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Business Model Innovation for Upcycling

Uncovering Conditions and Their Interactions Facilitating and Hindering a Sustainable Business Model Transformation

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Abstract

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Keywords Business Model Innovation, Sustainability, Creating Value from Waste, Upcycling, Sustainability Archetype, Barriers and Facilitators

Research question What conditions promote or hinder business model innovation for sustainability in the field of upcycling and how do these conditions interact?

Methodology – This single-case study is characterized by applying a qualitative research approach and an inductive reasoning with a systematic and transparent approach. The research conducted semi-structured interviews as the main source of data and was analyzed by applying a grounded theory approach to gain an in-depth understanding of the phenomenon.

Theoretical perspectives - The paramount focus of the thesis is business model innovation for sustainability, with 'creating value from waste' as an archetype. The concept of upcycling, as sub-archetype, is examined as a radical form of business model transformation affecting the value proposition of the company. Furthermore, conditions are seen as neutral since their appearance and absence can have both positive or negative effects on the business model transformation.

Conclusions – The research has identified some conditions for sustainable business model innovation to be more significant for upcycling than others. Furthermore, it uncovers new conditions and reveals interactions between them, facilitating or hindering business model innovation for upcycling. This study can eventually provide a simplified model that can easily be generalized to other forms of radical sustainable BMI.

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Adam & Clarissa

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1 Introduction

1.1 Background

Companies are increasingly looking for tools to innovate their business models for sustainability but upcycling, the art of creating value from waste, remains at the bottom of many toolboxes. This is not due to upcycling lacking effectiveness, as it will create closed-loop systems in place of the standard end-of-pipe solutions that only serve to negate the harm done by waste (Winkler, 2011). Closed-loop systems, in contrast, allow firms to pursue the creation of value and maximize the economic, environmental, and societal effects of their processes and products as they reuse waste to initiate new processes (Carrillo-Hermosilla, del Rio Gonzalez, and Könnölä, 2009). Neither is it due to a lack of applications, as upcycling waste has been explored in everywhere from food production (Egelyng, Romsdal, Hansen, Slizyte, Carvajal, Jouvenot, Hebrok, Honkapää, Wold, Seljåsen, and Aursand, 2018), to concrete manufacturing (Shafigh, Mahmud, Jumaat, Ahmmad, and Bahri, 2014), to carbon nanomaterials (Zhuo and Levendis, 2013). For upcycling to remain at the bottom of the toolbox, despite its usefulness across diverse applications, the focus must be on a firm's sustainable business model innovation (BMI) and the conditions that have prevented upcycling from becoming commonplace.

Achieving sustainable development has been an accepted goal of business since the 1990's (Dyllick and Hockerts, 2002) and both industry and academia have become acquainted with the most common sustainable innovations. Reducing the use of waste through lean manufacturing has been researched by many sources and there is a wealth of literature exploring the best practices to do so (Shah and Ward, 2003). Recycling excess or end-of-life materials back into raw materials is so commonplace that a focus has evolved into how to make reverse supply chains to capture more recyclable materials (Melo, Nickel, and Saldanha-da-Gama, 2009). These tools of reducing and recycling support a firm's current business model, allowing for increasing efficiencies without radically changing the business model. These refinements are exploitative innovations and relying only on them eventually leads to a stagnation point of suboptimal performance; to provide lasting prosperity explorative innovations must be balanced alongside these refinements (March, 1991). Upcycling fundamentally changes the view of the waste from a negative drain on company resources to an opportunity to add value, thus requiring radical

BMI. The conditions leading to these radical changes needs to be better understood, as the field of sustainable BMI has been dominated by exploitative measures and offers ever shrinking opportunities for firms to squeeze out additional value. Thus, there needs to be a change in focus from exploitative to explorative sustainable BMI.

Recycling is so ingrained in society that we typically do not think of it as requiring defining, but for the purpose of this thesis we will use European Union's definition of recycling waste:
"Recycling of waste is defined as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes." (EU, 2008)

With this definition in mind, we can define non-recyclables as waste material that is unable, either technically or economically in the current business model, to be reprocessed back into a value chain, making it valueless. Upcycling is then the act of innovating a new business model (BM) to transform a valueless (non-recyclable waste) material into a relatively high value material. Thus, upcycling differs from recycling in that it requires the exploration of a new business model, whereas recycling initiatives are exploitations within the existing business model. A full list of further definitions can be found in Appendix 1.

To further expand on the difference between recycling and upcycling, we must define what sustainable BMI is. At the fundamental level, a BM can be understood as having three interacting elements; a value offering, creation and delivery of value, and value capture (Richardson, 2008). However, viewing a BM as an unchanging model ensures that it will eventually become outdated and unsustainable. Demil and Lecocq (2010) explained that a BM must be evolving to meet the challenges of a changing world, thus a transformational approach that fine tunes (or radically changes when required) the BM is needed for a sustainable advantage. This transformation approach makes up BMI and if it is done successfully, while being hard to replicate, it will lead to a sustained competitive advantage (Teece, 2010). However, the transformation needs to encompass three values; economic, social, and environmental if it is to be truly sustained in the long run (Elkington, 1999). Therefore, sustainable BMI is the

transformational act of offering, creating, and capturing economic, social, and environmental value.

With these definitions in mind we can locate that the value offering is what causes upcycling to require a new business model, whereas recycling supports the current one. Recycling does not touch the products and services that a company offers its customers, rather it is a method to increase process efficiencies by returning excess material into its raw form to be used again in an earlier stage of a manufacturing process. Upcycling on the other hand, requires the development of a new value offering as it seeks to use excess material to meet applications outside of the existing BM.

It should be no surprise by now that the significant differences between upcycling and recycling require different conditions to meet. We have seen this through the conditions of the past decades that have led to recycling becoming second nature for firms, while not leading to many successful upcycling initiatives. However, upcycling has never been more achievable as ongoing global trends have created better environments for this explorative and sustainable form of BMI. These trends are sustainability, which has saturated the corporate world throughout the last decades, and the rise of open innovation (OI) which both make it easier to collaborate across industries in the goal of creating value from waste (Slotegraaf, 2012). At the same time, thought leaders in innovation are looking at nature for inspiration in new developments and designs via biomimicry (Appio, Achiche, Martini, and Beaudry, 2016). In nature, the concept of waste does not exist as it is always utilized by a new process that captures value (Lovins, Lovins, and Hawken, 1999), effectively making nature an expert in upcycling. The trends and inspirations of the past decades has made it easier than ever for companies to reach further into their toolbox and implement upcycling to innovate their business models towards a sustainable future. Thus, it represents the perfect tool to explore further in the pursuit of reaching a balance between exploitative and explorative measures in sustainable BMI. However, to do so companies need to understand which conditions they need to foster to allow for upcycling initiatives to flourish. Therefore, this paper serves to explore and identify the key conditions for upcycling to take place in the modern firm.

1.2 Problem Discussion

The examples of successful BMI are inspiring as Johnson et al. (2008) reports that "11 of 27 companies born in the last quarter-century that grew their way into the Fortune 500 in the past 10 years did so through business model innovation". Due to the successes of the past, research has developed to understand the conditions that allow for the BMI that has propelled others to redefine their industry. These conditions can be external or internal to the firm, hard factors or soft factors, and an accelerator or hindrance to BMI.

Focusing on the conditions that are preventative of BMI, Assink (2006) compiled five general barriers that tend to plague firms. The first is when firms fall victim to their own success and their organization develops to become overly rigid to maximize their current BM, creating massive inertia to deviate from the core operations. Secondly, the capacity of to unlearn the methods of the past come into play, as new mindsets are required to pursue new lines of innovation. Thirdly, Assink (2006) identified that the risk barrier for management to commit resources to new projects was severe as the uncertainties mounted as the projects became more distant from what the company was experienced in. The fourth reason was simply a lack of optimal innovation management, where the creativity and motivation needed to pursue innovations were not nurtured within organizations. Lastly, the time it takes to reshape a company's infrastructure to market an innovation represents a barrier, as if it takes too long the demand for the new product or service could no longer be present by the time the organization is ready. The work of Assink (2006) and the identification of the conditions that hindered BMI, has been important to organizations as they seek to avoid the plagues to innovation. However, the knowledge base incomplete without also understanding the conditions that will drive BMI.

In his highly sighted work, Chesbrough (2010) brought light to two highly important conditions for BMI; leadership that enables organizational change and effectuation leading to experimentation. The weight of importance to experimentation brings into light that companies are dynamic entities that will not be able to follow a standardized recipe to BMI; rather they will need to tailor the process, through iterations, to their particular cases. This adds to the importance of understanding and fostering BMI conditions that are universal to the process, much like how a

creative chef does not need to follow a recipe to create a tasty meal, but instead relies on a fully stocked kitchen to produce their edible art.

However, the optimal conditions for BMI are not agreed upon by the existing literature base. Johnson et al. (2008) points to understanding a customer's need and then finding the best way to meet that need, at a profit. In the opposite approach, Demil and Lecocq (2010) look first at the resources the firm has, and then builds outwards from there to generate value. Both researchers have valid examples to promote their claims which suggest that the field of BMI is large enough that certain conditions are needed for different types of BMI. Acknowledging the large and diverse literature base, Carayannis, Sindakis, and Walter (2014) realized the need to focus on particular types of BMI to bring clarity to the conditions and chose to narrow their field of study to BMI for sustainability. Organizational design, governance, ambidexterity (the ability to manage the mainstream business while also pursuing innovations), and cross-functional teams were what Carayannis et al. (2014) identified as enablers for BMI that would lead to sustainability.

While these conditions discussed above are internal to the firm, Boons and Lüdeke-Freund (2013) stepped back and realized that sustainable BMI could be achieved by focusing on the gaps between organizations, thus supply chain management and open innovation were identified as keys to sustainable development. Bossle, Dutra de Barcellos, Vieira, and Sauvée (2016) further emphasized that external factors were important, although they identified the major factors to be government regulations and peer pressure. All of the different views of sustainable BMI shows that it is too broad and too fresh of a subject for literature to have evolved in agreement of the most important conditions that promote and hinder it.

To further add to the diversity of the literature de Jesus and Mendonça (2018) viewed the conditions as hard and soft. Again, government regulations came into play, while they were supplemented by additional soft factors like social awareness and customer preferences to sustainable services. When switching views to hard factors, de Jesus and Mendonça (2018) found technology and economics could either be barriers or motivators, depending on the innovation. Instead of adding to the complexity of literature towards sustainable BMI, our focus

on upcycling will allow us to narrow our focus to radical sustainable BMI. By looking at a subset of sustainable BMI, we will bring consistency and simplicity to the conditions, where current literature has been inconclusive and ever expanding when faced with the entire subject of sustainable BMI.

