UNIVERSITY OF TURKU

ABSTRACT

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Supervisor(s)	Ph.D. Sini Laari, Ph.D. Harri Lorentz		

Abstract

Sustainable procurement is a growing concern in organizations across industries, as stakeholders are placing higher emphasis on organization's and its suppliers' sustainability performance. Organization and its suppliers are not seen as separate entities regarding sustainability, and organizations are often held responsible for sustainability failures of their suppliers. Procurement has an imperative role driving forward organization's sustainability, as it is placed between external and internal stakeholders and majority of sustainability implications arise from supply chain.

Sustainable procurement builds commonly around triple bottom line (TBL) which integrates three dimensions; environmental, social, and economic. This study adopts the TBL concept. Even though sustainable procurement has gained popularity, and common frameworks such as TBL exists, the field has remained fragmented. Sustainable procurement is also a difficult task to implement in practice. Fragmentation, lack of knowledge, and difficulties regarding implementation and development are factors which can be eased through maturity models. There is a clear research gap as no empirically validated maturity model for sustainable procurement exists.

The study uses a constructive research approach and creates the first empirically validated scientific maturity model for sustainable procurement and utilizes it. The model is based on existing scientific literature on procurement and sustainability, and the creation process follows frameworks presented in literature. Validation of the model is done through a questionnaire and an expert interview. The created model includes 38 dimensions that are grouped to five categories addressing common procurement tasks and enablers of sustainability. The study creates five levels of maturity evolving from "non-existent" to "sustainability leader".

The maturity model is tested with a questionnaire with a single organization and participants consist of procurement professionals. The organization received an overall maturity level of 2.47 out of 5. This maturity indicates that the organization has adopted a large variety of sustainable procurement practices, but they are not yet well implemented throughout the organization. Thus, there is a high dependency on individuals. The results also indicate that maturity of sustainability drivers and enablers, and supplier management are the lowest. Organization is also able to utilize the model as basis for future development. The maturity model should be more widely adopted to gain information on sustainable procurement in practice and generate generalizable results. This would provide valuable aid for both practitioners and scientific community.

Key words	Sustainable procurement, Maturity model

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Tiivistelmä

Kestävän hankinnan merkitys organisaatioille on kasvussa sidosryhmien keskittyessä yhä enemmän organisaation sekä sen toimittajien kestävyyteen. Organisaatiota ja sen toimittajia ei enää nähdä erillisinä kokonaisuuksina, vaan organisaatiot joutuvat usein vastuuseen toimittajiensa vastuuttomasta toiminnasta. Hankinnalla on elintärkeä rooli organisaation kestävyyden kehittämisessä, sillä se sijaitsee ulkoisten ja sisäisten sidosryhmien välillä, ja suurin osa kestävyyteen vaikuttavista tekijöistä syntyy organisaation toimitusketjussa.

Kestävä hankinta rakentuu yleisimmin kolmoistilinpäätöskäsitteen (TBL) ympärille, mikä koostuu kolmesta ulottuvuudesta; ympäristöllinen, sosiaalinen ja taloudellinen. Tämä tutkimus omaksuu TBL-käsitteen. Vaikka kestävä hankinta on kasvattanut suosiotaan ja yleisiä viitekehyksiä, kuten TBL, on olemassa, on aihealue edelleen hajanainen. Kestävän hankinnan toteuttaminen käytännössä on myös haastavaa. Hajanaisuus, tietotaidon puute, ja käytännön toteutuksen haasteet ovat asioita, joita voidaan parantaa maturiteettimallien avulla. Tämänhetkisessä tieteellisessä kirjallisuudessa on selkeä puute, sillä empiirisesti validoitua tieteellistä maturiteettimallia kestävälle hankinnalle ei ole kehitetty.

Tämä tutkimus soveltaa konstruktiivista tutkimusotetta ja kehittää ensimmäisen empiirisesti validoidun tieteellisen maturiteettimallin kestävälle hankinnalle, sekä hyödyntää sitä käytännössä. Malli perustuu tieteelliseen kirjallisuuteen hankinnasta sekä kestävyydestä, ja sen kehitysprosessi seuraa kirjallisuudessa esitettyjä viitekehyksiä. Mallin validointi suoritetaan kyselyn ja asiantuntijahaastattelun avulla. Kehitetty malli sisältää 38 dimensiota, jotka luokitellaan viiteen hankinnan tehtäviä ja kestävyyden mahdollistajia kuvaavaan kategoriaan. Tutkimuksessa luodaan viisi maturiteettitasoa, jotka kehittyvät ”olemattomasta” ”kestävyysjohtajaan”.

Mallia hyödynnetään kyselynä yhden organisaation kanssa, ja osallistujat ovat hankinnan ammattilaisia. Organisaatio sai tietoonsa yleisen maturiteettitason, joka oli 2.47 ylimmän tason ollessa 5. Tämä taso indikoi, että organisaatio on implementoinut suuren joukon kestävän hankinnan käytäntöjä, mutta ne eivät ole vielä samalla tasolla läpi organisaation. Toteutus on vielä hyvin paljon kiinni yksiöistä. Tuloksien mukaan heikoin maturiteettitaso on ryhmillä kestävän hankinnan ajurit ja mahdollistajat, sekä toimittajahallinta. Organisaatio käytti mallia myös tulevan kehityksen pohjana. Kehitettyä maturiteettimallia tulisi hyödyntää laaja-alaisemmin, jotta voitaisiin saada yleistettäviä tuloksia sekä paremmin ymmärtää kestävää hankintaa käytännön tasolla. Tämä hyödyttäisi sekä organisaatioita, että tieteellistä yhteisöä.

Avainsanat	Kestävä hankinta, vastuullinen hankinta, maturiteettimalli

UNIVERSITY OF TURKU
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SUSTAINABLE PROCUREMENT MATURITY MODEL

Creation, Empirical Validation, and Utilization

Master's Thesis
in Supply Chain Management

Author:
Tuomas Halonen

Supervisor(s):
Ph.D. Sini Laari
Ph.D. Harri Lorentz

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Turku

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TABLE OF CONTENTS

1 INTRODUCTION 9

2 SUSTAINABLE PROCUREMENT 13

2.1 Definition of sustainable procurement 13

2.2 Difficult nature of sustainable procurement 15

2.3 Procurement process and sustainability 17

2.4 Strategic sourcing and sustainable supplier management 20

2.4.1 Commitment to sustainability 23

2.4.2 Building sustainability capabilities 25

2.4.3 Assessing sustainable practices 27

2.4.4 Managing risk and opportunities 28

2.4.5 Tackling sustainability related uncertainty 29

2.5 Enabling sustainable procurement 31

2.5.1 Drivers of sustainable procurement 31

2.5.2 Barriers of sustainable procurement 34

3 MATURITY MODEL 37

3.1 Construction of a maturity model 38

3.1.1 Planning phase 40

3.1.2 Development phase 40

3.1.3 Evaluation phase 43

3.2 Existing sustainable supply chain and procurement maturity models 43

3.2.1 Sustainable supply chain management maturity models 44

3.2.2 Procurement maturity models 48

4 METHODOLOGY 52

4.1 Positioning of the study 52

4.2 Used methods 54

4.2.1 Literature review 55

4.2.2 Open coding 58

4.2.3 Validation questionnaire 59
4.2.4 Process of model creation 60
4.2.5 Expert validation 61
4.2.6 Maturity model utilization 62
5 ANALYSIS: CREATION OF SUSTAINABLE PROCUREMENT MATURITY MODEL 64
5.1 Planning 64
5.1.1 Specifying the audience 64
5.1.2 Defining aims 65
5.1.3 Clarifying scope 65
5.1.4 Defining success criteria 65
5.2 Development 66
5.2.1 Creating dimensions 66
5.2.2 Creating maturity levels 73
5.2.3 Formulating cell texts 77
5.2.4 Choosing administrative mechanism 79
5.3 Evaluation and empirical validation 79
5.4 Expert validation 80
5.5 Maturity model utilization 83
5.5.1 Maturity level assessments of respondents 84
5.5.2 Maturity levels of individual dimensions 86
5.5.3 Comments received through the questionnaire 90
5.5.4 Maturity level mean – standard deviation matrix 91
6 DISCUSSION AND CONCLUSION 95
6.1 Characteristics of sustainable procurement maturity model 96
6.2 Company's performance regarding sustainable procurement maturity 97
6.3 Future research 99
REFERENCES 102

ANNEX 1 110

ANNEX 2 115

ANNEX 3 119

ANNEX 4 123

LIST OF FIGURES

Figure 1 Dimensions of Triple Bottom Line 14
Figure 2 Linear procurement process 18
Figure 3 Hybrid PPM of strategic sourcing process 21
Figure 4 Sustainable supply management process 22
Figure 5 Maturity model creation process 39
Figure 6 Maturity model creation process 39
Figure 7 Constructive research process 54
Figure 8 Maturity model creation and methods 55
Figure 9 Similarities in maturity model creation processes 61
Figure 10 Iterative cell texts formulation process 79
Figure 11 Distribution of maturity levels given by respondents 85
Figure 12 Maturities of each dimension group 87
Figure 13 Maturity level mean and deviation matrix 92

LIST OF TABLES

Table 1 Criteria for sustainable supplier selection 19
Table 2 Categorization of sustainable procurement drivers 31
Table 3 Preview of maturity model to become 42
Table 4 Sustainable supply chain management maturity models 46
Table 5 Existing procurement maturity models 50
Table 6 Framework of business research methodologies 52
Table 7 Information sources 57
Table 8 Initial dimensions 68
Table 9 Validation questionnaire results 70
Table 10 Different maturity levels 74
Table 11 Characteristics of maturity levels in sustainability, SC, and procurement literature 75
Table 12 Initial maturity model levels 77
Table 13 Validated maturity levels and descriptions 81
Table 14 Maturity levels of individual dimensions 86

1 INTRODUCTION

Sustainability has seen tremendous growth in interest from practitioners and scientific community alike. Organizations regardless of industry have started to adopt sustainable practices, while expectations and scrutiny from stakeholders has seen new heights (Foerstl et al. 2018). There are multitude of reasons behind the growing interest on sustainability, but research has implicated that major, and probably most important, driver of sustainability adoption has been the growing pressure from external stakeholders (Beske 2012). Stakeholders' perception on organization's responsibility has also expanded and they have started to focus on organizations' suppliers (Foerstl et al. 2018). According to multiple studies (Akhavan & Beckmann 2017; Hartmann & Moeller 2014; Sancha et al. 2019) organizations are increasingly held responsible for sustainability failures of their suppliers.

Procurement functions as a gatekeeper between internal business units and external suppliers, and thus has a position in which it can have a significant impact on sustainable performance of the whole organization (Goebel et al. 2018). In addition to procurement's position, the amount of goods and services bought has been increasing, and it is estimated that purchases in multiple industries represent approximately 80 % of the total expenditure, while outsourcing ratio exceeds 90 % in numerous organizations (Johnsen et al. 2019). Studies have stated that sustainability of an organization is largely defined by performance of its suppliers (Beske 2012; Miemczyk et al. 2012). According to Miemczyk et al. (2012) an organization is no more sustainable than the suppliers from whom it procures. Despite external pressure being a major source of motive for sustainability and procurement having a key position for responding to that pressure, there are also other perks and motives for implementing sustainable procurement. According to McMurray et al. (2014) improving sustainable procurement performance can increase organization's efficiency, compliance, and transparency as well as provide financial savings.

Even though sustainability has been in the spotlight for some time, it is still highly fragmented field that is hard to grasp as well as implement in practice. This is also very much true for the field of procurement, which according to Filho et al. (2019) represents a relatively new way of integrating sustainability into organizations. Historically sustainability has been cascading towards environmental factors and studies on social and economic sustainability have been scarcer (Martin & Pato 2019; Miemczyk et al. 2012). This has led to fragmentation of the term, and still today sustainability is often seen just

through environmental perspective. This notion is backed up also by results of this study. According to Martin and Pato (2019) after period of environmental dominance, the perception has moved towards more holistic view on sustainability in the form of triple bottom line (TBL). TBL was first introduced by Elkington (1998) and it is comprised of three pillars of sustainability: environment, social, and economic. TBL has risen to be the most used definition of sustainability and is dominant in sustainability related scientific literature (Marting & Pato 2019).

The aim of this study is to build a maturity model (MM) for sustainable procurement (SP). Maturity model can be defined as collection of factors that describe characteristics of an area of interest through various stages of maturity (Pullen 2007). MMs are considered to have multiple beneficial attributes, especially in fields where knowledge and maturity are still relatively weak. According to Andreasen and Gammelgaard (2018) maturity models have an ability to explain complex entities and guide development of addressed function for organizations. Proenca and Borbinha (2016) bring forward three main benefits that maturity models provide to organizations; understanding of opportunities, strengths, and weaknesses, an ability to monitor progress regarding common practices, and measures for benchmarking. From challenging nature of sustainability and recent up rise of sustainable procurement, it is clear that maturity model is a beneficial tool for increasing knowledge within organizations and enable them to transfer procurement into more sustainable direction.

Motives for this study are linked to growing interest on sustainability, fuzzy and fragmented nature of sustainability, the absence of empirically validated maturity models on sustainable procurement, the importance of procurement for sustainability of an organization, and the difficult nature of sustainability integration into procurement processes. As stated by Filho et al. (2019) procurement function is often unfamiliar with basic principles concerning sustainable procurement. A maturity model is a suitable way of addressing the current issues and build more knowledge on sustainable procurement practices. Maturity model on sustainable procurement will allow organizations to increase their knowledge on sustainable procurement practices and gives them clear indication on what needs to be done in order to turn their operation into more sustainable. Through utilization of the model organizations can also note their weaknesses and strengths and decide on needed actions. In order to create the first empirically validated maturity model for sustainable procurement and illustrate its utilization, this study coins following research questions:

- What are the characteristics of a good sustainable procurement maturity model?
- How does the case company perform in terms of sustainable procurement maturity?

According to Reefke and Sundaram (2018) literature on sustainable supply chain maturity models has been scarce, and there is a need for additional research. Same argument can be made regarding sustainable procurement maturity, as there is not yet an empirically validated model existing. Thus, this study aims to provide initial research on sustainable procurement MMs and shed light on this previously unstudied field. The study will focus on creating the first empirically validated SP MM, describe it thoroughly, and analyze its utilization as well as results it can provide.

The first research question describes the developed maturity model and its characteristics and attributes. In addition to describing the created MM, the question strives to answer on overall characteristics that constitute a solid sustainable procurement maturity model. The characteristics largely represent a general model being built in this study but will also account factors that relate to sustainable procurement maturity models regardless of scope. Probably most important characteristics considered under this question are nature of dimensions, levels and cell texts that are well suited for SP MM. This question aims to give detail perception of the created model and practical information on content of SP MMs. Thus, it contributes to overall knowledge on the subject and helps future studies on sustainable procurement maturity models.

The second research question is relevant from theoretical and managerial perspectives. In order to be successful, the model needs to provide estimates on organizations' performance regarding sustainable procurement maturity. Thus, it is important to test the developed MM with a case company and see what kind of results it can provide. The second question will answer how the utilizing organization performs (maturity level) regarding sustainable procurement. Answering this question in detail, can also provide valuable information for future research and companies utilizing the model.

This study is structured as follows. First chapter is comprised of literature review conducted on sustainable procurement. Aim of the chapter is to construct a clear vision of sustainable procurement and bring forward important characteristics of sustainable procurement from the perspective of procurement process and drivers. The chapter will function as a foundation for creation of the maturity model. As a first thing, the chapter

will go through concept of sustainability and definitions of sustainability within procurement context. Afterwards different sustainability practices are highlighted from the perspective of procurement processes and strategic sourcing. Lastly, the chapter will go through different drivers and barriers of sustainable procurement. These subjects intend to bring forward concrete practices, actions, and attributes that can be integrated into the sustainable procurement maturity model.

Second literature review chapter will focus on scientific literature on maturity models. It will go through the creation of maturity models and highlight important factors which should be accounted during the creation process. Literature review will thus provide a framework for the maturity model construction. After going through maturity models in general, the chapter will address existing maturity models on sustainable supply chain management and procurement. There are no sustainable procurement maturity models, so study of previous models is conducted through these two relating disciplines.

After the two literature review chapters, methodology is presented. In the methodology chapter the study is positioned according to business research methodologies framework, and different methodologies used in the study are presented and justified.

Fifth chapter will see actual construction of the sustainable procurement maturity model and its utilization. The chapter is organized according to the utilized maturity model creation process, which is divided into planning, development, and evaluation. After evaluation, the empirically validated model is presented, and results from utilization are analyzed.

2 SUSTAINABLE PROCUREMENT

It has been stated that sustainability of an organization and its supply chain is largely depended and defined by the sustainability of its suppliers (Lu et al. 2018). Importance of supplier management and the amount of procured goods and services has increased (Johnsen et al. 2019). These statements highlight importance of procurement's ability to conduct actions in a sustainable manner and manage supplier base and relationships for better. Success of procurement affects sustainable performance of the entire organization.

Sustainability in the context of procurement is becoming more and more important for organizations. One of the main reasons, and arguably the most significant, is the growing stakeholder focus on suppliers' performance. Stakeholders have turned their focus to the suppliers (Foerstl et al. 2018) and organizations are increasingly facing negative impacts for their suppliers' unsustainable behavior (Akhavan & Beckmann 2017; Hartmann & Moeller 2014; Sancha et al. 2019). Kähkönen et al. (2018) further state that majority of customers do not differentiate between sustainability of organizations and its suppliers. As they are often seen as one, sustainability issues in suppliers' end influence directly the buying organization. Thus, it is not surprising that stakeholder scrutiny is a major driver of sustainability improvement. According to Beske (2012) organizations commonly engage in sustainable practices due to external pressure.

2.1 Definition of sustainable procurement

Although the imperative nature of sustainable practices is becoming more apparent, implementation and management of sustainable procurement practices is not. Sustainability requires procurement department to adopt more comprehensive strategies, develop new set of skills, attain new information regarding multiple industries and geographical locations, and co-operating more intensively with internal and external stakeholders (Johnsen et al. 2019; Kähkönen et al. 2018; Villena & Gioia 2018; Akhavan & Beckmann 2017). Focusing solely on traditional issues, such as quality, costs, and time doesn't align with the principles of sustainability and cannot provide sustainable outcomes (Akhavan & Beckmann 2017).

What does sustainable procurement then mean? According to Pagel et al. (2010) sustainability in the context of procurement means the adaptation of environmentally and socially responsible practices, while simultaneously maintaining good economic perfor-

mance. Walker and Phillips (2019) describe sustainable procurement as a pursuit of sustainability goals through supply and purchasing processes. These definitions highlight few important characteristics. Firstly, currently sustainable procurement is often tied around the concept of triple bottom line (TBL) referring to environmental, social, and economic dimensions of sustainability (Elkington 1998). Secondly, sustainable procurement consists of magnitude of different procurement practices, principles and drivers. TBL dimensions and examples are shown in figure 1.

Triple Bottom Line		
Environment	Social	Economic
- Reduction of emissions - Purchasing eco-friendly products - Environmental supplier selection criteria - Demanding environmental standards - Training	- Health and safety - Decent wage - Codes of conduct - Governance - Human rights - Selection criteria - Auditing	- Long term economic success - Cost calculation - Bribery - Customer complaints - Prices

Figure 1 Dimensions of Triple Bottom Line

Environmental dimension refers to actions aimed at reducing negative environmental impacts and may relate to purchased goods, services and suppliers providing them (Riikkinen et al. 2017). Crespin-Mazet and Dontenwill (2012) state that important concepts are reduced emissions, preservation of natural resources and waste minimization. The concepts can be fulfilled through various actions such as including environmental criteria to supplier sourcing decision, adhering to environmental standards and training, and estimating purchased materials as well as design process (Miemczyk et al. 2012).

Social dimension refers to implementation of socially sustainable practices to procurement function (Riikkinen et al. 2017) and includes concepts such as health and safety of employees, human rights and cultural diversity (Crespin-Mazet & Dontenwill 2012). According to Hofer et al. (2012) actions through which these can be achieved include i.e. codes of conduct, audits, certificates, and supplier evaluation. Social dimension considers human and governance practices, and combats actions such as child labor, safety, inequality of sexes and corruption.

Economic sustainability is probably most easily relatable in traditional business sense as it addresses the long-term economic success of an organization. Economic sustainability is vital for organization's survival and enables it to thrive. Performance of the dimension can be measured through cost-indicators such as cost of non-compliance, customer complaints and returns, employee compensation claims, and cost of accidents (Reefke and Trocchi 2013). Economic responsibility relates also to factors such as fuel efficiency and R&D for new product design and cost reductions (Crespin-Mazet & Dontenwill 2012).

In the past scientific literature has mainly focused the environmental aspect of sustainability and studies related to social dimension have been scarcer (Martin & Pato 2019; Miemzcyk et al. 2012). Hence, the term sustainability has tended to cascade towards environmental factors. According to Martin and Pato (2019) after a period during which the environmental dimension dominated the scientific landscape, a more holistic view of sustainability in the form of triple bottom line (TBL) has risen as the go-to approach. This can be seen from research of sustainable procurement (SP) and sustainable supply chain management (SSCM) where TBL has been the most common approach and definition for sustainability (Riikkinen et al.2017; Goebel et al. 2018; Khan et al. 2018; Gimenez and Tachizawa 2012; Martins & Pato 2019).

2.2 Difficult nature of sustainable procurement

During the past years sustainability has become a major research topic, but despite its popularity the domain has remained highly fragmented and theoretical (Villena & Gioia 2018; Johnsen et al. 2019). Fragmentation refers to the number of varying definitions and differences in the inclusion of sustainability dimensions. Theoretical nature of the domain indicates that literature has largely focused on questions of what and why and neglected the questions of how (Villena & Gioia 2018). The researchers add that focus in scientific literature should shift from explaining sustainability and its reasons to describing its implementation in practice. Miemczyk et al. (2012) bring forward more issues regarding the existing literature on sustainable procurement; depth of levels of analysis and problems with the topic of focus. Levels of analysis refer to the problem that researcher often describe addressing a whole supply chain/network, when they only study sustainability from, i.e. internal or dyadic perspective. Topic of focus regards dimensions of sustainability and their inclusion within research. Focus can be on a single dimension such as

environment or address whole scope of triple bottom line, but problem arises when it is not clear which one study is referring to.

It is not unusual for a study to use the term sustainability when it is only accounting a single dimension (Miemczyk et al. 2012). According to Montabon et al. (2016) there are multiple cases where the term sustainability is used, when in fact only a certain dimension such as environment or economic are accounted. Multiple studies refer to sustainability but disregard the social dimension (Montabon et al. 2016; Miemzcyk et al. 2012). According to Montabon et al. (2016) this is problematic as sustainability is commonly understood in line with TBL including all three dimensions. Based on mentioned fragmentation, characteristics and issues, we can identify three main variables between studies of sustainable procurement:

- Inclusion of sustainability dimensions
- Inclusion of procurement processes
- Depth of levels of analysis

First variable refers to the inclusion of different aspects of sustainability, most notably environmental, social and economic dimensions. It is not always clear which dimensions are accounted under the term of sustainability, and different studies may focus on alternative dimensions. Procurement processes are also a variable between studies, as they focus different parts and aspects of procurement such as sustainable supplier selection or sustainable supplier management. Third variable regards author's ability to choose the depth of inspection; will the study address whole supply network, dyadic buyer-supplier relationships or merely internal collaboration. Recently the importance of levels of analysis has been highlighted, as studies have implied that lower-tier suppliers tend to possess higher risks for sustainability violations (Villena & Gioia 2018). These variations are not a problem as a face value, but they do emphasize need for standardized terms and clear definitions for goals and scope of studies.

Although TBL has risen as the most common definition, the field of terms remain multiple and fragmented. Besides TBL, there are multiple terms for sustainability which include but are not limited to SERP (socially and environmentally responsible procurement) (Hoejmosa & Adrien-Kirby 2015, green procurement (Mosgaard 2015), CSR (corporate social responsibility) (Hajd 2020). Similar by nature, the terms differentiate largely by the dimensions they include; some clearly focus certain while others address multiple dimensions of sustainability. Terms such as green procurement have a narrower focus on

environmental aspects of sustainability (Mosgaard 2015), while some clearly highlight both environmental and social aspects.

"High fragmentation" mentioned by Villena and Gioia (2018) is also present in literature reviews through the incorporation of multiple search words. According to Gimenez and Tachizawa (2012) studies use various terms for the same subject, and therefore there is a need to include multiple keywords. Their literature research included terms, such as sustainab*, environment*, green, corporate social responsibility, supply, procurement, and purchasing ("*" indicates that the search engine includes all words with the defined beginning, i.e. sustainability and sustainable). In their tertiary literature review Martin and Pato (2019) used keywords sustainab*, triple bottom line, green*, social*, ecologic*, environment*. Fragmentation of used terms enhances the importance for a clear definition of the included dimensions.

This study refers to sustainability as the entity of environmental, social, and economic dimensions, and thus follows the most common definition of sustainable procurement, the triple bottom line.

2.3 Procurement process and sustainability

Bäckstrand et al. (2019) state that procurement is complex and difficult entity and defining what is included into the process is not as simple as it seems. This is also clearly present in definitions of the function. Procurement has been described as activities required to get goods from a supplier to certain destionation (Van Weele 2010). Lyson and Farrington (2012) state that procurement is a process of obtaining goods and services. Regardless of its complex nature, it is a critical, strategic, and important business function that enables organizations to deal with numerous stakeholders throughout multi-level supply chains (Van Weele & Van Raaji 2014; Bäckstrand et al. 2019; Choi & Krause 2006). According to Johsen et al. (2019) fuzzy nature of procurement can partially be derived from supply chain management (SCM). SCM includes multiple business functions such as logistics, distribution, and procurement, and possibly due to weak theoretical foundation, has developed unclear definitions and boundaries between these functions (Johnsen et al. 2019).

Like sustainability, there is a vast amount of similar terms for procurement function. Practitioners as well as researches refer to terms such as procurement, purchasing, supply management, sourcing, acquisition, buying, and purchasing and supply management (PSM) (Bäckstrand et al. 2019; Johnsen et al. 2019, pp. 8). It is important to note that the

different terms are usually used indiscriminately and thus limiting the search to a single term does not provide the sought result. Even though similar and overlapping by nature, there are some common distinctions between the terms, i.e. procurement tends to be more inclusive and strategic by nature while purchasing refers to tactical execution of the function. (Johnsen et al. 2019). It can be seen that PSM equals procurement as purchasing fills the tactical nature and supply management the strategic nature of procurement function. Due to this more inclusive nature, this study uses the term procurement instead of purchasing. In addition to the process itself, procurement highlight the importance of internal and external stakeholders (Bäckstrand et al. 2019).

Procurement process can be divided into several stages. There are various ways to depict the process, but generally it is divided into 6 stages which are specifying, selecting, contracting, ordering, expediting, and evaluating (Van Weele 2010; Bäckstrand et al. 2019). These stages can be categorized as source-to-contract (specifying, selecting, and contracting) and procure-to-pay (ordering, expediting, and evaluating) groups (Johnsen et al. 2019). Procurement process is presented below in fig. 2.

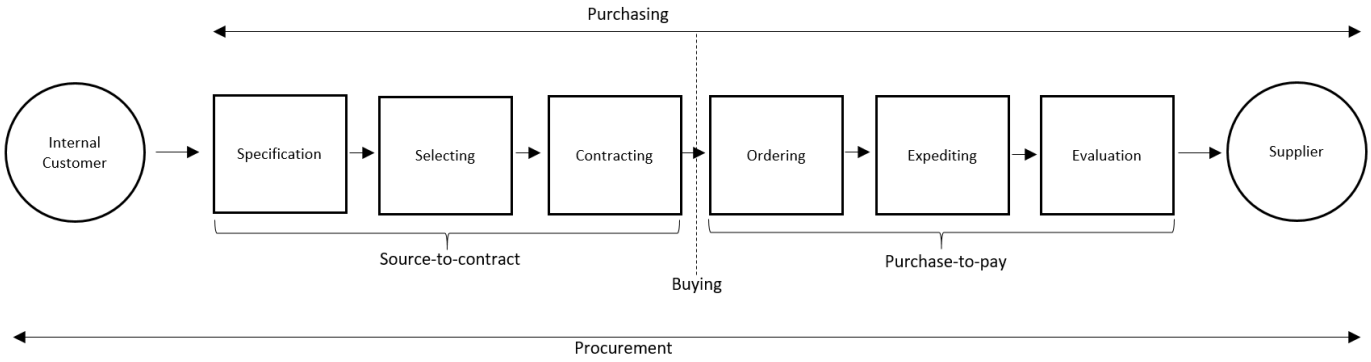


Figure 2 Linear procurement process (Van Weele 2010, Bäckstrand et al. 2019; Johnsen et al. 2019)

From sustainability perspective it is important to acknowledge that sustainability can and should be accounted in all the steps of the procurement process. Inclusion of sustainability into the procurement process should already start from specification and selection stages. Tundys (2016) highlights that one of the most important operational activities for green supply chains is the selection and evaluation of suppliers. Memari et al. (2019) state that supplier selection is among the most critical decisions for any organization. Results of supplier selection have clear direct impact on economic factors such as profitability,

but it also impacts environmental and social dimensions (Memari et al. 2019). Organizations should integrate sustainability criteria to traditional criteria such as technical requirements, cost, delivery terms, and lead times. (Johnsen et al. 2019). Criteria for sustainability can be related to environmental, social and economic dimensions, see table 1.

Table 1 Criteria for sustainable supplier selection (Memari et al. 2019; Johnsen et al. 2019; Tundys 2016)

Criteria Category	Examples of Criteria
Environmental	Environmental management system
	Code of conduct
	Waste management
	Air emissions
	Compliance with local laws, i.e REACH
	Protection of biodiversity
Social	Health and safety
	Minimum wage
	Staff training
	Code of conduct
	Involvement of stakeholders
	Commitment to social management
Economic	Quality
	Lead time
	Price
	Technical capability
Value and Collaboration	Willingness to disclose policies, practices, and actions
	Promoting social responsibility in supply chains
	Values and standards compatible with those of customer

In addition to using sustainable criteria in selection process, organization can also communicate the importance of sustainability to its suppliers by sharing the selection criteria and explaining their impact for the final result. Sharing selection criteria is a great way of informing suppliers of the importance of sustainable actions and sustainable performance (ISO, 2017).

Contracting is seen as the last step of source-to-contract phase and it also can be used to integrate sustainability into the procurement process. According to Dubey et al. (2018) contracts form the foundation for future collaboration and relationship management in buyer – supplier relationship. Through contracts organizations can push sustainable agenda and demand sustainable actions and practices from suppliers, i.e. specify resources to be used and declare how the process itself should be conducted. Through these

kinds of statements, the buyer can restrict supplier from using, i.e. non-sustainable resources, exploitative labor practices, and polluting processes. Albeit its potential, sustainability clauses in contracts are still relatively rare practice of implementing sustainability. (Johnsen et al. 2019). Dubey et al. (2019) bring forward three key features that define sustainability in contracts; long term economic survivability of entities within the supply chain, causing no harm to the environmental, social and economic systems, and buyer and supplier are interconnected through sustainability enabling contracts and items. Sustainability can be integrated also to the last three stages of procurement process constituting the procure-to-pay phase. Expediting can positively impact quality of received good, and thus help an organization to mitigate produced waste. Evaluation refers to assessing supplier performance according to received goods and services and it can result in positive notifications as well as negative problems. Probably most notable tool used for evaluation is auditing. Sustainability perspectives can be integrated to auditing process and thus used to monitor, assure and improve supplier's sustainability performance. (Johsen et al. 2019).

2.4 Strategic sourcing and sustainable supplier management

Sustainable supplier management (SSM) is a process of managing environmental and social performance of organization's suppliers, and it includes selection, evaluation, monitoring, and development of suppliers. Miemczyk et al. (2012) provide a more precise definition also used by Foerstl et al. (2018), *"Sustainable supply management is the consideration of environmental, social, ethical, and economic issues in the management of the organization's external resources in such way that the supply of all goods, services, capabilities and knowledge that are necessary for running, maintaining and managing the organization's primary and support activities provide value not only to the organization but also to society and the economy."*

SSM is discussed as a separate topic due to its reoccurring non-linear nature (Villena & Gioia, 2018), and the fact that majority of organization's social and environmental impacts are produced by suppliers' operations at their premises (Foerstl et al. 2018). SSMs importance has increased as organizations are held increasingly responsible of their suppliers' actions and non-compliance, and even failures of just one supplier can result in reputational and financial damages (Giunipero et al. 2012). Emphasis and growth of

strategic aspect of procurement is also supported by changes in purchasing process models. According to Bäckstrand et al. (2019) purchasing process models have developed from early decision-making process models to linear process models (see figure 2.) and more recently towards higher level and strategic process models. Presentation procurement of process has also evolved and seen linear, cyclical and hybrid models combining the first two (Bäckstrand et al. 2019).

