, business ethic, and also some other sustainability related topics when joining Ericsson and also some mandatory training based on the specific job roles".* The understanding of supplier development is in line with the theories which are intended to satisfy Ericsson's development or requirement needs. For example, when asked about the understanding of supplier development, the interviewee B said, *"when there is a problem with suppliers, we will try to solve the problem by improving their performance".*

4.5.2. Sustainability in different SD life-cycle stages

- **In the designing and the recruiting stage**

In Ericsson's SD practices, the three aspects of TBL (economic, environmental and social) have been taken into practice. In this stage, the decision about SD strategies are based on the evaluation results of supplier performance in economic, environmental and social aspects from the previous SD life cycle. If the evaluation results of a certain supplier is not as good as the expected, Ericsson will design the SD practices with relevant strategies. In the recruiting stage,

Ericsson chose the suppliers with the most potential in sustainability improvement by using competitive pressure and incentive strategies.

- **In the implementing stage**

Ericsson pays equal attention in economic, environmental and social aspects. Not just focusing on the economic indicators, such as quality, lead time, production improvement, but also focus on environmental and social indicators. The interviewee E offered some example indicators regarding this. The interviewee E mentioned *"the environmental indicators are included, such as renewable energy ratios, water management, carbon footprint monitor and the climate target of 1.5 °C; the social indicators, such as occupational health and safety, employee well-being"*. In regard to employee well-being, the interviewee E described that *"many of Ericsson's suppliers from the developing countries have a frequent problem of employee over-time working to improve efficiency in suppliers' manufacturing process".* These environmental and social indicators weigh equally the same as the indicators in economic aspects in the supplier performance card evaluation.

- **In the evaluation and rewarding stage**

If suppliers have deficient performance in environmental or social aspects, the overall score will be low and the consequences are the lower business involvement and suspending the future and current cooperated projects or business until the improvement is recognized in the next time assessment.

Chapter 5. Discussions

The discussion chapter is based on the empirical findings and the literature reviews. This chapter will discuss the supplier development strategies and life cycle, supplier development or supplier switching, supplier development as ongoing practices not a short-term program as well as supplier development impact from sustainability perspective.

5.1. Supplier development strategies and life cycle

Supplier development is designed to achieve benefits to the BF while improving its suppliers as Krause (1999), Krause and Ellram (1997a) described. The strategies of SD practices which include direct and indirect are the way of achieving the aim. The four stages of the SD life cycle are necessary in order to achieve the aim of SD.

The SD practices in Ericsson are both in digital and non-digital methods in the SD life cycle. Ericsson offers free online courses to its suppliers, especially tier 1 suppliers. Under the Covid-19 pandemic when traveling is restricted, the digital methods are largely used in Ericsson's SD practices. Knowledge transfer, top management involvement, evaluation and incentives are critical to achieve SD aims successfully which is in line with the findings of Liu et al. (2018). Modi and Mabert (2006) as well as Dou et al. (2014) claimed that top management support both financially and non-financially are effective.

However, for the direct top management support financially are restricted or limited as in Ericsson's case due to the risk of direct support when SD practices are misconducted by suppliers. As Liu et al. (2018), Hahn et al. (1990), Giannakis (2008) and Dou et al., (2014) described the SD life-cycle stages where each stage has its clear aims, duration and responsibilities. In Ericsson's case, each stage in the SD life cycle is not clearly distinguished. Some of the stages, such as the designing, recruiting stages could be mixed up when there are no clear distinctions.

5.2. Supplier development or supplier switching

As the description of Dastyar et al., (2020), BFs tend to switch suppliers instead of developing suppliers when there are many alternatives. One of Ericsson's sourcing rules is that *"Ericsson would not allow having only one supplier for any type of business demand"* said the Interviewee F. Such policy offers opportunity for Ericsson to switch suppliers when the ROI is low on

developing the current suppliers. Ericsson's SD level covers most of the important aspects in SD from basic level to advanced level according to the descriptions from Chavhan et al., (2012), which covers supplier performance evaluation, standardizations and qualifications, visiting suppliers' site, certifications, involve suppliers in materials improvements, training and education, involve suppliers in future product development process, top management involvement and support. However, the strategies in the SD life cycle may be considered as not benefiting optimal options from a business perspective, especially when there are many other suppliers to choose from which is in line with opinions from Cole and Aitken (2019). If there are more than one suppliers in some business supply, certain BFs may think that it is easier to switch to a new supplier when there are any problems with the old supplier rather than invest time, human assets, technical and financial in developing the old supplier for improvement.