Research on sustainable BMI for upcycling will bring to the forefront new conditions while lowering the importance some of the conditions of the previous research done on the broad subject of BMI. These changes will reflect the intricacies of upcycling, from the perceptions of the organization with working from a previously valueless substance to challenging how the organization perceives value beyond profit margins. There is also the rising uncertainty of how to forecast how much waste you will have in the future as the business grows, but production processes also become leaner. As opposed to exploitative measures like recycling, we expect the explorative BMI needed for upcycling to demand more extreme conditions to overcome the added challenge of causing drastic change in the face of uncertainty. Companies learning how to foster conditions for explorative BMI, like upcycling, will be able to restore the balance between exploration and exploitative and achieve prominent growth (He and Wong, 2004).

Looking to industry for inspiration of the conditions that shape upcycling we have identified examples of BMs that have been built around upcycled products. The fashion industry has had many small players embrace upcycling and market apparel made from plastic and wood waste (Todeschini, Cortimiglia, Callegaro-de-Menezes, and Ghezzi, 2017). The struggles in the fashion industry have been in scaling the upcycled product and competing with the large players. In heavier industries, factories have been built next to each other to create areas of industrial symbiosis where they try to utilize each other's waste energy and material (Behera, Kim, Lee, Suh, and Park, 2012). Creating these industrial parks, have challenges to replicate due to the amount of work and uncertainty in the exploration, feasibility, and the commercialization stages of planning them. Furthermore, industrial parks mainly just transport energy and materials which provides little learnings in the innovation of new upcycled products. While these examples have shown that creating value from waste can be made into a business, they are not without barriers that have kept them from being adopted by more companies.

TerraCycle, considered to be at the forefront of upcycling businesses (Yi, 2014), offers the best example of what the navigation of barriers will bring. Profitability and growth have validated their BM as they are looking for more capital to further scale their operations. TerraCycle not only transforms post-consumer waste into valued products, but also works with manufacturers to upcycle pre-consumer waste, developing tacit knowledge in close-loop generation. As promising as TerraCycle's future is, it still represents only a small part of the value potential of upcycling. If firms can combine their own specialized knowledge with the upcycling skill showcased by TerraCycle then the potential impact on global sustainability is significant. Therefore, looking at the conditions that promote and hinder sustainable BMI for upcycling in corporations that have core businesses and specialties other than upcycling will have far reaching impacts.

The aforementioned cases show that there is both an awareness and motivation in industry for the conversion of waste into value. The issue lies within the firm's ability to support their waste product with a sustainable BM. A literature search with keywords "upcycle" or "upcycling" shows that academia has a significant interest in creating value from waste, but limited knowledge in conditions needed to support a BM that will capture the value, as the found articles are dominated by the engineering field describing the technical possibilities of upcycling. Firms looking for inspiration on how to organize their BMs around an upcycled product receive little help from the current literature base. Thus, this thesis will be a lens that focuses the fractured literature base about sustainable BMI into the subject matter of the radical sustainable BMI needed for upcycling. We will be looking for the conditions that are at the heart of the matter, instead of adding to the complexity of the previous literature we seek a powerful simplicity that serves consolidate the previous findings.

1.3 Purpose and Research Question

The purpose of this research is to fill the gap in knowledge when it comes to sustainable BMI for upcycling. Connections will be drawn from existing literature that cover both sustainable BMs and BMI which will guide the research processes. However, the bulk of the findings will be tailored specifically to upcycling. As the current literature covers the benefits of creating value from waste (Bocken et al., 2014) there is now the need to lay down the foundations of the implementation stage. Our research will look into the conditions and their interactions that allow

companies to implement upcycling business models and those that prevent them from doing so. It will provide a road map for interested firms to follow when coming up with a plan to generate value from waste. The thesis will also supply a stepping stone into the interesting topic of upcycling and allow future literature to uncover more models as upcycling becomes more common in the twenty-first century. To accomplish this purpose, we will be guided by the following question:

What conditions promote or hinder sustainable business model innovation in the field of upcycling and how do these conditions interact?

1.4 Case Company

The identified gap about the value creation of non-recyclable waste material through BMI for sustainability and the discussion about the conditions and occurring challenges, was identified and investigated within a single-case company. Since a case study approach is a very popular and widely used research design in business research (Eisenhardt and Graebner, 2007), due to its concern with complexity and particular nature of the case per se (Stake, 1995), we were able to gain valuable insights and eventually conduct a detailed and intensive analysis of the case. Nevertheless, we considered concerns about the generalizability of our single-case study research and its external validity. We are aware of the limitations of the company's representativeness, which might not yield findings applicable to all cases (Bryman and Bell, 2011). However, this challenge will be considered and further examined in Chapter 3 by applying an appropriate methodology approach, which encounters the described matter.

The case company prevails on the leading edge of composite core materials, supplying broad markets across multiple industries. Beyond their product portfolio, the case company additionally offers technical expertise, structural engineering services, and trainings for their applications, which distinguishes them from their competitors as a premium supplier. Initiated and established in the middle of the twentieth century, the company went through different mergers and changes in ownership and is now entirely owned by a Swedish private equity conglomerate. With more than 1000 employees, the case company has developed new products

and services and has expanded globally with manufacturing sites and sales subsidiaries in all six populated continents.

1.4.1 Sustainability

The company's understanding of sustainability is mostly expressed by investments in resource efficiency, improvements in social and working conditions, and protection of natural ecosystems by, for instance, actively reducing their carbon footprint. According to the case company's perception, growth and greater responsibility go hand in hand. An important lead of the identified gap in BMI for sustainability is that the company provides good insights of the distinction between internal and external sustainability. This can be seen by their intra and inter-organizational efforts towards sustainability, on which we will elaborate in the following.

Inter - Due to the core material`s characteristics of being strong and light, it is beneficial for performance and energy efficient transportation applications, which lead to positive effects such as reduced fuel consumption, increased range, and greater load-bearing capacity. The case company is interacting with many clients to develop innovative projects related to electrical drive, renewable energy, and eco-innovations, and is a substantial and indirect contributor to an overall carbon footprint reduction.

Intra - Evaluating their own climate impacts, the company is addressing several starting points towards sustainability through internal measures. One example is the recent switch to biofuel at one of their production facilities. However, the most crucial factor the company must deal with is waste from the production process. Product life-cycle and disposal strategies are considered when talking about the case company’s efforts towards internal sustainability. Since most of their production waste materials are made of a recyclable composition, the company is able to currently reuse it by reverting it back into the production chain. Nevertheless, there is one waste material of high volume that occurs during the manufacturing process of the main product, which is not recyclable nor sustainably disposable. The company identified the potential benefits of creating value from waste by using this waste as a solution for a new product in the marine sector, named Upseries (name was changed for reasons of anonymity). However, the company

has struggled to realize this solution and identify applicable BMs, covering both existing business principles and future-fit business goals (Kurucz, 2017).

A particular challenge for this case is that the case company core competencies are in offering the premium range of the materials they produce. Thus, the perception of working with waste, a material that is on the opposite side of the spectrum from premium, has been a significant barrier in promoting incentives for the company to spend time developing a BM for this good. While this development gives ample opportunity to see how perceptions of waste affects upcycling, it is also likely to overweight our findings in the degree it affects that average case.

Simultaneously, a new position within the executive board was established two years ago, commissioned and assigned to spur the case company's performance on corporate sustainability. This decision was initiated and backed up with strong organizational commitment and eventually lead to significant structural and cultural change. In consideration of the investigation and analysis in this thesis, these changes within the organization might unveil important roots affecting a company's ability for BMI in the field of value generation from waste. First observations are that the case company might suffer from cognitive limitations, especially when dominant logic proves to be a prevailing constraint. The chance for creating enough value from new business opportunities are significantly lower, when there is not an obvious fit to a company's current value system (Chesbrough, 2010). Hence, the case of the case company and its organizational ability to develop an innovative BM for the Upseries as a form of upcycled waste, serves a good focus area of further examination.

1.5 Outline of the Thesis

Chapter 1 - Introduction - The first chapter serves as overall introduction to the field. Initial impressions define the background of the study and provide a good understanding of the research area of conditions affecting sustainable BMI for upcycling. The identified problems and challenges, like a firm's inability to support their waste products with a sustainable BM or limited knowledge in capturing the value, point out the necessity of further investigations and research. The purpose of this study, to examine these intricacies, is therefore of immense

importance, which is also eventually specified within the research question. The last section of Chapter 1 describes the conditions and context of the research and introduces the case company that the study is embedded in.

Chapter 2 - Literature Review - Chapter 2 starts with the exploration of select research on general BMI and then funnels down to sustainable BMI and then the field of creating value from waste. Prevailing definitions and understandings as well as theories, frameworks, and contradictions between them are presented to eventually clarify and justify the purpose of this research.

Chapter 3 - Methodology - This chapter introduces and justifies the chosen approach of methodology for the data collection and analysis. The chosen method was applied to ensure transparency in all stages of proceeding for both data collection and analysis. After elaborating on the overall research approach, we will map out our research strategy and design, which will eventually retain the generalizability of the research. In the data collection method and specifically the choice and justification of interviewees and samples is described and presented. Required conditions for the interviews as well as an interview guide, tested within a pilot interview, eventually complete the method. Afterwards the data analysis method is explained, which gives clarification of how the collected data was used and analyzed to develop and understand the dynamics of a grounded-theory model. Eventually, the final part is discussing any concerns about validity and reliability of the research and provides further transparency.

Chapter 4 - Findings - In this chapter the overall findings of the data analysis are presented and in detail explained. Illustrations of the data structure enable the reference to the source of our data by filing them into themes, categories and dimensions. This process enables eventually the identification of the factors affecting a company's ability for BMI in the field of upcycling.

Chapter 5 - Discussion - Additionally to the identification of dimensions and factors in Chapter 4, the relationship and interdependencies between them are presented and explained in Chapter 5 by illustrating a dynamic inductive model. Furthermore, the described literature in the literature

review is put in relation to the empirical findings, which eventually answers the research question and fulfills the purpose of this research, to develop a generalized framework.

Chapter 6 - Conclusion and Implications - The last chapter finally highlights once again the most important findings and eventually draws conclusions out of it. Organizational impacts and potential managerial recommendations of implementation complete the developed framework. Besides limitations of the research due to several constraints, a further outlook on potential future research and research niches is given.

2 Literature Review

2.1 Structure of Literature Review

The literature review will start with the broad conditions of general BMI. While we will not go into depth and present an exhaustive list of conditions for general BMI, we will cover the main conditions, which will lead into how they need to be modified when we step into the field of sustainable BMI. As we examine sustainable BMI we will explore the conditions that are both external and internal, hard and soft, and promoting and hindering. In doing so we will start to focus in on the fields that are more closely related to upcycling, touching on what has been done with creating value from waste, creating circular economies, and the micro-developments of industrial parks that use proximity to capture value from waste. We will also review the differing degrees of BMI required for upcycling and recycling, and in doing so identify why understanding the conditions for upcycling is a greater addition to current literature.