Next, we will shortly go through the concept of strategic sourcing and role of different management processes for development of sustainability capabilities. Strategic sourcing refers to construction and maintenance of approved and preferred supplier base. Concept of strategic sourcing becomes imperative for sustainable procurement as a large number of sustainable practices relate to ongoing supplier management which cannot be adequately described through linear process chart. On the other hand, presenting all sustainability practices within procurement process requires also linear modelling. Thus, a hybrid model accounting both linear and cyclical process models is suitable for sustainable procurement. A rather well-known hybrid procurement process model is presented by Johnsen et al. (2019). It includes linear stages of pre-selection and selection after which supplier becomes an approved supplier and moves towards the cyclical part of the process model (Johsen et al. 2019; Bäckstrand et al. 2019). The hybrid process model of strategic sourcing is presented in figure 3.

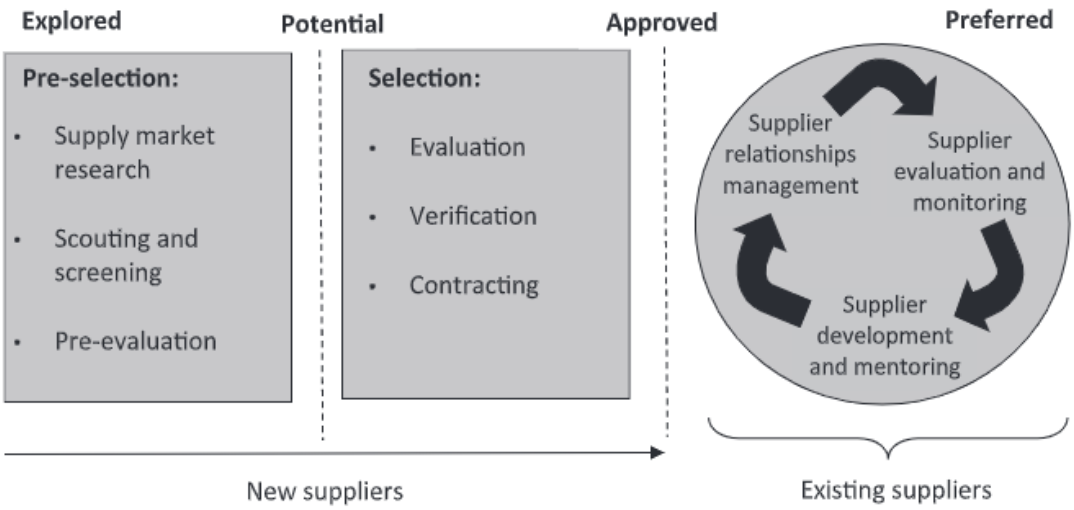


Figure 3 Hybrid PPM of strategic sourcing process (Johnsen et al. 2019)

Studies have stated that managing a sustainable supply network is a complex task that can't be depicted only through linear and causal relationships (Villena & Gioia 2018).

Thus, it is important to describe the ongoing and recurring supplier management process within strategic sourcing and address how it is linked to sustainable procurement practices. Strategic sourcing process contains actions of exploring and selection, which occur before a supplier is selected, and clearly overlap with linear procurement process. More importantly strategic sourcing has ongoing supplier management actions; relationship management, evaluation and monitoring, and development and mentoring (Johnsen et al. 2019).

Working with long-term supplier is becoming more and more important for organizations as sustainability risks are growing in significance and tackling them requires continuous supplier evaluation, development, and management. (Johnsen et al. 2019). It has also been established that the process of selecting and evaluating previously unknown suppliers is costly, time consuming, and risky, and thus, utilization of well-known proven suppliers is preferred. Due to these reasons the concept of strategic sourcing is so important; organizations can't mitigate sustainability risks and keep the costs down with ever changing supplier base as the selection and approval of suppliers is a time consuming and costly process. (Johnsen et al. 2019). This notion coincides with Pagel et al. (2010) definition of sustainable procurement, which states that the process should provide a solid economic performance.

The linkage between strategic sourcing and sustainable procurement can be clarified through comparing processes of both actions. Villena and Gioia (2018) depict sustainable supply management, which is an integral part of sustainable procurement, as ongoing activity in which various processes are closely linked and influence each other. Sustainable supply network management process is depicted in fig 4. (Villena and Gioia).

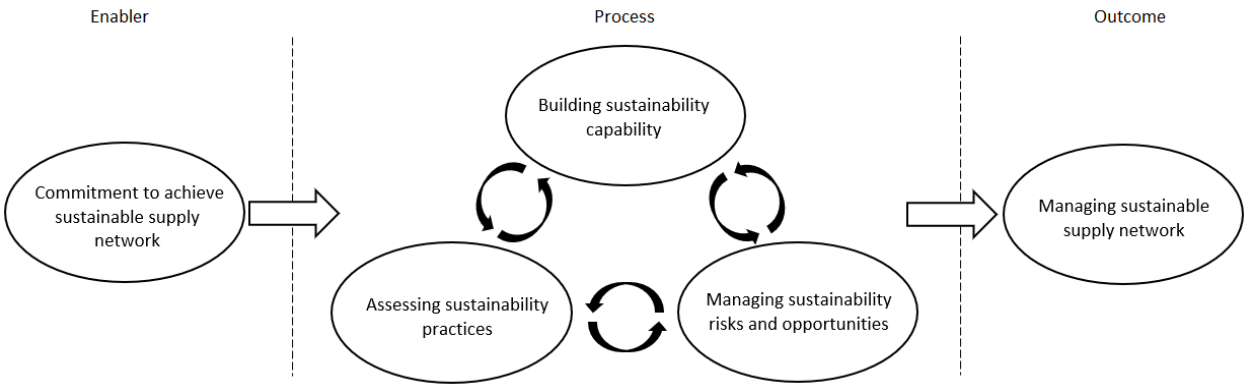


Figure 4 Sustainable supply management process (Villena & Gioia, 2018)

The model consists of three ongoing processes which are assessing sustainability practices, building sustainability capability, and managing sustainability risks and opportunities. These three recurring processes are made possible by firms' commitment to sustainability, on the left, and through them the firm can enable and run a sustainable supply network, depicted on right.

2.4.1 Commitment to sustainability

The framework clearly highlights importance of individual practices, but also brings forward necessity of commitment. This indicates that sustainability in procurement is not only a result of practices, but also a result of commitment enabling the integration of sustainability. Without a certain level of commitment and allocation of resources MNCs (Multi-national corporations) do not have the capability to push sustainability agenda forward, hence they are not able to create truly sustainable supply networks. Depicted on the left-side of Fig. 4. Villena and Gioia (2018) divide the aspect of commitment to three subcategories which are:

- Having a supportive organizational structure
- Setting long-term goals for the firm and its suppliers
- Incentivizing sustainability commitment to suppliers'

Supportive organizational structure states that organization needs to build so that it truly enables the development of sustainability. This means hiring personnel dedicated to sustainability agenda and creating managerial positions responsible for sustainable supply. According to Villena and Gioia (2018) organization should have a sustainability chief officer as well as a sustainability executive in the board of directors. In addition, there should also be a person responsible for implementing the organization's sustainability program to tier-one and lower-tier suppliers. Tier-one supplier means firm's own suppliers and lower-tier suppliers refers to their suppliers' suppliers. Lastly supportive organizational structure involves resources assigned to organization's sustainability agenda. Through assigned resources and dedicated staff actions such as supplier assessment, supplier risk-management and supplier training become possible but also impactful. (Villena and Gioia, 2018). According to Goebel's et al. (2018) literature review there are multiple organizational and cultural barriers for implementing sustainable procurement.

Based on the studied MNCs Villena and Gioia (2018) noted that setting long-term goals is a key factor when striving for sustainable supply network. Each MNC had set

long-term sustainability goals for themselves and their tier-one suppliers, with the intention to create long-term orientation towards major sustainability concerns. A previous study from Flammer and Bansal (2017) also states that this type of goal setting is used to facilitate long-term commitment and development actions towards sustainability issues. A common problem with the development of sustainability is the conflict with organization's long-term goals and short-term economic performance. Focusing on sustainability may often dilute the short-term economic performance of an organization, and thus deter organizations from taking meaningful sustainability actions. (Goebel et al. 2018**)**. Villena and Gioia (2018) point out that this is one of the main reasons why long-term goal setting is so vital. When striving for long-term improvement firms are encouraged to invest in sustainability actions such as supplier training and buying environmentally friendly materials. In addition to MNC setting goals, the suppliers themselves should set clear long-term sustainability for their business. For example, one of the MNCs required their strategic suppliers to do materiality assessment based on which the suppliers then selected two most relevant issues, such as waste management or recycling, for their business and declared publicly two long-term goals related to those issues (Villena and Gioia 2018). Villena and Gioia (2018) also include lower-tier suppliers to the function of setting goals. According to Slawinski and Bansal (2015) majority of lower-tier suppliers tend to ignore interests, such as sustainability, of stakeholders as they aim to deliver short-term results. Therefore, Villena and Gioia (2018) see that demanding suppliers to go forward with sustainability requirement to their suppliers is needed.

The last sub-category is incentivizing suppliers' commitment to sustainability. It means recognizing and rewarding suppliers as they contribute to organization's sustainability targets (Porteous et al. 2015). With incentives MNCs can align suppliers' goals to their own and create beneficial competition between suppliers as they aim for more sustainable processes and rewards (Villena and Gioia 2018). According to Porteous et al. (2015) penalties and incentives can help the buyer organization to reduce operating costs and increase suppliers' compliance regarding agreed sustainability requirements. Incentives concerning additional training on improving sustainability performance and increased business opportunities for supplier have been shown to be especially potential for increasing supplier sustainability and lowering organization's operating costs (Porteous et al. 2015). Villena and Gioia (2018) also noted that reward programs tend to increase supplier's awareness on and willingness to operate in sustainable manner. Rewarding might be tied to different factors, but most commonly used are KPIs (Key performance

indicators) related to sustainability, significant contribution to MNC's sustainability targets, and awards for high achievements in environmental programs (Villena and Gioia 2018). For example, MNCs can set some critical sustainability KPIs such as GHG-emissions (Greenhouse gas), anti-corruption or employee safety and then use these KPIs to rank suppliers if their performance (e.g. quality and on-time delivery) is otherwise on the same level. In this manner suppliers will focus on economic performance but also implement more sustainable solutions.

2.4.2 Building sustainability capabilities

Building sustainability capability refers to various actions organizations can undertake in order to strengthen and validate their sustainability performance. According to Villena and Gioia (2018) this dimension can be described through four main measures:

- Collaboration with key stakeholders
- Offering sustainability training for suppliers
- Setting as well as enforcing sustainability expectations through contracts
- Collaborating to deal with suppliers

First measure, which is collaboration with key stakeholders, has been validated and considered as a vital action in multiple studies in the field of sustainable procurement (Huq et al. 2016; Gualandris et al. 2015; Villena and Gioia 2018). Through collaboration with external stakeholders organizations can acquire several benefits such as unified requirements for sustainability, increased knowledge, and legitimacy for their sustainability endeavors (Gualandris et al. 2015). Mosgaard (2015) states that collaboration between stakeholders is needed because sustainability issues are not as simple to communicate as economic factors such as prices. In their study Villena and Gioia (2018) noticed that all MNCs offered some level of sustainability training for their suppliers, through which they strived to build sustainability capability within their supply network. This would indicate that leading MNCs have come to a conclusion that collaboration can provide benefits, such as mentioned by Gualandris et al. (2015).

Training of procurement employees and suppliers has been seen as an action that supports the function of supply chain management (Mosgaard 2015). Carter and Dresner (2005) state that training can be used as a method for overcoming barriers in environmental management. MNCs included in Villena's and Gioia's (2018) study utilized training of suppliers mainly through three channels; use of own sustainability team, supplier peer

learning and industrial organizations. Organization's sustainability team was used during different visits (i.e. audits) and events (i.e. training sessions) with suppliers and team's task was to bring forward and discuss best practices. One of the MNCs had achieved supplier peer learning by creating sustainability panel consisting of sustainability leader suppliers. Suppliers in the panel gained learning through sharing social and environmental challenges and discussing how they are dealing with them. Lastly the MNCs were able to provide training to a broader scope of suppliers (tier-one and lower-tier) through their industry organizations. Suppliers were encouraged to take a part in different conferences and sustainability trainings held by the industry organization. (Villena & Gioia 2018).

Basis of communication and relationship management between a supplier and a buyer is created through contracts (Dubey et al. 2018). The researchers further elaborate that benefits gained through investments in organization's supply chain can be severely mitigated in the absence of adequate inclusion of sustainability factors to contracts. Some industry leaders in the study of Villena and Gioia (2018) have modified their terms to contractually bind suppliers to their sustainability expectations and requirements. Despite not having contractual terms, all of the studied organizations had placed expectations for their suppliers' sustainability performance. These expectations included matters such as safety and wellbeing of employees, respect of human rights, ethical behavior and compliance with regulation. In cases where expectations or requirements are violated for the first time, organization should try to work together with supplier to assess the causes and figure out how to rectify the situation. If supplier doesn't make improvements and continue to disregard expectations, then organization should implement penalties or in some cases end the business relationship. (Villena and Gioia 2018). Lack of sustainability in industry leaders' contracts speaks for the difficult nature of the task. Dubey et al. (2018) state that there has been significant improvement made regarding integration of sustainability to contracts, but the practice is still seldom used.

Last dimension of sustainability capacity building is collaboration in order to deal with unexpected turn of events. This collaboration can take between competing MNCs or between the buyer and supplier organization. Competing MNCs have collaborated in the way of informing each other of underperforming suppliers, i.e. organizations can inform each other if it comes to their attention that accidents at common supplier's facilities have increased. By sharing information MNCs can co-operate to push change in supplier's operations and enhance sustainability. (Villena and Gioia 2018)

2.4.3 Assessing sustainable practices

Sustainability assessment practices is the second of the ongoing processes to enhance and build sustainability in the supply network. According to Villena and Gioia (2018) it can be divided to three sub-processes which are:

- Supplier sustainability assessments
- Supplier sustainability scorecard
- Closing correcting action plans

Supplier sustainability assessment process is a common practice to uphold sustainability in supply network (Porteous et al. 2015; Villena & Gioia 2018). According to Torres-Ruiz and Ravindran (2018) organizations conduct sustainability assessment of their suppliers mainly due to increasing scrutiny on businesses, growing impacts of climate change, and obtainable benefits. Izadikhah et al. (2017) state that in order to establish a sustainable SC its' members from suppliers to top managers should be committed to sustainability. With the help of assessments firms can estimate whether their suppliers comply with the defined sustainability standards. Most common ways to conduct these is either supplier self-evaluation questionnaires or on-site audits. If the organization has knowhow it can develop self-evaluation questionnaires itself, i.e. sustainability team, but it may also use questionnaires developed by or based on industry organizations or third-party firms. (Villena and Gioia 2018).

Villena and Gioia (2018) noticed that sustainability leader MNCs had two common features regarding their assessment processes which were the inclusion of questions regarding lower-tier supplier sustainability and that the results were included in supplier risk evaluation or supplier scorecards. Villena and Gioia (2018) noticed that lower-tier suppliers don't often comply with sustainability requirements partly because they acknowledge that their customers (tier-one suppliers) aren't penalizing them due to lack of data usage. This might be one reason behind results of Tachiziwa's and Wong's (2014) study which indicated a higher possibility of lower-tier suppliers breaking sustainability requirements.

Alongside traditional economic measures, such as quality and on-time delivery, sustainability leaders have modified their supplier scorecards to include labor and environmental indices, which able procurement experts to track the development of set sustainability criteria. This also communicates to suppliers that certain criteria are followed periodically, and that they can distinguish themselves in a positive way by performing well

in the sustainability dimension. Sustainability factors are not the first separator, but if suppliers are even according to economic measures, they can be ranked based on sustainability criteria. (Villena & Gioia 2018). According to Villena and Gioia (2018) an automotive MNC followed two sustainability KPIs in its supplier scorecards which were score on supplier's sustainability self-assessment and expenditure targets for purchases from minority suppliers. Other KPI factors measured were contingency plans and monitoring of own suppliers. It is also important that organizations do not keep the KPI information to themselves but actively discuss the results with their suppliers and bring forward actions plans if necessary. (Villena & Gioia 2018)

Last practice of sustainability assessment is corrective action plans. This means that if a factor such as an audit or supplier self-assessment, shows non-compliance, the MNC is capable of addressing the issues (Villena and Gioia 2018). According Lechler et al. (2019) corrective actions are used by buyers to address and improve suppliers' shortcomings. Villena and Gioia (2018) state that corrective action and the penalty should be in relation with the severity of the violation. In some cases, meeting the required improvement can be tied to contract continuity or losing a membership at an industry organization. Also, the implementation speed of actions depends on the violation. Usually the less severe a violation is, the quicker the corrective action is to conduct, i.e. exchange of machinery to meet standards. (Villena & Gioia 2018).

2.4.4 Managing risk and opportunities

Last separate entity of the sustainability building process is sustainability risks and opportunities management. Villena and Gioia (2018) divide this process to three actions which are:

- Mapping the firm's supply network
- Conducting a risk-assessment program
- Managing a crisis

Organizations can gain multiple benefits by mapping their supply network. Mapping provides a better picture of the risks the organization faces, helps to clarify opportunities it has, and can helps to attain key information such as locations and dependency (Villena and Gioia 2018). According to Villena and Gioia (2018) sustainability leaders use mapping foremost to identify their potentially risky lower-tier suppliers as they already have an understanding of their tier-one suppliers. Mapping of lower-tier suppliers has become

especially important as majority of sustainability violations has been shown to often occur at their facilities (Tachiziwa and Wong 2014). However, mapping lower-tier suppliers tends to be a difficult task as tier-one suppliers often refuse to help the organization in such projects (Hofmann et al. 2018). According to Hoffman et al. (2018) reasons for this include information on suppliers being considered strategic, sharing being seen as potentially harmful, and existence of mistrust between supplier and their customer. Vice versa mapping of tier-one suppliers is easier as the organization itself has the required information (Villena and Gioia 2018).

The second part of sustainability risks and opportunities management is conducting a risk-assessment program. According to Hoffman et al. (2014) stakeholders hold MNCs responsible for misconducts in their supply network, and hence MNCs must take actions in order to mitigate risks of reputational damage. To decrease the chances of reputational damage, organizations evaluate their suppliers based on various criteria and develop sustainability risk mitigating strategies. Sustainability leader MNCs have assessed their suppliers based on financial stability, business volume, commodity type, location, environmental risk, and labor issues. (Villena & Gioia 2018). Based on these factors suppliers can be ranked or classified and a type of risk-mitigation strategy can be selected; control-based approach or collaboration-based approach (Hajmohammad & Vachon 2016).

The last function is crisis management. Although an organization would take all the preventive actions it will still, at some point, face a crisis such as environmental scandal, a large-scale accident, or natural disaster. In order to mitigate impacts of such events organizations should set plans and responsibilities, such as responsible personnel, spokesperson, corrective actions and clear goals.

2.4.5 Tackling sustainability related uncertainty

Although, there are vast amount of practices an organization can conduct SSM, the practical implementation isn't easy. According to Foerstl et al. (2018) one of the most challenging aspects associated with SSM-function is the difficulty of observing true supplier performance regarding social and environmental practices in their supply networks. There have been cases in which, i.e. despite extensive auditing an organization has remained unaware of use of child labor in its supplier's premises. Graham (2015) bring forward an example from outdoor clothing manufacturer Patagonia who was unaware of cruel treatment of animals by its wool suppliers, although the company presents itself foremost as sustainable and environmentally friendly. Foerstl et al. (2018) state that sustainability-

related uncertainty (SRU) is not a problem just for low skill organizations, but also for sustainability leaders and their procurement managers. SRU is a difficult matter regarding first-tier suppliers, but exponentially increases in complexity when moving into domain of lower-tier suppliers. Due to SRU, increasing stakeholder scrutiny, and complexity of supply networks (Giunipero et al. 2012), the area of processing sustainability related information is emerging as imperative skill for procurement departments (Rauer & Kaufmann, 2015).

Foerstl et al. (2018) state that sustainability-related uncertainty creates information processing needs (IPN) for an organization, which is understandable as success of sustainability aspirations are largely depended on attainable information and its reliability. Foerstl et al. (2018) coined six distinct information processing mechanisms (IMP) which can support sustainable procurement from the perspective of SRU. Three IMPs related to decrease of IPN and they were stakeholder collaboration, creation of self-contained tasks, and sustainability driven supply chain modification. Other three regarded increase of IPC (information processing capability); investment in information systems, creation of lateral relations, and process design. Multiple of these IPN IMPs relate strongly to activities mentioned also by Villena & Gioia (2018):

- Have experts who interact NGOs
- Exchange supplier evaluation results with competitors
- Create incentives for suppliers
- Provide sustainability know how
- Have experts who work at supplier sites

While these actions moderate current supplier relationships and reduce SRU in existing domain, the last IPN reducing IPM: sustainability driven supply chain modification, reduces uncertainty through more concrete actions of reducing distance to suppliers, reduce amount of supplier tiers used, and reduce number of suppliers per product/category. Also, activities concerning improvement of IPC are closely twined to concepts brought up by Villena & Gioia (2018). Investment into information systems, creation of lateral relations, and process design integrated all together 12 different activities/practices:

- Training employees for SSCM
- Hire experts for SSCM
- Use external experts to conduct audits
- Integrate green and social criteria into a central database
- Integrate green and social criteria into supplier relationship management

- Standardize supplier evaluation criteria
- Use sector specific supplier evaluation criteria
- Create cross-functional SSCM teams
- Employ experts who work in different regions
- Evaluate beyond first-tier suppliers
- Re-asses supplier periodically
- Apply risk-based evaluation to identify critical suppliers

From the different studies we can see that ideas, principles and practices of sustainable supply management seem to align, but the frameworks and categorizations changes. From the perspective of maturity model creation this doesn't impose a problem, as the model is based on literatures understanding of most important sustainable procurement practices, which are aligning. Differences in frameworks and categories does imply that considerable though must be on creation of maturity model dimensions.

2.5 Enabling sustainable procurement

According to Filho et al. (2019) literature on drivers and barriers of sustainable procurement has clearly cascaded towards the former. This is suspected to be result of a desire to focus on the positive aspects of sustainability, rather than the negative implications and possible downsides. Although the desire to focus on the positive might explain the difference, one must also account the similarity and overlapping nature of sustainability drivers and barriers, as barriers are often underdeveloped drivers (Filho et al. 2019). In other words, certain drivers and barriers refer to same concepts but represent other ends of maturity spectrum, i.e. commitment and lack of top management commitment. This nature of gradual development suits well to the concept of maturity model, as the models often describe logical and gradual development from unskilled to best practices (Pullen 2007). Drivers and barriers indicate possible maturity model dimension, development through maturity levels, and dimension categorization.

2.5.1 Drivers of sustainable procurement

Drivers and barriers of sustainable procurement, and more generally sustainability improvement within supply chain management, can be categorized through multiple criteria. Three types of categorization are shown below in table 2.

Table 2 Categorization of sustainable procurement drivers

Author	Categorization	Examples of drivers
Walker et al. 2018	Internal drivers	Management commitment
		Competitive advantage
		Organizational ethics
	External drivers	Customer expectations
		Customer scrutiny
Tay et al. 2015	Strategic drivers	Alignment between strategies
	Functional drivers	Sustainability competence within procurement
Paulraj et a. 2017	Instrumental drivers	Improving organization's reputation
		Improving competitiveness
		Enhancing shareholder value
	Relational drivers	Increasing organization's legitimacy
	Moral drivers	Right way of doing business

A simple way of categorizing is to divide them to external and internal drivers and barriers (Walker et al. 2018). External drivers refer to pressure and motives building outside of the organization, such as customer expectations and scrutiny, and legislation, while internal drivers address organization's internal reasons, i.e. leadership committed to sustainability, competitive advantage, and organizational ethics.

Tay et al. (2015) divide drivers and barriers to strategic and functional. Strategic refers to factors such as degree of alignment between sustainable procurement strategy and organization's strategy, while functional drivers and barriers might relate, i.e. level of sustainability competence within procurement.

Another way of categorizing drivers comes from Paulraj et al. (2017) who divide them to instrumental, relational, and moral motives, which were constructed through combining supply chain and business ethics literature. Instrumental motives refer to self-interest driven reasons and indicates that organizations opt for sustainable practices because of monetary benefits. Instrumental motives include factors such as increasing firm's reputation, improving competitiveness, and enhancing shareholder value. Relational motives indicate that organizations are driven to sustainable practices due them aligning and addressing interest of organization's stakeholders. Several stakeholders have little interest on organization's economic performance and thus relational motives are thought to be an important influencer. In other words, organizations are motivated to sustainability because of how they are perceived by stakeholders. A major relational motive is to increase firm's legitimacy which means how organization's actions are perceived by outside entities. The final category according to Paulraj et al. (2017) is moral motives which indicates that organizations are driven to sustainable practices simply because they consider it the right way to conduct business. (Paulraj et al. 2017). Results of the study conducted by

(Paulraj et al. 2017) implicated that relational and moral motives are key drivers of sustainable actions and that organizations with high moral motivation are more likely to achieve higher levels of performance than those operation on amoral motives.

A major, and arguably most influential driver, for sustainable performance improvement is external pressure from customers and other stakeholders and resulting need of organizations to align their operations with interests of these outside groups. This is supported by Paulraj et al. (2017) who found relational motivation as key driver, and Becke (2012) who stated that organizations are primarily moving towards more sustainable practices due to external pressure. Also, multiple studies (Akhavan & Beckmann 2017; Hartmann & Moeller 2014; Sancha et al. 2019) have stated that stakeholders place more emphasis on organization's supplier performance and hold buying organizations increasingly responsible. All these notions coincide with the growing influence of relational motives.

ISO (2017) brings forward a number of drivers in addition to stakeholder pressure and expectations:

- Competitive advantage
- Innovation
- Legislation and regulation
- Public policies
- Risk management
- Security of supply chains
- Investor confidence
- Workers
- Supplier commitment
- Cost optimization
- Economic value creation
- Personal leadership
- Organizational ethics

From the listed drivers it is easy to understand that organizations are driven towards sustainable procurement by multiple factors and reasons may differ between organizations and industries. In a questionnaire conducted by Meehan and Bryde (2011) reputation was the most important driver of sustainability. In addition to reputation, ethical motivation, leading best practices, anticipated legislation, current legislation, and CEO (Chief executive officer) vision were important drivers of sustainability. Quite surprisingly cost

savings, customer pressure, and third-party pressure were the weakest drivers. This contradicts more recent studies, which emphasize the importance on customer and third-party pressure (Beske 2012, Miemczyk et al. 2012). Regarding Meehan's and Bryde's (2011) study it might be an overstatement to discuss strongest and weakest drivers, as the results were quite close to each other. Strongest three drivers received scores of 3.98; 3.98 and 3.84 while the weakest three received scores of 3.11; 2.81 and 2.67. The questionnaire was conducted with a scale from one to five. According to measurement scale set by Meehan and Bryde (2011) the strongest drivers were "neutral", which was also the rank of one of the weakest drivers. The other two were "weal", but it has to be noted that they were on the higher end of the scale.

As seen, there are multiple reasons for organizations to opt for sustainable procurement. These drivers range from external drivers of legal environment or stakeholder pressure to internal moral motivation of organizational ethics. According to ISO (2017) drivers for practicing sustainable procurement varies between types of organizations and environments in which they operate. For an individual organization, understanding its own drivers is important as it helps to form aligned sustainability targets and objectives for supply chain and improve internal communication (ISO, 2017). According to ISO (2017) after organization has mapped its ambition towards specific sustainability drivers, it can use that knowledge to better develop relevant objectives and goals.

2.5.2 Barriers of sustainable procurement

Filho et al. (2019) bring forward six barriers that are often restricting organizations from adopting sustainable procurement practices.

- Perceived costs and budget restrictions
- Attitude of managers
- Lack of knowledge and experience
- Scarcity of sustainable product and service suppliers
- Procurement evaluation criteria
- Diverse stakeholders

Perceived costs and budget restrictions refer to the issue that often goods and services contributing to sustainability improvement are perceived as expensive or requiring high capital investments (Blair & Wrigh 2012). This partly results from sustainable production

methods being perceived as more expensive than their traditional counterparts. As a typical objective for procurement is to acquire goods and services at lower costs (even in cases where this objective isn't aligning with organization's own strategy), the cost effectiveness of sustainability is a significant barrier for implementation (Filho et al. 2019).

Another key barrier is negative attitude of managers. According to Filho et al. (2019) management might be reluctant and dismissive towards sustainability implementation in procurement and may often prioritize other projects and goals over those regarding sustainability. Third barrier is lack of knowledge and experience. It has been noted that procurement function can often be unfamiliar with various basic principles of sustainable procurement, such as broader cost modeling, and sustainable supplier management (Filho et al. 2019). According to Cheng et al. (2018) there is also a lack of knowledge on how to implement socially and environmentally sustainable practices into procurement. This includes procedures such as integrating sustainability into category strategies and involving and selecting sustainability criteria to tendering process.

Scarcity of suppliers providing truly sustainable products and services is also a barrier for SP. Situation can be such that availability of sustainable suppliers does not fulfill the demand. When local supply is not sufficient organizations have to turn to suppliers locating all over the globe, which in turn increases the need for transportation services and can diminish gained sustainability benefits. Barrier of procurement evaluation criteria refers to the problem that there is no simple division regarding sustainable and unsustainable products or services, and procurement might not be fully aware of this. There are constant tradeoffs between sustainable and unsustainable practices, such as product itself is produced in sustainable manner but it needs to be transported from far away. These kind of overlapping and contradicting criteria and principles can make it hard for procurement to decide on how to proceed and what is the correct way of conducting operations. Uncertainty in turn can result in inactivity regarding sustainable practices. (Filho et al. 2019). Last barrier brought forward by Filho et al. (2019) is diverse stakeholders. This barrier refers to noted issue that expectations and interests of different stakeholders quite often vary significantly. This can make it hard for procurement to understand what should be prioritized and what the correct way forward is. (Glock & Broens, 2011).

A large share of barriers can be described as undeveloped drivers (Filho et al. 2019). These drivers and barriers are important from the perspective of sustainable procurement maturity, as they describe function's ability to develop and manage sustainable procurement practices. Nature of drivers and barriers being in other ends of the same spectrum

also suits well the concept of maturity models, as they essentially describe the same entity, but from the different extremes of maturity. An important notion can be made regarding SP drivers and barriers, and sustainable practices in procurement process. Certain drivers and barriers function as enablers or disablers of sustainable procurement process and they clearly locate outside of the linear, cyclical and hybrid procurement process models. In contrast, some sustainable practices (see chapter 2.2) can clearly be placed to the procurement process model, and thus locate in the domain of the process itself. This difference will be noted in the creation of maturity model dimensions.

3 MATURITY MODEL

Maturity model can be described as a conceptual framework consisting of factors that describe the development of a certain area through time (Pigosso et al. 2013). Pullen (2007) defines the model as a collection of factors that describe the characteristics of an assessed area during various stages of development. As seen from these definitions, maturity models are built of relating factors and describe development through multiple stages. Schiele's (2007) view supports this understanding by describing maturity model as definitions of multiple stages that an organization must go through in order to achieve higher sophistication.

According to Andreasen and Gammerlgaard (2018) maturity models are considered to have an ability to explain and guide change and development in organizations, also in the function of purchasing and supply management (PSM). The popularity of maturity models becomes more apparent when considering the fact that continuous improvement of processes, capabilities, policies, and structures is a common objective for organizations and supply chains in which they operate (Reefke & Sundaram 2018). Through continuous development organizations aim to gain competitive advantages and maturity models can help them in reaching that goal.

According to Proenca and Borbinha (2016) maturity models provide organizations mainly three types of enablers; measures for benchmarking and auditing, understanding regarding opportunities, strengths and weaknesses, and an ability to assess progress against common practices. Maturity models are also seen to possess multiple beneficial attributes, as they provide a structured approach to the prioritization of activities and goals (Lockamy & McCormack 2004; Reefke & Sundaram 2018), point out actions for improvement (Schiele 2007), provide a common language, vision and are easily communicated (Schiele 2007; Reefke & Sundaram 2018). Due to these factors Schiele (2007) states that the models have a high managerial relevance and benefit the assessed firms. Maturity models are also an effective way for organizations to build a comprehensive view of their processes and thus, helping them to improve performance management and benchmarking processes (Reefke & Sundaram 2018).