Supplier development or supplier switching is an option for the BF. As Chapter 2.2.1. described, development or switching depend on which option could get more benefits in economic, social and environmental aspects (Friedl & Wagner, 2012; Talluri & Narasimhan, 2004; Handfield et al., 2000). If the total return is higher than the total cost in supplier development instead of supplier switching due to the cost of changing new suppliers, supplier development should be adopted. Otherwise, BF can decide to switch to new suppliers. However, the BF needs to keep in mind about the effectiveness of long-term relationships and collaborations on the buyer-supplier relationships.

Ericsson as one of the biggest multinational companies in its industry has suppliers all over the world. With the glory of being a top international company with good reputation and stable financial support, "it is a pride for the supplier to cooperate with Ericsson" said the interviewee A. Besides, Ericsson also has its own sourcing strategy which is to "cut the tail" and cooperate with large and global suppliers. These lead to some suppliers being strongly willing to work with Ericsson and thus Ericsson has so many back-up suppliers. Even though it is not easy to become Ericsson's approved suppliers when the selection standards are high, there are still distinct levels of supplier after approved by Ericsson. In line with the supplier classifications from Handfield et al., (2000), Ericsson divide its approved tier 1 suppliers into strategic suppliers and non-strategic suppliers according to the interviewee E and F. Strategic suppliers are the suppliers who have long-term relationships and collaborations with Ericsson and its product or service are not easy to be replaced but very critical to the success of Ericsson's product, project or service to Ericsson's customers. Non-strategic suppliers are the suppliers whose short-term collaboration with Ericsson and its product or service are easy to be replaced

by the suppliers' competitors and also it is not critical in the success of Ericsson's product or service. From the illustration of all the interviewees, the non-strategic suppliers are easily switched by new competitive back-up suppliers when serious problems arise in supplying. On the contrary, the strategic suppliers who are not easily replaced, in other words, the replacement cost is much higher, will be considered to implement supplier development practices (Friedl & Wagner, 2012). However, even for strategic suppliers, SD practices mostly consist of setting up requirements and then monitor the improvement progress, evaluate the performance outcomes afterwards, and award the best improvements after evaluation. Ericsson tends to implement indirect SD strategies in the SD life cycle rather than direct involvement strategies in SD practices.

In Ericsson's case, suppliers will be further developed or switched to a new one depending on if the supplier is a strategic supplier or not. From a sustainability perspective, supplier development should always be the first option for BF instead of switching. By implementing supplier development, BF extends its value on sustainability perspective to more of its suppliers (Panigrahi et al., 2019). By doing so, the BF could benefit from the positive impact on its business performance as well (Krause, Handfield & Scannell, 1998; Krause and Ellram, 1997a; Saghiri & Wilding, 2021; Gualandris et al., 2014). If one supplier is not familiar with the BF's sustainability value, BF should spend more time or effort to improve the supplier' understanding on sustainability instead of just changing it. Keep changing the unsustainable suppliers instead of helping the suppliers to be more sustainable, will leave more suppliers, business or people behind of the UN SDGs. Regarding supplier switching or development, the interviewee A explained that "it is all about money". As Seuring & Müller (2008) stated, social and environmental aspects are largely neglected compared with economic reasons. For the long-term corporate sustainable development perspective, supplier development or switching is not only about money. The BF considers the risks from all the three aspects in TBL, not just economics (Faisal, Banwet & Shankar, 2006; Routroy and Pradhan, 2013). SD is not a financial cost for BFs but rather a way to take and extend its responsibilities and extend to its suppliers and thus gaining long-term benefits instead. By doing so, BFs are lowering the risks of being interrupted by sustainability regulations currently or in the future from the suppliers' side and thus gaining supply stability and achieving competitive advantages from suppliers.