2.2 Sustainable Business Model Innovation and Conditions

2.2.1 General BMI

The development of innovative BM, similar to upcycling, has well known benefits (Johnson, Christensen, and Kagermann, 2008; Teece, 2010; Demil and Lecocq, 2010). In turbulent markets and changing environment, it is important for companies to remain competitive by continually

adapting and renewing their BM (Kuratko, Morris and Covin, 2011). However, in many cases BMI is still under-employed by managers. The changes internally and externally are unattractive at the beginning of BM development because there is a lack of understanding in the nature of both the business and path to BMI (Johnson et al., 2008). To overcome these challenges the authors have described three steps; (1) to not view the problem as BMI, but instead focus on the need of a customer, (2) develop how your company can fill that need at a profit, and then (3) identify the changes need to do so. This path highlights the importance of making an economic profit but leaves out capturing synergies within the environmental and societal realms. Summarizing Johnson et al. (2008) is to focus on understanding a customer need and then having the skill to develop a strategy to fill that need profitably.

In contrast with Johnson et al. (2008), Demil and Lecocq (2010) start with the resources that a firm has in the process of transforming their BM. This is more pertainable for our purposes, when examining the opportunities for a value proposition for a given waste material to be upcycled. Waste can be modified to make it a better fit for certain customers, but when the end goal is to upcycle, the waste resource must be utilized in some form. Looking for customer needs opens the door to many offerings but limiting ourselves to examining what a company's resources are, as Demil and Lecocq (2010) recommend, ensures that the value offering is a good fit for the business.

While Johnson et al. (2008) points to lack of understanding as the biggest barrier to BMI, other academics have looked at more specific challenges. Chesbrough (2010) has compiled the reasons that academics have identified, as well as suggestions to succeed in BMI. He states that managers that have been promoted via their success under the current BM may feel threatened by undertaking BMI where their skills may no longer be valued. He also brings into question who needs to lead the charge of BMI, since it will often be cross-department oriented. The CEO is best able to navigate the different departments, but again they may be resistant to changing BMs from what has worked for them in the past. In addition, Chesbrough (2010) says the dominant logic of the firm has evolved so that the organization pays more attention to information that agrees with the current BM, so that contrasting information is easily ignored, spurring no innovation. It is recommended for a degree of effectuation to be undertaken in the

firm so that actions are promoted instead of spending to much time analyzing. This promotes experimentation that will create a large data set to find out what type of BMI works best for a firm's given resources. However, even if this is achieved and promising BMI is implemented, it still consists of additional challenges as it will often be a low margin business to start with and managers are likely to keep pushing resources to existing, high margin, businesses. Due to these barriers that Chesbrough (2010) compiled, even managers with a strong understanding of BMI will find many hurdles to cross on their way to promote change.

Assink (2006) delved deeper in the subject of BMI barriers, and in doing so painted a more daunting picture of what conditions are hampering BMI. Assink agrees with Chesbrough (2010) that dominant logic prevents innovation as bureaucracy grows to be excessive as a firm seeks maximize the efficiencies of the core business. However, Assink (2006) identifies that the inability of a firm to unlearn compounds the problem of dominant logic as it creates scenarios where companies are unable to react to changes. On top of these problems, the firm often lacks methods to access the risks of new ventures or the processes to foster innovation, even when there is an identified innovation to pursue. Assink (2006) shows that the conditions that inhibit BMI are interactive and create a web of barriers that need to be overcome to find success. Thus, it is not enough to address just one barrier and expect results; rather a systematic approach must be taken to promote the conditions that will lead to BMI.

The listed BMI barriers are related in that they can be addressed by organization design and governance. Carayannis, Sindakis and Walter (2014) note that these two tools can be used to get the best allocation of resources and capture the internal entrepreneurship that exists in the firm to promote BMI and separate the organization from its peers. The authors report that hierarchy, power distribution, and control can all be modified by these tools, altering them to promote new dominant logics and finding successful champions.

However, Carayannis et al. (2014) found the picture becomes more complicated when the company starts to think about how to achieve BMI sustainably. The authors show that firms must not only seek the methods that balance the three pillars of economic, environmental, and societal

value, but also the short term vs. the long term. To address the added challenges of sustainable BMI we will need to focus our lens on the literature that seeks to add light to the field.

2.2.2 Sustainable BMI

Literature about sustainability has little controversy over the importance of the subject or what it implies. Although there is varying terminology, sustainability encompasses three main pillars that a business must meet. Dyllick and Hockerts (2002) refer to these pillars as economic, natural, and social, whereas Elkington (1999) initially calls the metrics the triple-bottom line. Meeting all of the pillars allows for sustainable and synergistic gains and contributes to a sustainable development of the company. The essence of the concept lies in the understanding that a single-minded focus on economic sustainability on its own, cannot remain as a sufficient condition for the overall sustainability of the corporation. Both social and environmental issues need to be considered to increase ecological and social efficiency of the company's operations (Dyllick and Hockerts, 2002). Often referred to as the three main pillars of sustainability they create economic, environmental as well as social value (Lüdeke-Freund, 2010), each prevailing with integrity but also influencing another due to their interrelated nature (Dyllick and Hockerts, 2002). For the purposes of this thesis, we adopt Elkington`s (1999) approach to sustainability, determined by economic, environmental and social conditional shades of sustainability, since these three pillars have been guiding industry for decades and are still as relevant as ever. While the "internet of things" is the next wave affecting industry, its development is still guided by the triple-bottom line (Müller, Kiel, and Voigt, 2018). Slotegraaf (2012) reports that it is not just increasing industry awareness of the need to develop sustainably, but also increasing government regulations that make managers more attracted to sustainable practices. While, the need to focus on economic, environmental, and societal values are well accepted by literature, the BMs to achieve sustainability are more varied (Bocken et al., 2014), thus the conditions for sustainable BMI in the current literature tend to be fractured.

While sustainable innovations and BMs have been growing areas of interest for the last decades, the field of how they interact with each other is not as mature. Boons and Lüdeke-Freund (2013) examined this gap in knowledge to promote the development of the field. The earlier work in

BMI, as by Johnson et al. (2008), where profits were the center of interest, had to be changed. The value proposition under Boons and Lüdeke-Freund (2013) now encompasses economic, environmental, and social values for which a BM must provide. This creates the need for balance in planning, as profit maximization can no longer occur without regard for the harm it causes to others. Also, the idea of firms being black-boxes and pursuing sustainable BMI by themselves was found to be ineffective. The authors noted that particular attention must be paid to the supply chains and customer interfaces to promote sustainable development. The view is no longer of solely the firm, but other strategies along the entire value chain, where boundaries must be spanned across the organizational gaps.

Despite the complexities in covering the intricacies of the broad topic of sustainable BMI literature has looked at the general conditions that promote it. Bossle, Dutra de Barcellos, Vieira, and Sauvée (2016) investigated both the internal and external factors that drive sustainable innovations through a literature review. What they found was the drivers are skewed to external factors; mainly that of government regulations, as companies seek to comply with tightening standards. Open innovation, or what the authors referred to as cooperation, was also an important factor, as companies seek to extend sustainable initiatives across their value chain (Boons and Lüdeke-Freund, 2013). Peer and market pressure were also highly considered by the literature as companies try to keep pace with competitors by offering sustainable products or services. However, the authors found relatively little support from literature that companies were actually using sustainable innovation to get ahead of their peers in the race to be more sustainable. When changing views to internal factors, efficiency was found to be the predominant factor, mainly due to its clear cost savings. Environmental leadership, culture, and capability within the firm were all found to play a role in promoting eco-innovation and can be affected by human resources. Bossle et al. (2016) also made a clear proposition that external and internal factors are interactive in a dynamic world. The firm can shape its environment for sustainability, just as the environment can shape the firm.

To bring a degree of focus to the broad field of sustainable BMI, de Jesus and Mendonça (2018) compiled the existing drivers and barriers that literature has identified for creating circular

economies, an important subset of the broader sustainability movement. Circular economies encompass the field of upcycling as it is about how to continually reutilize waste. Soft factors, like government regulations, increasing social awareness, and customers switching preferences from ownership to service models were found to be important drivers. The largest barriers were technological; finding the appropriability of new tech-innovations, the time between design and implementation, and developing the support and training networks to facilitate the use of the technology. Even when technology barriers were overcome, de Jesus and Mendonça (2018) identified significant economical hurdles like high capital costs and uncertainty in the return on investments. These factors, compiled by the authors, were general to all circular economies, including methods of reuse, recycling, and extension of product life.

Taking the works of Bossle et al. (2016) and de Jesus and Mendonça (2018) together we can identify that literature has started to narrow down the leading factors affecting not only sustainable BMI, but more specifically closed loops. External and soft factors offer incentives for companies to start the journey, while uncertainties in how to overcome the technological and economical barriers are causing inertia that prevent implementation of sustainable BMI. While we expect these factors to extend to the field of upcycling, we also expect to see the barriers to become larger as the amount of innovation required grows. In the next section we will explore the degree of innovation required for upcycling compared to recycling and other sustainable tools methods.

2.3 Sustainable Business Model Innovation for Upcycling and Conditions

2.3.1 Degree of Business Model Innovation

Waste is a common term for the generation of something that offers no value, in most cases offering negative value to the environment and society if left untreated. King and Lenox (2002) explored the profitability of different initiatives to reduce the negative attributes of waste. End-of-pipe solutions were found to have historically been management's most utilized tool to lower the impact of their operational waste as they require little innovation to address. End-of-pipe solutions create a balancing act of how much economic resources the company should spend to

prevent damage to their environment and the authors found it offers the lowest potential to turn waste into profit. They argued that management needs to innovate and reach past end-of-pipe solutions to find the waste solutions where economic gains can be realized along with societal and environmental benefits. King and Lenox (2002) suggest that looking at the source of the waste to prevent it presents opportunities for profit addition. This view of waste reduction has been popularized in literature as eco-efficiency where both economic and environmental gains are achieved (Ghisellini, Cialani, and Ulgiati, 2016).

End-of-pipe solutions and waste reduction (or eco-efficiencies) do not encompass all of the options available to a firm though. Carrillo-Hermosilla, del Rio Gonzalez, and Könnölä (2009) see the options of end-of-pipe treatment and eco-efficiency solutions, but also have added eco-effective solutions. Eco-effectiveness is the creation of closed-loop systems that allow for what was once waste to be transformed into the input of a new process, which is where upcycling and recycling fit under. The authors advocate that these solutions are the most sustainable options, leading to the creation of not only economic and environmental value, but also value added to society. It is unsurprising that the most sustainable options also represent the closest relation to the natural world as the concept of waste does not exist in the today's ecosystems (Lovins et al., 1999). While the benefits of closed-loop systems are not a point of controversy, the higher degree of innovation needed to create them (Carrillo-Hermosilla et al., 2009), adds larger barriers for industry to adopt them. Therefore, there is still an underutilization of eco-effective solutions in industry as the conditions to promote them are not well understood.