According to Lockamy and McCormack (2004) higher levels of maturity are associated with effective goal attainment, ability to conduct continuous improvement, higher control, higher cost efficiency, and improved forecasting. Regarding procurement Schiele (2007) states that mature organizations are seen to apply world-class best practices, while

organizations with lower maturity are unable to do so. Studies imply that the level of maturity should be increased step by step and any levels should not be skipped (Schiele 2007, Lockamy & McCormack 2004). According to Lockamy and McCormack (2004) this is because previous levels provide the necessary foundation for successful implementation of the next one. This view is shared by procurement related maturity models, as they associate skipping of levels with major difficulties and highlight the importance of evolutionary development (Schiele 2007).

Even though maturity models possess multiple benefits, they are not without flaws. Maier (2012) highlights that it is important to bring forward possible deficiencies and disadvantages of maturity models. Maturity models have i.e. been criticized for lack of empirical validity and being too simplistic for being useful (Lasrado et al. 2015). Lasrado et al. (2015) state that there are three major criticisms that maturity models face; Lack of theoretical foundation for adoption of certain structure and not basing the structure, i.e. levels and dimensions, to literature, lack of strong empirical validation of selected variables such as dimensions and levels and lack of operationalizing maturity measurement. This study aims to deter from these risks by establishing a strong base from scientific literature, defining a clear method for maturity model creation and conducting empirical validation throughout the process. In the next section we will describe maturity model creation process based on scientific literature.

3.1 Construction of a maturity model

As maturity models have gained popularity and been implemented to a growing number of disciplines and functions, they have been modified to better suit the individual characteristics of those subjects. Although the model needs to be adjusted, there are common variables regarding its structure; number of levels, definition of levels, names of dimensions, number of dimensions, and definitions for cells (Proenca & Borbinha 2016; Schiele 2007; Maier et al. 2012). As a result, MMs typically form a matrix that has the dimensions and levels of maturity on their own axis and in the junction of those axis the cell texts. This typology is called a maturity grid (later referred as maturity model) and it is the most common form for maturity model representation (Correia et al. 2017).

According to Maier et al. (2012) maturity grids and other model typologies, such as likert – like questionnaire, have a lot of similarities and can be hard to distinguish but possess some key differences which can be categorized to work orientation, mode of assessment, and intent. Maturity grids tend to be usable by a larger scope of organizations

and industries, while other typologies may focus to a more specific process and form narrow best practices according to which the maturity of an organization is determined. Grids on the other hand typically identify characteristics that any organization should have in order to operate with high performance regarding the studied subject. Secondly, some typologies use yes/no -based questionnaires to assess the performance of an organization, while a key feature of maturity grids is a descriptive text for each level of maturity and dimension. (Maier et al. 2012).

According to Maier et al. (2012) development of a maturity models consist of four phases which are planning, development, evaluation, and maintenance. These four phases and their structure is depicted in fig. 5.

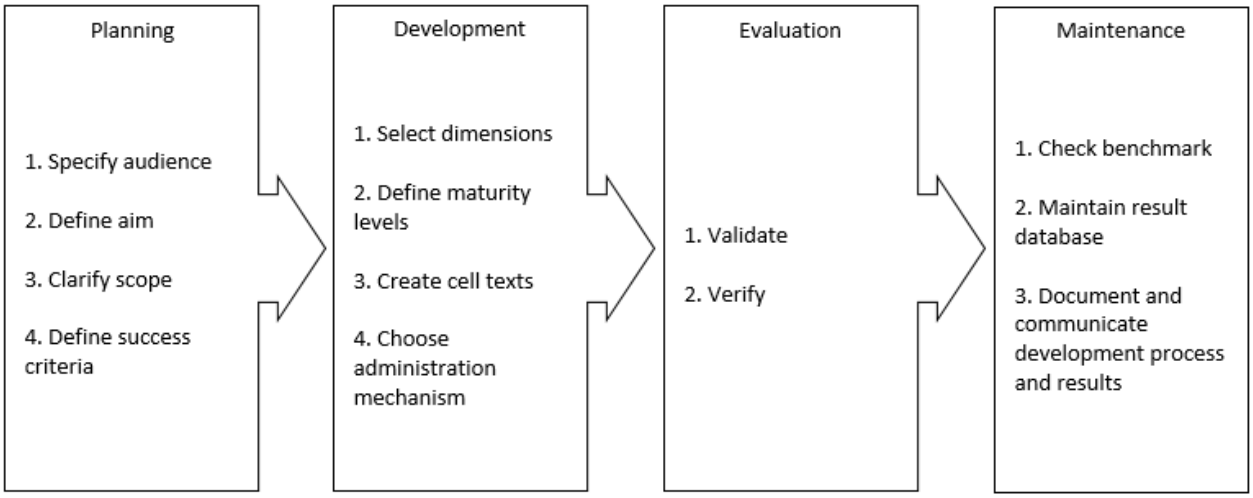


Figure 5 Maturity model creation process (Maier et al. 2012)

Although different typologies may differ by intent and outlook as stated by Maier et al. (2012), there is still considerable similarities between creation processes coined by different researchers. According to Becker et al. (2009) creation process of a maturity model consists of following main steps.

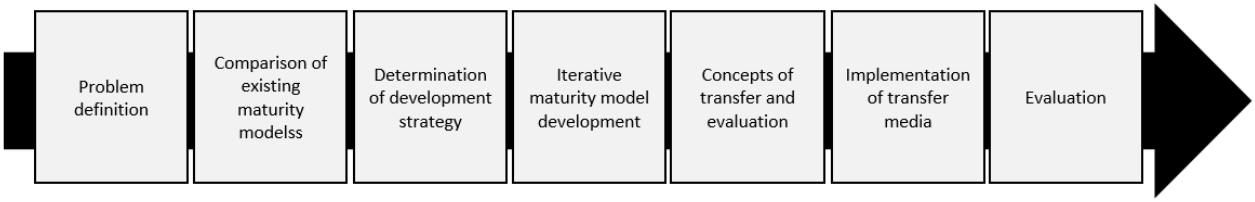


Figure 6 Maturity model creation process (modified from Becker et al. 2009)

From figures 5 and 6 we can see multiple similarities between the two creation processes. Both very clearly include steps which occur prior to the creation process, during the creation process, and after the creation process. In Becker et al. (2009) the process is described in linear fashion and evaluation mentioned twice or rather trice as "iterative maturity model development" can also be seen to be based on evaluating the results. Meanwhile Maier et al. (2012) brings forward evaluation of a separate higher-level phase that includes two steps: validation and verification. Although evaluation is mentioned after the development phase Maier et al. (2012) highlight the importance of ongoing evaluation and iterative nature of the creation process.

3.1.1 Planning phase

According to Röglinger et al. (2012) documentation regarding the maturity model must include basic information about the application domain. Röglinger et al. (2012) categorize basic information as a part of basic design principles while Maier et al. (2012) include them into the planning phase. Maier et al. (2012) states that in planning phase, the researcher should decide the intended audience, the purpose of the model, the scope, and the success criteria. According to Röglinger et al. (2012) basic information consists of similar factors and includes things such as purpose, target group, and audience. The planning phase is needed in order to build transparency, clarity, and accuracy of interpretation (Maier et al. 2012). The first step, specify audience, refers to bringing forward the users of the model and the subject of the assessment, also referred as improvement entity. All stakeholders should be unveiled regardless of the point in timeline in which they are involved. The researcher should also define the scope of the maturity model and inform if it is intended to be generic or i.e. industry specific. A generic maturity model should be applicable by all industries and organization which are in contact with studied function. Lastly the researcher should define criteria for success. This will able a more objective and transparent decision whether the model has been successful or not. The criteria can follow i.e. principles of usefulness and usability. (Maier et al. 2012).

3.1.2 Development phase

Development phase refers to the actual creation of the maturity model and it includes selecting dimensions, defining maturity levels, formulating text cells, and defining administration mechanism (Maier et al. 2012; Schiele 2007). According to Maier et al.

(2012) defining the dimensions, which are used to measure the level of maturity, is one of the most, or even the most difficult aspect of creating a maturity model. Dimensions are the relevant factors of the analyzed area, such as organizational culture, control, resources, and co-operation. The number of dimensions varies between studies and can be anything from single digits to multiple dozens. (Schiele 2007). Due to the difficult nature, a researcher should have a clearly defined and transparent approach to the creation process. A widely used approach and justification is expertism meaning that the selected dimensions are based on experience in the studied field. However, in the absence of significant prior experience or in a relatively new area of study this approach is inadequate, and a literature review approach should be selected. The selected dimensions can be validated further and modified by interviewing experts and combining different approaches. (Maier et al. 2012). According to Schiele (2007) a maturity model should address all the relevant dimensions that describe the studied entity. He adds that in order to build a comprehensive model one should use a theoretical background to construct the dimension (Schiele 2007). This means using i.e. existing literature to define the relevant factors compared to a situation where dimensions are created through a subjective thought process.

The next step in creating a maturity model is to define the levels of maturity. Levels of maturity describe different stages through which an organization moves as its processes and capabilities are improved. Reefke and Sundaram (2018) state that maturity levels can be used to described business characteristics related to regulative, behavioral and performance standards of studied subject. Position at lower levels indicates a lower maturity (skill), while the highest level is in accordance with dimension best practices. (Schiele 2007). The number of levels and their definitions varies between studies according to, i.e. studied area, process, and function. That said, most MMs contain between four and six levels of maturity (Schiele 2007; Proenca & Borbinha 2016). According to Maier et al. (2012) the levels of maturity need to be distinct, well defined, and need to show a logical progression from one level to the next. Similar to previous step the levels can be coined through multiple approaches, such as existing literature and they can be represented through descriptive phrases or by numeric values (Schiele 2007; Villena & Gioia 2018). The third step is formulating cell texts and it occurs in junctions of defined dimensions and levels. According to Maier et al. (2012) this is one of the most important steps in the model creation process. The researchers add that the texts should be precise, clear, and concise. They also state that researcher should decide and establish how to organize the text creation process, i.e. the text can be created by using different information sources

namely recipients of assessment or existing practices and literature. It should also be brought forward in which order the texts for different maturity levels were created. A common way is to determine first the extremes and only after that create texts for the middle maturity levels. (Maier et al. 2012). Outlook of a maturity model after these three steps is shown in table 3.

Table 3 Preview of maturity model to become

		Levels of maturity					
Dimensions		1	2	3	4	5	Maturity Score
D1	D1.1	Description for D1.1/L1	Description for D1.1/L2	Description for D1.1/L3	Description for D1.1/L4	Description for D1.1/L5	
	D1.2						
	D1.3						
D2	D2.1						
	D2.2						
D3	D3.1						
	D3.2						

Table 3. contains five levels of maturity which are described through numbers and dimensions concerning the studied subject. In this example the dimensions are divided to three main dimensions (D1, D2, and D3) and to sub-categories beneath them i.e. D1.1. This categorization follows a common way of presenting dimensions and will be applied to the study at hand. In procurement maturity model of Schiele (2007) there were 5 main dimensions which included a total number of 111 issues. Issues refer to sub-categories (D1.1, D1.2) and in the end they will be assessed and scored. Cell texts are located at the junctions of issues and levels. Below the column “maturity score” will marked the achieved maturity of each issue.

According to Maier et al. (2012) defining administration mechanism is the last step in development phase. It refers to selection of distribution and assessment method. This means defining the way in which the finished model will be delivered to assessment entities and how the assessment will be conducted. According to Maier et al. (2012) the method of assessment depends on purpose of the model. If the focus is on process itself, a usual distribution method is by paper and assessment can occur in the form of interviews

or workshops. These process-focused models tend to aim towards improving performance and raising awareness of assessed entities. Focus can also be directed towards the end results and benchmarking. In these cases, the preferred method is typically electronical distribution in the form of questionnaires. (Maier et al. 2012).

3.1.3 Evaluation phase

Evaluation is an ongoing phase and do not clearly distinct itself from the creation process as maturity models are likely to be modified and refined over time when limitations occur. As a result, there is no clear line moving from the development phase to the evaluation phase. A key point regarding evaluation is that it should be conducted during the creation process and notions from stakeholders and participants should be accounted and perceived. As the feedback is asked and received the maturity model should be iteratively modified on ongoing basis. The iterative nature of creation is one of the most important aspects of maturity model success (Moultrie et al 2016; Maier et al. 2012). According to Maier et al. (2012) there is no clear definition on how long the evaluation process should continue but it may be concluded after a saturation point or after a certain level of satisfaction is achieved. Saturation point refers to situation in which i.e. no more significant changes are being suggested by the stakeholders. Maier et al. (2012) states that in ideal situation the first assessment sessions are treated as final stages of the evaluation phase.

Understandably evaluation is a crucial phase from multiple perspectives. It validates the selected attributes, levels and dimensions, offers feedback whether the model fulfills its requirements, and brings forward issues which need to be refined. After the maturity model is complete (levels, dimensions, and texts) it must be tested in order to confirm its relevance and validity. (Röglinger et al. 2012; Maier et al. 2012).

The last phase of maintenance is not covered in this literature review as it is not relevant for the study at hand. This study's aim is to create an initial version of sustainable procurement maturity model and this scope does not include further maintenance.

3.2 Existing sustainable supply chain and procurement maturity models

Maturity model has risen in popularity and spread to various fields of research. This can be seen from scientific community's adoption of the concept to multiple disciplines, i.e.

data analytics (Carvalho et al. 2019), lifecycle management (Myrodia et al. 2019), logistics (Werner-Lewandowska & Kosacka-Olejnik 2018) and purchasing (Schiele 2007; Andreasen & Gammelgaard 2018). Although the models have been widely adopted and their usage has been growing (Wendler 2012), there is not a scientific maturity model for sustainable procurement. As Reefke and Sundaram (2018) state maturity concepts addressing supply chain sustainability have remained largely unexplored, and only few empirically validated models exist. This study aims to fill this gap in scientific literature and provide practitioners an empirically created model for addressing their sustainability practices in the field of procurement. For scientific literature this study provides an initial steppingstone for further developing maturity model concepts in the area of sustainable procurement.

An imperative step in creating a new maturity model is to get acquainted with existing models. According to Wendler (2012) it is crucial to evaluate previous research and analyze existing models before the development of a new maturity model. As the aim of this study is to create a maturity model for sustainable procurement, I will be reviewing relating maturity models concerning sustainable supply chains and procurement. Despite procurement being a part of supply chain management, there is still a need to have more in-depth understanding of procurement specific models.

3.2.1 Sustainable supply chain management maturity models

According to Reefke et al. (2014) there have been a scarce amount of maturity models regarding sustainable supply chain management (SSCM). They further elaborate that due to distinct nature of the discipline, there is a need for additional models. Sustainable supply chain models are needed to address specific difficulties organizations face regarding their supply chains, i.e. stakeholder demands, industry standards, and changes in regulation (Prokesch 2010, R14). Baumgartner and Ebner (2010) state that sustainability maturity models can provide a framework that helps organizations develop and establish sustainability practices aligning with organization's strategy. According to Benmoussa et al. (2015) sustainable supply chain maturity models are most appropriately used when they increase understanding on sustainability improvement in supply chains.

Reefke and Sundaram (2018) point out that a maturity model needs to be modified and build for the purpose at hand. They summarize that a model addressing sustainable supply chain management should:

- Establish a clear and shared vision
- Provide a common language by setting goals, objectives, and guidelines
- Help users to communicate and evaluate their decisions
- Outline the purpose of the transformation
- Outline a progression strategy between the current state and the long-term strategy

The requirements outlined by Reefke and Sundaram (2018) are relatively general and have been used by other disciplines. This does not mean that they are not valid for sustainability related maturity models. Due to the fragmented nature of sustainability it is understandably imperative to create a clear vision and basis for common language for those utilizing the model. In addition to characteristics listed by Reefke and Sundaram (2018), Correia et al. (2017) state that sustainability related supply chain maturity models tend to heavily emphasize the validation process, as improper validation mitigates relevancy and usefulness of the created model. It has also been noted that sustainability related maturity models used to emphasize environmental dimensions, but recently they have adopted TBL approach (Correia et al. 2017). According to Reefke and Sundaram (2018) supply chain management related maturity models tend to integrate levels which develop from weak state of collaborative actions to supply chain environment which utilizes it extensively. Reefke and Sundaram (2018) state that highest levels of maturity can only be achieved through intensive collaboration.

In table 4. below are six sustainable supply chain related maturity models, their scope, number of levels and dimensions.

Table 4 Sustainable supply chain management maturity models

	Edgeman & Eskildsen (2014)	Hynds et al. (2014)	Okongwu et al. (2013)	Reefke & Sundaram (2018)	Kurnia et al. (2014)	Allais et al. (2017)
Scope	TBL	Environment	TBL	TBL	TBL	TBL
No. Levels	5	4	4	6	4	5
Dimensions	Strategy and governance, Process implementation and execution, Financial results, Sustainability results, Innovation results, and Human capital results	Strategy and Design tools	Use of standards, Performance management, Life cycle management, Pollution management, Relationship management, Employee management, Profitability management, and Economic value distribution management	-	Sustainability data collection, Sustainability reporting, Sustainability benchmarking, Sustainability training, Sustainability risk analysis, and Sustainability governance	Consideration of environmental governance, Consideration of social governance, Consideration of stakeholder governance, Consideration of territory governance

There are clear similarities between the studies presented in table 4. Sustainable supply chain management maturity model literature mostly utilizes qualitative methods, such as interviews and case studies (Correia et al. 2017). This notion aligns with previous findings, as Wendler (2012) stated that maturity models focus on qualitative methods. Correia et al. (2017) state that maturity models from sustainable supply chain management perspective utilize mostly maturity grid approach. Out of the models presented in table 4, five are using the maturity grid approach. Reefke and Sundaram (2018) do not create a maturity grid but develop instead a model for maturity level improvement. As it can be seen, the models integrate four to six levels of maturity, but have large variation regarding number of dimensions.

Broad nature of supply chain management is also apparent from the models as they address sustainability from various perspectives. Edgeman and Eskildsen (2014) have rather general model that builds around triple bottom line and integrates six dimensions. The selected dimensions address different aspects of sustainable enterprise excellence and range from human capital to strategy. For each dimension, there is five levels of maturity. Edgeman and Eskildsen (2014) describe each dimension and their overall maturity through four key areas, i.e. innovation results are looked through innovation for sustainability, other innovation, business model innovation, and sustainable innovation. All key areas have their respective descriptions for each maturity level.

While Edgeman and Eskildsen (2014) had more general model, Hynds et al. (2014) focused their model more precisely on sustainable new product development. The model consisted of two main areas, strategy and design tools, which were further divided into 14 sub-dimensions, such as corporate sustainability policy, integration of sustainability, supply chain, life cycle assessment process, and material and part selection. Both Edgeman and Eskildsen (2014) and Hynds et al. (2014) present lowest levels of maturity as non to little emphasis on sustainability and highest levels as a leading position where sustainability is fully integrated.

Okongwu et al. (2013) address sustainability within supply chain management from the perspective of continuous improvement. They created four levels of maturity for eight dimensions addressing multiple important factors under the sustainability umbrella. In addition to the four levels, initial, intermediate, advanced and world-class, they also had a fifth level as primeval. Primeval was not a level as such as it was given if there were no information regarding the dimension at hand. The created model relied on TBL approach,

but also included governance as a separate entity. Governance included two dimensions that were use of standards and performance management (Okongwu et al. 2013).

Kurnia et al. (2014) also coined four levels of maturity similar to Okongwu et al. (2013); non-existent, low, moderate high. From the sustainable supply chain maturity models, it is clear that a large part of maturity level progression starts from a state of very low maturity. Maturity model created by Kurnia et al. (2014) has also a more general scope as it addresses sustainable supply chain management capabilities. The levels build around TBL and all together six dimensions are used. Important themes in their model are, i.e data collection and utilization, training, reporting and governance. All of these are heavily present in sustainable procurement literature as well.

Governance is present in multiple sustainable supply chain maturity models. Allais et al. (2017) created their maturity model specific to governance and addressed it through four dimensions. The model was also heavily influenced by the concept of TBL as two of the dimensions evolved around environmental and social governance. Allais et al. (2017) also coined a dimension of stakeholder governance, a factor which is immensely important for sustainability of procurement.

As we can see, there is a lot of different and valid configurations for sustainability related maturity models in domain of supply chain management. Still there are multitude of common factors which should clearly be noted in creation of sustainable procurement maturity model. Most importantly the models use mostly qualitative methods, they build heavily around TBL approach, they are commonly configured as maturity grids, and number of their levels range from four to six.

3.2.2 Procurement maturity models

Úbeda et al. (2015) define procurement maturity as a measurement of sophistication, professionalism and advancement within procurement department. The researchers further elaborate that maturity regarding procurement indicates how various factors, such as suppliers, communication, people and strategies, are managed within procurement in order maximize suppliers' potential. While a large portion of sustainable supply chain maturity models increase maturity from non-existent to world-class (Kurnia et al. 2014; Okongwu et al. 2013), procurement maturity increases through role and state of procurement department.

Úbeda et al. (2015) state that more mature procurement departments have moved beyond administrative role and are conducting strategic work and supporting various

business functions. Mature procurement departments are also seen able to bring additional value to the organization. Schiele (2007) brings forward that organizations with high maturity are not dependent on knowhow of individual employees, as there are standardized practices and the department is structured to perform regardless of changing individuals. Levels of maturity are also commonly tied to worldwide best practices. It has also been implied that high maturity procurement departments have integrated world-class best practices, while departments possessing lower maturity are unable to do so (Úbeda et al. 2015).

Below table 5. presents several procurement maturity models, number of maturity levels and their scope regards six common dimensions brought forward by Schiele (2007). Procurement related maturity models have a larger number of commonalities than sustainable supply chain management models, as their dimensions can be categorized according to common groups.

Table 5 Existing procurement maturity models (Modified Schiele, 2007)

	Freeman & Cavinato (1990)	Keough & Camish (1991)	Burt & Doyle (1994)	Chadwick & Rajagopal (1995)	Cousins et al. (2006)	Schiele (2007)	Úbeda et al. (2015)
Number of levels	4	4	4	4	4	4	5
	Presence of common dimensions						
Planning	x	x	x	x		x	x
Structure of procurement		x	x	x		x	x
Procurement processes		x		x		x	x
Human resources	x	x	x	x	x	x	x
Controlling	x		x	x	x	x	x
Collaborative supply relation			x	x	x		x

Schiele (2007) categorized topics addressed in procurement maturity models to six distinct dimensions which are planning, structure of procurement, procurement processes, human resources, controlling, and collaborative supply relation. These common dimensions give indication regarding the subjects that are commonly covered in procurement maturity models. The studies in question did not use these precise dimensions but can be categorized under them. According to Schiele (2007) planning is among the first operational steps in procurement process and almost all procurement MMs include some actions belonging to it. Planning can include activities such as market analysis, specification of materials, and pooling. According to Villena and Gioia (2018) sustainability leaders conduct market analysis and sustainability risk assessment and map their supply network. These actions can be seen to fall under the planning dimension used by Schiele (2007).

Structure of procurement refers to factors such as organization of procurement, mandates and responsibilities of procurement, hierarchical status of procurement, and integration of procurement. Clear structure is needed if there is a desire for procurement to fulfill its tasks, and thus it is a key dimension for maturity of the function. (Schiele 2007). Structure of procurement can be seen to closely link with maturity characteristics brought

forward by Úbeda et al. (2015), as they mentioned that lower maturity departments tend to be administrative by nature while high maturity departments have strategic role within their respective organizations.

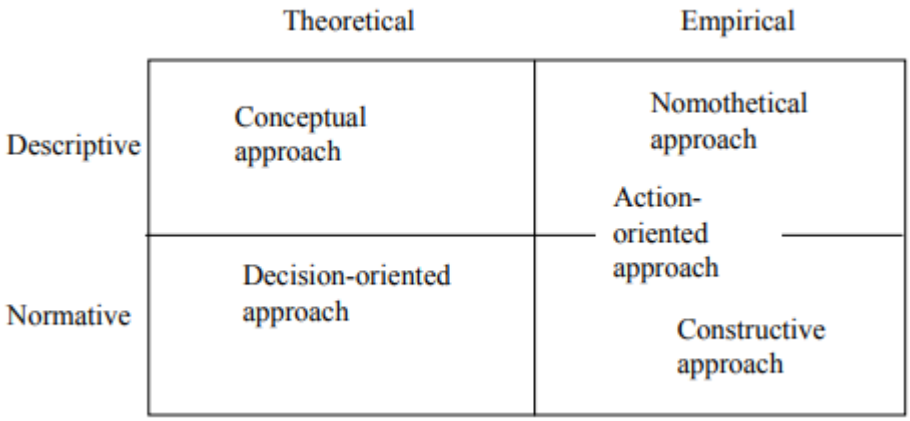
Studies have stated that procurement process should start by coining a sourcing strategy as studies have long shown a positive performance impact of effective sourcing strategies and long-term plans (Cousins et al. 2005; Schiele 2007). As a result, a large magnitude of procurement MMs include supplier management actions such as supplier development, supplier selection, and supplier training. These processes are also vital for the sustainability of procurement as mentioned by Villena and Gioia (2018). The fourth common dimension of procurement maturity models is human resources and it is considered to be a key enabler of strategic procurement. Although people have been widely considered in procurement maturity models Schiele (2007) points out that the focus has largely been on outcomes and not in deeper enablers such as performance incentives and career development. This is also noted in later maturity model of Úbeda et al. (2015) where people dimensions are considered through factors such as incentives, HR plan, and college degrees. The fifth common topic within procurement maturity models is controlling. Controlling refers to measuring performance and controlling it, which is not a simple task for procurement, as pointed out by Schiele (2007). Controlling maturity has been measured in maturity models through factors such as available tools and systems, processes, spend maps, and risk management.

4 METHODOLOGY

4.1 Positioning of the study

Metholodical approach and positioning of this study is presented through research categorization framework developed by Neilimo and Näsi (1980) and further refined by Kasanen et al. (1993). The framework was built for business related research and consists of two dimensions; descriptive-normative and theoretical-empirical. Business research methodologies framework presented below (Neilimo & Näsi 1980; Kasanen et al. 1993).

Table 6 Framework of business research methodologies (Neilimo & Näsi 1980; Kasanen et al. 1993)



The four concepts theoretical, empirical, descriptive and normative give broad implications of nature of the study. First two implicate what kind of data or knowledge the research mainly utilized, and latter two categorizes studies based on their goals. Theoretical concept means that the research mainly leans towards theoretical knowledge, and thus does not rely on experimenting. Empirical indicates the opposite as it states that data is collected by experimenting either from field or laboratory. Research which is descriptive aims to describe, explain and forecast the studied phenomena and thus answer questions such as “how is” and “what is”. Unlike descriptive study, a normative study is target oriented and has a clear goal of developing something for practical use. (Neilimo & Näsi 1980).

Based on these four concepts studies can broadly be divided into five distinct approaches. These five approaches are decision-oriented, conceptual, nomothetic, action-

oriented and constructive approach. First four of these were included into the original framework (Neilimo & Näsi 1980), but the last one, constructive approach, was later added by Kasanen et al. (1993). This study is positioned as constructive approach, as the aim is to create a construct, sustainable procurement maturity model.

According to Vafidis (2007) a study conducted according to constructive approach aims to build a solution in the form of construct, which is based on both theoretical and practical knowledge. This is in line with the principles of maturity model creation, as Maier et al. (2012) state that maturity models should be based on strong theoretical foundation, but at the same time acknowledge and be modified based on empirical data and validation. Vafidis (2007) further elaborates that constructive approach usually leads to a situation in which the researcher is directly linked to the research object, i.e. an organization and has an effect to its behavior. This study is directly linked to a real-life organization and effects its behavior, which further positions this study as a constructive.

Lukka (2014) describes constructive approach as a methodology producing innovative new constructs, which are intended to solve real-life problems and as a result contribute to scientific research. In heart of this approach is the construct which itself is an abstractive term referring to a wide range of outcomes such as diagrams and models. Typical for these constructs is that they emerge through innovation and development rather than discovery. Core elements in constructive approach are: (Lukka 2014).

- Focus on real life problems which need to be solved
- Production of innovative construct which is meant to solve a problem
- Close cooperation between researcher and practitioners, which is expected to produce experience-based learning
- Closely linked to existing scientific literature
- Emphasis on reflecting empirical finding back to scientific knowledge

Compared to traditional research methods impacting real-life practices is at the core of constructive approach. As a result, constructive approach is by nature development by trial and error and should be viewed as an attempt to build something new. The approach can be seen to build upon pragmatic philosophy indicating that research should be estimated regarding impact and usability in practice. Thus, an ideal end result on a research following constructive approach is to develop new construct that produces value for both theoretical and practical solutions. (Lukka, 2014). Process of constructive research can be described as follows (Lukka 2014):

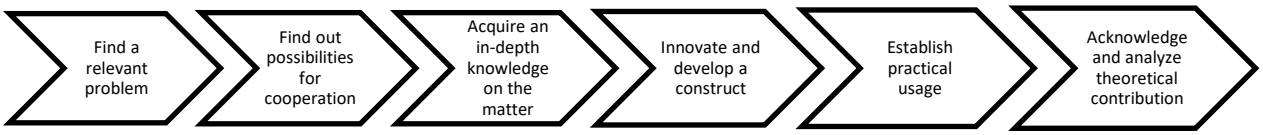


Figure 7 Constructive research process (Lukka 2014)

Pragmatic nature aligns well with maturity model as pragmatisms states that truth of theories is dependent on usability in practice and there can be multiple solutions to same problem, hence multiple truths. One mostly used and critical aspect for success of a maturity model is its effectiveness to provide value to parties utilizing it (Maier et al. 2012). Simultaneously it is easy to see that several maturity models may provide useful solutions to similar issue regardless of them being different from each other.

4.2 Used methods

This chapter describes the different methods utilized in this study; literature review, open coding, maturity model creation, questionnaire, and expert validation. These methods have been chosen as they are well suited for constructive research process and improve quality of the maturity model. Main steps in the creation process of sustainable procurement maturity model from the perspective of utilized methods are illustrated fig. 8 below.

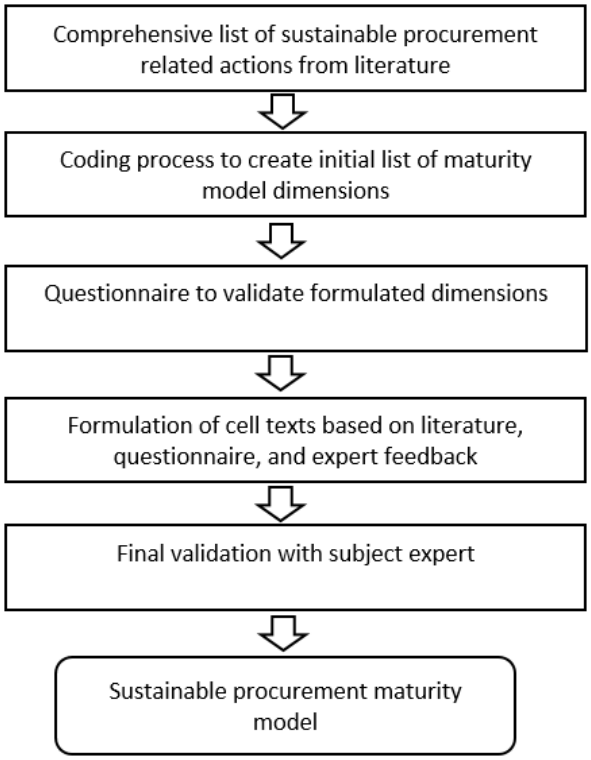


Figure 8 Maturity model creation and methods

4.2.1 Literature review

According to Maier et al. (2012) in absence of considerable expertisms regarding the selected research topic, maturity models should always be based on existing literature, as a literature review is considered to be the only valid way of obtaining required in-depth knowledge on the topic. Acquiring in-depth knowledge is also highlighted by Lukka (2014) as a part of constructive research process. In addition to literature review, Lukka (2014) mentions other methods for acquiring in-depth knowledge such as interviews.

Wendler et al. (2012) emphasize literature review as an imperative step in creation of new maturity model due to the need of evaluating and analyzing previous models. Literature review conducted in this study focuses on two distinct topics which are sustainable procurement and maturity models. The literature review in-part provides the required in-depth knowledge regarding the subject and forms a solid foundation for the construction of an initial maturity model.