5.2.1. Sustainable scenario for SD option

There are different options for BFs to do supplier development instead of switching to a new supplier according to the importance classification of suppliers in *Figure 2* (Handfield et al, 2000). Firstly, for strategically approved suppliers, BF evaluates the total cost of changing a new supplier when facing supplier problems. When both the business volume and risk are high, BFs consider integrating supplier development instead of supplier switching (Dastyar et al., 2020). For Ericsson, the strategic suppliers are in the top considerations for supplier development. Secondly, for bottleneck suppliers, the risk of switching is high but the business volume is low. In such a situation, supplier development should be the first option to develop the long-term business commitment partnership in business and ensure the supply stability unless the cost of switching is higher than the return of supplier development. In addition, for leverage and nonstrategic suppliers, BF also put it supplier development for long-term corporate sustainable development. Extending the sustainability value to such kinds of suppliers is extremely critical for the success of achieving the UN SDGs in leaving no one behind.

However, when they were asked about the possibility of developing such kinds of suppliers in Ericsson, all of the interviewees gave negative responses regarding this. The reasons are mainly related to the cost, risk and return on investment (ROI). The interviewee B said, *"from a risk management perspective, we look at the ROI. If the risk is high with low return expectation. We think that we have sufficient reasons for switching off the lower performing suppliers".* But from the long-term sustainable development perspective, such kind behavior will not be positive for the success of sustainable development, especially when such kind suppliers have a large business volume and hold a certain amount of natural and social resources. Leaving them in behind will have negative effects like the water drop effect which will affect more and larger scales of other parts. BFs may feel such stress for their business when they need to make profit for their own survival and success. But if developing such kinds of suppliers can help BFs make profits and the total return higher than the total cost when it is carefully and fully planned, BF manages to do it for the long-term business development. Under the situation which Friedl and Wagner (2012) described, supplier development of the leverage suppliers and nonstrategic suppliers should be the first options. In order to ensure the long-term ROI, BFs can sign fixed-price contracts for a certain period with such suppliers. After the contract time, suppliers change the price if it is improved through SD practices and it will also have the ability to attract other large customers in the global market in the meanwhile working with the BF who helped them to develop.

5.3. Supplier development as ongoing practices or a short-term program for corporate sustainable development

As the literature indicates (Liu et al., 2018; Hahn et al., 1990; Giannakis, 2008; Dou et al., 2014), SD practices have their own life cycle which contains four stages, and each stage is clearly distinguished with a different time frame. However, the empirical study shows that SD could be either an ongoing practice or a short-term program for corporate sustainable development.

Ericsson as one of the biggest BFs in its industry makes SD practices as the ongoing practices in its sourcing strategy for corporate sustainable development. However, each stage in the SD life cycle has no deadline as in the short-term program. There is no clear time boundary for each of the SD life-cycle stages in Ericsson but rather have clear and efficient strategies in each stage according to the problems and also the situation. Thus, there are no clear guidelines for what strategies should be adopted in SD practices in Ericsson but rather rely on communication time-to-time with suppliers and previous experience.

But a short-term SD program may compensate for the disadvantages of ongoing practices for corporate sustainable development. The main advantages of short-term SD programs are efficiency and results oriented. When there is no time limit, things may have the possibility of being inefficiently solved with higher cost. To make the optional choice, it is helpful to have a guideline about what strategies need to be adopted in the SD life cycle and it also can be updated constantly in change management. To achieve corporate sustainable development, ongoing SD practices or short-term SD programs need to depend on the certain situation and certain problems, not just rely on experience.

5.4. Integrating sustainability in SD life-cycle practices

As described by Coşkun et al. (2022) and Ghayebloo et al. (2015), to make supplier development sustainable, the three aspects in TBL need be equally focused on while integrating sustainability into each of SD life-cycle stages. Sustainability concerns reflect why and how a SD program is needed. When there is a need to be more sustainable with suppliers, SD practices need to be adopted for corporate sustainable development. After designing the SD practices, the sustainable criterion is necessary for evaluating suppliers' sustainable performance (Coşkun et al., 2022; Ageron, Gunasekaran & Spalanzani, 2012). Coşkun et al. (2022) extended the

sustainable criteria in evaluating supplier performance by combining economic, environmental and social indicators together and not just focusing on economic and environmental indicators.