Existing research on sustainable BM has identified several archetypes of strategies that companies can pursue to achieve BMI for sustainability. Bocken et al. (2014) with a more comprehensive view have developed three groupings of mechanisms containing several archetypes to accelerate the development of sustainable BMI in both research and practice.

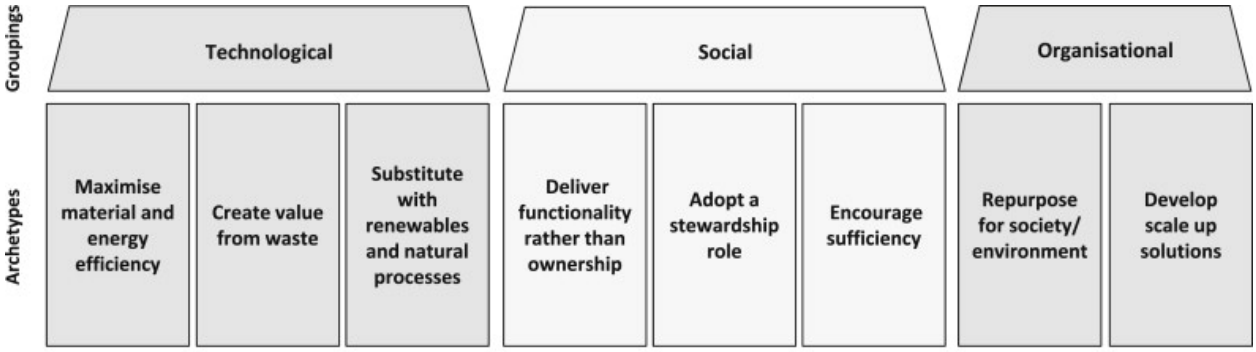

Figure 1 - The Sustainable BM Archetypes (Bocken et al., 2014)

'Creating value from waste' as one of the archetypes, is differentiated by Bocken et al. (2014) in itself (referred to as sub-archetypes) as this archetype seeks to achieve both (1) reducing waste to a minimum, for instance by reverting it back into the production stream in form of recycling, and (2) creating entirely new value from what is currently perceived as waste, to which upcycling is to be considered. Reduction of waste looks to improve on the efficiencies of the current BM, while the creation of new value calls for the creation of a new BM for the waste.

Within this framework Laukkanen and Patala (2014) identified also several different conditions that are hindering the diffusion of these archetypes. Lack of legislative pressure, as well as lack of economic incentive and lack of awareness and understanding were identified to be the main barriers to create value from waste (Laukkanen and Patala, 2014). These three conditions, as we can call them, are not only very broad, they also have no indication of in which context they are to be seen in regards of the differentiation in sub-archetypes of reducing waste or creating new value. Literature proceeds in developing these blurred barriers into conditions for BMI for sustainability (see Figure 2), which eventually detaches them from the individual archetypes entirely. The crux of the matter though is that by merging sub-archetypes, the possibility of identifying new conditions evolving from only one of the sub-archetypes has been entirely vanished in the first place. The authors concede that their very wide view lacks details in relation to specific kinds of innovations (Laukkanen and Patala, 2014) and further research is needed to utilize a clear approach and focus on specific archetypes of BMI for sustainability like creating value from waste.

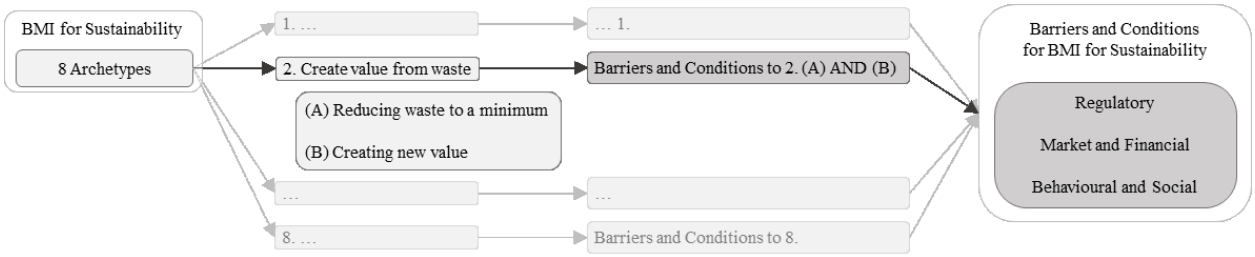

Figure 2 - BMI for Sustainability Condition Evolution, according to Laukkanen and Patala (2014)

Further expanding on this point, Schaltegger, Lüdeke-Freund and Hansen (2012) distinguish and propose a framework of multiple degrees of BMI, following different strategies for each. Defensive strategies usually conduct slight degrees of BM adjustment or adoption aiming to protect the current business strategy by cost-efficiency-oriented measures, affecting only a minor number of business elements, explicitly excluding the value proposition. Moreover, accommodative strategies can be modifications of internal processes or external networks and are partly linked to environmental or social objectives (e.g. environmental protection), whereas proactive strategies feature radical changes towards a company's core business and prevailing logic, affecting many different BM elements, including a new or redesigned value proposition. Although all of these strategies are defined as BMIs, in the framework of business strategies striving towards sustainability, proactive innovation strategies are considered to be most impactful (Bocken et al., 2014).

With Schaltegger et al.'s (2012) framework we can further define recycling as a defensive measure to protect the current business model. The need for compliance, risk and cost reduction is often the focus of such incremental BM adjustments (Schaltegger et al., 2012). We therefore consider the issue of recycling as an incremental BM adjustment, not addressing the actual value proposition dissolved from BM innovation, as defined by the authors. Without changing the value proposition and little adjustment to the business strategy, incremental changes can continue to be served by the dominant logic and existing conditions within a company. The recreation of the BM that upcycling needs, what Schaltegger et al. (2012) would label as a proactive strategy, gives us a lens to see what conditions need to be in place to purse a form of radical sustainable BMI.

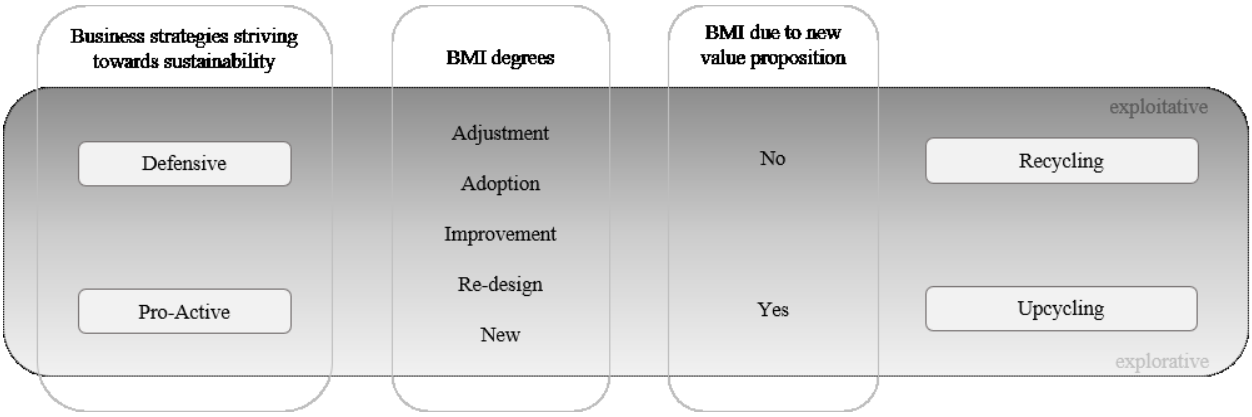

Figure 3 - Necessity of Differentiation between Upcycling and Recycling, adapted from Schaltegger et al. (2012)

2.3.2 Known Trends Specific to Upcycling

While looking for the keys to a sustainable future, there are two trends that have opened the door to make upcycling a viable option for companies to pursue; open innovation and sustainability (Slotegraaf, 2012).

2.3.2.1 Upcycling via Open Innovation

The term open innovation, coined in 2003 by Chesbrough's Open Innovation book (Chesbrough, 2003), initiates a controversial debate about its novelty. As some business practitioners and scholars argue, companies have previously peered beyond their organizational borders to develop new products and services, but there is still a remaining uncertainty for many firms about the intricacies involved in the underlying processes of open innovation (Slotegraaf, 2012).

Yet, open innovation is one of the most discussed topics in innovation management and has been approved to be a valuable concept for firms in various contexts (Huizingh, 2011). Slotegraaf (2012) identified two shifts in business practice that necessitate attention in the domain of open innovation. The first shift links to business strategies and models, including suitable practices companies can use during their innovation process. The second shift centers on sustainability, identified by several trends indicating a push especially towards environmental sustainability (Slotegraaf, 2012). Digging deeper in the area, open innovation, specifically in the field of environmental sustainability, appears to be dominated by the importance of network structures and its dynamic characteristics. Investigations of Roome (2001) on the relationship of networks

to environmental management and sustainable development show that there is a significant role of contribution, which can be expected to continue developing. Hence, networks and open innovation will be of even greater importance for sustainable upcycling solutions. Another trend is the emphasis on stakeholder analysis, highlighting the importance of frequent, meaningful interactions between companies and their stakeholders (Roome, 2001). Roscoe, Cousins and Lamming (2016) state that the intensity of the relationships to specifically suppliers, can play an important role for companies to identify and implement eco-innovations. Depending whether there are strong or weak ties to either strategic or many several suppliers, incremental or radical eco-innovations are more likely to be identified. Another promising route is the opportunity of building weak ties to suppliers that bridge structural holes in their network (Roscoe et al., 2016). Alternatively, an innovation intermediary can be put into place to provide access to external knowledge in different industries for specific environmental technologies and expertise. Either way, fact is that a single company is usually unlikely to possess all knowledge elements to efficiently succeed in environmentally sustainable innovation efforts like upcycling (Slotegraaf, 2012).

Furthermore, there is an emphasis on the specific and different requirements of co-creation with external partners at different stages of the product life cycle. Tekic and Willoughby (2017) suggest what type of actor may be involved as co-creators in product innovation projects, which type of co-creation may be appropriate, and how a suitable co-creative setting and network can be developed. They see early and especially latter stages of the product life cycle as distinct contexts for co-creation strategies for product innovation. Although there is a prevailing differentiation between early and latter stages of a product life cycle, solutions for how companies can manage their environmentally sustainable and innovative co-creation projects with external contributors, are still rather broad and do not consider specifications and even differences between recyclable and non-recyclable products.

In the domain of upcycling there are several cases of firms that have established important partnerships with major brands on the latter stage that ensured them access to specific knowledge (Slotegraaf, 2012). However, literature indicates that there are still gaps in the understanding of how this is exactly being practiced and meant to be implemented. New frameworks are required

to explain how to efficiently pursue environmentally sustainable innovation efforts all along the value chain that can offer competitive advantage and show how to successfully establish sustainable solutions. We propose in the framework of this thesis an approach via BMI through the lens of sustainability, since the issue of sustainability eventually leads back again to the field of traditional business strategy and innovation communities, ecosystems, networks, and their implications for competitive advantage, are most likely to be fully captured if they fit the strategic model of a firm (Chesbrough and Appleyard, 2003).