Literature review will follow the principles of triangulation and relate critically to the reliability of used references. In context of literature review triangulation refers to a practice of using multiple sources of data to enhance the credibility of that data, and thus increase the credibility of research. Using multiple methods for analyzing certain data is

also considered as triangulation. (Salkind, 2010). This study follows the principles of triangulation also in this manner as the maturity model is evaluated and validated through several methods. To practically demonstrate the criticality towards used journals and sources of information, all journals used in this study are checked through Finnish Publication Forum's classifying system. This system is meant for assessing quality of academic research, and it has been created by Finnish scientific community (Julkaisufoorumi, 2019). Scientific publication channels (journals) are rated from 0 to 3, where 1 indicates basic, 2 leading and 3 highest level of research. Rating of 0 is given to channels which do not meet requirements for level 1. (Julkaisufoorumi, 2019). Number of articles used per journal, ratings of those channels and number of journals not included into any rated channel are presented in table 7.

Table 7 Information sources

Journal	No. of sources	Rating
Journal of Purchasing and Supply Management	10	2
Journal of Cleaner Production	9	2
Journal of Supply Chain Management	8	3
Supply Chain Management: An International Journal	5	2
Journal of Operations Management	4	3
Journal of Business Ethics	3	2
International Journal of Production Economics	3	2
International Journal of Productivity and Performance Management	3	1
Sustainable Develoment	2	0
Strategic Management Journal	1	3
Organization Science	1	3
Information and Software Technologies	1	3
Production and Operations Management	1	2
International Journal of Physical Distribution & Logistics Management	1	2
Journal of Manufacturing Systems	1	2
Decision Support Systems	1	2
International Business Review	1	2
Transportation Research Part D: Transport and Environment	1	1
Business and Information System Engineering	1	1
Association for Information Systems	1	1
IEEE Transactions on Engineering Management	1	1
Harvard Business Review	1	1
Global Business Review	1	1
International Journal of Procurement Management	1	1
Business Strategy and Environment	1	1
Research-Technology Management	1	1
Journal of Management Accounting Research	1	1
Proceedings of the European Conference on Information Systems (ECIS)	1	0
Journal of Business Research	1	0
Performance Improvement	1	0
International Journal of Social Science and Humanity	1	0
Australasian Conference on Information Systems	1	0
IEEE International Conference on Advanced Logistics and Transport	1	0
International Journal of Supply Chain Management	1	0
Internet sources and books	8	

All together there is 72 scientific articles used in this study. In addition to these journals there is 3 citations from books, and 5 internet sources. Out of the 72 journals 15 have been published in highest level (3), 35 in leading level (2), 13 in basic level (1) publication channels, and nine that were rated 0 or not published in a channel rated by Finnish Publication Forum. Overall 70% of journals used were published either in highest or leading level publication channels, which supports high quality and trustworthiness. Most heavily used channels were Journal of Purchasing and Supply Management (10 articles), Journal

of Cleaner Production (9 articles), Journal of Supply Chain Management (8 articles), Supply Chain Management: An International Journal (5 articles), and Journal of Operations Management (4 articles). Two of these journals received a rating of 3 and three received rating of 2. According to Finnish Publication Forum (2019) rating classes of 2 and 3 consist of restricted amount of journals considered most influential and high-class by expert committee.

Important article for this study which did not receive high rating in Finnish publication forum rating system regarding its publication channel is Maier et al. (2012) "*Assessing Organizational Capabilities: Reviewing and Guiding the Development of Maturity Grids"*. The study was published in "IEEE Transactions on Engineering Management", which received a rating of 1 in the system. Although appearing in "basic" -level publication channel, the study has received good scores regarding research interest and it has been used as citation over 110 times (Researchgate, 2019). Some of these citations are in journals published in channels that have received better ratings from Finnish publication forum, i.e. "Journal of Cleaner Production". These factors assure trustworthiness and quality of the study and the methodology of maturity model creation presented in it. It is also important to note that in order to be eligible for rating 1 the publication channel needs to be peer-reviewed (Finnish Publication Forum, 2019).

In addition to high quality of used sources, the sources were relatively recently published which implies current importance of the subject matter. 55 % of the used articles were published in 2015 or later and as much as 43 % of sources were published either in 2018, 2019, or 2020. Only 21 % of the studies were published earlier than 2010. This supports the fact that sustainable procurement is a relatively new topic for scientific literature and still in its infancy.

4.2.2 Open coding

Based on literature review we acquire a large set of sustainable procurement practices, enablers, and actions etc. which are overlapping and similar by nature. In order to end up with initial list of dimensions for the maturity model these found attributes need to be sorted, filtered and grouped. To do this, this study follows a coding methodology. Coding can be seen as a way of conducting data reduction, which is one component of data analysis process described by Miles & Huberman (1994). According to Miles & Huberman (1994) data reduction is first phase of analysis after initial data collection period. This chronological order aligns with the study at hand as coding is performed right after the

literature review. Data reduction is process of modifying larger sets of data, i.e. notes through focusing, simplifying and abstracting (Miles & Huberman, 1994), which then enables further analysis of the data. Coding can be described as a process of organizing data by themes (Rayan, 2004). According to Eriksson & Kovalainen (2008) these themes can be derived from theoretical framework or empirical evidence and they are respectively referred as priori or posteriori. This study conducts coding as open coding which is one of the emergent coding types (Eriksson & Kovalainen 2008). In open coding units of analysis can be document, pages, paragraph, lines and words, and in case of this study the units of analysis will be words and lines that describe sustainable procurement practices. According to Eriksson and Kovalainen (2008) open coding is essentially meant to uncover, name and develop categories based on initial data and the process includes closely examining and comparing the data for similarities and differences (Eriksson & Kovalainen, 2008). This nature of coding is apparent for this study, as the intent is to compare found practices, enablers and actions for similarities and differences and group them according the emerging themes.

4.2.3 Validation questionnaire

Through the coding process we attain our initial set of dimensions for the model. According to principles of maturity model creation process (Maier et al. 2012; Becker et al. 2009) and constructive research approach (Lukka, 2014) it is beneficial and important to validate results through empirical methods. Using these methods also further increases researcher's understanding of the subject. Validating and modifying dimensions through additional methods also follows the principle of iterative creation process highlighted by multiple researchers (Maier et al. 2012; Becker et al. 2009). In order to comply with these set principles, a survey was conducted to validate the initial list of dimensions. The survey questionnaire is aimed towards specific audience, procurement and sustainability experts, and intends to provide valuable information regarding validity of dimensions, and future development of the maturity model. According to Anttila (2014) questionnaire (survey) provides information regarding how certain group of respondents relate to selected matter, and that questionnaires are well suited to gain a perception of attitudes and opinions of large audience. Questionnaires are best suited to making comparison and mapping different circumstances as well as opinions (Anttila, 2014). Questionnaire was selected as a method in this study because it is an efficient way of gaining empirical validation for selected dimensions. Information needed for the validation in this stage was also simple

(yes/no), and thus acquiring such information did not require more in-depth analysis in the form of i.e. interviews. The questionnaire included two questions concerning each dimension:

- Is the dimension relevant from the perspective of sustainable procurement (Y/N)?
- Is the dimension something that Procurement can influence (Y/N)?

At the end of the questionnaire (after dimension related questions) there were two additional questions asking if there is additional dimension that should be included and what those dimensions would be. In addition to these closed questions the respondents had an opportunity to leave an open comment for each dimension. Possibility of comments was introduced with the intent of acquiring more in-depth thoughts regarding the dimensions.

4.2.4 Process of model creation

Creation process for the maturity model follows the process presented by Maier et al. (2012), see figure 6. Exception is that this study conducts first three phases suggested by Maier et al. (2012) but leaves the last step of maintenance for future consideration. The third phase, evaluation, is conducted on ongoing basis and integrated throughout the creation as suggested by Maier et al. (2012). Evaluation is also done in the form of expert validation and utilization of validated maturity model.

Although creation process follows these steps, other ones are noted and utilized within the framework described by Maier et al. (2012). Most notably the process coined by Becker et al. (2009), see figure 9, is utilized and considered in the creation of the model. Most of the steps described by Becker et al. (2009) overlap and co-exists with Maier et al. (2012) model and provide additional perspective to the process, i.e. Becker et al. (2009) separately bring forward the importance of addressing previous maturity models. The suggested approach is also backed up by other maturity model related scientific literature, as they have a similar understanding of common variables such as dimensions and levels, and necessary steps, i.e. result validation (Wendler 2012; Schiele 2007; Reefke & Sundaram 2018; Proenca & Borbinha 2015). Based on these notions it seems that Maier et al. (2012) provides a good framework for creating a maturity model according to common understanding of scientific literature. Below in fig. 9 the links between

Maier et al. (2012) and Becker et al. (2009) processes of maturity model creation are presented:

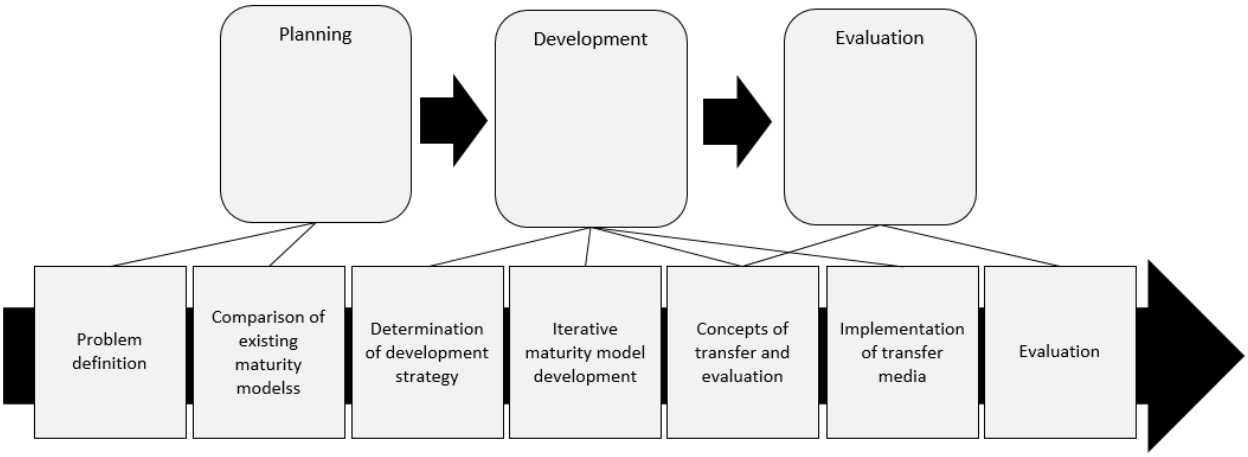


Figure 9 Similarities in maturity model creation processes (based on Maier et al. 2012; Becker et al. 2009)

Through the presented creation process and described methodologies of literature review, open coding, and questionnaire this study coins an initial version of the maturity model. Multiple studies (Maier et al. 2012; Lasrado et al. 2015; Becker et al. 2009**)** emphasize importance of empirical validation of created maturity models. Before mentioned questionnaire contributes to this empirical validation, but in addition to dimensions, the whole model needs to be validated. Maier et al. (2012) state that after a maturity model is finished its validity and relevance needs to be confirmed.

4.2.5 Expert validation

In order to empirically validate the initial maturity model prior to utilization, this study conducts an interview following interview guide approach (Patton, 1990) with a subject expert. According to Hirsjärvi et al. (1997) interviews are a suitable method when there is, i.e. a desire to study complex subjects, topic is relatively unknown, or topic is related to iteration of prior concepts. These characteristics align with sustainable procurement maturity model development as the entity is complex, relatively unknown (no prior empirically validated sustainable procurement maturity models exists) and linked to iteration of previously created initial model. Interview guide approach is defined by Patton (1990)

as list of topics, issues or question which are to be explored during the interview. Interview guide approach is similar to semi-structured interview and the terms are used interchangeably in the context of interview approach (Fontana & Frey, 2000). In this study the conducted interview forms around created sustainable procurement maturity model, which provides the topics and issues to be discussed. The interview is informal as the interviewed expert largely decides the important bits and pieces to be discussed. The chosen expert is in managerial position in procurement and has considerable experience from the field of procurement from multiple organizations. In addition to having experience from procurement, the expert has also been heavily involved in sustainable procurement for years and has driven changes towards sustainability in many organizations.

Expert validation was held in three interview rounds each set lasting approximately two hours. The initial maturity model was sent to the participant prior first set. In the beginning of the first set the model and its goals were introduced.

4.2.6 Maturity model utilization

The maturity model is utilized as a questionnaire. Questionnaire was a suitable method for maturity model utilization as there was an intent to get assessments from a larger audience. According to Trobia (2011) questionnaire is suited for collection individual data from a certain topic. MM was turned into a questionnaire and sent in electronical form to procurement professionals within the indirect procurement department. The questionnaire was formed so that each dimension was paired with a corresponding question and a list of all maturity level descriptions. Participants were instructed to select the corresponding maturity level description and explained that they have a possibility to write a comment for each dimension. Thus, the questionnaire used close-ended questions, but also integrated open-ended question principles in the form of comments. Open-ended questions are suitable when participants can provide meaningful data by free expression (Trobia 2011). Due to complex nature of sustainability and in order to acquire ideas for improvement, ability to freely express opinions were seen important. Trobia (2011) also points out that close-ended questions might be problematic as participants are not able to find a suitable answer. This issue was in part mitigated through giving the participants an opportunity to explain their answers.

Trobia (2011) highlights the importance of explaining the meaning of the questionnaire for participants as well as giving them proper instructions. Instructions, meaning, and background for the questionnaire and maturity model were provided in the invitation

sent to each respondent. In addition, a common ground between the participants was created through explaining key terminology such as “sustainability”.

The model was sent to 136 possible attendees of which 22 provided answers, thus forming a response rate of 16%. This does not imply that all respondents answered to all dimensions (questions), but rather that 22 individuals provided their answers to certain number of dimensions.

5 ANALYSIS: CREATION OF SUSTAINABLE PROCUREMENT MATURITY MODEL

Fifth chapter is organized according to maturity model creation process network (Maier et al. 2012). Foundation and background information is stated in planning phase. Development of maturity model from start to initial version is described in each corresponding sub-chapter of 5.2. Initial version is done after cell text formulation and presented in Annex 3. The final version of the maturity model is created after expert validation and can be seen in Annex 4. After finalizing the model, chapter 5.5 focuses on utilization of the model and analyzing achieved results.

5.1 Planning

Discussions with assignment organization and current scientific literature formed basis for the planning phase. Requests of assignment organization were modified to align with current scientific literature and as such with intended scope of this study. Subjects under planning were discussed with relevant stakeholders and modified accordingly. In addition to stakeholders, the nature of sustainable procurement, and the absence of empirically validated models strongly guided the planning of the maturity model. After the planning was completed, it was validated by stakeholders.

5.1.1 Specifying the audience

Intended audience for this maturity model are procurement departments regardless of industry and whether they are conducting direct or indirect procurement. That said the first user, and thus more specific audience, of the model will be indirect procurement department of the assignment organization. Despite being initially utilized by single organization, the model is intended to be used by both procurement disciplines, direct and indirect, and other organizations across multiple industries.

Expected users of the model are managers and senior managers within these functions. This is because they have an overview regarding the current state of procurement and an ability to impact the decision making in procurement. Thus, providing them with information regarding maturity of sustainable procurement is a logical and rational decision. Managers and senior managers are highlighted as rational users due to these reasons outlined by Maier et al. (2012).

During creation and implementation of the model, the audience will include a wider range of personnel from procurement functions. When choosing the levels of maturity, it is beneficial to gain a common and more objective opinion, as it will yield more reliable results for future consideration. Thus, the audience will also include internal experts of procurement and sustainability disciplines. They will participate in validation of selected dimensions and levels. According to Maier et al (2012) external experts are important as they able multiple perspective, thus limiting risks of one-dimensional thinking. Due to this reason the audience will also include experts outside of procurement function of the assignment organization.

5.1.2 Defining aims

The aim of the maturity model is to raise awareness regarding sustainability practices within the procurement function and support transition towards more sustainable procurement practices. Model strives to enable the user to benchmark its current sustainable practices to practices found in scientific literature and those of sustainability leaders. Model also aims to clarify strengths and weaknesses of current practices and able the coordination of clear goals. These targets are well aligned with knowledge building nature of maturity models brought forward in literature (Andreasen & Gammerlgaard 2018; Proenca & Borbinha 2018; Lockamy & McCormack 2014).

5.1.3 Clarifying scope

This maturity model is built with a generic scope and intended to be used by procurement departments regardless of industry. Due to the goal of building awareness and relatively universal nature of sustainable procurement practices, a generic scope is suitable. This maturity model addresses sustainable procurement in its entirety and is built around hybrid procurement process model accounting actions related to procurement process. In addition to procurement process, the scope includes enabling attributes (see chapter 2.5.2). Enablers are included as they have an imperative role in the success of sustainability of procurement.

5.1.4 Defining success criteria

Success criteria for the model are by nature high-level requirements. This study sets three main criteria for success of the model:

- Increasing awareness and building knowledge
- High usability and usefulness
- Interoperability with procurement and SSCM maturity models

Firstly, the model needs to be interoperable with other procurement and SSCM maturity models, especially with the former one. This is achieved through basing the maturity model on existing literature and categorizing dimensions according to recorded procurement process. Interoperability with SSCM is received through maturity level and cell texts creation. In addition to interoperability, success criteria include usability and usefulness of the model. In order to be counted as a success the model needs to be easy to implement and use, and utilizing organizations need to regard the model as useful. Usability and usefulness are in line with model's aim of raising awareness (Maier et al. 2012). Raising awareness and building knowledge indicate that the model has an ability to increase organization's knowledge on sustainable procurement and highlight strengths and weaknesses that it has. Awareness is also achieved through realization of possibilities for future development.

5.2 Development

5.2.1 Creating dimensions

The dimensions of the maturity model are created through iterative coding process. The process started by collecting actions, practices, attributes, processes etc. related to sustainable procurement from scientific literature and other publications. The complete list of gathered practices is presented in Annex 1. and it contains over 159 mentions of sustainable practices from various sources, including but not limited to (Akhavan & Beckman 2017; Villena & Gioia 2018; Johnsen et al. 2019; ISO20400; Tate et al. 2012; ETI 2017). In addition, some practices are suggested by the researcher. These practices went through identical validation and iteration process. Some of the mentions are identical, overlapping or coincide with each other, and as such, the over 150 gathered practices do not refer to unique values.

Afterwards the gathered practices where grouped with similar ones in order to form relevant and logical dimensions for the maturity model. This categorization was conducted in two steps, and results were validated and modified after each one according to

expert opinions. Firstly, the practices were divided to those directly referring to procurement process and to those referring to enablers of procurement process, i.e. internal goal setting, resource allocation, dedicated employees, and employee training. This categorization was based on literature where both procurement process models, and drivers of sustainable procurement are present. Secondly, the practices were divided to smaller groups, forming the final sub-level dimension. Results of this process are provided in Annex 1 where first column contains the individual actions, second column grouped actions, and third the final sub-level dimension.

Dimensions formed around the concepts discussed in chapter two; procurement process models, strategic sourcing, sustainable supplier management, and drivers of sustainable procurement. Non-compliance formed a separate dimension. Non-compliance is a part of supplier management as it describes actions taken in cases of supplier non-compliance and failure. It was raised as a separate issue, because in literature the importance of working with non-compliant suppliers was highlighted (Villena & Gioia 2018; Johnsen et al. 2019).

As a result, an initial list of 39 dimensions was formed. For these dimensions, a question and description of lowest maturity were created. Question is meant to provide a frame for each individual dimension. The frame indicates accounted factors for the dimensions and hints how the maturity levels are going to progress (Schiele 2007). The initial 39 dimensions are listed below in table 8.

Table 8 Initial dimensions

Drivers and enablers of sustainable procurement	Pre-selection	Supplier selection	Supplier management	Non-compliance
Organization's strategy and sustainability	Category strategy and sustainability	Cost calculation	Sustainability goals and targets for suppliers	Corrective action plans for non-com
Procurement strategy and sustainability	Market research	Codes of conduct	Rewards and incentives for suppliers	Designed consequences
Procurement policies and sustainability	Specifying supplier and product/service criteria	Supplier requirements	Collaboration with suppliers	Managing supplier failures
Commitment of top management		Tendering process	Training for suppliers	
Perception of sustainability		Suppliers selection criteria	Sustainability in suppliers scorecards	
Targets and goals incorporate sustainability		Supplier due diligence process	KPIs for sustainable performance	
Internal rewards and incentives for sustainability		Available methods	Supplier self-assessment	
Mapping of sustainability risks		Sustainability in contracts	Auditing suppliers	
Dedicated personnel			Sustainability reporting from suppliers	
Role of sustainability in Procurement			Tools for managing sustainability	
Guidance for employyes			Lower-tier supplier management	
Employee training				
Perception of own role and impacts on sustainability				
External collaboration regarding sustainability				

Before moving forward with the creation process, the formed dimensions were validated and modified through a questionnaire. Dimensions, questions and first level of maturity presented in the questionnaire can be seen in Annex 2. Aim of the questionnaire was to conduct an initial validation of selected dimensions, bring forward issues regarding dimensions and highlight possible dimensions which hadn't been included yet. Additional comment field provided respondents an opportunity to give ideas on each individual dimension such as how the dimensions currently relates to procurement, overlapping nature of dimensions, and suggestions regarding maturity level development. Questionnaire was sent to a group of experts including procurement, sustainability and compliance professionals. The questionnaire received answers from seven respondents and results can be seen in table 9.

Table 9 Validation questionnaire results

	Is the issure relevant?			Can Procurement Influence?			Additional comment
	Y	N	Y/N	Y	N	Y/N	
Organization strategy and sustainability	7	0	0	4	2	0	2
Procurement strategy and sustainability	6	0	0	5	0	0	1
Procurement policies and sustainability	5	1	0	5	0	0	1
Perception of sustainability	4	0	1	2	1	1	2
Commitment of top management	4	1	1	4	1	0	2
Targets/Goals incorporate sustainability issues	5	1	0	5	1	0	1
Internal incentivizes/rewards for sustainability	4	1	1	4	2	0	2
Mapping sustainability risks	5	0	1	5	0	1	1
Dedicated personnel	6	0	0	6	0	0	1
Role of sustainability in Procurement	5	1	0	6	0	0	2
Guidance	5	0	0	4	0	1	2
Employee training	5	0	0	5	0	0	1
Collaboration regarding sustainability	4	0	0	4	0	0	0
Perception of own role and impact on sustainability	4	1	0	4	0	1	2
Sustainability integrated into category strategy	4	0	0	4	0	0	0
Market research	5	0	0	4	0	1	1
Specifying supplier and product/service criteria	4	0	1	3	0	2	1
Cost calculation	4	0	0	4	0	0	4
Codes of conduct	5	0	0	5	0	0	2
Supplier requirements	4	0	1	5	0	0	0
Tendering process	3	0	1	4	0	0	2
Supplier selection criteria	4	0	0	4	0	0	1
Supplier due diligence process	5	0	0	5	0	0	2
Available methods	4	0	1	4	0	1	2
Sustainability in contracts	5	0	0	5	0	0	1
Sustainability goals for suppliers	5	0	0	5	0	0	0
Rewarding/Incentivizing supplier sustainability performance	5	0	0	5	0	0	0
Collaboration with suppliers	4	0	1	5	0	0	1
Offering sustainability training for suppliers	4	1	0	5	0	0	3
Sustainability in supplier scorecards	5	0	0	5	0	0	0
KPIs for sustainable performance	5	0	0	5	0	0	0
Supplier self-assessment	5	0	0	5	0	0	1
Auditing suppliers	5	0	0	5	0	0	2
Sustainability reporting from suppliers	2	1	0	3	0	0	2
Tools for managing sustainability	5	0	0	4	0	1	2
Lower-tier supplier management	5	0	0	4	0	1	1
Corrective action plans for non-compliance	5	0	0	5	0	0	2
Designed consequences for non-compliance	4	0	1	5	0	0	0
Managing supplier failures	4	0	1	5	0	0	1

Majority of respondents regarded selected dimensions relevant from sustainable procurement perspective and not a single dimension gathered more answers for irrelevancy than relevancy. Worst ratio concerning these options was received by “Sustainability reporting from suppliers”, which received only three answers of which two were for rele-

vancy and one for irrelevancy. Due to receiving only a 66% approval rate from the respondents, it is important to further back up selection of this dimension by scientific literature. Sustainability reporting has been brought forward by Villena and Gioia (2018), and ISO20400 (2018), as an important action, especially if it is done by supporting suppliers to publicly disclosing their reports.

None of the dimensions received two votes for irrelevancy and the second worst ratio was 4 to 1, meaning that 80% of the respondents saw the dimensions relevant. This ratio was received by "Commitment of top management", "Internal incentives/rewards for sustainability", "Perception of own role and impact on sustainability", and "Offering sustainability training for suppliers". In addition to 80% of respondents voting for relevancy, scientific literature also backs up their importance for the sustainability of procurement (Villena & Gioia 2018; ISO 20400, 2017; Meehan & Bryde 2011).

Majority of respondents saw dimensions as something that procurement can influence, which further indicates that selected dimensions are relevant for procurement. Results also show that only dimensions to receive "no" regarding procurement's ability to influence belonged to "drivers and enablers" dimension of the maturity model. This is understandable as some of these dimensions consider large concepts that do not necessary fall under procurement's responsibility within the organization, and thus procurement is not able to influence them. One respondent commented dimension of "Organization strategy and sustainability" in following manner, *"Dependent on the level of importance of procurement in the organization, but in general, Procurement executes the strategies of the organization"*.

Only six out of 39 dimensions did not receive any comments. These comments provided valuable information regarding the initial dimensions and had an important role in future development of the model. Comments resulted in following changes and notes:

- Names of dimensions changed
- Questions for the dimensions modified
- Order of dimensions in the model was changed
- Seemingly overlapping dimensions were marked for future inspection
- Some dimensions need improved explanations
- Guidance for maturity level development and cell text formulation
- In addition to negative failures, also need to account positive performance
- Even though things relate to sustainability of procurement, they are not necessarily on procurement's responsibility

Received comments led to multiple changes in the initial dimensions. Some dimension names were changed as respondents commented that their idea might be lost due to misunderstanding, i.e. dimension "Commitment of top management" received the following comment: "The term in the dimension could be "procurement top management" so that there isn't confusion on company's top management and procurement top management". Some questions were also modified for similar reasons. A considerably big change made based on the comments was rearranging sub-dimensions under supplier selection category. As one respondent noted, it makes more sense to arrange the dimensions in chronological order following the selection process itself. This modification improved usability of the maturity model.

In addition to immediate changes, some comments resulted in notes to be accounted later on in the development process. Multiple dimensions received comments which indicated that they seem similar or overlapping with another dimension. These pairs of dimensions were:

- "Corrective action plans for non-compliance" and "Designed consequences for non-compliance"
- "Supplier self-assessment" and "Sustainability reporting from suppliers"
- "Sustainability in supplier scorecards" and "KPIs for sustainable performance"
- "Targets/goals incorporate sustainability issues" and "Role of sustainability in procurement"

These dimensions were not modified straight away, as first it was important to see if development of maturity levels and cell texts would bring forward clear differences and distinctions between them. For the respondents, some dimensions might have seemed close to identical as they did not have full range of maturity levels to work with. During the creation of cell texts, it became apparent that dimensions "Sustainability in supplier scorecards" and "KPIs for sustainable performance", and "Corrective action plans for non-compliance" and "Designed consequences for non-compliance" were close to identical and thus combined into single dimension. Combination of similar dimensions improves the usability of the model, as it reduces complexity. In the end the final group of maturity model dimensions were coined.

5.2.2 Creating maturity levels

As there is no previous maturity model for sustainable procurement, this study cannot directly utilize existing maturity levels, and thus forms a new group of maturity levels with descriptions. These levels are based on existing literature and maturity levels regarding procurement, sustainable supply chain management and sustainability in general.

According to Schiele (2007) most procurement maturity models include 3 to 5 levels of maturity. When looking at comparison done by Akhavan and Beckman (2018) we can notice that most SSCM related maturity models include typically 4-5 levels. Sustainability related SCM maturity models typically start from non-existent as first level and proceed to best practices and continuous development (Reefke & Sundaram, 2018). Sustainability related maturity models highlight multiple factors regarding the development of maturity levels. Important factors behind determining level of maturity are sustainability embeddedness in existing processes as well as whether sustainability is considered from compliance or proactive development perspective (Reefke & Sundaram, 2018). Scientific literature also highlights the fragmented nature of sustainability (Miemczyk et al. 2012), and thus it is important that the maturity levels also consider whether procurement department has a holistic view on sustainability and is it considering all relevant sustainability issues. Besides considering maturity levels from sustainability point of view it is important to account aspects of procurement maturity models. Schiele (2007) states that an important factor considering development of maturity levels is standardization of processes and decrease of dependency on individual employees. Based on this notion, the maturity levels in this study integrate the idea of standardized processes and independency from individual employees. Table 10. presents maturity levels of SSCM and procurement maturity models.

Table 10 Different maturity levels

Reefke & Sundaram (2018)	Okongwu et al. (2013)	Lockamy & McCormack (2014)	Robinson et al. (2006)	Vahs (2005)
1	Primeval	Ad hoc	Start-up	A particular best-practice activity/tool/method is known within the organisation
2	Initial	Defined	Take-off	A position or person is assigned to perform the task
3	Intermediate	Linked	Expansion	The process for completing the task is defined and documented as well as applied
4	Advanced	Integrated	Progressive	Cross-functional integration in the company is assured while basic requirements are met
5	World class	Extended	Sustainability	
6				

Reefke and Sundaram (2018) created six levels of maturity for their SSCM maturity model, which were simply named as 1, 2, 3, 4, 5, and 6. The lowest level of maturity describes a situation where a supply chain is unaware of sustainability, possibly non-compliant with regulation and has not undertaken any sustainability actions. Second level of sustainability starts to see basic compliance, but measures are still disconnected. From third level onwards goals and standards for sustainability have been defined and all supply chain members are compliant with regulation. Next considerable step occurs in fifth level were the supply chain moves from reactive to proactive measures. Highest maturity level indicates a state of continuous improvement and supply chain's position as a sustainability leader. (Reefke & Sundaram 2018).

Okongwu et al. (2013) coined four levels of maturity for their supply chain sustainability maturity model. These levels develop from "initial" through "intermediate" and "advanced" to "world class". The model doesn't include a separate description of levels but describes development of each dimension through cell texts corresponding with each specific level.

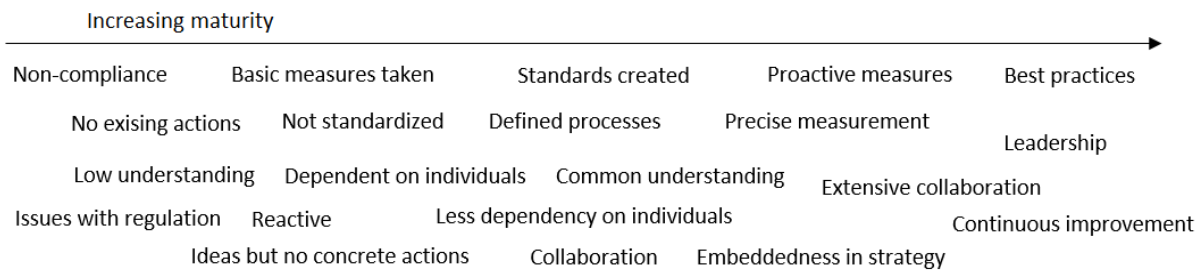
In their supply chain management process maturity model Lockamy and McCormack (2014) formed five levels of maturity; Ad hoc, Defined, Linked, Integrated and Extended. Ad hoc is defined as a state were supply chain practices are unstructured and poorly defined, processes are not standardized, and performance is unpredictable. Defined stage states that basic processes are defined and documented, and process performance is more predictable. Lockamy and McCormack (2014) describe linked as a breakthrough level where collaboration between internal functions, vendors and customers starts to happen through teams that have unified views on matters and aligned goals.

Robinsen et al. (2006) developed five levels of maturity for their corporate sustainability knowledge management maturity model. According to Robinsen et al. (2006) knowledge management highlights continuous improvement, innovation regarding processes, and emphasizes role of people. Five levels they created are start-up, take-off, expansion, progressive, and sustainability. The first level regards a situation where organization is aware of knowledge management and its possibilities to some point but has not moved into concrete actions. The following levels see inclusion to goals, broader understanding of concepts and forming links to concrete business objectives. In the highest levels the concepts become deeply embedded into the organization, its processes and culture. There are in-depth measures to follow up development and incentives build to guide right actions. (Robinson et al. 2006).

Schiele (2007) used best practices of each dimension to define the level of maturity but mentioned that Vahs (2005) business process maturity levels functioned in the background. Vahs' (2005) maturity levels increase from acknowledging certain practices to having dedicated personnel, implemented processes and cross-functional integration within the organization. Following similar principle of evolution Schiele (2007) stated that in procurement maturity models an important factor for maturity levels is the development from individual dependent to standardized processes. Thus, maturity levels concerning procurement should implement an idea of improving from individual dependent functions to standardized common principles that are followed by larger crowd.