In the empirical case, Ericsson pays equal attention to the three aspects of TBL in its SD practices from designing, recruiting, implementing, evaluating and rewarding. Ericsson adopted the sustainable evaluating criteria when giving suppliers different performance cards in order to improve human well-being and environmental sustainability in the long-term for Ericsson and also for the suppliers. For suppliers who participated in SD practices they also benefited from the new knowledge and were more competitive after improvement of SD. This improved the suppliers business in sustainability and also had a positive effect on suppliers' social and environmental improvement further.

However, the sustainability impact of Ericsson's SD life-cycle practices is limited due to the sourcing strategy of "cutting the tail" even though the three TBL aspects (economic, environmental and social) are paid equal attention. The main reason for this is because the suppliers of Ericsson are mostly large and global suppliers. Such kinds of suppliers have sufficient resources in finance, human assets and knowledge or information. They will have the ability to do self-correction and self-improvement when problems arise. But if a supplier does not have enough resources in finance, human assets or knowledge, the supplier will not have the ability to improve itself without the support of its BF. This is also the reason that Ericsson prefers to work with the large and global suppliers instead of small and local suppliers who need lots of direct involvement for improving. Besides, Ericsson's SD practices are rather supplier compliance requirements in sustainability, climate, or future business strategy. Such kind of SD practices may have limited influence in really helping the suppliers who indeed need help from the BF to be more sustainable in business, social and environmental aspects.

From a sustainability perspective, to achieve larger SD effectiveness, BF need not only focus on strategic and large suppliers' alignment in business and sustainability, but also need to pay attention to the Small and Medium Enterprises (SMEs). If BFs worry about the ROI and risks, they can set up an additional subsidized branch company who only focus on helping the SMEs to be qualified and approved suppliers of the BF through short-/long-term education or training programs. To ensure it is a win-win option for both the BF and the suppliers, there must be a benefit evaluation and negotiation between the two parties. After agreement by both parties, the program can be conducted under a certain period and be supported by both of the top

management decision-makers. This has a meaning of leaving a way for SMEs to be improved not just be abandoned or rejected by large BFs.

Chapter 6. Conclusions

The final chapter will summarize the empirical answers for the research questions. Furthermore, it will also contain reflections, limitations and the future research suggestions.

6.1. Final conclusions

This thesis has introduced the importance of sustainability for a company's survival and success and sustainability in company's supply chain management. The main topic of this thesis is supplier development practices for corporate sustainable development. The method of this thesis is a case study on Ericsson. This thesis studies the concept of supplier development from the origin, definition of this concept, the enabling and hindering reasons of integrating SD practices. Then the introduction of different strategies in the SD life cycle follows. Furthermore, this thesis also described how to integrate sustainability in each of SD life-cycle stages. The data of this thesis was collected through both primary interviews and secondary web-page based data. After conducting the empirical study research, this thesis has generated sufficient data to answer the research questions. The concluded answers to the research questions are to be discussed in the following parts.

6.1.1. Strategies in SD life cycle for sustainable development

Throughout the empirical research about Ericsson's sourcing strategy and supplier development practices, the author found out that there are direct and indirect strategies in different SD life-cycle stages. In the designing SD stage, incentives, management support in human assets, company's policy support, investment in technical and equipment are adopted in Ericsson's early SD practices. In the recruiting stage, mainly incentive and competitive pressure are embraced. In the implementing stage, mainly the knowledge transfer through education, training, face-to-facing technical support or online courses or guidelines and the top managers' support in human assets and investments. In the evaluation and rewarding stage, there are mainly the indirect incentive strategies which include monitor, assessment and rewarding.

6.1.2. Sustainability in Ericsson's SD practices

There are sustainability considerations in Ericsson's SD life cycle. Ericsson uses supplier performance cards to evaluate suppliers' performance outcomes through SD practices. The results of the evaluation will be used in the rewarding SD stage but also will be used in the

designing SD stage. If there is a need to improve a supplier, the new assessment begins according to certain sustainability criteria. In the recruiting stage, the most potential suppliers in sustainability improvement will be focused on. In the implementing stage, the three aspects of TBL will be paid equal attention to. In the evaluation and awarding stage, the results of the three TBL aspects have equal proportion in the final supplier performance card.