2.3.2.2 Upcycling via Sustainability

In Section 2.2 "Business Model Innovation for Sustainability Conditions" we examined literature that touched upon the importance of sustainability and what conditions are needed for sustainable BMI. Now, that we have limited our focus to upcycling, we will examine the literature base for creating value from waste.

An innovative BM can challenge the way we think of something we thought was simple. That is what creating value from waste does, as by doing so it effectively eliminates the concept of waste (Bocken et al., 2014). Instead of keeping the negative connotations with waste or by-products, researchers had changed their terminology to describe waste that is being pursued to create value from as co-streams (Egelyng et al., 2017). While prevention of waste is still preferred, a trade-off point is eventually reached where the technological applications of upcycling are more feasible than any method to reduce it. Bocken et al. (2014) say that value generation from waste depends on partnerships, often outside of the industry. The combinations of different industries coming together makes the different applications limitless, while the level of open innovation in a firm controls how many applications are attainable. The rise of open innovation, as Slotegraaf (2012) predicted, makes this field more applicable to many industries that had no perceivable options a decade ago, again showing the interaction of open innovation and sustainability.

There had been a level of success in the implementation of creating value from waste in micro-developments. Industrial symbiosis occurs in eco-industrial parks where a variety of uncorrelated industries come together to reuse each other's waste, lowering their collective footprint

substantially (Chertow, 2000). These eco-industrial parks mimic nature by viewing waste as simply as an input into a different process, creating closed loops. They are created through much work in searching for the right companies, building the contracts, and implementing the waste transfers, with the end result enabling multiple companies to reap economic and environmental benefits (Behera et al., 2012). The industrial symbiosis that exists in these parks show that the trends of sustainability and open innovation can come together to enable the creation of value from waste. However, for upcycling to scale upwards from these specific eco-industrial parks a more general BM for upcycling must be identified that does not depend on having factories placed in a small area.

Complicating the manner of BMI for upcycling is when traditional tools to address sustainable BMI are no longer useful in the upcycling niche. One of the most popular and reliable tools for sustainability has been to change business models from being good-oriented to service-oriented (Lovins et al., 1999; Bocken et al., 2014). The service perspective allows for resources to be shared amongst many users, creating more value from each unit input, making it so companies must supply less material for their given demand. However, in the case of upcycling waste, where the creation of waste is independent of the demand for it, the service model starts to lose some of its effectiveness. This additional challenge amongst others yet to be uncovered, are what we plan to explore and understand as we research this topic in our case study.

The following table provides an overview of potentially relevant conditions for BMI for Upcycling:

Category	Condition for BMI	According to
	(-) Organizational rigidity (-) Inability to unlearn (-) Risk averse senior management (-) Suboptimal innovation process (-) Infrastructural barriers to follow through	*Assink (2006)*
	(-) prevailing dominant logic	*Sivertsson & Tell, 2015*
	(+) Leadership for change (+) Experimentation and effectuation	*Chesbrough (2010)*
	(-) inadequate knowledge of existing BM	*Chesbrough (2010)* *Johnson et al. (2008)*

	(+) Understanding a customer need (-) lack of understanding of current BM	*Johnson et al. (2008)*
	(+) Leveraging company resources	*Demil and Lecocq (2010)*
	(+/-) Regulatories	*Sivertsson and Tell (2015)*
Category	Conditions for BMI for Sustainability	According to
Internal disablers	(-) High capital costs	*Jesus and Mendonça (2018)*
	(-) Short-termism (-) lack of marketing know-how (-) profitability/satisfaction of existing BM	*Laukkanen and Patala (2014)*
	(-) Enterprise culture (-) Leadership, management (-) Lack of motivation	*Eichen, Freiling and Matzler (2015)* *Laukkanen and Patala (2014)*
	(-) Financial uncertainty and risk	*Laukkanen and Patala (2014)*
	(-) Uncertainty in ROI	*Jesus and Mendonça (2018)*
	(-) Uncertainty in the exploration, feasibility, and the commercialization stage	*Behera, Kim, Lee, Suh, and Park (2012)*
	(-) Risk aversion	*Sosna et al. (2010)* *Laukkanen and Patala (2014)*
Internal enablers	(+/-) (Lack of) flexibility	*Carayannis, Sindakis, and Walter (2014)* *Laukkanen and Patala (2014)*
	(+) Cross-functional/organizational (+) Balance long and short term (+) Ambidexterity (+) Organizational design	*Carayannis, Sindakis and Walter (2014)* *&* *Huang, Lai, Kao and Sung (2014)*
External social factors	(+/-) (Lack of) social awareness (+/-) Customer preferences/acceptance	*Jesus and Mendonça (2018)* *Laukkanen and Patala (2014)*
	(+) Peer pressure	*Bossle, Dutra de Barcellos, Vieira, and Sauvée (2016)*
External factors	**(+/-) Interfaces between organizations** (+) Open Innovation (+) Supply chain management	*Boons and Lüdeke-Freund (2013)*
	(+) close proximity for collaborations	*Behera, Kim, Lee, Suh, and Park (2012)*

	(-) Lack of involvement of stakeholders in decision making (-) no stakeholder pressure	*Laukkanen and Patala (2014)*
	(+/-) Appropriability of technology depending on the innovation	*Jesus and Mendonça (2018)*
	(-) Lack of encouragement to innovativeness	*Laukkanen and Patala (2014)*
Macro-economic factors	**(+/-) Economics**	*Jesus and Mendonça (2018)*
	(-) Lack of economic incentives (-) Operational environment stability	*Laukkanen and Patala (2014)*
	(+/-) Governance	*Carayannis, Sindakis and Walter (2014)* *Bossle, Dutra de Barcellos, Vieira and Sauvée (2016)* *Jesus and Mendonça (2018)*
	(-) Lack of long-term legal regulatory frameworks (-) Inconsistent and overlapping regulatory mechanisms (-) Lack of normative rules/industrial standards	*Laukkanen and Patala (2014)*
Category	Conditions for BMI for 'Creating value from waste' (sustainability archetype)	According to
	Conditions for BMI for 'reducing waste' and Conditions for BMI for 'creating new value'	*Bocken et al. (2014)*
	(+/-) (Lack of) legislative pressure (+/-) (Lack of) economic incentives (+/-) (Lack of) awareness and understanding	*Laukkanen and Patala (2014)*
	Conditions for BMI for 'reducing waste' and/**or** Conditions for BMI for 'creating new value'	
	(+/-) *not assignable* Trends: (+) Open Innovation (+) Sustainability	*Slotegraaf (2012)*

Table 1 - Overview of Potentially Relevant Conditions for BMI for Upcycling

2.4 Review and Contribution

The research on BMI for sustainability as revealed is still not fully conceived. Frameworks and mechanisms of how to establish BMI for sustainability have not been developed yet in detail due to limitations in data amongst others. Consequently, the specifications and requirements of non-recyclable waste and its transformation into valuable co-streams within upcycling are barely considered either. Scattered cases show that upcycling can be made into an innovative, sustainable, and successful BM and also existing literature indicates an increasing and significant interest in creating value from non-recyclable waste. But these cases also show that they are not without barriers that have kept other companies from implementing upcycling and making it commonplace.

Existing literature is only scratching on the surface of BMI for sustainability. Authors acknowledge that the wide view with which they have examined BMI for sustainability lacks details related to specific kinds of innovations (Laukkanen and Patala, 2014), further research is needed to utilize a clear approach and focus on upcycling as a specific sub-archetype of BMI for sustainability. By actually keeping consistency in differentiating between upcycling and recycling within one archetype, and as literature also recommends it, the question evolves of the identified conditions' affiliation to the individual sub-archetypes. The identified conditions would be more transparent whether they were mostly initiated by the creation of value from non-recyclable waste or waste reduction and recycling. Additionally, we expect to identify entirely new conditions by opening the opportunity to investigate individually on upcycling, enabled to consider specific challenges of its nature that would have been originally eliminated due to its sub-archetypal merge in the first place.

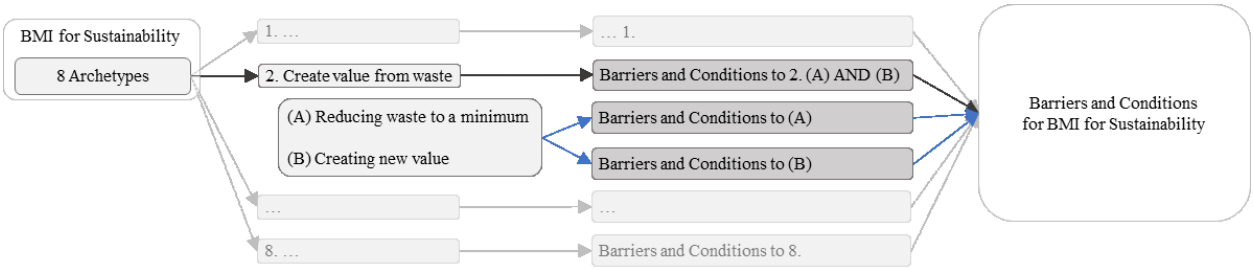

Figure 4 - Existing Conditions and Contribution of the Research, adapted from Bocken et al. (2014)

This approach is supported also from another perspective when it comes to defensive and proactive business strategies striving towards sustainability. Upcycling, requiring the exploration of a new business model, is here also differentiated to recycling, considered as exploitative initiatives within the existing business model. Hence, we defined recycling as an incremental BM adjustment and is not a strong case to study the conditions of BMI. Further literature showed that the actual crux of the matter lies in the higher degrees of BMI when it comes to re-designing and creating new BMs and value propositions.

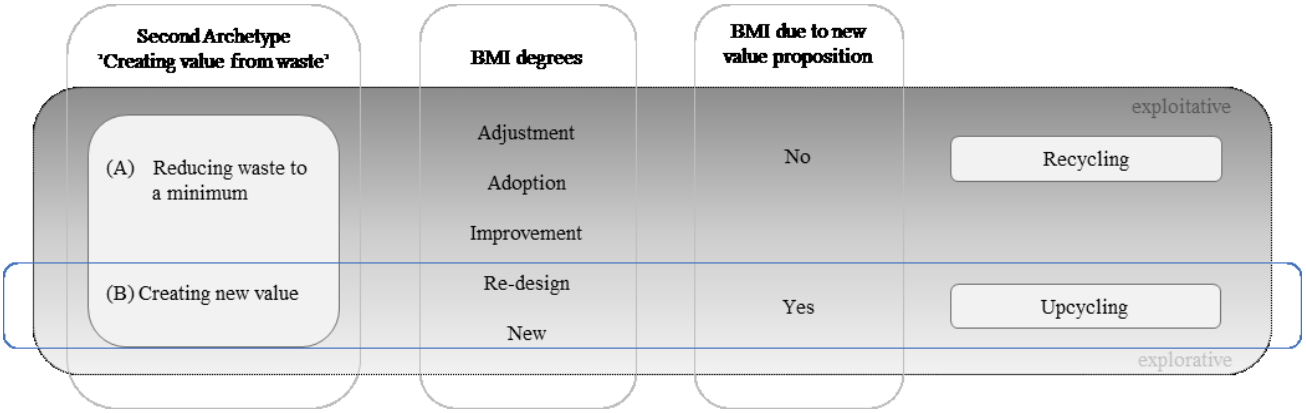

Figure 5 - Necessity of Differentiation between Upcycling and Recycling (2), combined and adapted from Bocken et al. (2014) and Schaltegger et al. (2012)

Putting these frames on top of each other we get a clear pattern, that recycling as a BM adjustment for incremental change can be an interesting field to investigate in detail, but has neither significant relation to BMI for sustainability, nor necessity for further research. However, it demonstrates the clear need of differentiation to upcycling in its approach to performance. The process of upcycling is here of specific interest since prevailing conditions do not seem entirely adequate or remain incomplete. Also investigating the specific opportunity of upcycling via backward induction shows that the research field is predominated by an engineering approach but is neglecting economic aspects, which indicates on uncovered conditions and upcycling as an open field of research.