Common features and characteristics of maturity levels were gathered from the literature and are presented below in table 11. Characteristics in table 11 together with presented studies form a basis for maturity level development.

Table 11 Characteristics of maturity levels in sustainability, SC, and procurement literature



This study creates five levels of maturity. This decision is based on the literature, complex nature of sustainability, and feedback from procurement experts. Also as mentioned by Reefke and Sundaram (2018) it is possible that there are no sustainability efforts, which highlights the need for a level of very low maturity. This differs a little bit from Schiele (2007) and Vahs (2005) procurement maturity levels which include some level of actions already in the first level of maturity. Due to the complex nature of sustainability and likelihood of there being no actions, this study chooses to start the maturity levels from a situation of non-existent sustainability actions. The lowest level builds on Reefke's and Sundaram's (2018) description, "*SC is unaware and non-compliant to any regulations and undertakes no sustainability efforts"*. Following the description, this study names the first level of maturity non-existent. Non-existent describes a situation where procurement is not aware of sustainability, is not conducting any meaningful sustainability related practices, does not consider sustainability as a matter of procurement, and might have problems with compliance.

Second level of maturity is named "Ad-hoc, reactive, and dependent on individuals, but initial steps taken". These characteristics describe a situation where initial steps have been taken and some awareness has been created. Organization still has a reactive stance on sustainability and actions are dependent on individuals, as there are no proper guidance or standardized processes. This description aligns and brings forward attributes highlighted in sustainability, supply chain and procurement maturity models, such as Schiele (2007) and Reefke and Sundaram (2018).

Third maturity level represent a middle ground. There are common principles and standardized processes regarding sustainability, sustainability is starting to be clearer part of procurement, and there is a holistic understanding of the subject. Third level indicates that accomplishing positive results is not as dependent on individuals as there are clear processes and principles. This aligns with Schiele (2007) statement regarding procurement maturity development. The middle level is needed as it describes a situation were common principles and standards are coming into play, but there are still shortcomings in proactive development and deeper collaboration. These things are highlighted by SC and sustainability maturity models (Reefke & Sundaram 2018; Lockamy & McCormack 2014; Okongwu et al. 2013).

In the fourth level procurement moves from compliance to proactive sustainability development and organization clearly strives to distinct itself based on its sustainable performance. Sustainability in this stage is a key part of procurement and looked from

multiple perspectives. Collaboration has also deepened, and organization has improved ways of measuring and pushing sustainability performance forward.

The highest level is named as "Continuous improvement, best practices and holistic view on sustainability". This level describes a situation where sustainability is in the core of procurement function. The level is described by continuous improvement, implementation and utilization of best practices, and heavy prioritization of sustainability within procurement. Initial maturity levels, their names and descriptions are presented in table 12.

Table 12 Initial maturity model levels

Level of maturity	Description
Non-existent	Procurement is unaware of sustainable practices and practically takes no sustainability efforts
Ad-hoc, reactive, and dependent on individuals, but initial steps taken	Procurement has created awareness regarding sustainability and introduced some sustainability initiatives.
Common principles and clear emphasis on sustainable procurement	Sustainability principles, goals, and practices are starting to be aligned throughout procurement function. Defined processes in place and consistency established. Holistic view on sustainability.
Pro-active measures in place and sustainability as a key part of procurement	Procurement has developed from compliance towards pro-active sustainability efforts. Sustainability performance measured throughout processes and suppliers.
Continuous improvement, best practices and holistic view on sustainability	Continuous development, sustainability leader, and sustainability in heart of operations.

5.2.3 Formulating cell texts

This study constructs cell text on extremes first basis. According to this method the lowest and highest levels of maturity are coined first and only afterwards the middle levels of maturity are created (Maier et al. 2012). According to Maier et al. (2012) it is important to define whether the cell texts are formulated according to prescriptive or descriptive approach. This study accommodates the latter. Descriptive approach is well suited to situations in which there are no exact right answers and creating a detailed widely applicable explanation is difficult (Maier et al. 2012). This is true in the field of sustainable procurement, as there are no exact answers and the definitions might vary due to fragmented

nature of the discipline. That said there are some underlying widely accepted principles derived from literature that will be used as basis for the model, i.e. TBL.

Formulation of the cell texts also followed an iterative approach meaning that there were multiple versions of cell texts which were refined through multiple rounds. Firstly, bullet points were created for all extreme cells to describe the most important characteristics of each individual dimension-level conjunction. After all cells had bullet points, they were comprehensively written out assuring that nothing important was left unnoticed. The same process was then conducted with the middle levels (2 to 4). After all individual cells had comprehensive descriptions they were read through and modified based on discussions with procurement experts. Finally, the cell texts were compressed to only contain most important and relevant information that summarized the essence of that dimension – level conjunction. One of the success criteria set for this model was its usability which would be deterred by too complex cell texts. This final step also functioned as a way to notice any mistakes in the texts prior to final validation. Compressing cell texts also suits this model's goal of being informative and to be filled by individual procurement professionals.

This method aligns with bottom-up creation process. According to DeBruin et al. (2005) bottom-up process starts with determining measures and requirements which is followed up by creation of definitions. It is suited for fields where there is literature and evidence of what represents good and bad level of maturity (DeBruin et al 2005). There is literature on sustainable procurement practices and what is considered good maturity wise (ISO 20400 2017; Villena & Gioia 2018; Reefke & Sundaram 2018; Filho et al. 2019), but there is a clear need for standardized creation process due to before mentioned difficulties. Bottom-up approach establish a good framework for cell texts creation. Figure 11. presents an example of this iterative process through creation of cell text for dimension's "Organization strategy and sustainability" maturity level 4.

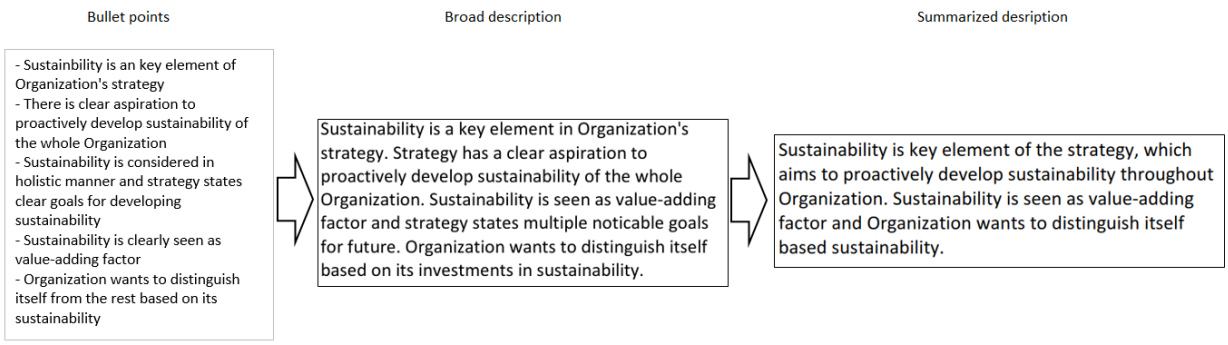


Figure 10 Iterative cell texts formulation process

Initial version of the model emerged after the previously described phases. The initial model has a very strong basis in literature and its dimensions have gone through validation in form of the questionnaire. Open comments in the questionnaire provided also help in the creation process of cell texts. The initial maturity can be seen in Annex 3 (see page 95).

5.2.4 Choosing administrative mechanism

This study opts for electronic based distribution system in order to reach a larger number of participants within the utilizing organization. According to Maier et al. (2012) electronic distribution systems are often used for benchmarking and paper-based systems for knowledge building. However, this study does not conduct benchmarking between organizations, but uses the electronic distribution to collect information from wider range of internal procurement professionals. As such, this administrative mechanism will benchmark differences within dimension maturities and internal differences. Due to this solely internal use, the study will increase the knowledge regarding sustainability practices throughout the procurement function. The maturity model will be electronically distributed as a questionnaire throughout the procurement function.

5.3 Evaluation and empirical validation

As Maier et al. (2012) point out, evaluation is overlapping phase which occurs during the creation process. Evaluation should be conducted simultaneously with planning and development stages and after the model's creation. Evaluation also refers to empirical validation of the maturity model. Empirical validation is one of the most important things in maturity model creation and represents often an area of failure in studies (Maier et al.

2012). Evaluation and empirical validation are clearly present in three distinct steps of the creation process:

- Questionnaire on the validity of selected dimension
- Expert validation
- Utilization of the finalized model

Through these three steps the maturity model is evaluated and validated. Validation was conducted in three different time points; prior initial model, after initial model, and after finalized model. Reason for this were concentration of focus and effort and assuring the quality through multiple rounds of validation. Concentration of focus and efforts refers to the fact that first only the dimensions were validated. There was not levels or cell text, and thus participants' focus was solely on the created dimensions.

In addition to these three clearly distinct steps evaluation has been present throughout the creation process in the form of iterative creation process and coding of sustainability activities. There have also been constant discussions with procurement and sustainability experts throughout the process.

5.4 Expert validation

First, the created maturity levels, their descriptions and development were addressed. Amount of maturity levels, their descriptions, and progression from level to the next were seen relevant. However, it became apparent that the initial names of maturity levels were too broad and thus difficult to grasp. Names of levels were shortened to give a quick and accurate prescription. Refined maturity level names can be seen from table 13.

Table 13 Validated maturity levels and descriptions

Level of maturity	Description
Non-existant	Procurement is unaware of sustainable practices and there are no sustainability efforts
Initial steps taken	Procurement has created awareness regarding sustainability, but actions tend to be ad-hoc, reactive and dependent on individuals
Common principles and standards	Clear emphasis on sustainability. Principles, processes, and practices are starting to be standardized. Holistic view on sustainability
Proactive measures	Sustainability is a key part of procurement actions. Movement from compliance to proactive sustainability efforts.
Sustainability leader	Continuous development, best practices implemented, and sustainability in the heart of operations.

After the names of maturity models were decided we started to go through each dimension and its maturity levels one by one. At this point the expert suggested that we would keep the maturity level names and their definitions in our sight all the time in order to make sure that the cell text are progressing logically and according to defined level descriptions. This reduced the differences between dimensions as each were set according to the corresponding maturity level definition, and thus should assure better alignment throughout the model.

During the three interview rounds the expert provided valuable information on improving usability of the model. According to the expert some of the terms needed to be changed according to each individual organization utilizing the model, or there needs to be short descriptions what is meant by these terms. Most notably using the term “organization” can mean different things to different respondents. Organization should thus be changed to name of the organization utilizing the model or there should be a short explanation that organization in this model refers to the utilizing firm in its entirety.

When it comes to the cell texts themselves, the subject expert provided mainly seven types improvements and information:

- Fixing logical mistakes and proof reading
- Summarizing cell texts that were written too broadly
- Assessing and fixing logical progression of dimension’s cell texts according to set level definitions
- Assessing TBL inclusion in cell texts
- Fixing conflicts between cell texts and reality

- Bringing forward cell texts that did not provide adequate information or where otherwise fuzzy
- Confirmation of cell texts that were good

The expert noticed few logical mistakes in the cell texts, which were fixed, i.e. first dimension's first level stated, "Sustainability has small to non-existent role", which was corrected to "Sustainability has non-existent to minor role". These kinds of mistakes lower the model's usability and diminish its quality. Cell texts were already summarized during the formulation process (see fig. 10.), but there were still some unnecessarily broad descriptions. These descriptions were discussed and summarized versions together with the participant.

The subject expert noticed some problems regarding logical progression of cell texts. Some dimensions incorporated too high requirements in lower levels while few had too easily obtainable requirements in higher levels. According to the subject expert i.e. dimension 26. "Sustainability in contracts" had too easily obtainable fifth level and it did not possess big enough gap to fourth maturity level. Due to easily obtainable requirements the cell text was not aligning with the definition of "Sustainability leader" level. Cell text was corrected and changed to include principle of back-to-back contracts. This means that suppliers are contractually required to include similar sustainability requirements in contracts with their own suppliers.

Inclusion of TBL dimensions to the cell texts was refined according to received feedback. The expert stated that the existing cell texts placed too strict requirements regarding the amount of accounted sustainability dimensions in each stage, i.e. dimension "Perception of sustainability" stated in third level "Sustainability is defined through two dimensions". This was seen too restrictive as there were also other factors contributing to the maturity level. As a result, the cell text was modified to "Sustainability is defined through more than one level". This description set clear principle of having multidimensional understanding of sustainability, but still gave emphasis on rest of the factors in the level.

Despite not resulting in any modifications, an important input from the validation process was to receive confirmation on levels which were already fine and did not need any tuning. The validated final version of the maturity model is presented in Annex 4.

5.5 Maturity model utilization

Created sustainable procurement maturity model was utilized with single organization's indirect procurement. Utilization was conducted in order to help the procurement organization to develop sustainability, confirm usability of the model, and depict results as well as benefits the model can provide.

Utilization of the model went well and received feedback was overwhelmingly positive. Possibility of comments was perceived highly important as they gave a possibility to express current situation more precisely. This highlights an understandable challenge with general SP MM. Even though cell texts are created in descriptive fashion, and dimensions set according to scientific literature and well-known practices, they do not always align with the organization in question, i.e. some respondents noted that they would score the dimension somewhere between two of the presented maturity levels. Some respondents felt that certain dimensions and cell texts were not fully aligned with the organization itself, which is understandable, as a general model does not account characteristics of an individual organization. Due to challenging and multi-dimensional nature of sustainability and procurement, an additional comment field is suggested in the future utilization SP MMs.

Importance of definitions was also clear. Organizations use different terms and definitions, i.e. "organization" and "function" might have alternative meanings. This becomes even more apparent when utilizing the model as a questionnaire for a broad audience. It is important to clarify some key concepts and their meaning within the maturity model, and in the field of sustainability this can be seen to be more imperative as there are multitude of ways to perceive sustainability and opinions of individuals vary. It is also important that researchers use these defined terms in a coherent fashion. Researcher can add definitions to the model for terms such as "organization" and "sustainability", or then modify the content according to each organization, i.e. replacing term organization with company name.

The created maturity model can be considered successful as it accomplished the goals set for it. Set goals were usability of the model, usefulness of the model, and its ability to build knowledge on sustainable procurement. The model achieved all of these with satisfactory results. Results provided an in-depth view for the procurement unit regarding level of its maturity, differences between categories, weaknesses and strengths of its current

state, and an initial idea for future development. Utilization was also used as a final round of validation, a factor which is accounted important by Maier et al. (2012).

Measured overall maturity level was 2.47. This score is calculated based on average maturity scores of all individual dimensions and indicates a maturity between “initial steps taken” and “common principles and standards”.

5.5.1 Maturity level assessments of respondents

Each procurement employee received a link to the questionnaire. Respondents were not obliged to provide answers for each dimension as they were allowed to decide whether they have needed information. Due to this reason all respondents did not answer to all questions.

Maturity levels given by respondents ranged from 1.636 to 3.125. Thus, the difference between given lowest and highest maturity level is 1.489. This is a quite significant difference as the lowest estimate signals “non-existent”, while the highest places the maturity level to “common principles and standards”. There were no large differences on maturity levels depending on number of dimensions answered by respondent. Average of maturity level given by respondents who answered 10 to 20 questions was 2.233, average of those who answered 21 to 30 questions was 2.694 and average of respondents who provided estimates for more than 30 dimensions was 2.44. Even though there were no significant differences it is interesting to note that respondents who answered the least questions gave on average the lowest maturity level.

Out of the 22 respondents 19 stated the product/service category which they are working with. There were larger differences between categories than according to number of questions answered, but the differences still remained relatively small. Respondents working with IT-services gave the highest average maturity level at 2.565 while those working with commodities gave the lowest average at 2.143.

Figure 11 below shows the distribution of maturity levels given by respondents. Maturity level given by one respondent was excluded from the figure, as it was based only on two dimensions. Figure 11 does not differentiate given maturity levels according to categories or number of answered questions.

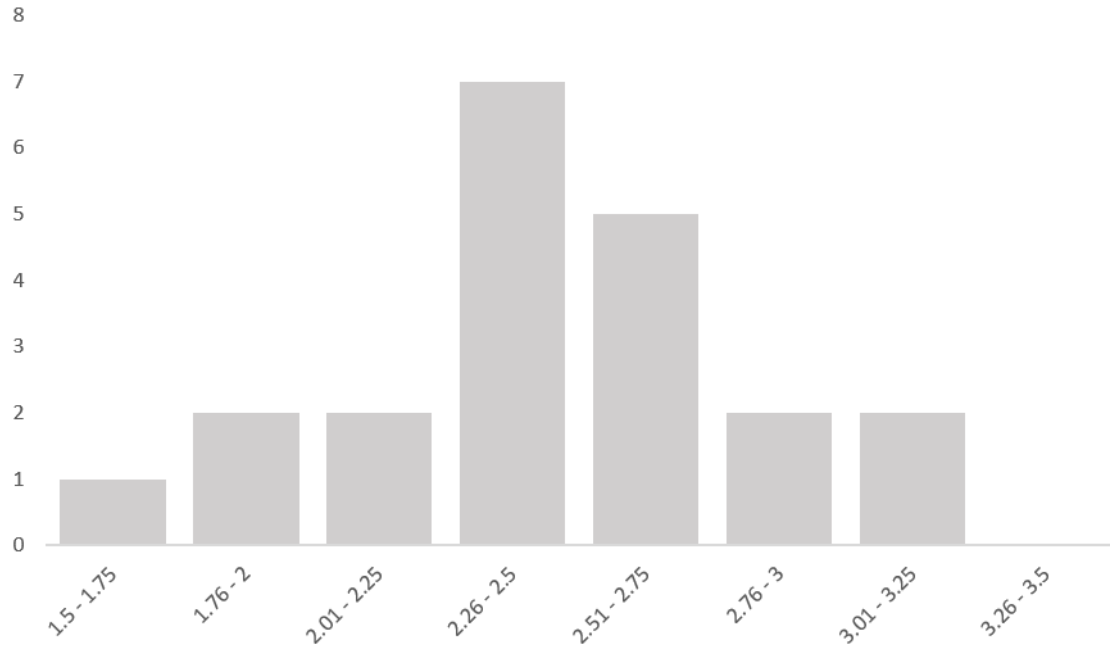


Figure 11 Distribution of maturity levels given by respondents

The individual maturity level estimations clearly center between levels two and three, as 16 out of 21 responses belonged between these levels. Highest concentration of given individual maturity levels were between values 2.26 – 2.5 (7), and 2.51 – 2.75 (5). Maturity level estimates falling between values 2.26 and 2.75 represent 57.1 % of all given estimations. In total there were five maturity level estimations that were either below two or over three. Based on the results we can note that the respondents seem to have an aligning view on the current maturity level, as none of the given maturity levels deviated a lot from the measured mean of 2.419 and most of them were centered on it. The standard deviation of the answers was 0.375 and all of the given estimates located within three standard deviations from the measured mean. 95.2 % of given maturity levels were within 2 standard deviations and 71.4 % within one standard deviation. The results indicate a normal distribution of given maturity levels, but it is apparent that the perceived normal distribution is skewed towards right. This can be shown to be true by calculating the skewness with Pearson's first coefficient of skewness. The result is 0.166 which indicates that the maturity level estimates are positively skewed. The positively skewed normal distribution of answers would indicate that there is some common level of understanding between the respondents on the current maturity of sustainable procurement. This is turn supports a notion that the maturity model results depict the current situation within the

procurement organization. It is also interesting to see that even though sustainability and sustainable procurement are both complex issues which are difficult to implement in practice, the respondents seem to have some what aligning view on them.

5.5.2 Maturity levels of individual dimensions

In addition to overall maturity level, the maturity model provided information on maturity levels of individual dimensions. Maturity levels of individual dimensions provide more in-depth information on the current state of different sustainability areas. Average maturity level of each dimension is presented below in table 14.

Table 14 Maturity levels of individual dimensions

Organization strategy and sustainability	3.4	Codes of conduct	3.4
Procurement strategy and sustainability	2.5	Available methods	3.1
Procurement policies and sustainability	2.4	Supplier due diligence process	3.5
Perception of sustainability	1.6	Tendering process	3.0
Commitment of Procurement top management	2.5	Cost calculation	2.8
Role of sustainability in Procurement	2.9	Sustainability in contracts	3.1
Procurement's perception of its impact on sustainability and role in sustainable development	3.3	Collaboration with suppliers	2.3
Mapping sustainability risks	2.1	Supplier self-assessment	2.8
Guidance on sustainability	1.9	Sustainability in supplier scorecards and KPIs	2.0
Employee training	2.1	Auditing suppliers	3.4
Targets/Goals incorporate sustainability issues	2.0	Management of audits	2.8
Internal incentivizes/rewards for sustainability	1.7	Sustainability goals for suppliers	2.2
Dedicated personnel	1.9	Incentivizing supplier sustainability performance	1.3
Collaboration regarding sustainability	1.5	Offering sustainability training for suppliers	1.8
Category strategy and sustainability	2.4	Sustainability reporting from suppliers	1.6
Market research	2.4	Tools for managing sustainability	2.0
Specifying supplier and product/service criteria	2.4	Lower-tier supplier management	2.3
Supplier requirements	2.6	Managing supplier failures	3.1
Supplier selection criteria	2.2	Responding to supplier non-compliance	3.3

From the results we can easily see dimensions which have received high and low maturity levels in relation to the overall maturity level of 2.47. Maturity of dimensions can also be utilized to calculate maturity levels for the five distinct dimension groups. Maturity levels of each group are presented below in fig. 12.

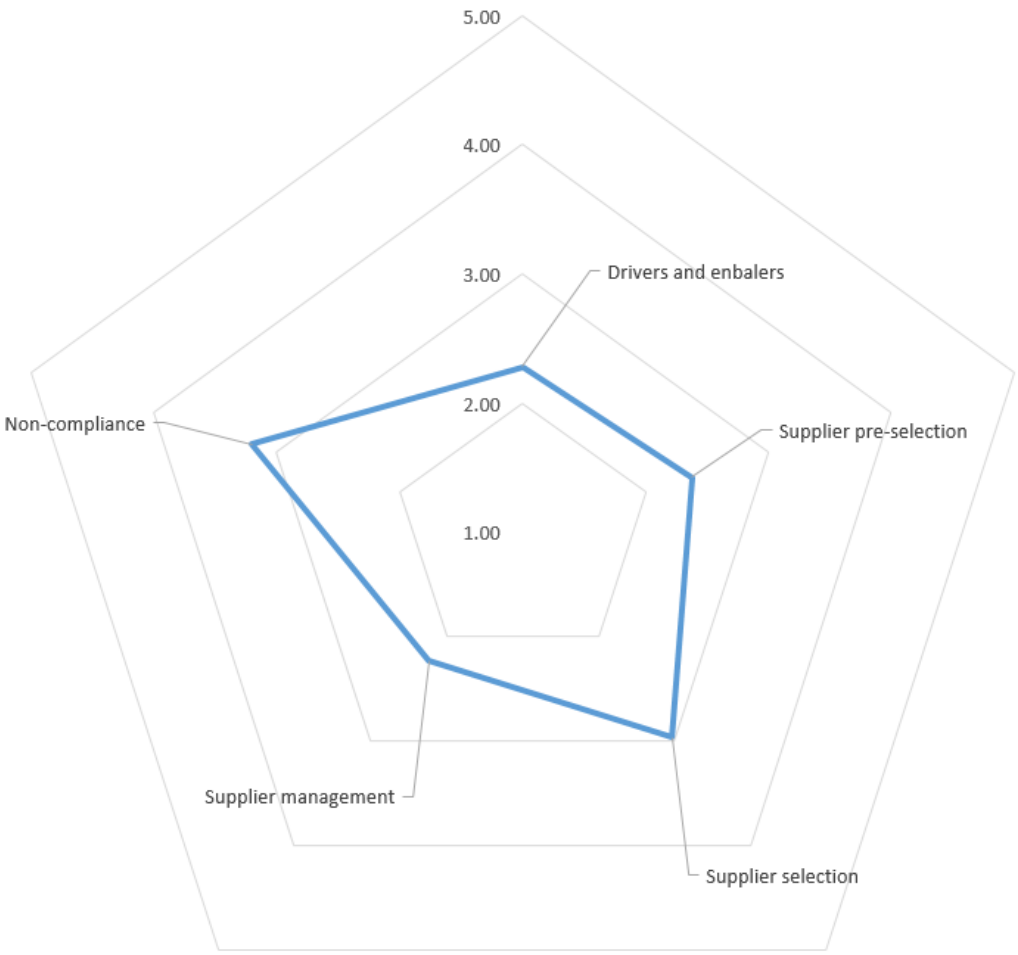


Figure 12 Maturities of each dimension group

The highest maturity was obtained by "non-compliance" which had a maturity of 3.2. The group was the only one that received a maturity level above three. Rest of the groups received following maturities; Selection (2.96), Pre-selection (2.38), Drivers and enablers (2.28) and Supplier management (2.23).

These maturity levels indicate that the procurement function is lacking from perspective of sustainable supplier management, and that there is no adequate drivers and enablers allowing and encouraging procurement professionals to push sustainability forward. Low maturity of drivers and enablers can indicate that the procurement organization does not have necessary expertise and commitment to conduct sustainable procurement. This in turn can explain lower scores in supplier management, as it is ongoing and more complex practice requiring deeper collaboration with supplier than i.e. supplier selection. Also dimensions belonging to supplier pre-selection received on average lower scores than ones in supplier selection.

Some dimensions clearly achieved a maturity level above the overall maturity of 2.47. In total there were nine dimensions that received a maturity level of three or higher. These are presented below in order from highest to lowest:

- Supplier due diligence process (3.5)
- Organization strategy and sustainability (3.4)
- Codes of conduct (3.4)
- Auditing suppliers (3.4)
- Procurement's perception of its impact on sustainability (3.3)
- Responding to supplier non-compliance (3.3)
- Available methods (3.1)
- Managing supplier failures (3.1)
- Tendering process (3.0)

The highest individual maturity level was obtained by Supplier due diligence dimension. The dimension regards whether the procurement conducts due diligence for suppliers in onboarding phase. Maturity level four requires that close to all new suppliers go through due diligence and that there is considerable support from internal experts. From the nine dimensions two belonged to drivers and enablers, four to supplier selection, one to supplier management, and two to addressing non-compliance group. Please see Annex 4. for descriptions of maturity levels in question.

In addition to dimensions receiving high maturities there were multiple dimensions receiving low scores. In total there were eight dimensions that received a maturity below two and one of these dimensions received a maturity level closer to one. Below, in order from lowest to highest, are dimensions that received the lowest maturities:

- Incentivizing supplier sustainability performance (1.3)
- Collaboration regarding sustainability (1.5)
- Perception of sustainability (1.6)
- Sustainability reporting from suppliers (1.6)
- Internal incentives/rewards for sustainability (1.7)
- Offering sustainability training for suppliers (1.8)
- Guidance on sustainability (1.9)
- Dedicated personnel (1.9)

The lowest maturity was received by dimension "Incentivizing supplier sustainability performance". The dimension received a maturity level of 1.3 which indicates that cur-

rently there exists close to no incentives for supplier sustainability. None of the respondents ranked the maturity level above two. The other dimension considering incentives, Internal incentives/rewards for sustainability, was also amongst the lowest ranking dimensions with a maturity level of 1.7. Scientific literature has highlighted the fragmented and difficult nature of sustainability (Miemczyk et al. 2012). Results of the maturity model would suggest that this holds true also in practice as the dimension "Perception of sustainability" received the third lowest maturity. The dimension regarded whether procurement understands sustainability as a combination of environmental, social, and economic factors and is there unified view on sustainability throughout the procurement function and the organization. From the eight lowest scoring dimensions five belonged to drivers and enablers, and three to supplier management group. For managers these results highlight areas which should be focused and improved in future. Especially certain dimensions within groups drivers and enablers, and supplier management, would need to be improved. For precise maturity level descriptions, please see Annex 4.

Comparing the dimension that received the lowest and highest maturity levels highlights interesting factors. When looking at the dimensions with high maturities, we can see that they are fairly simple, straightforward and require little collaboration with suppliers. Factors such as supplier due diligence process, codes of conduct, auditing suppliers, tendering process are all managed within the organization and follow similar protocol regardless of situation. In a way they are nonrecurring tasks meaning that once the process or practice has been created it is done, and using it in practice requires only little input, i.e. after the codes of conduct have been created using them is straightforward. On the other hand, establishing practices linked to supplier management such as sustainability training for suppliers, collaboration regarding sustainability, incentivizing suppliers, and sustainability reporting from suppliers require much deeper collaboration and capabilities. They also require more commitment and expertise from the procurement organization, individual employees, and are ongoing by nature. This means that they require constant work in order to be successful compared to i.e. codes of conduct which can be created and utilized as it is.

It is also interesting to see that a large share of dimensions belonging to the group of drivers and enablers were among the ones to receive lowest maturities. Dimensions perception of sustainability, guidance on sustainability, dedicated personnel, and internal incentives for sustainability all received maturities under 2. These results potentially high-

light the underlying issues why supplier management received so low maturity. Employees are able to conduct nonrecurring straightforward tasks but are not able to implement sustainable practices to supplier management processes due to practical understanding and support being inadequate. Low maturity of internal incentives also speaks for the fact that organization's goals and incentives are not necessarily aligned. If the organization desires to achieve improvements regarding sustainable procurement, its importance should be concretely highlighted through its actions. At least in terms of incentives, this is not currently the case.

5.5.3 Comments received through the questionnaire

In addition to the obtained numeric data, a highly important output from the model was comments from the respondents. In total there were 72 comments written. The comments gave each respondent a possibility to clarify their thoughts, explain the dimension in more detail, and bring forward problems, improvements ideas, and strengths. Multiple respondents brought forward existing codes of conduct and due diligence process which are adopted and widely used. Comments also clarified that absence of sustainability considerations is not necessarily an issue within the organization. However, from the comments it became clear that the definition of sustainability and its meaning in practice are still largely obscured for procurement employees. For example, one respondent wrote, *"Procurement does not have a clear concept and even the definition of sustainability is a bit fuzzy, depending on the category, employee etc. We do a lot of activities under the umbrella of sustainability but that is not very clear for all"*. Another respondent highlighted the absence of common practices, *"Importance is understood, but actions are based on individuals more than a concept"*. For managers these comments give more concrete idea on possible underlying issues which need to be addressed.

Gaining data from single maturity dimensions provides managers a clearer picture of the current situation. In this case, it seems quite clear that the organization has established multiple sustainability related processes and practices that are widely recognized and used throughout the procurement. These include practices such as codes of conduct, supplier auditing, due diligence process, and management of supplier failures. Respondents also seem to understand that procurement function has sustainability impacts and can improve sustainability performance. Linkage between organization's strategy and sustainability also scored high. Even though there are multiple processes in order and sustainability is

recognized as an important subject, it is apparent that sustainability practices can be improved, and a concrete understanding of the term is partly lacking. This is evident from low scores of dimensions such as “Perception of sustainability”, “Guidance on sustainability”, and “Sustainability reporting from suppliers”. Open comments provided valuable information to back up the gained results and explained in more detail current strengths, weaknesses, and obstacles.

5.5.4 Maturity level mean – standard deviation matrix

Utilizing the maturity model more as a questionnaire within an organization provides information on varying perceptions of employees. The extent of differentiating perceptions was measured as standard deviation of provided maturity level estimates. Results of the questionnaire in maturity level mean – standard deviation matrix are provided below in figure 13. In the figure Y-axis represents measured maturity level mean and X-axis the measured standard deviation.