6.2. Reflections

This thesis has empirically studied the telecom company Ericsson. The results show the strategies in SD life cycle that are adopted by Ericsson are in line with the theories. The integration of sustainability in different SD life-cycle stages is embedded with equal attention to the three aspects of the TBL (economic, environmental and social). However, the results can not reflect how well Ericsson is in supplier development for corporate sustainable development. There are two main reasons that make the empirical results in Ericsson in line with theories in SD. The first reason is due to the large size and how global the suppliers that Ericsson have. The second reason is Ericsson's sourcing policy of "cutting the tail" which enables Ericsson to have less sustainability conflicts with the suppliers.

This thesis has contributed to filling the gap in providing more empirical research from the telecom industry. The thesis has also contributed to deepening the knowledge of what strategies are adopted in the SD life cycle and how sustainability is integrated in SD practices for corporate sustainable development in telecom practices.

6.3. Limitations and future research suggestions

- **Limitations**

This study has only focused on the multinational top company in telecom industry Ericsson. Due to the enormous size and large business volume demand, Ericsson has a large number of suppliers worldwide. However, because of Ericsson's sourcing strategy "cutting the tail", the suppliers are mainly large and global companies. These large and global companies have higher ability and needed resources in finance, human assets and other things for self-improvement than small and local supplying companies. This phenomena makes the study of only focusing on Ericsson and its suppliers in SD practices limited. Furthermore, the concept of supplier development has a short history so far which means there is not yet enough and rich evidence to support the effect of supplier development practices both quantitatively and qualitatively.

The existent theories are most under the frame of qualitative studies (Liu et al, 2018). Lastly, the designed single-case study has limitations in external validity. The method of single-case study has led to the analysis of this thesis only focused on Ericsson's perspective and has limited the holistic understanding of the influence of SD practices.

- **Future research suggestions**

Therefore, for future research studies, there need to be more research studies about medium sized BFs in different business industries about the strategies and impact of SD practices, not just the global and big-size BFs who have large and global suppliers. The impact of SD practices are necessary. But when studying the impact of SD practices, more suppliers' perspectives are needed in order to have a more holistic understanding. More quantitative evidence is needed to analyze the effect of supplier development practices. Multi-case study for SD practices in different companies' practices could have stronger external validity. Multi-case study can greatly improve the external validity, credibility and generalizability of the empirical findings. In addition, which strategies should be applied in different SD life-cycle stages and also how to make the different strategies to be more efficient in practice need more perspectives from suppliers. Thus, it is needed to study how suppliers view the BF's SD practices on them.

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6. Interviewee F, Supplier Relationship Manager in Ericsson. Interviewed by Pingping Xu (Face-to-Face offline Interview). 2022-04-06.

Appendix.

Appendix 1. Interview Ethical Considerations

- Interview Ethical Considerations
- Ensure the confidentiality of the interviewee's information.
- Ensure the interview questions do not violate the safe and ethical treatment of all the participants.
- Ensure the interviewee has the right to refuse or terminate any interview questions against the interviewee's will.
- Ensure to inform the interviewees about the interview process and get permission before recording the interviewee
- Assure the interviewee that the results of the interview only be used in academic work
- Assure the interviewee will get feedback about the results of the thesis afterward
- Assure the permission from the interviewee before publishing the results of the interview and the thesis

Appendix 2. Interview questions

1) What is supplier development from your company or your perspective?
2) Do you think your company must consider sustainability in supplier development?
3) Have you been trained about sustainability in sustainable supplier development? If yes, what is the training?

4) Which are the important aspects (economic, environmental or social) in sustainable supplier development in your company?

5) What are the connections between sustainability and supplier development in your opinion?

6) Does your company or you in your position have any trouble or problem in interacting with your suppliers?

7) How does your company deal with supplier relationships?

8) Is your company implementing (or planning to do) sustainable supplier development practices or programs? Why? Or why not?

9) How does your company implement sustainability into supplier development practices?

10) Do you think sustainable supplier development is part of Ericsson's social responsibilities?

11) What are the enabling reasons and hindering reasons for your company to adopt supplier development?

12) What are sustainable supplier development practices or programs mainly focusing on?

13) What strategies are adopted in the sustainable supplier development life cycle?

14) What are the improvements in supplier collaboration after implementing sustainable supplier development practices from your or your company's perspective? In which way?

15) Are there any improvements in your company's business performance from a supply chain perspective after implementing sustainable supplier development practices?

16) How does your company evaluate the effect of sustainable supplier development practices or programs?