Literature has covered some conditions prevailing, but they are blurred due to the combined approach of exploitative and explorative research. Clearly, there is a distinct need of a qualitative in-depth understanding of case studies to explain the conditions that allow for sustainable BMI

for upcycled waste to be successfully conducted. For this reason, the aim of our thesis is to fill this gap by focusing on the particular field of upcycling, which will uncover factors defining a firm's ability to innovate their BM in a sustainable fashion. In the next chapter we will discuss our method of conducting and analyzing our research.

3 Methodology

3.1 Research Approach

The findings of our thesis are not independent of our chosen research process (Bryman and Bell, 2015), therefor it is with careful consideration that we approach our research to ensure the experiences of the case company give the greatest value to theory. Our research is geared towards to managers looking to capitalize of the elusive tool of upcycling, while at the same time adding to the foundation of literature for future models to be built upon. Inductive reasoning will be applied as we build upon the specifics of the case company to make a general model through an iterative process that shapes both our research topic and the generality of our findings (Bryman and Bell, 2015).

In terms of epistemology, our research will make use of interpretivism, which acknowledges that our business research is shaped by human beings who perceive their own social reality, and it is the role of the researcher to understand and give context to the actions coming from those social realities (Bryman and Bell, 2015). Bryman and Bell (2015) noted that the interpretivism can lead to findings that are surprising from an external point of view. These non-obvious answers are highly sought after, as they can help explain the lack of upcycling business models, despite the documented need for them.

We also accept that organization and culture are dynamic entities that are constantly being changed by the social actors that operate within them, thus we have, what Bryman and Bell (2015) refer to as, constructionist ontology. This stance will allow us to deconstruct the many layers of the organization and allow us to perceive how the interactions and thought processes of

the employees create incentives and inertias in the face of challenges (Bryman and Bell, 2015). Combining constructivism and interpretivism will allow us to dive deeply into the specifics of the case company and to create a mosaic from the uncovered findings.

3.2 Research Strategy and Design

The inductive, interpretive, and constructivist approach all lend themselves to a qualitative research strategy (Bryman and Bell, 2015). Since the goal of the research is to add to theory in the void gap of sustainable BMI for upcycling the qualitative approach is ideal to delve deep into the immature subject matter. Our focus on the generation of the theory, rather than testing or measuring, provides little value to pursuing alternative (quantitative) strategies, so a mixed method (Bryman and Bell, 2015) will not add significant value. Keeping our research strategy solely qualitative will maximize our ability to produce rich and novel theory.

3.2.1 Single Case Study Design

A case study was chosen to explore the particularities of an organization that possesses the desire to implement an upcycling business model, but still is on the journey to achieve successful implementation. This offers a representation of the typical firm's journey to use upcycling. Bryman and Bell (2015) noted that the findings of a representative case cannot be applied universally to all other cases and companies, which is align with constructivist ontology in that social environments are dynamic and reliant on the actors of the individual organizations. However, the authors found that the emerging theory from the unique case can produce a level of generalization that can be used to solve complexities in other organizations. Thus, our methodology will not seek to stay at a shallow level to improve the generality of the findings, rather it will delve deep to find the fundamental findings so that they can be connected to build a theory with a strong degree of universality.

3.2.2 Research Process

The process to be followed during the research is highly iterative. No topic areas or subsequent knowledge at the beginning of the research was to be taken for granted. As findings were

uncovered through research, early concepts were re-evaluated to see if they were still relevant or needed to be shaped differently. To facilitate this iterative process, constraints and structure to the research are minimal at the beginning of the research, allowing for significant freedom to change research areas, but are added as the research progresses and iterations become relatively smaller scale. Thus, the process of identifying gaps in knowledge and ability is done through unstructured interviews, while developing the findings is done by semi-structured interviews.

3.3 Data Collection Method

In the framework of the chosen single-case study design, the research field is distinguished by various characteristics that will be mostly considered in our data collection method. Due to the lack of research studies in the field of BMI for sustainability in the niche of upcycled waste, an open approach of data analysis is required to let potential conditions reveal promoting or hindering BMI. Supplementary an in-depth analysis and internal data collection method ensures a deep understanding of the organizational essence and dynamics, prevailing and framing the conditions to be investigated. For this reason, we conducted a combined data collection method that is considering both an initially explorative approach and an in-depth analysis of the collected data. The concept of using more than one method of data in the study is commonly referred to triangulation by Bryman and Bell (2011) and eventually contributes to both validity and reliability of the research, by developing an understanding of a complex social reality being influenced by specific conditions (Bryman and Bell, 2011). Therefore, our collection method consists of a portfolio of unstructured interviews, spontaneous talks, company material, notes of subjective impressions, tape material of recorded meetings, and semi-structured interviews, which will be elaborated in Chapter 3.3.3.

3.3.1 Case Company

The methodology of this research was chosen according to the nature of a single case study design and is concerned to elucidate the unique features of the case company. This idiographic approach is conducted with purposive sampling that intends to reveal deeper knowledge of organizational dynamics, eventually answering the research question. Supported by the following

data analysis approach in the framework of grounded theory, which we will elaborate on in Chapter 3.4.1, we aim to get a better understanding of the essence of organizational dynamics within our research and based on the assumption that the organization and its processes are a social construct, influenced and organized by social actors (Bryman and Bell, 2011). This perspective is also align with Gioia, Corley and Hamilton (2012) to focus especially on the understanding of an employee`s experience on processes, and specifically in this case the process of value generation. In order to answer the research question, we can therefore ensure a synergic fit of methodology to the case company, since the case company has been confronted throughout with the issue of value generation from non-recyclable waste and has experienced both the factors hindering and supporting BMI for sustainability in the upcycling field. Furthermore, we identified several "knowledgeable agents'' (Gioia et al., 2012) in the organization that can help to explain and understand the thoughts, intentions, actions, and conditions prevailing around this research area, which affirms us in our purposive sampling approach of strategic sampling.

3.3.2 Unstructured Interviews

Due to the flexible nature of unstructured interviews, we considered this technique to be a valuable contribution to our data collection methodology. Although we know findings concluded from unstructured interviews cannot be generalized to other settings (Bryman and Bell, 2011), they were designed in our case for the purpose of capturing a bigger picture of the organizational structure and identifying a research area, where eventually our research question derived from. For that reason, not all the interviews have been recorded or transcribed, since they do not function as a source of data collection as such.

In the framework of this research the following unstructured interviews have been undertaken:

Department/Position	Date	Initial topic
Head of Sustainability	Frequent discussions	
Technical Sales Manager	23.01.18	Non-recyclable waste
CEO	Frequent discussions	
Executive Assistant	Frequent discussions	Development of the industry
VP HR	Frequent discussions	
Research Engineer (R&D; Sustainability)	26.01.18	Production and waste creation
Sales Coordinator	29.01.18	Impressions & Assessment of the case company
Consultant & Former Employee	02.02.18	
Sales VP	02.03.18	Cost structures

Table 2 - Overview Selected Unstructured Interviews

Although these selections are relatively a small ratio of the overall employees, they provide a representative perspective of different departments and positions, which is why we consider the identified research topic of BMI in the field of upcycled waste to be omnipresent within the whole company.

3.3.3 Semi-Structured Interviews

With the research topic identified we needed to add more structure to keep our conversations concise and tailored to the right areas. Adding structure contributes a degree of standardization to the interviews, limiting the amount of variability in responses that are due to the way the questions are asked, increasing the validity of the findings (Bryman and Bell, 2015). However, due to the novel research area, we value the freedom to pursue interesting lines of thoughts that arise during the interview, therefore we conducted semi-structured interviews. A desired element of semi-structured interviews is that, while initial questions are planned, follow-up questions can be asked to explore interesting points in the conversation (Bryman and Bell, 2015). The semi-structured nature of interview is the optimal mix to keep us on track without suffocating our freedom to adjust to answers.

3.3.4 Interviewee Selection

For the sampling of interviewees, we built a portfolio of participants that have had a diverse involvement in the case. The variety of conditions identified in the literature review and through unstructured interviews means that one person cannot possibly be an expert in every condition. Therefore, we employed purposive sampling to handpick interviewee candidates that meet our baseline conditions and add alternative views from other candidates to get the best understanding of the social phenomenon we have investigated (Bryman and Bell, 2015). This ensured that while many R&D specialists worked closely with the case, not all of them were interviewed, instead selecting others, employees with no management function as well as mainly middle to top-management to add a holistic view of the case. Covering several different departments like HR and Finance for example, allowed for more context information and assured to touch upon several aspects linked back to identified conditions in the existing literature.

To ensure the relevance of included interviewees, they underwent a portfolio of three selection criteria, of which at least one criterion per candidate had to apply:

Criterion 1 - Strategic Decision Rights of Upseries: This criterion allows us to interview those, who were confronted with the necessity to deeply reflect on the matter of upcycling as their decisions guided the company throughout the development of Upseries. For the matter of this criterion, especially middle and top-management positions are of great relevance to target the research objective.

Criterion 2 - Involved in Development of Upseries: Interviewees that were involved, without necessarily guiding the overall upcycling strategy, will allow us to dig deeper into the intricacies of certain conditions, particularly hard factors like a specific type of expertise to fully understand problems and paths that need to be overcome, but also soft factors like initial thoughts and approaches amongst others, are of high value in order to answer the research question.

Criterion 3 - Involved in General Waste Management and / or Sustainability: To understand the organizational context, upcycling is embedded in, we also interviewed employees and

managers, who did not have to be necessarily involved in the specific case of Upseries but were confronted with the overall subject of waste management and / or sustainability in general. This criterion allowed us to gather perceptions of several department perspectives on culture, finance, and waste in the context of sustainability.