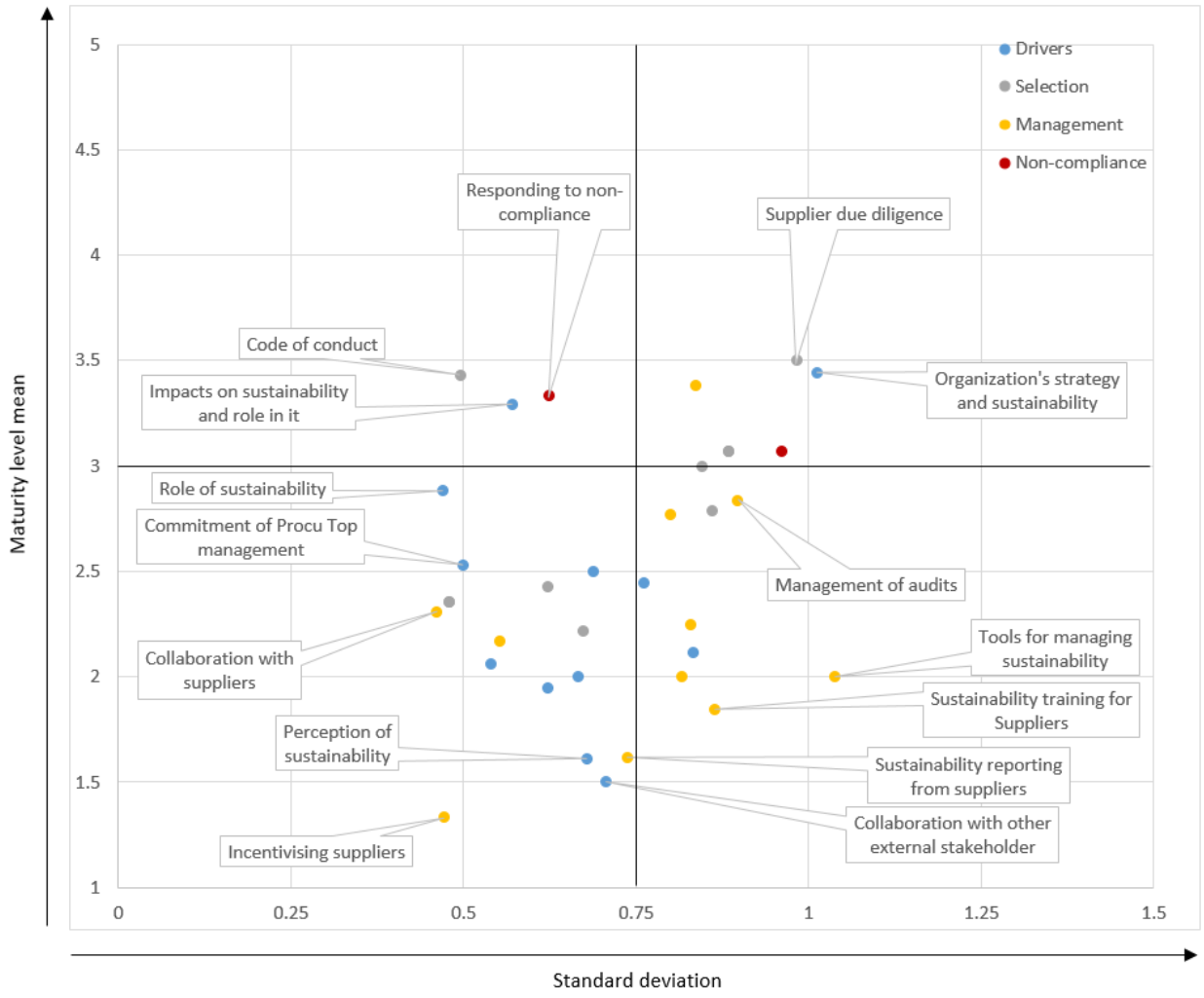


Figure 13 Maturity level mean and deviation matrix

The matrix shows us the difference between dimensions according to measured maturity level and standard deviation of the answers. Standard deviation provides information on how spread out the values are. Low standard deviation implicates that respondents had similar understanding on the level of maturity, while higher deviation means that there are larger differences between individual opinions. Standard deviation of zero would imply that all of the respondents gave that dimensions the same maturity level. The matrix and its results can roughly be divided into four sections:

- Agree that good (low – high)
- Agree that bad (low – low)
- Disagree with exception being good (high – low)
- Disagree with exception being bad (high – high)

Low – high indicates dimensions that possess a good maturity level and are well established throughout the procurement function. This notion is supported by the fact that there is little deviation between the given maturity levels, indicating that employees agree on the good level of maturity. For example, codes of conduct were assessed by 14 respondents of which eight gave a rating of 3 and six rated it has having a maturity level of 4. There were no maturity level estimates under 3. This indicates that all respondents are well aware of the dimensions in question and agree that it is well established. Other dimensions which placed in this group was procurement's impact on sustainability and ability to improve it. The dimension received 17 estimates of which ten stated 3, six stated 5, and one respondent rated it as 2. The responses are coherent which indicates a common understanding between the respondents. Based on this result the procurement organization understands that it has role and impact in sustainability performance but is still unaware how improvements can be achieved and unsure, as an entity, what is meant by sustainability. This is backed up by maturity of perception of sustainability which is 1.6. Low – low section represents dimensions that have a low maturity and have not been addressed in the procurement. Absence, or low maturity, of such dimensions is supported again by the fact that there was little deviation between the answers and the answers resulted in low maturity, i.e. dimension incentivizing supplier sustainability received 12 responses of which eight rated it as having a maturity of 1 and four as 2. This speaks for notion that the dimension is not well implemented anywhere in the procurement organization, as none of the respondents recognized it as being even level 3. The section borders are not precise and differences between high and low maturity and deviation become fuzzy when closing the section limits.

High – low indicates a group of dimensions that received low maturity level accompanied with high standard deviation. This means that majority of respondents rated the maturity low, but some assessed the maturity to be considerably higher, i.e. dimension "Tools for managing sustainability" received six assessment indicating maturity level one, but one respondent placed the maturity to be four. This can result from multitude of reasons and highlights the importance for further investigation, i.e. it is possible that some individual category has perfected certain areas while others have fallen behind.

The last section is high – high which indicates a high maturity level mean with high standard deviation. Majority of respondents regard the maturity level to be high, but few have declared it to be low, i.e. eight respondents estimated the maturity level of "Supplier due diligence" to be four or five, but three placed the maturity level at two. Procurement

should try to understand reasons for this variation, i.e. are there certain employees or categories who are not using existing processes or tools.

The dimensions belonging to the group of drivers and enablers had on average the lowest standard deviation between the answers, while addressing non-compliance and supplier management had the highest. One possible reason for this result is that drivers and enablers, and supplier selection include dimensions that more clearly visible for all employees and handled through common practices while addressing non-compliance and supplier management include dimensions that are more specific to individual categories. Dimensions belonging to supplier management and addressing non-compliance also require in-depth collaboration with suppliers, commitment, and expertise to perform. It can be that due to lack of common practices and knowledge, these dimensions have differentiated more than ones in supplier selection, and drivers and enablers. The organization should study category specific responses giving high maturities for dimensions that have otherwise been overwhelmingly seen as low maturity. In this way organization could map best practices being used in some parts of the organization and try to implement them elsewhere. Respondent from category development and processes rated, i.e. lower-tier supplier management to be 4, despite majority of respondents giving it a maturity level of 2. In the dimension of offering sustainability training for suppliers one respondent from IT category and one respondent from technical services category rated it as 3, while mode of the answers was 1. The organization could dig deeper and try to learn from those employees and categories, which have been able to implement better practices.

When trying to utilize the results it is important to note, that organizations should try to identify the most important dimensions for them. The created general SP MM includes high number of dimensions, and all dimensions are not necessarily relevant for the organization utilizing the model.

6 DISCUSSION AND CONCLUSION

Sustainable procurement is a subject that will grow in importance during the next years. Sustainable performance of organizations is more heavily scrutinized by its stakeholders, and failures in sustainability can result in significant damages (Beske 2012; Akhavan & Beckmann 2017; Hartmann & Moeller 2014; Sancha et al. 2019). At the same time the role of procurement regarding the end result is increasing, as procurement functions as a gatekeeper between the organization and its suppliers (Goebel et al. 2018). Suppliers are not considered as separate entities anymore and stakeholders are holding organizations' more and more responsible for failures at their suppliers' premises (Akhavan & Beckmann 2017; Hartmann & Moeller 2014; Sancha et al. 2019).

Even though the importance of sustainable procurement has become apparent, the function has remained difficult to grasp and implement. Studies (Villena & Gioia 2018; Johnsen et al. 2019; Miemczyk et al. 2012) highlight the fragmented nature of sustainability literature and the abundancy of supply chain management and procurement related sustainability literature. Goebel et al. (2018) bring forward that implementing sustainable procurement practices is a difficult task for organizations. Due to these reasons, more research on sustainable procurement is needed. This study reduced this research gap by building a sustainable procurement maturity model to help organizations guide their sustainable procurement endeavors.

Main target of this study was to create first empirically validated general maturity model for sustainable procurement and prove its potential through real life utilization. In order to fulfill these goals and describe achieved results, this study placed two research questions:

- What are the characteristics of a good sustainable procurement maturity model?
- How does the case company perform in terms of sustainable procurement maturity?

The first question focuses on describing the created model, and its characteristics. The second question was aimed to explain results and potential benefits that can be achieved from utilization of the model. In order to get improved view of the created maturity model, please see Annex 3. (Maturity model before expert validation), and Annex 4. (Finalized maturity model).

6.1 Characteristics of sustainable procurement maturity model

Characteristics of a solid sustainable procurement maturity model start from the creation process. There are multiple methods and principles for maturity model creation from multiple researchers, but it is apparent that certain principles tend to be universal. Firstly, there should always be a solid and rational source of information for the model. Author must be able to quantify why he or she has selected a certain source of information. As pointed out by Maier et al. (2012) in the absence of significant expert knowledge, a best basis for the model is scientific literature. Other highly prevalent themes in literature are study of prior models, iterative nature of creation process, and empirical validation of the model. In addition, selection of goals, defining intended audience, selection of an administrative mechanism, and selection of scope are common across literature (Maier et al. 2012; Becker et al. 2009). It can be argued that due to fragmented and multidimensional nature of sustainable procurement, these principles become even more important for sustainability related maturity models.

The maturity model created in this study is general by nature meaning that it can be utilized by a procurement organization regardless of industry or whether focus is on indirect or direct procurement. The general nature was achieved by creating the model around common procurement steps and processes, such as linear procurement process (Van Weele 2010) and strategic sourcing process (Johnsen et al. 2019), and drivers of sustainable procurement that are universal by nature. Impact and meaning of different drivers and selected dimensions vary between organizations as brought forward by ISO (2017), but the maturity model provides an excellent starting point for future development. The following list summarizes the characteristics of the created maturity model and its utilization:

- Dimensions set according to common procurement steps and enablers
- 5 levels of maturity to integrate procurement and sustainability perspectives
- Logically progressing maturity levels which clearly differ from each other
- Basis for achieving certain level of maturity is standardized
- Descriptive cell texts that are kept short but informative
- Definitions for key terms in utilization
- Comment field for each dimension in utilization
- Validation present throughout the creation process

The created sustainable procurement maturity contains 38 individual dimensions which are allocated to five groups: drivers and enablers of sustainable procurement, pre-selection, supplier selection, supplier management, and non-compliance. These five groups encompass major procurement tasks as well as factors that enable procurement to thrive in them.

The different stages of maturity are presented for each dimension through five maturity levels: non-existent, initial steps taken, common principles and standards, proactive measures, and sustainability leader. These maturity levels have clear linkage to existing maturity levels from sustainable supply chain and procurement maturity models such as Schiele (2007) and Reefke and Sundaram (2018). Most distinctively idea of strong processes rather than dependency on individuals rose from procurement maturity models, and development from non-existent to reactive to proactive from sustainability related maturity models.

The cell texts were created to be informative but summarized. In addition to increasing usability, the nature of cell texts guide organizations on future development. The desired nature of cell texts was obtained through an iterative process, which saw first the creation of wide definitions that were later summarized and shortened.

The meaning of definitions and explanations is to improve usability and credibility of the created maturity model and are important due to fragmented nature of sustainability. Sustainability can be seen, depending on person, as only an environmental or social issue, or as the combination of multiple dimensions. Differences in understanding create misconceptions which in turn create deceptive results. By including, e.g. definition of sustainability in the beginning of the maturity model, the researcher can assure that there is some level of common understanding between respondents.

One important factor contributing to results and benefits of the created maturity model was inclusion of open comment fields. The comment fields provided feedback on the model itself and in-depth information regarding the current state of procurement from the perspective of individual respondents. Through the comments the procurement department was able to construct more precise picture of the current situation and challenges, and set

6.2 Company's performance regarding sustainable procurement maturity

The company received an overall maturity level of 2.47 out of 5. This indicates that the procurement organization is between maturity levels 2 and 3 which are defined as initial

steps taken (2) and common practices and standards in use (3). Numerical results and comments both validated this result, as multiple dimensions were not showing standardized practices, inclusion of all sustainability dimensions, or proactive practices. Dependency on individuals is often considered as a sign of lower maturity in procurement related maturity models, as is lack of proactive measures and inclusion of all sustainability dimensions in sustainability related maturity models. Even though the organization did not receive a high maturity, it is clear that some practices are already being used and sustainability is to some extent considered in procurement activities.

The procurement organization did not have homogeneous maturity through all of the dimension groups. Groups supplier pre-selection, supplier selection, and addressing non-compliance received higher maturities than groups drivers and enablers, and supplier management. Highest maturity was received by addressing non-compliance (3.2), and the lowest by supplier management (2.23). This can also be seen to back up the statement that the organization is not conducting its sustainability processes in proactive manner. Addressing non-compliance occurs when the organization reacts to noted violations, and is thus reactive, while dimensions in supplier management group have a potential to take proactive measures. Low maturities of drivers and enablers and supplier management indicate that procurement should focus them. Firstly, required commitment and expertise should be build through improving drivers and enablers, after which the organization could start to improve its practices under supplier management.

A large share of individual dimensions receiving highest and lowest maturity estimations had certain characteristics. Multitude of dimensions receiving high maturities are practices which can be created within the organization, require little collaboration with suppliers, and are relatively easy to utilize after they have been created, i.e. codes of conduct, tendering process, and supplier due diligence process. On the other hand, majority of dimensions that received lower maturity scores require extensive collaboration with suppliers, management of supplier base, and constant commitment, i.e. sustainability reporting from suppliers, collaboration on sustainability, and sustainability training for suppliers. Compared to i.e. codes of conduct, these are not as straightforward, and their success is not linked to certain point in time, but rather on continuous effort. In addition to supplier management related dimensions, a multitude of dimensions belonging to the group of drivers and enablers received low maturities. Perception of sustainability, guidance on sustainability, internal incentives for sustainability, and dedicated personnel all

received a maturity score below 2. Results of these dimensions can explain why the maturity of supplier management is so low.

The procurement organization benefited from the maturity model in multiple ways. The maturity model improved the procurement organization's understanding on sustainable procurement and sustainability. The model does not provide employees with required capabilities to conduct procurement in sustainable manner, but it emphasized different processes and practices which are included in it, and thus works as a foundation for future improvement. The maturity model also provided a basis for creating plans for development of sustainable procurement in the future. Procurement organization opted to use the model in reoccurring fashion to measure progress against set targets.

6.3 Future research

This study recognized an existing research gap regarding sustainable supply chain and procurement maturity (Reefke et al. 2014; Reefke & Sundaram 2018), and thus contributed to existing scientific literature by creating the first empirically validated sustainable procurement maturity model. In addition to creating the model, this study brought together a vast amount of scientific research from the fields of sustainability and procurement and made them easily accessible and usable for future research. The conducted literature review addressed procurement processes and tasks from enablers to non-compliance and all sustainability dimensions. This contributes to the current scientific literature, as the studies concerning sustainable procurement have previously remained largely fragmented and segregated (Villena & Gioia 2018; Johsen et al 2019; Miemczyk et al 2012).

Even though the study decreased the existing research gap and brought together scientific literature from procurement and sustainability, there is a vast need for future research on sustainable procurement. The future research is needed in part, as there are obvious limitations regarding hereby conducted study. The created maturity model has only been utilized by one organization, and thus analyzing or making conclusions on sustainable procurement in larger scale is not possible. The empirical validation of the model also has its limits. Validation was conducted through a questionnaire and a multi-round interview with a single subject expert and could thus be put through further validation and improved accordingly.

As an empirically validated sustainable procurement maturity model has now been created, future research could turn its focus to broader utilization and result analyzation.

There remains a lot of open questions that if answered could provide valuable contribution for scientific community and practitioners. It has been stated that sustainability in procurement is difficult concept to integrate (Filho et a. 2019), but exactly what are the most difficult aspects? Are there common aspects of sustainable procurement that receive low maturity levels? Are the challenges mainly relating to lack of drivers and enablers, supplier selection, supplier management, addressing non-compliance, or a combination of all of them? The maturity model could be used to conduct maturity assessments for a large group of organizations to shed light on these questions. This study indicates that, procurement has lowest maturity on "Drivers and enablers" and "Supplier management" but cannot in any way confirm this as a commonality between organizations and industries. Equally the maturity model could be used to understand maturity level differences between organizations, industries, and countries and to conduct benchmarking between them. Insight received from studies focused on these questions, could help the scientific community to steer its efforts towards major issues and problems faced by practitioners.

Assessing sustainable procurement maturity also brings up an interesting research topic from the perspective of contingency theory. As pointed out by ISO (2017), the impact and meaning of different sustainability drivers vary between organizations and there is no single ubiquitous driver. This aligns with principles of organizational contingency theory which implies the abundancy of single best way to make decisions, lead an organization, or organize it (Donaldson 2006). In the core of contingency theory is an idea that organizations are different and fit of practices and solutions depend on organization's characteristics. This raises questions regarding the desirable and needed maturity levels for sustainable procurement. Is there certain minimum level of maturity, overall or dimension specific, which is applicable for all organizations? Is there or is there not a need for all organizations to aim for the highest levels of maturity? Answering these kinds of questions would improve our current understanding of sustainable procurement, and its position and role within various organizations.

Future research could also create descriptive models for sustainable procurement. These models could set a narrower scope from procurement process, sustainability dimension, industry, or category perspectives. Maturity models with narrower scope could account individual characteristics of their perspective and set dimensions and cell texts accordingly. Descriptive models would be able to address characteristics of selected area and provide more specified guidance for improvement.

It is predictable that the importance of organization's sustainability will continue to grow in the future. If an organization desires to be truly sustainable, it should make sure that procurement is conducted in a sustainable manner. Procurement is a function that can turn the desire to be sustainable into a reality.

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ANNEX 1

Individual actions	Grouped action	Sub-dimension	Dimensions
	Organization strategy and sustainability	Top level commitment	Drivers and enablers of sustainable procurement
Sustainability integrated into procurement strategy	Procurement strategy and sustainability		
Policies in place concerning sustainability aspects	Procurement policies and sustainability		
Different dimensions of sustainability are grasped Procurement has holistic view on sustainability Awareness of potential benefits and pitfalls of sustainability efforts	Perception of sustainability		
Commitment of top management Support and approval of top management	Commitment of top management		
Reduction of pollution to air, water, and land Minimizing energy/ material consumption through reduce, reuse, recycle Setting long-term sustainability goals Avoidance of corruption Procurement department has other external goals beside cost reduction Carbon footprint and CO2 reduction	Targets/goals incorporate sustainability issues	Functional commitment	
Rewards include sustainability performance Internal incentives for improving sustainability performance	Internal incentives/rewards for sustainability		
Mapping firm's supply network Mapping the supply base in order to understand where risks lie Supply chain mapping and evaluation Supply chain mapping and evaluating Recognizing high sustainability risk categories	Mapping sustainability risks		
Dedicated personnel to extend sustainability to suppliers Having sustainability chief officer and a sustainability executive in the board of directors Assigning unit heads to handle violations/emergencies	Dedicated personnel		
Sustainability is seen as a competitive advantage and priorities are set accordingly Sustainability practices seen as a source of competitive advantage	Role of sustainability in procurement		
Procurement familiar with sustainability standards Clear guidance for employees Supplier management principles Established EHS management principles	Guidance		

Sustainability management in place			
Recruiting employees with sustainability related skills Trying to change the mindset of employees In-house training Sustainability training Education around sustainability practices	Employee training		
Internal collaboration between departments to enhance sustainability Collaboration with government Collaboration and joint development with other stakeholders Collaboration with NGOs Collaboration with key stakeholders Collaboration to deal with suppliers Internal collaboration between staff Working with competitors to handle problems Engaging strategic suppliers and consultants to map the firm's supply network Commitment to develop industry-wide sustainability standards and training Participation in industry initiatives Membership in NGO Collective industry initiatives Leading role in industry organization Organization is participating to the development of industry wide standards Sharing resources with industry partners to achieve sustainability goals for the entire industry	Collaboration regarding sustainability		
Quantification of impacts of SC operations on all sustainability dimensions	Perception of own role and impact on sustainability		
Defining sustainable procurement criteria Supplier diversity Choosing types of sustainability requirements Analyzing organizational needs Finding information to establish requirements Analyzing market	Sustainability integrated into category strategy		Pre-selection
Ranking/Classifying suppliers by risk potential Conducting risk-assessment program Systematic supply chain analysis and supplier classification Mapping firm's supply network Identifying potentially risky lower-tier suppliers and tailoring risk mitigation for them	Market research		

Prequalifying suppliers Setting sustainability criteria in specification stage Suppliers conduct recycling Supplier has processes for waste disposal Supplier has take-back programs Supplier management endorses sustainability policy Supplier involved in recycling Sustainability criteria is designed into the product Setting sustainability criteria in specification stage	Specifying supplier and product/service criteria	
Cost inclusion in selection process Including TCO to supplier selection process Including LCC to supplier selection process	Cost calculation	Supplier selection
Supplier code of conduct Codes of conduct Minimum sustainability codes of conduct	Codes of conduct	
Definition of minimum requirements and standards Applying minimum and optional requirements Minimum sustainability codes of conduct	Supplier requirements	
Managing tenders RFI RFP Sustainability as one of the deciding factors	Tendering process	
Selection criteria disclosed Sustainability as one of the deciding factors	Supplier selection criteria	
Compliance checks for supplier on boarded	Supplier due diligence/compliance process	
Availability of audits and inspections to procurement	Available methods	
Setting and enforcing sustainability expectations in contracts Implementing the contract Revising supplier contracts to include sustainability criteria Compliance and contract term Fair pricing	Sustainability in contracts	
Procurement sets performance targets for suppliers Setting long-term sustainability goals for suppliers	Sustainability goals for suppliers	Supplier management
Supplier rewarding Recognition to suppliers who meet or exceed corporate sustainability goals Recognizing suppliers for cascading sustainability requirements to their suppliers Incentivizing sustainability commitment to suppliers Supplier incentives	Rewarding incentivizing supplier sustainability	
Collaboration and joint development with suppliers	Collaboration with suppliers	

Collaboration with suppliers Supplier involvement in corporate sustainability improvement Supplier involvement in EHS risk and impact reduction Supplier involvement in design Supplier involvement in reduction of commodity use? Supplier involved in improving efficiency Supplier equipment change (maybe incentivizing) Developing sustainability criteria together with supplier Encouraging supplier customer joint initiatives Supplier process change Collaboration on improvement plans Information sharing Online supplier access to sustainability information Technology sharing with suppliers to help improve sustainable outcomes Shared knowledge and assets	
Supplier training and education Supplier development and mentoring Offering sustainability training for suppliers Extensive supplier training Yearly training conferences for suppliers Training from organization or NGO	Offering sustainability training to suppliers
Managing supplier sustainability scorecard Reviewing scorecards periodically Supplier rating system including sustainability issues 3rd party provided scorecards	Sustainability in supplier scorecards
Definition and measurement of clear KPIs KPIs are aligned with overall sustainability Strategy Sustainability KPIs include lower-tier suppliers	KPIs for sustainable performance
Supplier assessment Surveying suppliers on sustainability initiatives Conducting supplier sustainability assessment Supplier annual self-assessment Supplier self-assessment Assessment criteria set accordingly Supplier assessment	Supplier self-assessment
Following up on corrective actions suggested in audits Supplier site visits and audits Supplier audits Supplier assessment and audits Supplier audit program	Auditing suppliers
Supplier provides sustainable performance reporting	Sustainability reporting from suppliers

Supplier can provide sustainability reporting on demand Sustainability reporting		
Performance and measurement tools for consistent and accurate measurement Measurement tool for sustainability compliance monitoring	Tools for managing sustainability	
Sustainability is cascaded to lower-tier suppliers Organization is able to monitor lower-tier suppliers Tier-one supplier are required to cascade sustainability to their suppliers	Lower-tier supplier management	
Follow-up activities Closing on correcting action plans Corrective action plan Formal corrective action plans	Corrective actions plans for non-compliance	Addressing non-compliance
Designing consequences for non-compliance and remediation Penalizing supplier for sustainability non-compliance	Designed consequences for non-compliance	
Managing supplier failure Working with suppliers to address anomalies Documenting and addressing non-conformities	Managing supplier failure	

ANNEX 2

Intention of this questionnaire is to **validate** selected dimensions for sustainable procurement maturity model and bring forward **issues and shortcomings** of current selection.

"Dimensions" column holds measurable dimensions of sustainable procurement maturity model. For each dimension there are a question (column C) and level 1 of maturity: Non-existent (column D). Please **provide your opinion** as Y for "yes" and N for "no", whether the dimension **makes sense** to you from a procurement point of view and is the issue something that you think procurement **can influence**. There is also a possibility to add additional comments regarding each dimension. **Please mark your answers to this sheet document, in green cells**. At the end of the model there are **two additional** questions, please answer those. Please note that "Level 1" of maturity is only meant to give additional information of the dimensions and more levels are to be created later on.

	Dimension	**Question**	**Level 1: *Non-existent***	Does question make sense from the perspective of sustainable procurement?	Can procurement influence the issue?	Additional comment
D1	**Sustainability enablers**					
D1.1	**Top-level commitment**					
	Organization strategy and sustainability	Does organization's strategy integrate issues of sustainability and how important matter sustainability is for the organization from the perspective of competitive advantage?	Sustainability has only small to non-existent role in the organization's strategy. Sustainability is not regarded as an important issue for organization and competitive advantage is gained through other means such as low prices.			
	Procurement strategy and sustainability	Does procurement strategy integrate matters of sustainability? Is sustainability seen as a key part of the success of Procurement?	Procurement strategy doesn't include aspects of sustainability. Sustainability isn't seen as value-adding activity and thus cascading it doesn't start from strategy.			
	Procurement policies and sustainability	Is there existing policies for procurement concerning matters of sustainability? How extensively are different dimension of sustainability are covered?	Procurement doesn't have written policies regarding sustainability, i.e. Green procurement policy or anti-corruption and bribery policy. Concepts and principles for sustainability are left unclear and undefined.			
	Perception of sustainability	How sustainability is perceived and defined in Procurement? Does Procurement have a wide perception of the concept and stakeholders it includes?	Procurement doesn't have a holistic and clearly defined concept for sustainability. Perception of sustainability is fuzzy and changes between categories and employees. There are no common language regarding sustainability.			
	Commitment of top management	How committed top management is to achieve sustainability within procurement? Is top management bringing forward the importance of sustainable practices and actively trying to develop it?	Procurement top management doesn't regard sustainability as an issue concerning the function. Focus is solely on traditional factors such as price, and sustainability efforts are left to responsibility of individual employees. No resources are forwarded towards improving practices, guidelines etc. to improve sustainable performance of Procurement function.			
D1.2	**Functional commitment**					
	Targets/Goals incorporate sustainability issues	Does targets/goals set for Procurement include issues of sustainability? How extensively different dimensions of sustainability are included?	There are no clearly defined sustainability related goals/targets set for Procurement function. Current targets do not include matters of sustainability and as such there are no sustainability related metrics followed.			
	Internal incentivizes/rewards for sustainability	Are employee rewards tied to sustainable performance and are there internal incentives to improve sustainability? Have rewards been tied to individual or function level performance?	Internal rewards are tied to traditional factors such as costs and sustainability related incentives/rewards are not incorporated.			
	Mapping sustainability risks	Does Procurement map its sustainability risks associated with countries, categories, and suppliers? Is there a comprehensive sustainability risk portfolio which is kept up-to-date on ongoing basis?	Procurement hasn't mapped, and hence, isn't aware of different sustainability risks associated with its categories and countries of origin. There hasn't been any systematic study of sustainability risks, and current understanding is based on hunch.			

	Dedicated personnel	Does Procurement have employees dedicated to improve sustainability within the function?	There isn't dedicated personnel to assist Procurement at sustainability related issues. Procurement itself doesn't have employees whose main responsibility is to watch over and develop sustainability, and cascade sustainability to suppliers.			
	Role of sustainability in Procurement	How sustainability's role is seen in Procurement? Is sustainability perceived as irrelevant factor or value-adding activity in core of the function?	Sustainability is separate and irrelevant issue for procurement. Perception is that sustainability exists outside of Procurement function and is managed elsewhere.			
	Guidance	Does organization provide guidance on sustainability practices and principles to procurement professionals, and how extensively different aspects are addressed?	Procurement doesn't have guidance on sustainability issues for procurement professionals. If employee is interested in sustainable practices, he/she has to solely rely on self-learning.			
	Employee training	Does organization provide training regarding matters of sustainability? How extensive and inclusive offered training is?	Organization doesn't provide training on sustainability and overall principles and concepts of sustainability are not covered by training programs. Learning of sustainability is left to individual employees and peer-to-peer learning is not advocated.			
	Collaboration regarding sustainability	Does Procurement collaborate with external stakeholders (non-suppliers) to improve sustainability performance? How extensive the collaboration is and what is Procurement's role in it?	Procurement is not searching or aware of possible external stakeholders, i.e. NGOs or industry organizations, with whom it could collaborate in order to improve sustainable performance. Procurement isn't taking part in any external collaborative action and doesn't regard collaboration as a potentially beneficial endeavor.			
	Perception of own role and impact on sustainability (social, environmental and economic)	How Procurement sees its own role as influencer on sustainability issues? Does Procurement understand impacts of its actions and possibilities to contribute to sustainable development?	Procurement doesn't consider itself as a contributor to sustainability issues and doesn't think it can have an impact on the sustainable performance of the organization. Procurement hasn't created a view of its impact on various sustainability related issues and ways in which it could affect those.			
D2	**Pre-selection**					
	Sustainability integrated into category strategy	How deeply sustainability issues are integrated into category strategies and to the creation process?	Sustainability issues aren't integrated into individual category strategies and as such most relevant sustainability issues aren't assessed during development of the strategy. Strategy is reactive by nature towards sustainability issues and no proactive measures are taken.			
	Market research	Does market research (prior tendering) also cover sustainability perspective? Is market research used to bring forward most relevant sustainability issues and utilized in the development of supplier/product criteria? Is Procurement able to identify its role and influence on individual market basis through, i.e market engagement matrix?	Market research is conducted but sustainability isn't covered. Major sustainability risks aren't brought forward or considered as input for later selection/ qualification criteria.			
	Specifying supplier and product/service criteria	Are sustainability issues integrated to the process of specifying supplier criteria and considered beside traditional criteria such as delivery time? Does Procurement utilize expertise of internal stakeholders in specifying?	Sustainability issues and considerations aren't used in specifying stage. Procurement doesn't place any minimum sustainability requirements for supplier and products/services entering tendering process.			
D3	**Supplier Selection**					
	Cost calculation	When comparing and assessing prices is Procurement only counting immediate costs or has it incorporated more comprehensive costing models of TCO or LCC? Does Procurement have an understanding of costs cumulating throughout products life-cycle?	Procurement is only considering immediate costs, such as unit prices, and it doesn't have an understanding of broader cost concepts or accumulation of costs through life-cycle. Procurement isn't considering costs through concepts such as of TCO or LCC.			
	Codes of conduct	Does Procurement have codes of conduct for its suppliers? How extensive and inclusive the used code is and to what extent it is required from suppliers? In the development phase has internal or external stakeholder expertise utilized?	Procurement doesn't have code of conduct for its suppliers.			
	Supplier requirements	Does procurement utilize minimum requirements that supplier and its product/service has to fulfill in order to be eligible for RFP? In addition to minimum requirements, has Procurement created a level of good and preferred performance regarding	Sustainability issues aren't integrated to minimum supplier requirements. Organization isn't aware of most influential/ high-risk issues that should be mitigated through imposing minimum requirements.			

		such sustainability issues? Is Procurement utilizing processes, i.e. RFI, in order to attain needed information in high-risk cases?				
	Tendering process	Does Procurement have well defined tendering process addressing and mitigating possible sustainability issues, such as bribery and unfair competition?	How to conduct tendering process is left to judgement of individual employees, and no guidelines or minimum standards for the process is defined.			
	Supplier selection criteria	How often and extensively are sustainability issues integrated to supplier selection criteria as one of the decisive factors? Is selected criteria based on systematic reasoning, i.e. most probable/high-impact sustainability issue?	Decisive selection criteria almost never includes sustainability issues. Guidelines for inclusion of such issues are not provided and integration of sustainability issues is completely left on individual employees who rarely incorporate them.			
	Supplier due diligence process	Is supplier due diligence or background checks conducted as part of supplier onboarding? Are there guidelines and limits for conducting such processes?	Procurement doesn't have formal due diligence or background checks in place for suppliers in onboarding phase. As a result Procurement's awareness on potential sustainability conflicts with suppliers, i.e criminal conviction, is low.			
	Available methods	Does Procurement have an access to effective methods for assuring supplier claims and qualifications in selection phase, i.e auditing or third party reports?	Procurement doesn't have methods available to them to assure claims and qualifications in selection phase. Practices such as auditing are only available as reactive measures when non-compliance or failures are noticed.			
	Sustainability in contracts	Is Procurement able to include sustainability clauses to contracts? Are there common templates including sustainability issues?	Contracts do not include matters of sustainability and suppliers are not contractually bind to comply with sustainability requirements.			
D4	**Supplier management**					
	Sustainability goals for suppliers	Does organization place sustainability related goals/targets for its suppliers? Are goals designed together with supplier and stakeholders, and aligned with industry/supplier relevant issues?	Procurement doesn't address possibility of sustainable development targets/goals with suppliers, and no targets are set. Partly as a result, following up on the development of supplier sustainability performance is minimal.			
	Rewarding/Incentivizing supplier sustainability performance	Does organization reward suppliers who exceed expectations for sustainable performance?	Procurement doesn't have any kind of rewards for outstanding sustainable performance. There are no incentives for suppliers to improve sustainable performance and exceed sustainability requirements.			
	Collaboration with suppliers	Does Procurement collaborate with supplier in order to enhance sustainability in the supply network?	Procurement's collaboration with supplier is minimal and doesn't include aspect of sustainability development. Sustainability issues aren't discussed, brought forward or addressed as part of the relationship management.			
	Offering sustainability training for suppliers	Does Procurement provide or make available sustainability training to suppliers? How extensive the offered training is?	Procurement doesn't offer or make available sustainability related training to suppliers, i.e through own or industry organization training.			
	Sustainability in supplier scorecards	Does supplier scorecards include sustainability issues? Are there clear, measurable and systematic approach for including sustainability metrics?	Supplier scorecards don't integrate issues of sustainability. Focus is solely on traditional factors such as cost, quality and on-time delivery.			
	KPIs for sustainable performance	Has Procurement developed sustainability KPIs to be measured for its suppliers? Are KPIs derived from clear measurable data points?	Procurement hasn't developed KPIs to measure any aspect of supplier sustainability performance. Procurement doesn't either have the data or willingness to construct such KPIs.			
	Supplier self-assessment	Does Procurement have a self-assessment questionnaire for suppliers including sustainability issues?	Procurement doesn't have self-assessment questionnaire for suppliers which includes sustainability issues (environmental, social, economic),			
	Auditing suppliers	Does organization conduct supplier audits?	Procurement doesn't utilize audits to confirm supplier compliance and performance regarding sustainability issues/requirements, i.e. health and safety, decent wage, and waste management			
	Sustainability reporting from suppliers	Is Procurement able to attain sustainability reporting from suppliers? Is Procurement able to utilize obtained data?	Procurement hasn't built relationships/collaboration with suppliers which includes suppliers reporting on their sustainability.			