Interviewee	Position	C1	C2	C3	Date of Interview
Interviewee 0	Pilot	-	-	-	14.04.18
Interviewee 1	Sales Coordinator		✓	✓	16.04.18
Interviewee 2	VP HR			✓	17.04.18
Interviewee 3	Business and Sales Development	✓			18.04.18
Interviewee 4	Operations Manager		✓	✓	18.04.18
Interviewee 5	VP Sales			✓	19.04.18
Interviewee 6	Former Quality & Environmental Management			✓	19.04.18
Interviewee 7	Research Engineer		✓	✓	20.04.18
Interviewee 8	VP Sales	✓	✓	✓	23.04.18
Interviewee 9	VP Sustainability	✓	✓	✓	23.04.18
Interviewee 10	CEO	✓		✓	23.04.18

Table 3 - Overview Selected Semi-Structured Interviews

3.3.5 Interview Guide

In order to capture the interviewee's insights, perceptions, values, behaviors, and emotions for the purpose of this research in a suitable way, we decided to develop the interview guide according to the suggestions on semi-structured interviews by Bryman and Bell (2011). Starting

off with the general research area, it was narrowed down to specific research questions and interview topics; and resulted in three parts and several sub-categories. For the matter of a natural flow of the interviews, the guide is divided in an introduction part (Part A), a question part (Part B1 and B2) and a closing up (Part C). For deeper insight, please see the full interview guide in Appendix 2.

Part A provides formalities about the interview`s conditions, as an approval of every employee to record and subsequently transcribe the interviews for analysis (Bryman & Bell, 2011), and contains an introduction text to the topic. Furthermore, it starts of with some generic questions that record the most important "facesheet" information of the interviewees (Bryman & Bell, 2011), which is helpful to understand the context of given answers.

Part B initiates with some explorative questions and is then split into Part B1 that touches upon conditions for BMI for Upcycling before the commercialization of Upseries; and Part B2 investigating on changes and conditions after the commercialization to achieve a full before-and-after comparison. However, the first set of questions relates primarily to obtaining an understanding and alignment of the interviewee`s comprehension of concepts, terms and values; and to provide clarification if necessary. Since creating value from waste is a key theme throughout the interview, background questions around this theme help to identify its role in the interviewee's work activities, which enable for better sense during latter more specific questions. Part B1 is designed to let the interviewees reflect in an explorative way on their first experiences, expectations, and thoughts about Upseries. The following questions are focused on obtaining a general overview on how Upseries has been integrated into the firm and how this process has been developed. As the case company has been confronted with the challenge of BMI for Upcycling for over two years, it is the overall aim to understand the prevailing conditions the company has gone through towards and after final commercialization. Furthermore, as for an supplementary aspect of the research study we integrated some questions about the case company's recycling activities, based on Schaltegger et al. (2012) and Bocken et al. (2014), to differentiate recycling as a simple modification of internal processes or external networks and prove Upcycling to be a proactive strategy, featuring radical changes and affecting many different BM elements, including a new or redesigned value proposition. This way we can

additionally highlight the novelty and necessity of the research field of Upcycling and our overall contribution to it.

To collect the full data, Part B2 is mostly based on identified conditions for BMI for Sustainability, presented in Chapter 2.2, but formulated with a high level of leeway in how the interviewees can reply (Bryman & Bell, 2011). In this way we can both, ensure the validity of the case company to its research field and uncover new conditions beyond them in the specific field of upcycling.

Financials, Risk & Uncertainty - Conducted topics of the overall conditions, allow touching upon existing literature in a more clearly arranged way. Due to this approach, we can cover conditions and barriers, identified by Jesus and Mendonça (2018), Laukkanen and Patala (2014), and Behera et al. (2012), with topics like Financials and Risk & Uncertainty.

Strategy - Since literature has identified sustainability to be eventually looping back into the field of traditional business strategy (Chesbrough and Appleyard, 2003), questions about strategic activities and the case company's visions of how Upcycling fits the strategic model of the firm. Optional follow-up questions on specifications in long-term and short-term goals, related to ambidexterity, allowed us to test also Carayannis et al. (2014) concerns about balancing both goals beside the three pillars of economic, environmental, and societal value.

Culture - To touch upon cultural and organisational aspects as by Laukkanen and Patala (2014), Carayannis et al. (2014), and Jesus and Mendonça (2018) identified, the overall organizational design in which culture is embedded, is been moreover questioned by open questions and also covers conditions like awareness.

Motivation - As for 'Lack of motivation', discussed as a rather strong condition by Laukkanen and Patala (2014), we decided to split this topic in intrinsic and extrinsic motivation to better understand what interviewees perceived while working with Upseries.

Knowledge - The overall aim of this topic was to understand whether there is a relation between the burdensome development of Upseries and the case company's prevailing pool of knowledge. Since single companies are usually unlikely to possess all knowledge elements to efficiently succeed in environmentally sustainable innovation efforts like upcycling (Slotegraaf, 2012), we decided to do some further investigations.

Leadership - This topic, identified as a barrier by Laukkanen and Patala (2014), has not garnered much attention in the field of sustainable BMI. . However, it is interesting to note that it is a well discussed condition in the general BMI field, supporting change (Chesbrough, 2010). Moreover, our unstructured interviews indicated on this condition to be of greater importance, which is why we put a special emphasize on it in the interview guide.

Government & Market - The aim of this topic, was to touch upon the well discussed condition discussed by several authors like Carayannis et al. (2014), Bossle et al. (2016), Jesus and Mendonça (2018). Especially Laukkanen and Patala (2014) have identified lack of long-term and inconsistencies in regulations to be crucial and are discussing them also in relation to 'creating value from waste' as a form of legislative pressure. For this reason, we aim to investigate further in this condition and additionally broaden it up to market specificities (like peer or market pressure) to identify special relevance for the field of upcycling.

Open Innovation and Sustainability - As the specific field of upcycling has been so unknown in conditions, we based this topic from Slotegraaf (2012), who identified these two trends to open the door to make upcycling a viable option for companies to pursue. We explore this topic to understand the context that might have been approved to be a valuable concept for the case company (Huizingh, 2011).

However, we are aware that not all interviewees can provide the data about all topics. It is moreover to be mentioned that questions not included in the guide may be asked as the interviewer picks up on things said by interviewees.

Part C eventually intends to close up the interview and gives the interviewee the chance to reflect on Upseries in both ways, retrospectively as their learnings so far and prospectively about their personal future assessments. It also gives leeway to the overall interview guide by asking whether there might be anything else the interviewee would like to comment on or even bring up his or himself.

3.3.5.1 Pilot Interview

As for the importance for the interviewers of being familiar with the focus of the interview, a pilot interview was conducted to serve as a training scenario for the subsequent interviews (Bryman and Bell, 2015). This was conducted with an external of the case company in the role of an interviewee, who was unfamiliar with the details of the research, for further authenticity. It took place in similar conditions that the real interviews were conducted in. Due to this trial, we could moreover make sure the duration of the interviews is reasonable.

3.3.6 Interview Preparations

Due to the criteria of geographic location most interviews were conducted face-to-face. The main advantage of this was to be able to discern body language and keep the interviewee engaged for the duration of the qualitative interview (Bryman and Bell, 2015). The interviews that were with sales people that were outside of the local region were conducted via telephone. While the telephone eliminated our ability to discern body language, we knew that the salesman was used to talking on the phone and therefore unlikely to change any of his/her answers because of the telephone (Bryman and Bell, 2015).

More general housekeeping items were followed based on Bryman and Bell (2015), which amounted to choosing a quiet conference room in the case company's office where interruptions were unlikely. The interviews were recorded to make transcribing possible, thus easing our ability to sort the data afterwards. As well in setting up the interviews we made it clear that we were flexible with the timing of the interviews to best make the interviewee feel at ease and work with us to find time for the interview. Thus, we created optimal, given our resources, conditions for the interviews to be conducted in.

The interview itself was conducted by both researchers. This allowed us to assign roles to each interviewer to maximize our ability to gather relevant data. One was assigned to lead the interview, establishing a rapport with the interviewee and asking the general questions. The other interviewer was focused on reflecting on the answers and asking follow-up questions to pursue interesting lines of thoughts.

3.3.7 Ethical Considerations

There are four general areas brought forward by Bryman and Bell (2015) that we pay special consideration to in the conduction of our research:

Avoid harm to participants - Since our research asks for reflections, compared to research that conducts experiments, there is little opportunity of causing harm to participants by altering their views or causing stress. The potential harm arises from the possibility that their reflections to are viewed negatively by a reader whose opinion matters to the participant. To avoid this potential harm, we will publish our results with full anonymity of participants to prevent the findings being directly related to an interviewee.

Informed consent - There is no element of our research that is covert. Thus, we always make the members of the case aware of our research intent on all of our interactions. In the conduction of the semi-structured interviews, which are recorded, we ask for and receive approval for the recording of their answers before the interview starts.

Invasion of privacy - Questions of a personal nature are strictly avoided in our research. Participants retain the right to not answer any question they feel they cannot answer without delving into information that they do not feel comfortable revealing.

Avoid deception - By providing full transparency, there is no part of our research that is covert and we do not attempt to deceive participants in anyway. We attempt to have as little bias as possible in our research, so deceptions would only decrease the validity of our findings.

3.4 Data Analysis

To add a systemic approach to our data we will be following the multi-step approach developed by Gioia et al. (2012). Gioia et al. (2012) developed the approach to add transparency to how the data we collect from specific interviews evolves into general theory. The process puts the interviewees front and center, as the content they produce is the building blocks for what evolves into the resulting model. The authors also address the external validity of their method, how the researchers need to find the data points that can be generalized, thus a certain amount of skill is required in the selection process. The systematic approach produces a static picture of the data, which we will describe in the following paragraph, which can then be built into a dynamic model through the interactions of the data.

When the interviews are transcribed, the first step in Gioia et al. (2012)'s approach is to start coding the data. At this stage, there is no emphasis on conditioning the various data points into related groups. In fact, expanding the number of concepts is sought after as it supplies a rich field to work in for the next step. It is not until this step is complete that we look at the connections between the concepts that we developed in the first step and distill them into related themes. At this stage we will be able to identify what themes fit into the conditions that have been identified by earlier literature and what themes will be new additions. In the final step, these themes will be grouped into aggregate dimensions that will be the foundational groups for the dynamic model that will examine how they interact to produce the conditions of upcycling.