	Tools for managing sustainability	Does organization have systems to assist Procurement professionals in sustainable supplier management? Is relevant and needed data easily attainable and understandable?	Procurement professionals don't have tools/systems to help them managing sustainability and existing systems aren't well equipped to handle sustainability issues.			
	Lower-tier supplier management	Is Procurement able to manage sustainable performance of its lower-tier suppliers? Through which methods and how extensively is this management conducted?	Procurement doesn't have visibility of sustainable performance beyond first-tier suppliers. There have been no efforts to influence sustainability of lower-tier suppliers and Procurement doesn't consider that as its responsibility. First-tier supplier are not required to cascade sustainability requirements to their suppliers.			
D5	**Addressing non-compliance**					
	Corrective action plans for non-compliance	Does Procurement take corrective actions in case of supplier non-compliance? Are there processes in place to tackle occurred non-compliance and how swiftly Procurement is able to respond?	Supplier failures and non-compliance regarding sustainability issues doesn't result in corrective actions, except in most extreme cases where issues are becoming public. There are no clear processes for responding to non-compliance and employees are often left unsure regarding right course of actions.			
	Designed consequences for non-compliance	Has Procurement defined/designed consequences for supplier non-compliance?	There aren't guidelines or standards regarding consequences for non-compliance. Also there aren't penalties set in contracts for sustainability related non-compliance.			
	Managing supplier failures	How Procurement responds to supplier failures regarding matters of sustainability? Does Procurement have principles/guidelines when to opt for supplier development and collaboration or i.e termination of relationship?	Procurement doesn't have clear principles or guidelines for managing supplier failures. Managing failures is left to individual employees and actions taken are heterogeneous even in similar cases. Failures do not result in increased collaboration or efforts to improve supplier sustainability performance.			

ANNEX 3

Sustainability in Procurement means accounting environmental, social and governance dimensions while still achieving good economic performance. **Environmental dimension** refers to factors impacting nature, i.e emissions, waste management, energy consumption, deforestation and incidents having environmental impacts. **Social dimension** refers to human aspect, i.e work conditions, fair pay, health and safety and discrimination. **Governance dimension** refers to factors such as anti-corruption and bribery.

	Dimensions	Question	Level 1 Non-existant Procurement is unaware of sustainable practices and there are no sustainability efforts.	Level 2 Ad-hoc, reactive and dependent on individuals, but initial steps taken Procurement has created awareness regarding sustainability and introduced some sustainability initiatives.	Level 3 Common princeples, clear emphasis on sustainability of procurement Sustainability principles, processes, practices are starting to be aligned and consistent throughout Procurement. Holistic view on sustainability.	Level 4 Pro-active measures in place, sustainability as a key part of procurement From compliance to proactive sustainability effots.	Level 5 Sustainability leader Continious development, best practices implemented and sustainability in the heart of operations.	Assigned level (Please refer as value from 1 to 5)	Issue is something that the respondent can influence (Y/N)?	Additional comment (Should the texts be modified, additional comment on maturity)
D1	**Sustainability enablers**									
D1.1	**Top-level commitment**									
	Organization strategy and sustainability	How Organization's strategy considers sustainability?	Sustainability has only small to non-existant role in the Organization's strategy.	Sustainability has limited role in Organization's strategy, and focus is on compliance. Strategy has reactive approach to sustainability.	Sustainability is an important part of strategy and addressed in holistic manner. Strategy doesn't consider sustainability only in reactive means, as it includes some long-term sustainability ambitions.	Sustainability is key element of the strategy, which aims to proactively develop sustainability throughout Organization. Sustainability is seen as value-adding factor and Organization wants to distinguish itself based sustainability.	Organization and sustainability are one. Sustainability is integral in Organization's strategy, which emphasises continuous development and sets ambitious goals for sustainability. Organization strives to be leader in sustainability and regards it as major source of competitive advantage.			
	Procurement strategy and sustainability	How Procurement strategy considers sustainability?	Sustainability has only small to non-existant role in the Procurement strategy.	Sustainability has limited role in Organization's strategy, and focus is on compliance. Strategy has reactive approach to sustainability.	Sustainability is an important part of strategy, and addressed in holistic manner. Strategy doesn't consider sustainability only in reactive means, as it includes some long-term sustainability aspirations.	Sustainability is key element of the strategy, which aims to proactively develop sustainability throughout Organization. Sustainability is seen as value-adding factor.	Procurement desires to be the driver of sustainability within Organization. Sustainability and its improvement are central for the strategy. Strategy considers sustainablility as major value-adding factor, emphasizes ongoing development and sets ambitious goals for future.			
	Procurement policies and sustainability	How Procurement policies consider sustainability?	Procurement doesn't have written policies regarding sustainability, i.e. Green or sustainable procurement policy.	There isn't separate policy for sustainability, but its adressed in overall Procurement policy. Policy focuses on compliance.	Sustainable procurement policy exists and its has holistic view on sustainability. Comprehensive view on principles, but focus still on compliance. Policy is well known in Procurement.	Includes principles of proactive sustainability improvement, and is publicly published. Also internal stakeholders are well aware of the policy and regard it important.	Sustainbility Policy emphasises things such as continuous development and valuing sustainability over certain monetary values. Policy covers at least three sustainability dimensions and was developed together with relevant stakeholders.			
	Perception of sustainability	How sustainability is perceived and defined in Procurement?	Procurement doesn't have a clearly defined concept for sustainability, and it changes significantly between categories and employees.	Sustainability is mainly perceived as one dimension, i.e environment.	Sustainability is defined through two dimensions, i.e environment and social. Procurement employees have unified view, but view of internal stakeholders may differ.	Sustainability is defined through three dimensions: environment, social, and economic. Procurement and relevant internal stakeholders have unified view.	Sustainability is definied through three or more dimensions, i.e also governance. Whole Organization has unified view on sustainability.			
	Commitment of Procurement top management	How committed Procurement top management on achieving sustainability?	Procurement top management doesn't regard sustainability as an issue concerning the function.	Top management understands that sustainability is linked to procurement, but considers it only as a minor factor. Minimal resources, i.e employees' time, incentives, and projects, are assigned to sustainability.	Top management considers sustainability as an important factor, highlights this to employees and assigns resources moderately.	Top management drives sustainability in Procurement and emphasizes it as a key issue. It Aims to proactively develop sustainability, assigns considerable resources to its improvement, and requires regular updates on sustainability performance.	Procurement top management includes person responsible for sustainable procurement and its improvement. Top management gives their mandate to prioritize sustainability over other factors, such as costs, when its reasonable.			
D1.2	**Functional commitment**									
	Role of sustainability in Procurement	How sustainability's role and impact are seen in Procurement?	Sustainability is separate and irrelevant issue, which is seen to exists outside of Procurement.	Procurement sees that sustainability is related to its processes through regulation, and has only a minor role.	Sustainability has a important role in Procurement in the form of compliance with regulation and norms.	Sustainability has a key role in Procurement and it's seen as value-adding activity. There is a lot of emphasis on sustainability and a unanimous view of its role accross Procurement.	Sustainability is a core element of Procurement, its improvement is major value-adding activity, and it has a priority role in planning and implementing processes. Same role among relevant stakeholders.			
	Procurement's perception of itsimpact on sustainability and role in sustainable development.	How Procurement understands its impacts on sustainability and role in sustainability development?	Procurement doesn't consider itself as a contributor to sustainability issues or having an ability to improve sustainability of the Organization.	Procurement sees that it impacts certain sustainability dimension, i.e social, butisn't sure whether it can mitigate the negative impacts.	Procurement understands that it impacts all sustainability dimensions, but doesn't consider itself as a main contributor. Procurement sees that it has a role in assuring compliance.	Procurement sees itself having large impact on sustainability and significant role in improving sustainability through its processes, i.e supplier management. Procurement understands that it can proactively improve sustainability of whole Organization.	Procurement sees itself as a driver of sustainability improvement within the Organization, and has a comprehensive view of its impact on specific sustainability issues.			
	Mapping sustainability risks	How Procurement maps its risks related to sustainability?	Procurement doesn't map its risks related to sustainability in any level. Current understanding is based on hunch.	There isn't a standardized practice of mapping risks, but individual employees/categories conduct some sustainability risk mapping. Basic understanding of most influental risks on one level, i.e category.	Sustainability risk mapping is standard practice and Procurement is aware of most influental risks on two levels, i.e category and country. All dimensions are accounted, results are well documented and made available to Procurement professionals.	Also aware of moderate risks on two levels. Sustainability risks are mapped pre-emptively, i.e prior to new product or country, and future changes in risk portfolio are estimated. Procurement also knows how risks would effect the Organization.	Sustainability risk mapping is done at least on three levels, i.e category, country and supplier. Procurement has also been able to map sustainability risks lying upstream in the network, i.e lower-tier supplier risks. Risks are mapped ongoingly, and all relevant stakeholders are aware of them.			
	Guidance on sustainability	Is there guidance on sustainability to Procurement professionals?	Procurement doesn't provide guidance on sustainability issues. Employees rely on self-learning and searching for information.	Procurement has created some guidelines on basic sustainability principles, such as anti-corruption or supplier onboarding. Guidance on practical implementation is still scarce.	There are more comprehensive sustainbility guidance for employees. Guidelines are well documented, advocated andinclude most of the processes, i.e integrating sustainability criteria into supplier selection.	Responsibility on guidances and their development is clear, and they're also well known by relevant stakeholders. Compliance regarding set guidelines is followed, and defections are managed.	Extensive guidance regarding sustainability issues,all relevant aspects are addressed, and there are no uncertainties. Employees are able to bring forward issues in guidance, which are fixed, improved and developed as soon as possible.			
	Employee training	Does Organization provide training regarding matters of sustainability?	Procurement doesn't provide training on sustainability to its employees.	Training on sustainability is provided as self-learning for new employees. Covers basics and focus is on compliance.	Self-learning for new employees and periodically for existing ones. Training also through additional channel, i.e presentations. All Procurement professionals are required to accomplish.	Training periodically at least through three channels, i.e self-learning, presentations and workshops. More in-depth training provided, which aims to enhance employees' capabilities to proactively develop sustainability. Results are followed and training developed on ongoing basis.	Sustainability training is also provided ongoingly to relevant internal stakeholders, and made mandatory up to a certain point. Results are followed, utilized and discussed, and employees are able to request training on certain issues.			
	Targets/Goals incorporate sustainability issues	Are there targets/goals for Sustainable performance?	There are no sustainability related goals/targets for Procurement function, i.e safety, emissions or supplier certificates.	One or two sustainability related targets, which are minimal in importance. They aren't clearly communicated, followed and don't necessary align with business objectives.	A group of well established sustainability goals/ targets, which are aligned with Organization's objectives and most influental sustainability risks. Targets are clearly defined and there is a systematic approach on following them.	Sustainability goals/targets are implemented for two levels, i.e Procurement and individual targets and they are highly valued. Targets include multiple sustainability dimensions and are followed on ongoing basis.	Implemented for three or more levels, i.e Procurement, individuals and categories, and very highly valued. Goals include short, mid, and long-term targets, i.e monthly rewards for sustainability efforts.			
	Internal incentivizes/rewards for sustainability	Is sustainability improvement incentivized in Procurement?	There are no rewards/incentives concerning sustainable performance.	There are no separate rewards for sustainability, but sustainability performance has a minor part in reward criteria.	Overall reward criteria considers multiple dimensions of sustainability performance and gives it a large value. Incentives are still distant from every day work of employees.	Also more practical incentives, which are relatable and linked to employee's job description. Employees feel that they can improve sustainability and gain rewards through their own work. Sustainable performance forms a major part of overall reward criteria.	Improvements in sustainability are also ongoingly noticed by small rewards. Incentives and rewards have clear link to proactive development of sustainability performance.			

	Dedicated personnel	Are the dedicated employees for sustainability in Procurement?	There isn't dedicated employee taking care of sustainability in Procurement or in Organization.	There isn't dedicated employee in Procurement, but there are dedicated internal stakeholders. Their time is limited and expertise aren't necessary aligned with procurement specific sustainability needs.	Employee responsible of sustainability within Procurement, but sustainability isn't his/her sole responsibility. Focus is on large scale issues, i.e policy and guideline creation.	Dedicated employee whose sole responsibility is to work on sustainability, i.e develop, monitor, help Procurement professionals and cascade sustainability to suppliers.	Procurement has a sustainability team consisting of multiple dedicated employees. They have clear roles and responsibilities, which together include the whole procurement life-cycle, and all aspects of sustainability. They take responsibility and maintain relevant data bases.			
	Collaboration regarding sustainability	Does Procurement collaborate with external stakeholders (non-suppliers) to improve sustainability performance?	Procurement isn't collaborating with any external stakeholder regarding sustainability, i.e NGO or industry organization.	Procurement collaborates with one external stakeholder, i.e NGO, regarding sustainability. Collaboration is irregular.	Procurement is in active collaboration with one or two external stakeholders, i.e NGO or Industry organization. Periodical collaboration and Procurement is able to gain benefits from the it.	In addition to NGOs and industry organizations, there is collaboration with other firms to communicate failures and non-compliance of common suppliers, i.e sharing audit results. There are clear responsibilities regarding external collaboration.	Collaboration with competitors to share sustainability failures of common suppliers. Organization has a central role in or is a founder of, i.e industry organization and drives improvement of sustainability throughout the industry.			
D2	**Pre-selection**									
	Category strategy and sustainability	How individual category strategies consider sustainability?	Sustainability considerations aren't included into category strategies	Sustainability has limited role in category strategies, and only some consider it. Strategies have a reactive approach on sustainability.	Sustainability is important part of category strategies, and majority consider it. Strategies distinguish most influental sustainability risks, and create some action points for mitigation.	Sustainability is a key element and integrated into all category strategies. Strategies highlight most important issues, and establish clear proactive goals for sustainability.	Category strategies see sustainability as value-adding factor, and they include a range of considerations, i.e risks, actions, ambitious goals and expected benefits. Included sustainability issues are validated with internal sustainability experts.			
	Market research	Does market research (prior tendering) cover sustainability perspective?	Market research doesn't consider sustainability issues.	In some cases sustainability issues are included, but this isn't a common principle. Sustainability is clearly a minor detail.	Clear practice of including sustainability factors to market research, and two or more dimensions are considered. Aim is to mitigate noted issues in later processes.	Three or more dimensions, i.e environment, social, governance, are considered, and internal experts are helping to validate findings. Considerable effort to bring sustainability issues forward, and information is comprehensively used in future, i.e RFI.	Sustainability is strandardized part of every market research, and Procuremen proactively researches its possibilities to influence sustainability with market engagement matrix.			
	Specifying supplier and product/service criteria	Is sustainability integrated to the process of specifying supplier and product/service criteria?	Sustainability isn't part of specification and there isn't consideration what capabilities suppliers should have. i.e commitment to environmental protection and health and safety management.	Sometimes sustainability is included in specification, but this is dependent on individual employees. Specifications tends to consider individual sustainability dimensions, i.e social.	Clear principle of integrating sustainability into specification, and at least two dimensions considered. Majority of specifications consider current supplier actions.	Specifications also proactively consider capabilities for future development, i.e willingess to disclose sustainability performance and collaborate on sustainability. Specification is objectively based on Organizational objectives and market research.	Specification considers three or more sustainability dimensions, and is always done with internal experts. Specification criteria is utilized on ongoing basis later on and received goods, services and actions of suppliers are compared to set criteria.			
D3	**Supplier Selection**									
	Supplier requirements	Is there minimum sustainability requirements that supplier has to fullfill in order to be eligible for RFP?	Sustainability issues aren't integrated to minimum supplier requirements, and there are no defined go no-go determinents.	Some broad minimum requirements relating to regulation, i.e no child labor. These are asked and considered on yes/no basis.	In addition, some tenders include specific minimum requirements as go no-go criteria, i.e max age of truck fleet. Minimum limit is agreed prior to RFQ and supplier must pass in order to be eligible for selection.	In majority of tenders there are category specific go no-go sustainability criteria, which are developed together with relevant stakeholders. There are also defined limits for good and preferred performance.	Category specific go no-go criteria are in place for every tender. Suppliers are informed if they do not meet requirements and explained what needs to be done in order to be eligible next time. This is to promote sustainability and improve whole industry.			
	Supplier selection criteria	How often and extensively are sustainability issues integrated to supplier selection criteria?	0% to 20% of supplier selections include sustainable selection criteria. Inclusion is dependent on individual employees.	21% to 40% include sustainable selection criteria, but it's often regarding one sustainability dimension, i.e social. Inclusion of sustainability criteria is little unclear to employees.	41 % to 60% include sustainability criteria, which accounts at least two most relevant dimensions, i. e environment and governance. Inclusion of sustainability criteria is a clear practice for employees.	61% to 80% include sustainability criteria, which is based on objective information, i.e market research. Procurement knows most critical sustainability risks for each category, and selects criteria to match.	81% to 100% include sustainable selection criteria, which forms at least 20% of the finals score, and is used as deciding factor in cases of tie. Selection criteria includes at least three dimensions, but prioritizes most influental sustainability aspects.			
	Codes of conduct	Does Procurement have codes of conduct for its suppliers?	Procurement doesn't have codes of conduct for its suppliers.	Created codes of conduct are linked to compliance with regulation. Suppliers are made aware of codes of conduct, but codes aren't enforced.	Codes of conduct impose clear minimum requirements from regulation and ethical behaviour perspectives. Accepting codes is mandatory, and most of suppliers have done so. Issues under the codes are explained throughly.	Codes go beyond regulation and require suppliers to comply with Organization's own higher standards. Created with relevant stakeholders, consider all sustainability dimensions and demand suppliers to cascade requirements forward.	Codes also set requirements for enabling factors, i.e willingness to cooperate and information sharing. Suppliers' compliance with codes is monitored, and non-compliance always leads to actions. Procurement periodically benchmarks its codes and makes improvements if needed.			
	Available methods	Does Procurement have an access to effective methods for assuring supplier claims and qualifications in selection phase, i.e auditing or third party reports?	Procurement doesn't have methods for assuring suppliers' claims and qualifications in selection phase.	No official methods, but suppliers are looked through online search. Audits might be rarely used, but getting a permit to conduct an audit is complicated.	Clear mandate to use audits for confirming claims and qualifications of most riskiest suppliers. Also some defined processes for assuring supplier qualifications, i.e due diligence process. These methods are primarly used only for high risk suppliers.	Resources assigned to methods for pre-emptively assuring supplier qualification. Multiple methods for assuring claims, and clear guidelines when they are used, i.e due diligence for all, and auditing for high risk.	Only conducts business with sustainable suppliers and has the tools/methods to make this goal possible. Comprehensive "tool kit" to verify supplier's claims on sustainability: audits for majority of new long-term suppliers, comprehensive due diligence process, questionnaires etc.			
	Supplier due diligence process	Is supplier due diligence or background checks conducted as part of supplier onboarding?	No formal due diligence or background checks in place new suppliers. Large dependency on individuals and low awareness on potential sustainability conflicts, i.e criminal conviction.	Due diligence process established, but only suppliers in certain categories go through it. Process is unclear and its impact is largely dependent on employee's motivation and understanding.	Most new suppliers go through due diligence. Standardized process, which is clear for employees, and thus not reliant on individual employees.	Majority of new suppliers, 67% to 99%, go through due diligence. Process is precisely defined, and responsibility is on internal experts who confirm the quality of the process. All relevant issues are checked and statements, i.e no-go decisions, are listened.	100% of new suppliers go through due diligence. All internal stakeholders are working according to due diligence process and its suggestions. Results are saved and easily attainable later on.			
	Tendering process	Does Procurement have well defined tendering process addressing and mitigating possible sustainability issues?	There is no standardized tendering process. Tendering is left to judgement of individual employees.	Some fundamental principles set, i.e anti-corruption and competitive tendering. There are still no standardized process and tender quality varies between individuals. Following compliance with set principles is lacking.	Unified tendering process, which mitigates multiple risks under governance dimension, i.e bribery, unfair competition. Nearly all tenders are conducted according to defined process and principles. Compliance is monitored and problems are addressed immediately.	Tendering process mitigates risks at least in two sustainability dimensions, i.e governance and social. All Procurement professionals and relevant internal stakeholders are aware of the process and comply with it. Procurement actively educates on the process and follows how its complied.	Tendering process has been created with relevant internal stakeholders, and its continuously developed. Also all internal stakeholders are well aware of the process and working according to it. Even minor deviations require a top management mandate and all noticed non-compliance is immediately addressed.			
	Cost calculation	What kind of cost calculation Procurement utilizes when choosing products and services?	Procurement is only considering immediate costs, such as unit prices, and it doesn't have an understanding of broader cost concepts or cumulation of costs through life-cycle.	Some sourcing decisions are made using TCO (total cost of ownership) meaning that costs such as costs of use and end of life costs are accounted.	Most sourcing decisions are made using TCO.	All sourcing decision are made atleast using TCO and some utilize LCC. As part of LCC, Procurement is accounting costs of risks, benefits of opportunities, and costs of monetizable environmental and social externalities, i.e job creation or job loss.	Moved beyond TCO and accounting entire life-cycle costs (LCC) for majority of products and services. LCC supported by documents from tender participants and method of LCC calculation is based on the provided data.			
	Sustainability in contracts	Is Procurement inncluding sustainability clauses incontracts?	Contracts do not include matters of sustainability.	Some contracts have sustainability clauses, but principles regarding when and how to add these are unclear. Big variations in integration of sustainability in contracts between, and even within, categories.	Clearly defined principles for sustainability clauses, which are included in most riskiest categories. Little variation in sustainability between contracts of same category's suppliers.	Strive to include sustainability clauses in all contracts, which are aligning with most influental sustainability issues and Organization's objectives. Contracts give Procurement a clear mandate to take actions in cases of sustainability related non-compliance.	Sustainability clauses are a part of standard contract templates. If Procurement can't utilize standard templates, it assures sustainability clauses are included. Contracts are used to legitimize sustainable development, practices and objectives.			
D4	**Supplier management**									

	Collaboration with suppliers	Does Procurement collaborate with supplier in order to enhance sustainability?	Collaboration with suppliers doesn't include aspects of sustainability development.	Sustainability is minor concern in collaboration and only occasionally brought forward. Aim is to confirm compliance and inform supplier on sustainability issues.	Sustainability is clear part of collaboration with suppliers. Sustainability related topics and performance are always discussed, but emphasis is still on compliance.	Active collaboration on sustainability with majority of long-term suppliers. Besides compliance, a clear drive to proactive sustainability development. Communication works both ways and suppliers are able shed light on problems in buyer's practices regarding sustainability.	Extensive collaboration on sustainability issues. Procurement doesn't only provide guidance, but also conducts projects with suppliers. Collaboration addresses proactive improvement of sustainability throughout whole supply network.			
	Supplier self-assessment	Is there a self-assessment questionnaire for suppliers including sustainability issues?	Procurement doesn't have self-assessment questionnaire which includes sustainability dimensions, i.e environment and social.	Self-assessment questionnaire isn't specific to sustainbility, and all dimensions aren't included. Approximately0% to 25% of suppliers have answered to the questionnaire.	Separate self-assessment questionnaire for sustainability or all dimensions addressed in common questionnaire. At least 26% to 50% of suppliers have answered the questionnaire, and results are utilized. Suppliers answer prior to operations.	Comprehensive self-assessment questionnaire for sustainability issues, which addresses at least three sustainability dimensions and was developed with internal stakeholders. At least 51% to 75% of suppliers have answered, and answers are comprehensively utilized, i.e follow supplier development or form KPIs.	76% to 100% of suppliers answer self-assessment questionnaire prior starting and afterwards on periodical basis, i.e annually. Self-assessment scores are well documented and utilized in supplier management, i.e scores are turned to supplier KPI and used to set supplier targets.			
	Sustainability in supplier scorecards and KPIs	Does supplier scorecards include sustainability issues and KPIs for sustainability?	Supplier scorecards don't integrate issues of sustainability. Focus is solely on traditional factors such as cost, quality and on-time delivery.	Scorecards include sustainability measures for few categories. Measures are contentrated on single sustainability dimensions, i.e social.	Sustainability in scorecards starts to be a standard practice. Single KPI measuring sustainable performance and it is focusing a single sustainability dimension.	Majority of supplier have scorecards, which Integrate social and environmental criteria through relevant KPIs, i.e based on self-assessment questionnaire. Results are monitored periodically, and unsatisfying results are discussed with suppliers.	All mid to long-term suppliers have scorecards accounting sustainability . There are standardized KPIs for every supplier as well as category specific KPI. KPIs are clearly communicated to suppliers and unsatisfying results lead to improvement planning with suppliers.			
	Auditing suppliers	Does organization conduct supplier audits?	Audits aren't utilized to confirm supplier compliance and performance regarding sustainability issues/requirements, i.e. health and safety, and waste management.	Audits are only used as reactive measure when supplier failure has been noticed.	Audits are also used as proactive measure: high sustainability risk suppliers are audited prior to operations.	Majority of new suppliers are audited prior to selection, and a large portion of mid to long-term suppliers are audited periodically, atleast every third year.	Annual audits are conducted for all mid to high risk suppliers, and additional are done if there is reasonable doubt of non-compliance. There is a clear mandate and sufficient resources to conduct audits.			
	Management of audits	How Organization manages its audits?	Audits aren't managed. There are large variations in auditing practices and dependency on individuals.	Some efforts to standardize audits, but still dependency on individuals to raise up a need for an audit. Still no clear responsibilities and audits tend to focus single sustainability dimension, i.e social.	Standardized audits and clear principles when they need to be done. Responsible person for audit management, but has also other tasks. Audits are addressing multiple sustainability dimensions, i.e social and environment.	Dedicated person for audit management, who has responsibilities such as seeing that audits are up to standards, conducted periodically, and following supplier promises on improvements. Database for results, results are easily attainable and are utilized, i. e KPI for supplier development.	There is a team handling audit management and processes. Audits are developed through ongoing process and are in accordance with standards, i.e ISO19011. All sustainability dimensions accounted, but prioritazion on most influental issues.			
	Sustainability goals for suppliers	Does organization place sustainability related goals/targets for its suppliers?	Procurement doesn't set sustainability related targets/goals for suppliers.	Some individual suppliers have sustainability goals, and focus is on single sustainability dimension. There are no clear principles on integrating sustainability goals for suppliers.	Most high-risk categories and suppliers have sustainability goals/targets, and integrating these is becoming a standardized practice. Targets are aligned with category specific risks, but they mainly consider compliance.	Majority of long-term suppliers have sustainability goals/targets, which are aligned with supplier specific basis. There are both mid and long-term targets, which strive to compliance and proactive development of supplier's capabilities.	All long-term suppliers have sustainability goals/targets, which are developed together with suppliers, and monitored on ongoing basis. Development regarding targets is discussed frequently with suppliers.			
	Rewarding/Incentivizing supplier sustainability performance	Does organization reward suppliers who exceed expectations for sustainable performance?	Procurement doesn't have any rewards or incentives to motivate sustainability improvement for suppliers.	Few individual supplier incentives exists, but aren't necessary aligned with supplier's most relevant sustainability issues. No standardized practice.	Incentives are becoming a standardized practice for most high-risk categories and suppliers. They are tied to corresponding targets, and received if compliance is achieved. Suppliers are well aware of these incentives.	Procurement has rewarding on two levels, i.e individual supplier incentives and larger reward programs which award standout suppliers. Larger rewards are publicly disclose and they provide supplier a clear accolade.	Also additional incentives, i.e sustainable supplier of the month. Individual incentives are designed with suppliers, motivate proactive sustainability development and communicate Organization's values to broader audience. Incentives reward exceptional performance.			
	Offering sustainability training for suppliers	Does Procurement provide or make available sustainability training to suppliers?	Procurement doesn't offer or make available sustainability related training to suppliers.	Offering suppliers instructions on sustainability issues and practices, but no training as such. Suppliers are asked to cascade instructions to their employees.	Sustainability training provided to high risk suppliers, i.e safety training for contractors. Training is focusing single sustainability dimension, offered mostly as self-learning and considers compliance with requirements. Training is mandatory, and results are followed.	Training provided at least in two ways, i.e self-learning, on-site visits or workshops, and it includes more sustainability dimensions. Basic training provided as self-learning for all suppliers. Besides compliance, aim is to enhance suppliers' capabilities to improve their sustainability performance.	Clear preference/requirement for all suppliers to participate into sustainability training. Basic training for all and specialized training for certain categories. Training is provided through life-cycle; before and during the contract, and in cases of non-compliance. There exists a platform for suppliers to share, discuss and develop their sustainability practices, i.e annual conference.			
	Sustainability reporting from suppliers	Are supplier making sustainability reports and are they public?	Procurement doesn't receive sustainability reporting from suppliers and isn't utilizing publicly disclosed sustainability reports.	Few suppliers report on their sustainability performance periodically, but reports aren't utilized well in supplier management.There isn't practice asking suppliers to publicly disclose sustainability performance.	Sustainability reporting from multiple suppliers. Many are publicly disclosing their reports, which are noted and utilized. Procurement preferencing suppliers to publicly disclose sustainability reports.	Most mid to long-term suppliers provide sustainability reports and large portion of these are publicly disclosed. Procurement is actively directing suppliers to publicly disclosing their sustainability reports, which is also stated in selection stage. Sustainability reports are actively utilized.	Clear majority of mid to long-term suppliers are publicly disclosing their sustainability reports. Procurement is supporting and incentivizing suppliers public disclosure. Results are standardized in database and made comparable.			
	Tools for managing sustainability	Does organization have systems to assist Procurement professionals in sustainable supplier management? Is relevant and needed data easily attainable and understandable?	Procurement professionals don't have tools/systems to help them manage sustainability.	Sustainability has, in some ways, been integrated into existing systems / tools. Existing systems aren't well equipped to handle sustainability issues.	There are tools which integrate and manage sustainability. Either sustainability has been comrehensively integrated into existing systems, or there are specific systems for it.	Specialized tools/systems for sustainability improvement and integration into processes. Sustainability related information is readily available and tools/systems have capability to guide decision making, i.e red-flag audits and suggest most important sustainability criteria for category.	Comprehensive "tool kit" to support Procurement professionals in managing sustainability throughout the procurement life-cycle. Existing systems are well equipped to handle sutainability related data, and systems are improved continuously. Procurement is constantly searching for ways to enhance capabilities of its employees to conduct sustainable supplier management.			
	Lower-tier supplier management	How Procurement manages sustainable performance of its lower-tier suppliers?	No visibility on sustainable performance beyond first-tier suppliers.First-tier supplier aren't required to cascade sustainability requirements to their suppliers.	Vague understanding of sustainability issues affecting lower-tier suppliers. Procurement has low visibility on lower-tier sustainability performance, but is asking suppliers to cascade sustainability principles forward.	Moderate understanding of lower-tier sustainablity risks. Influences performance by requiring first-tier suppliers to cascade sustainability requirements. Most riskiest supply networks are noted and their first-tier suppliers are pushed harder. Procurement doesn't have ways to confirm lower-tier supplier compliance.	Holistic view on most influental lower-tier sustainability risks and ability to acquire better information regarding their status, i.e lower-tier suppliers having relevant certifications (ISO14000, responsible care, etc). More profound ways of influencing first-tier suppliers to cascade sustainability, i.e incentives and inclusion in supplier KPIs.	Procurement has mapped most influental and high-risk sustainability issues for its lower-tier suppliers and develop mitigation programs for them. Majority of tier-one suppliers are committed on cascading sustainability requirements. If non-compliance due to lower-tier supplier, that supplier is included into discussion.			
D5	**Addressing non-compliance**									
	Managing supplier failures	How Procurement responds to supplier failures regarding matters of sustainability?	Procurement doesn't have clear principles or guidelines for managing supplier failures. Managing failures is left to individual employees and actions taken are heterogenous even in similar cases.	Procurement mainly reacts to sustainability non-compliance by requiring suppliers to promise that the same issue won't happen again. There is no actual development program or collaboration.	Established basic principles on how supplier non-compliance regarding sustainability should be handled: detection of reason and making a mitigation plan together with the supplier.	Procurement has set clear and well defined principles and standards for responding to supplier non-compliance. Clear principles whether to opt for collaboration or control based development.	Failures are managed comprehensively including development plans, goals, responsible person, selected development method and timeframe. Goal isn't only to assure future compliance but improve estbalished process throughly.			
	Responding to supplier non-compliance	How sensitively Procurement responds to supplier failures/ non-compliance regarding sustainability issues?	Failures and non-compliance regarding sustainability issues doesn't lead to any corrective actions	Only largest failures and non-compliance that could damage Organization's reputation lead to actions	Clear failures and non-compliance leads to corrective actions despite it having potential to escalate to reputation damage or no.	Majority of failures and non-compliance regarding sustainability leads to corrective actions.	All failures and non-complience regardless of how small lead to corrective actions, which are aligned with the occurred incident. Also suspicion regarding possible non-compliance invokes actions amongst Procurement.			

ANNEX 4

	Dimensions	Question	Level 1 Non-existant Procurement is unaware of sustainable practices and there are no sustainability efforts.	Level 2 Initial steps taken Procurement has created awareness regarding sustainability, but actions tend to be ad-hoc, reactive and dependent on individuals	Level 3 Common princeples and standards Clear emphasis on sustainability. Principles, processes, and practices are starting to be standardized. Holistic view on sustainability.	Level 4 Pro-active measures Sustainability is a key part of Procurement actions. Movement from compliance to proactive sustainability effots.	Level 5 Sustainability leader Continious development, best practices implemented and sustainability in the heart of operations.	Assigned level (Please refer as value from 1 to 5)	Additional comment (Should the texts be modified, additional comment on maturity)
D1	**Sustainability drivers and enablers**								
	Organization strategy and sustainability	How Organization's strategy considers sustainability?	Sustainability has only non-existant to minor role in the Organization's strategy.	Sustainability has limited role in Organization's strategy, and it is focused on compliance. Strategy has reactive approach to sustainability.	Sustainability is an important part of strategy and addressed in holistic manner. Strategy doesn't consider sustainability only in reactive means, as it includes some long-term sustainability ambitions.	Sustainability is key element of the strategy, which aims to proactively develop sustainability throughout Organization. Sustainability is seen as value-adding factor and Organization wants to distinguish itself based sustainability.	Organization and sustainability are one. Sustainability is integral in Organization's strategy, which emphasises continuous development and sets ambitious goals for sustainability. Organization strives to be leader in sustainability and regards it as major source of competitive advantage.		
	Procurement strategy and sustainability	How Procurement strategy considers sustainability?	Sustainability has only non-existant to minor role in the Procurement strategy.	Sustainability has limited role in Procurement strategy, and it is focused on compliance. Strategy has reactive approach to sustainability.	Sustainability is an important part of strategy, and addressed in holistic manner. Strategy doesn't consider sustainability only in reactive means, as it includes some long-term sustainability ambitions.	Sustainability is key element of the strategy, which aims to proactively develop sustainability throughout Procurement. Sustainability is seen as value-adding factor.	Procurement desires to be the driver of sustainability within Organization. Sustainability and its improvement are central for the strategy. Strategy considers sustainablility as major value-adding factor, emphasizes ongoing development and sets ambitious goals for future.		
	Procurement policies and sustainability	How Procurement policies consider sustainability?	Procurement doesn't have written policies regarding sustainability, i.e. Green or sustainable procurement policy.	There isn't separate policy for sustainability, but its adressed in overall Procurement policy. Policy focuses on compliance.	Sustainable procurement policy exists and its has holistic view on sustainability. Comprehensive view on principles, but focus still on compliance. Policy is well known in Procurement.	Includes principles of proactive sustainability improvement, and is publicly published. Also internal stakeholders are well aware of the policy and regard it important.	Sustainbility Policy emphasises things such as continuous development and valuing sustainability over certain monetary values. Policy covers at least three sustainability dimensions and was developed together with relevant stakeholders.		
	Perception of sustainability	How sustainability is perceived and defined in Procurement?	Procurement doesn't have a clearly defined concept for sustainability, and it changes significantly between categories and employees.	Sustainability is mainly perceived as one dimension, i.e environment.	Sustainability is defined through more than one dimension, i.e environment and social. Procurement employees have unified view, but view of internal stakeholders may differ.	Common holistic view on sustainability: environment, social, and economic. Procurement and relevant internal stakeholders have unified view.	Whole Organization has unified view on sustainability.		
	Commitment of Procurement top management	How committed Procurement top management is on achieving sustainability?	Procurement top management doesn't regard sustainability as an issue concerning the function.	Top management understands that sustainability is linked to procurement, but considers it only as a minor factor. Minimal resources, i.e employees' time, incentives, projects, and sustainable policies are assigned to sustainability.	Top management considers sustainability as an important factor, highlights this to employees and assigns resources moderately.	Top management drives sustainability in Procurement and emphasizes it as a key issue. Aims to proactively develop sustainability, assigns sufficient resources to its improvement, and requires regular updates on sustainability performance.	Procurement top management includes person responsible for sustainable procurement and its improvement. Top management gives their mandate to prioritize sustainability over other factors, such as costs, when its reasonable.		
	Role of sustainability in Procurement	How sustainability's role and impact are seen in Procurement?	Sustainability is separate and irrelevant issue, which is seen to exists outside of Procurement.	Procurement sees that sustainability is related to its processes through regulation, and has only a minor role.	Sustainability has an important role in Procurement in the form of compliance with regulation and norms.	Sustainability has a key role in Procurement and it's seen as value-adding activity. There is a lot of emphasis on sustainability and a unanimous view of its role accross Procurement.	Sustainability is a core element of Procurement, its improvement is major value-adding activity, and it has a priority role in planning and implementing processes. Same role among relevant stakeholders.		
	Procurement's perception of its impact on sustainability and role in sustainable development.	How Procurement understands its impacts on sustainability and role in sustainability development?	Procurement doesn't consider itself as a contributor to sustainability issues or having an ability to improve sustainability of the Organization.	Procurement sees that it impacts certain sustainability dimension, i.e social, but isn't sure whether it can mitigate the negative impacts.	Procurement understands that it impacts all sustainability dimensions. Procurement mainly contributes to sustainability by assuring compliance.	Procurement sees itself having large impact on sustainability and significant role in improving sustainability through its processes, i.e supplier management. Procurement understands that it can proactively improve sustainability of whole Organization.	Procurement sees itself as a driver of sustainability improvement within the Organization, and has a comprehensive view of its impact on specific sustainability issues.		
	Mapping sustainability risks	How Procurement maps its risks related to sustainability?	Procurement doesn't map its risks related to sustainability in any level. Current understanding is based on hunch.	There isn't a standardized practice of mapping risks, but individual employees/categories conduct some sustainability risk mapping. Basic understanding of most influental risks.	Sustainability risk mapping is a normal practice and Procurement is aware of most influental risks. All sustainability dimensions (environment, social and economic) are accounted, results are well documented and made available to Procurement professionals.	Sustainability risks are mapped pre-emptively, i.e prior to new product or country, and future changes in risk portfolio are estimated. Procurement knows how risks would effect the Organization, and there is mitigation plans in place.	Procurement has also been able to map sustainability risks lying upstream in the network, i.e lower-tier supplier risks. Risks are mapped ongoingly, and all relevant stakeholders are aware of them.		
	Guidance on sustainability	Is there guidance on sustainability to Procurement professionals?	No guidance on sustainability exists.	Some abstract guidelines on sustainability exists (i.e anti-corruption or supplier onboarding). Guidance on practical implementation is scarce, and employees rely on self-learning.	There are more comprehensive sustainbility guidance for employees. Guidelines are well documented, advocated and include most of the processes, i.e integrating sustainability criteria into supplier selection.	Responsibility on guidances and their development is clear, and they're well known by relevant stakeholders. It is ensured that guidelines are followed, and deviations are managed.	Guidance on sustainability is made available to whole supply chain, and Organization strives to improve sustainability throughout.		
	Employee training	Does Procurement provide training regarding matters of sustainability?	Procurement doesn't provide training on sustainability to its employees.	Training on sustainability is provided for a certain group of employees, i.e new employees. Covers basics and focus is on compliance.	Training is provided for all Procurement employees and its mandatory. Training is provided periodically.	More in-depth training provided, which aims to enhance employees' capabilities to proactively develop sustainability. Also training for relevant internal stakeholders. Results are followed and training developed on ongoing basis.	Training on sustainable procurement is embedded into Organizational training programs. Results are followed, utilized and discussed, and employees are able to request training on certain topics.		
	Targets/Goals incorporate sustainability issues	Are there targets/goals for Sustainable performance?	There are no sustainability related goals/targets for Procurement function, i.e safety, emissions or supplier certificates.	One or two sustainability related targets. They aren't necessarely clearly communicated, followed or aligned with business objectives.	A group of well established sustainability goals/targets, which are aligned with Organization's objectives and most influental sustainability risks. Targets are clearly defined and there is a systematic approach on following them.	Sustainability goals/targets are implemented for two levels, i.e Procurement and individual targets and they are highly valued. Targets include multiple sustainability dimensions and are followed on ongoing basis.	Implemented for three or more levels, i.e Procurement, individuals and categories, and very highly valued. Goals include short, mid, and long-term targets, i.e monthly rewards for sustainability efforts.		
	Internal incentivizes/rewards for sustainability	Is sustainability improvement incentivized in Procurement?	There are no rewards/incentives concerning sustainable performance.	There are no separate rewards for sustainability, but sustainability performance has a minor part in reward criteria.	Overall reward criteria considers multiple sustainability dimensions and gives it moderate value. Incentives are still distant from every day work of employees.	Also more practical incentives, which are relatable and linked to employee's job description. Employees feel that they can improve sustainability and gain rewards through their own work.	Sustainability is pushed extensively through incentives and rewards, which are clearly link to proactive development of sustainability performance. Sustainable performance forms a key part of overall reward criteria.		
	Dedicated personnel	Are the dedicated employees for sustainability in Procurement?	There isn't dedicated employee taking care of sustainability in Procurement or in Organization.	There isn't dedicated employee in Procurement, but there are dedicated internal stakeholders. Their time is limited and expertise aren't necessary aligned with procurement specific sustainability needs.	Employee responsible of sustainability within Procurement, but sustainability isn't his/her sole responsibility. Focus is on large scale issues, i.e policy and guideline creation.	Dedicated employee whose sole responsibility is to work on sustainability, i.e develop, monitor, help Procurement professionals, cascade sustainability to suppliers, and cooperate with internal experts.	Procurement has sufficient number of sustainability dedicated employees. They have clear roles and responsibilities, which together include the whole procurement life-cycle and all aspects of sustainability.		

	Collaboration regarding sustainability	Does Procurement collaborate with external stakeholders (non-suppliers) to improve sustainability performance?	Procurement isn't collaborating with any external stakeholder regarding sustainability, i.e non-governmental organization (NGO) or industry organization.	Procurement collaborates with one external stakeholder, i.e NGO, regarding sustainability. Collaboration is irregular.	Procurement is in active collaboration with one or two external stakeholders, i.e NGO or Industry organization. Active collaboration through which Procurement is able to gain some value.	In addition to NGOs and industry organizations, Procurement collaborates with other firms to improve sustainability performance, i.e sharing best practices. There are clear responsibilities regarding external collaboration.	Collaboration in some extent also includes competitors. Organization has a central role in or is a founder of, i.e industry organization and drives improvement of sustainability throughout the industry.		
D2	**Pre-selection**								
	Category strategy and sustainability	How individual category strategies consider sustainability?	Sustainability considerations aren't included into category strategies	Sustainability has limited role in some category strategies. Strategies have a reactive approach on sustainability.	Sustainability is important part in most category strategies. Strategies distinguish most influental sustainability risks, and create some action points for mitigation.	Sustainability is a key element and integrated into all category strategies. Strategies highlight most important issues, and establish clear proactive goals for sustainability.	Category strategies see sustainability as value-adding factor, and they include a range of considerations, i.e risks, actions, ambitious goals and expected benefits. Included sustainability issues are validated with internal sustainability experts.		
	Market research	Does market research (prior tendering) cover sustainability perspective?	Market research doesn't consider sustainability issues.	In some cases sustainability issues are included, but this isn't a common principle. Sustainability is clearly a minor detail.	Clear practice of including all dimensions of sustainability to market research. Aim is to mitigate noted issues in later processes.	Internal experts are helping to validate findings. Considerable effort to bring sustainability issues forward, and findings of market research are used comprehensively in future, i.e RFI.	Sustainability is strandardized part of every market research, and Procuremen proactively researches its possibilities to influence sustainability with market engagement matrix.		
	Specifying supplier and product/service criteria	Is sustainability integrated to the process of specifying supplier and product/service criteria?	Sustainability isn't part of specification and there isn't consideration what capabilities suppliers should have. i.e commitment to environmental protection and health and safety management.	Sometimes sustainability is included in specification, but this is dependent on individual employees. Specifications tends to consider individual sustainability dimensions, i.e social.	Clear principle of integrating sustainability into specification, and at least two dimensions considered. Majority of specifications consider current supplier actions.	Specifications also proactively consider capabilities for future development, i.e willingess to disclose sustainability performance and collaborate on sustainability. Specification is objectively based on Organizational objectives and market research.	Specification considers three or more sustainability dimensions, and is always done with internal experts. Specification criteria is utilized on ongoing basis later on and received goods, services and actions of suppliers are compared to set criteria.		
D3	**Supplier Selection**								
	Supplier requirements	Is there minimum sustainability requirements that supplier has to fullfill in order to be eligible for RFP?	Sustainability issues aren't integrated to minimum supplier requirements, and there are no defined go no-go determinents.	Some broad minimum requirements relating to regulation, i.e no child labor. These are asked and considered on yes/no basis.	In addition, some tenders include specific minimum requirements as go no-go criteria, i.e max age of truck fleet. Minimum limit is agreed prior to RFQ and supplier must pass in order to be eligible for selection.	In majority of tenders there are category specific go no-go sustainability criteria, which are developed together with relevant stakeholders. There are also defined limits for good and preferred performance.	Category specific go no-go criteria are in place for every tender. Suppliers are informed if they do not meet requirements and explained what needs to be done in order to be eligible next time. This is to promote sustainability and improve whole industry.		
	Supplier selection criteria	How often and extensively are sustainability issues integrated to supplier selection criteria?	Supplier selections very rarely include sustainable selection criteria. Inclusion is dependent on individual employees.	Some tenders include sustainable selection criteria, but it's often regarding one sustainability dimension, i.e social. Inclusion of sustainability criteria is little unclear to employees.	Majority of tenders include sustainability criteria, which accounts at least two most relevant dimensions. Inclusion of sustainability criteria is a clear practice for employees.	Close to all tenders include sustainability criteria, which are based on objective information, i.e market research and internal experts. Most critical sustainability risks for each category are known, and selects criteria to match.	Sustainability criteria forms a considerable part of final score, and is used as deciding factor in cases of tie. Selection criteria includes all dimensions, but prioritizes most influental sustainability aspects.		
	Codes of conduct	Does Procurement have codes of conduct for its suppliers?	Procurement doesn't have codes of conduct for its suppliers.	Created codes of conduct are linked to compliance with regulation. Suppliers are made aware of codes of conduct, but codes aren't enforced.	Codes of conduct impose clear minimum requirements from regulation and ethical behaviour perspectives. Accepting codes is mandatory, and most of suppliers have done so. Issues under the codes are explained throughly.	Codes go beyond regulation and require suppliers to comply with Organization's own higher standards. Created with relevant stakeholders, consider all sustainability dimensions and demand suppliers to cascade requirements forward.	Codes also set requirements for enabling factors, i.e willingness to cooperate and information sharing. Suppliers' compliance with codes is monitored, and non-compliance always leads to actions. Procurement periodically benchmarks its codes and makes improvements if needed.		
	Available methods	Does Procurement have an access to effective methods for assuring supplier claims and qualifications in selection phase, i.e auditing or third party reports?	Procurement doesn't have methods for assuring suppliers' claims and qualifications in selection phase.	No official methods, but suppliers are looked through online search. Audits might be rarely used, but getting a permit to conduct an audit is complicated.	Clear mandate to use audits for confirming claims and qualifications of most riskiest suppliers. Also some defined processes for assuring supplier qualifications, i.e due diligence process. These methods are primarly used only for high risk suppliers.	Resources assigned to methods for pre-emptively assuring supplier qualification. Multiple methods for assuring claims, and clear guidelines when they are used, i.e due diligence for all, and auditing for high risk.	Only conducts business with sustainable suppliers and has the tools/methods to make this goal possible. Comprehensive "tool kit" to verify supplier's claims on sustainability: audits for majority of new long-term suppliers, comprehensive due diligence process, questionnaires etc.		
	Supplier due diligence process	Is supplier due diligence or background checks conducted as part of supplier onboarding?	No formal due diligence or background checks in place for suppliers.	Due diligence process established, but only suppliers in certain categories go through it. Process is unclear and its impact is largely dependent on employee's motivation and understanding.	Most of the new suppliers go through due diligence. Standardized process, which is clear for employees, and thus not reliant on individual employees.	Close to all new suppliers go through due diligence. Process is precisely defined, and responsibility is on internal experts who confirm the quality of the process. All relevant issues are checked and statements, i.e no-go decisions, are listened.	All new suppliers go through due diligence. All internal stakeholders are working according to due diligence process and its suggestions. Results are saved and easily attainable later on.		
	Tendering process	Is there well defined tendering process that addresses and mitigates possible sustainability issues?	There is no standardized tendering process. Tendering is left to judgement of individual employees.	Some fundamental principles set, i.e anti-corruption and competitive tendering. There are still no standardized process and tender quality varies between individuals. Following compliance with set principles is lacking.	Unified tendering process, which mitigates multiple risks under economic dimension, i.e bribery, unfair competition. Nearly all tenders are conducted according to defined process and principles. Compliance is monitored and problems are addressed immediately.	All Procurement professionals and relevant internal stakeholders are aware of the process and comply with it. Procurement actively educates on the process and follows how its complied.	Tendering process has been created with relevant internal stakeholders, and its continuously developed. Also all internal stakeholders are well aware of the process and working according to it. Even minor deviations require a top management mandate and all noticed non-compliance is immediately addressed.		
	Cost calculation	What kind of cost calculation Procurement utilizes when choosing products and services?	Procurement is only considering immediate costs, such as unit prices, and it doesn't have an understanding of broader cost concepts or cumulation of costs through life-cycle.	Some sourcing decisions are made using TCO (total cost of ownership) meaning that factors such as costs of use and end of life costs are accounted.	Most sourcing decisions are made using TCO.	All sourcing decision are made atleast using TCO and some utilize life-cycle costs (LCC). As part of LCC, Procurement is accounting costs of risks, benefits of opportunities, and costs of monetizable environmental and social externalities, i.e job creation or job loss.	Moved beyond TCO and accounting LCC for majority of products and services. LCC supported by documents from tender participants and method of LCC calculation is based on the provided data.		
	Sustainability in contracts	Is Procurement including sustainability clauses to contracts?	Contracts do not include matters of sustainability.	Some contracts have sustainability clauses, but principles regarding when and how to add these are unclear. Big variations in integration of sustainability in contracts between, and even within, categories.	Strive to include sustainability clauses in all contracts, which are aligning with most influental sustainability issues and Organization's objectives. Contracts give Procurement a clear mandate to take actions in cases of sustainability related non-compliance.	Sustainability clauses are a part of standard contract templates. If Procurement can't utilize standard templates, it assures sustainability clauses are included. Contracts are used to legitimize sustainable development, practices and objectives.	Procurement strives to include sustainability clauses with back-to-back principle to agreements. This means that suppliers are contractually bound to cascade sustainability requirements forward into the supply network.		
D4	**Supplier management**								
	Collaboration with suppliers	Does Procurement collaborate with supplier in order to enhance sustainability?	Collaboration with suppliers doesn't include aspects of sustainability development.	Sustainability is minor concern in collaboration and only occasionally brought forward. Aim is to confirm compliance and inform supplier on sustainability issues.	Sustainability is clear part of collaboration with suppliers. Sustainability related topics and performance are always discussed, but emphasis is still on compliance.	Active collaboration on sustainability with majority of long-term suppliers. Besides compliance, a clear drive to proactive sustainability development. Communication works both ways and suppliers are able shed light on problems in buyer's practices regarding sustainability.	Extensive collaboration on sustainability issues. Procurement doesn't only provide guidance, but also conducts projects with suppliers. Collaboration addresses proactive improvement of sustainability throughout whole supply network.		

	Supplier self-assessment	Is there a self-assessment questionnaire for suppliers including sustainability issues?	Procurement doesn't have self-assessment questionnaire which includes sustainability dimensions, i.e environment and social.	Self-assessment questionnaire isn't specific to sustainbility, and all dimensions aren't included. Implementation and utilization is heavily dependent on individual employee, and only some of the suppliers go through it.	Separate self-assessment questionnaire for sustainability or all dimensions addressed in common questionnaire. Clear practice of conducting self-assessment, and results are utilized. Suppliers answer prior to operations.	Comprehensive self-assessment questionnaire for sustainability issues that has been developed with internal stakeholders. Majority of suppliers have answered and answers are comprehensively utilized, i.e follow supplier development or form KPIs.	Close to all of contractual/long-term suppliers answer self-assessment questionnaire prior starting and afterwards on periodical basis, i.e annually. Self-assessment scores are well documented and utilized in supplier management, i.e scores are turned to supplier KPIs and used to set supplier targets.		
	Sustainability in supplier scorecards and KPIs	Does supplier scorecards include sustainability issues and KPIs for sustainability?	Supplier scorecards don't integrate issues of sustainability. Focus is solely on traditional factors such as cost, quality and on-time delivery.	Scorecards include sustainability measures for few categories. Measures are contentrated on single sustainability dimensions, i.e social.	Sustainability in scorecards starts to be a standard practice. Single KPI measuring sustainable performance and it is focusing a single sustainability dimension.	Majority of supplier have scorecards, which Integrate social and environmental criteria through relevant KPIs, i.e based on self-assessment questionnaire. Results are monitored periodically, and unsatisfying results are discussed with suppliers.	All mid to long-term suppliers have scorecards accounting sustainability . There are standardized KPIs for every supplier as well as category specific KPI. KPIs are clearly communicated to suppliers and unsatisfying results lead to improvement planning with suppliers.		
	Auditing suppliers	Does Procurement conduct supplier audits?	Audits aren't utilized to confirm supplier compliance and performance regarding sustainability issues/requirements, i.e. health and safety, and waste management.	Audits are only used as reactive measure when supplier failure has been noticed.	Audits are also used as proactive measure: high sustainability risk suppliers are audited prior to operations.	Majority of new suppliers are audited prior to selection, and a large portion of mid to long-term suppliers are audited periodically, atleast every third year.	Annual audits are conducted for all mid to high risk suppliers, and additional are done if there is reasonable doubt of non-compliance. There is a clear mandate and sufficient resources to conduct audits.		
	Management of audits	How Procurement manages its audits?	Audits aren't managed. There are large variations in auditing practices and dependency on individuals.	Some efforts to standardize audits, but still dependency on individuals to raise up a need for an audit. Still no clear responsibilities and audits tend to focus single sustainability dimension, i.e social.	Standardized audits and clear principles when they need to be done. Responsible person for audit management, but has also other tasks. Audits are addressing multiple sustainability dimensions, i.e social and environment.	Dedicated person for audit management, who has responsibilities such as seeing that audits are up to standards, conducted periodically, and following supplier promises on improvements. Database for results, results are easily attainable and are utilized, i. e KPI for supplier development.	There is sufficien resources for handling audit management and processes. Audits are developed through ongoing process and are in accordance with standards, i.e ISO19011. All sustainability dimensions accounted, but prioritazion on most influental issues.		
	Sustainability goals for suppliers	Does Procurement place sustainability related goals/targets for its suppliers?	Procurement doesn't set sustainability related targets/goals for suppliers.	Some individual suppliers have sustainability goals, and focus is on single sustainability dimension. There are no clear principles on integrating sustainability goals for suppliers.	Most high-risk categories and suppliers have sustainability goals/targets, and integrating these is becoming a standardized practice. Targets are aligned with category specific risks, but they mainly consider compliance.	Majority of long-term suppliers have sustainability goals/targets, which are aligned with supplier specific basis. There are both mid and long-term targets, which strive to compliance and proactive development of supplier's capabilities.	All long-term suppliers have sustainability goals/targets, which have been developed together with suppliers, and monitored on ongoing basis. Development regarding targets is discussed frequently with suppliers.		
	Rewarding/Incentivizing supplier sustainability performance	Does Procurement reward suppliers who exceed expectations for sustainable performance?	Procurement doesn't have any rewards or incentives to motivate sustainability improvement for suppliers.	Few individual supplier incentives exists, but aren't necessary aligned with supplier's most relevant sustainability issues. No standardized practice.	Incentives are becoming a standardized practice for most high-risk categories and suppliers. They are tied to corresponding targets, and received if compliance is achieved. Suppliers are well aware of these incentives.	Procurement has rewarding on two levels, i.e individual supplier incentives and larger reward programs which award standout suppliers. Larger rewards are publicly disclosed and they provide supplier a clear accolade.	Procurement prefers, when applicable, to design individual incentives together with suppliers, in order to assure motivation. Incentives/rewards are suffiecient to motivate proactive sustainability development and communicate Organization's values to broader audience. Higher rewards for exceptional sustainability performance.		
	Offering sustainability training for suppliers	Does Procurement provide or make available sustainability training to suppliers?	Procurement doesn't offer or make available sustainability related training to suppliers.	Offering suppliers instructions on sustainability issues and practices, but no training as such. Suppliers are asked to cascade instructions to their employees.	Sustainability training provided to high risk suppliers, i.e safety training for contractors. Training doesn't necessarily consider all sustainability dimensions and mainly focuses compliance with requirements. Training is mandatory, and results are followed.	More comprehensive training provided which includes all sustainability dimensions. Basic training provided for all suppliers. Besides compliance, aim is to enhance suppliers' capabilities to improve their sustainability performance.	Clear preference/requirement for all suppliers to participate into sustainability training. Basic training for all and specialized training for certain categories. Training is provided throughout life-cycle; before and during the contract, and in cases of non-compliance. There exists a platform for suppliers to share, discuss and develop their sustainability practices, i.e annual conference.		
	Sustainability reporting from suppliers	Are supplier making sustainability reports and are they public?	Procurement doesn't receive sustainability reporting from suppliers and isn't utilizing publicly disclosed sustainability reports.	Few suppliers report on their sustainability performance, but reports aren't utilized well in supplier management.There isn't practice asking suppliers to publicly disclose sustainability performance.	Sustainability reporting from multiple suppliers. Many are publicly disclosing their reports, which are noted and utilized. Procurement preferencing suppliers to publicly disclose sustainability reports.	Most mid to long-term suppliers provide sustainability reports and large portion of these are publicly disclosed. Procrurement is actively directing suppliers to publicly disclosing their sustainability reports, which is also stated in selection stage. Sustainability reports are actively utilized.	Clear majority of mid to long-term suppliers are publicly disclosing their sustainability reports. Procurement is supporting and incentivizing suppliers public disclosure. Results are standardized in database and made comparable.		
	Tools for managing sustainability	Does organization have systems to assist Procurement professionals in sustainable supplier management? Is relevant and needed data easily attainable and understandable?	Procurement professionals don't have tools/systems to help them manage sustainability.	Sustainability has, in some ways, been integrated into existing systems/tools. Existing systems aren't well equipped to handle sustainability issues.	There are tools which integrate and manage sustainability. Either sustainability has been sufficiently integrated into existing systems, or there are specific systems for it.	Specialized tools/systems for sustainability improvement and integration into processes. Sustainability related information is readily available and tools/systems have capability to guide decision making, i.e red-flag audits. There is anynomous whistle-blowing system and process in place.	Comprehensive "tool kit" to support Procurement professionals in managing sustainability throughout the procurement life-cycle. Systems are improved continuously and Procurement searches for ways to enhance capabilities of its employees to conduct sustainable supplier management. Whistle-blowing system and process is actively emphasized to whole supply network.		
	Lower-tier supplier management	How Procurement manages sustainable performance of its lower-tier suppliers?	No visibility on sustainable performance beyond first-tier suppliers. First-tier supplier aren't required to cascade sustainability requirements to their suppliers.	Vague understanding of sustainability issues affecting lower-tier suppliers. Procurement has low visibility on lower-tier sustainability performance, but is asking suppliers to cascade sustainability principles forward.	Moderate understanding of lower-tier sustainablity risks. Influences performance by requiring first-tier suppliers to cascade sustainability requirements. Most riskiest supply networks are noted and their first-tier suppliers are pushed harder. Procurement doesn't have ways to confirm lower-tier supplier compliance.	Holistic view on most influental lower-tier sustainability risks and ability to acquire better information regarding their status, i.e lower-tier suppliers having relevant certifications (ISO14000, responsible care, etc). More profound ways of influencing first-tier suppliers to cascade sustainability, i.e incentives and inclusion in supplier KPIs.	Procurement has mapped most influential and high-risk sustainability issues for its lower-tier suppliers and develop mitigation programs for them. Majority of tier-one suppliers are committed on cascading sustainability requirements. If non-compliance rises due to lower-tier supplier, that supplier is included into discussion.		
D5	**Addressing non-compliance**								
	Managing supplier failures	How Procurement responds to supplier failures regarding matters of sustainability?	Procurement doesn't have clear principles or guidelines for managing supplier failures. Managing failures is left to individual employees and actions taken are heterogenous even in similar cases.	Procurement mainly reacts to sustainability non-compliance by requiring suppliers to promise that the same issue won't happen again. There is no actual development program or collaboration.	Established basic principles on how supplier non-compliance regarding sustainability should be handled: detection of reason and making a mitigation plan together with the supplier.	Procurement has set clear and well defined principles and standards for responding to supplier non-compliance. Clear principles whether to opt for collaboration or control based development.	Failures are managed comprehensively including development plans, goals, responsible person, selected development method and timeframe. Goals aren't only to assure future compliance but improve estbalished process throughout.		
	Responding to supplier non-compliance	How sensitively Procurement responds to supplier failures/ non-compliance regarding sustainability issues?	Failures and non-compliance regarding sustainability issues doesn't lead to any corrective actions	Only largest failures and non-compliance that could damage Organization's reputation lead to actions	Clear failures and non-compliance leads to corrective actions despite it having potential to escalate to reputation damage or no.	Majority of failures and non-compliance regarding sustainability leads to corrective actions.	All failures and non-complience regardless of how small lead to corrective actions, which are aligned with the occurred incident. Also suspicion regarding possible non-compliance invokes actions.		