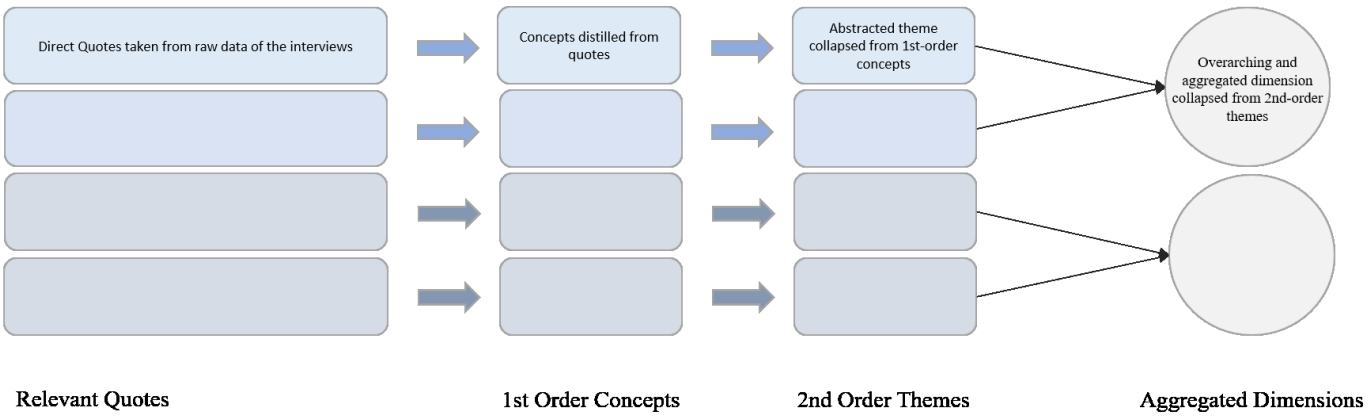

Figure 6 - Systematic Model for a Multi-Step Approach to Data Structure, adapted from Gioia et al. (2012)

The Gioia et al. (2012) method is the optimal choice for our research, mainly for the emphasis it puts on the data collected in the interviews. The rigorous coding process in the first stage decreases that chances for important findings to get lost in the sea of information gathered. The process then allows for a high degree of transparency that amounts for a full disclosure of how the concepts in our end model were developed.

3.5 Reliability, Validity, and Generalization

We recognize that our research is set in a dynamic social setting that is impossible to freeze or recreate (Bryman and Bell, 2015). Thus, our research process has sought to be dependable, allowing for readers to trust that our results hold merit (Bryman and Bell, 2015). This is done by keeping the transcripts and recording of the interviews and being transparent in our process following Gioia et al. (2012)'s method.

The inductive and iterative nature of our qualitative research helps us interpret the data we find into theory, as each step is done with much thought and reflection. The time we have spent with the case has allowed us to become familiar with the participants social reality and armed us well to examine the collected data (Bryman and Bell, 2015). As our research is not focused on measuring, so much as generating theory, the qualitative approach aided by an iterative approach in the social dynamics of the case ensure that our research is internally valid.

External validity, or generalization, is mainly due from the specifics of the case studied (Bryman and Bell, 2015; Gioia et al., 2012). The case of the researched company lends itself to the generalization because they experienced two years of futile upcycling development to become well acquainted with the barriers presented in general upcycling. At the time of the study, the case company was just successfully launching a BM for their upcycled product, thus making them well aware of the change in conditions that lead them to achieve success. As part of the Gioia et al. (2012) method, the interviewee's experiences that are generalizable were selected to ultimately construct the results of the research. Thus, both the case and the research methods lent themselves to the external validity of the research. The findings that cannot be generalized will be discussed in the limitations of the research at the end of the report.

4 Findings

4.1 Data structure on conditions for BMI for Upcycling

Our findings are sorted in dimensions that are made up of subsequent themes that may confirm or conflict with previous literature about sustainable BMI. Our overall findings consist out of three aggregated dimensions, which are (1) Motivation, (2) Support and (3) Open Innovation. As we go through each theme, we will discuss why these are important for upcycling, especially for the ones that were not identified by the existing literature base. It should be noted that we do not separate the found conditions into promoters or barriers because the conditions themselves are neutral; it is the degree to which they are present or absent that dictate their effects on upcycling BMI. Further discussion of their interactions will take place in Chapter 5.

4.2 Motivation

4.2.1 Perception

The perception of waste was found to differ between employees according to their level of involvement. Positively perceiving employees showed to be more motivated to work with Upseries, having higher appreciation for its properties and the value behind it. In contrast, negatively perceiving employees had hesitation to work with it and were less motivated.

"This is a product that is specific for your needs. It's not some kind of a low quality or whatever."

"But they sold the prime material and they didn't want to sell that [swear] (Upseries), [...]"

"[...] it (Upseries) is not sexy enough, I think."

Furthermore, a perceived challenge for employees is it to transcribe the value of Upseries to external markets by detaching it from its negative associations as waste.

"This is not a low end product, it is a product for a specific application, where, you know, the rest of our standard product doesn't really fit very well and that's exactly the perception that we like to transfer to the potential customers."

We found significant improvement in waste perception and awareness when waste was quantified by its volume as well as its potential monetary value. Those numbers were known only by a few people in the company and have not been communicated throughout the company because of reasons like *"this is not something we're proud of*" or *"this is not something we scream out about"*. Employees were partly shocked when they were informed of waste in the case company.

"As soon as you've put dollars on it and there was a lot of dollar signs and you realize, oh gosh, we have to do something about this."

"We have more awareness of how much waste we actually have, that's a good starting point."

A generic interest in sustainability and innovation was an important cornerstone for Upseries to evolve. It helped to perceive waste as something innovative and fun to work with.

"There's a lot of interesting things happening [...], it's like a start up and I think that`s great fun."

"There is a lot of things to invent to put something from your new ideas, some improvement that is not a necessarily part of the design or is already design.... they feel very happy and proud to be here."

Waste was perceived differently also depending on the individual's sense of environmental responsibility. While some were mostly driven by limited resource allocation on a global level, others were more concerned about the human part and future generations.

"[...] the future of the planet earth is one, where either we will recycle and upcycle or not, we cannot just leave and go to Mars or whatever."

Interestingly, waste was always positively perceived by employees in combination with effects on reputation. Having an upcycled product in the case company's product portfolio increased the overall credibility as a sustainable company in two ways. Externally, from a selling point of view and internally, from a (employer) branding perspective.

"We didn't have those kind of selling points and etc. and we see that there is a lot of interest for that."

"[...] they might say, oh, plastic (not exciting) ...god [...] and suddenly wow this is actually interesting. I mean almost every interview, we get questions about it (sustainability efforts)."

4.2.2 Business Development

The motivation for upcycling can grow due to potential business development opportunities. Upseries was perceived more than just a product to increase profit but as an opportunity to expand the business.

"Now you also have to look at it as an opportunity for new businesses [...]"

However, for the company's overall waste challenge, an upcycled product was perceived only as a part of the solution eliminating waste. Reducing waste is still the top priority on the agenda, and other waste issues require more solutions to achieve sustainability.

"We have only one way to eliminate the waste: that is [Upseries]. We don't have any developments for getting the other half of the problem."

Upcycling creates the rare possibility to combine economic and environmental values. Strategic goals to reduce disposal costs can change the organization's approach and perception of waste from a drain on financial resources to value generator. There is clear data indicating that some employees and managers are significantly more willing to work with Upseries as soon as they see financial success on the horizon. If financial success as a form of extrinsic motivation is of absence, employees refused to participate.

"They would like to earn as much money as possible [...] they sold the prime material and they didn't want to sell this [swear] (waste)."

"[...] if people start to see that, okay we can actually sell this, we can actually make money, you need one or two customer cases."

While any product has dependencies on its supply chain, the relationship with a waste product is a special case. The amount of waste that can be made into the upcycled product is completely independent from the demand. This unique dependency in production can be a challenge when addressing the right customers that cannot rely on constant supply. Additionally, the overall aim is it to reduce waste, which is contradicting in terms of establishing and growing a waste product.

"We were holding back a little bit, because we're a little bit afraid to go into something. Then maybe we can't deliver."

"We are also trying to minimize our waste, so we cannot grow [Upseries] to the sky."

"We cannot start to produce waste to meet that request."

The process of setting up a new BM for upcycling comes with significant lead times. Thus, traditional non-sustainable methods like cutting down on factories or staff were still favored when cost savings were required immediately. Short term initiatives for end-of-pipe solutions, like incinerating waste instead of sending it to the landfill, were undertaken when sustainable requirements needed to be achieved right away. However, the lead time needed was still relatively short compared to the time needed to eliminate waste completely. Therefore, creating value from waste is a means to bridge the gap between sub-optimal short term solutions and the ultimate long term goal of eliminating waste in its entirety.

"It takes those couple of months until you know if it's a failure or if it's still a possibility."

"[...] and then you need to fix the company fast. I mean, you need to, you know, get cost out immediate... get rid of buildings, you know, get rid of people [...]"

While investments in upcycling need to be justified it did have a very clear impact on the sustainability, which aided in attracting a favorable budget. In contrast, projects had weak sustainable values were left without investment.

"Nobody wants to invest money in something that is doomed from environmental point of view."

Since margins are usually smaller when producing a low-end product like a waste product, any possibility to make small improvement in the cost structure becomes instantly attractive. Local solutions, where transportation is easy and cheap, were especially found to be attractive in waste BMs. Close proximity of potential customers and production site were proven to be beneficial in the case company for developing the best match the particularities of each plant.

"The other plants should start looking into this now. Finding local customers. The transport costs would eat up all the small profits. So look for local. As local as possible. And then the struggle of the quality of the product. Someone should work on that to make the quality even better and some kind of control."

4.2.3 Uncertainty

While the case company was aware of the risks of trying out a new product in a new market, with higher probability of failing in the short term, interviewees saw that the real risk was to continue not do anything about waste. They saw that they were dependent on many things outside of their control that could eventually make it so they are unable to produce any waste at all. So to ensure that the company has a place in the future, they feel they have no option but to explore sustainable BMI as for upcycling.

"[...] the risk of not being sustainable, I think it will overcome in the short term or midterm many other risk that you can think of, especially stuff like landfill"

"[...] its financial risk, unnecessary financial risk, there is a lot of legal or legislative risk that you might... I mean you must put waste somewhere, it does not disappear, you do not incinerate it yourself. There is a lot of rules about what you can do with waste."

Another uncertain challenging aspect in BMI for upcycling that the case company went through, was the need to look broader than their current market and existing customers. Since waste products will usually have less specific and lower value properties than the mainstream products the company is familiar with, the waste product will need to be placed in the unknown low-end of the existing market, or a totally different new market where its properties bring more value. On the other hand, the upcycled product can be leveraged into markets where the high costs of the main products prohibited the company from competing in before. Looking for new markets also ensured that they would not need to fear cannibalizing their more profitable core business with sales of the lower margin waste product.

"[...] finding the correct market, it has several good properties that could be valuable outside our market."

"[...] our product was too good. So (the case company) is not delivering in what we call the (low-end market)"

"[...] asked by our sales guy if we have something cheap and no specific property. I see all this waste. Why don't we try something?"

"[...] always the temptation to replace our older foam."

So far there are no rules or guidelines in the local operating region that force companies to pursue upcycling initiatives. Thus, there is a high perceived fear of future regulations that might be adopted in the future. Our findings showed that employees expected a societal and governmental shift in the near future banning any waste disposal to landfills, which would jeopardize the overall existence of the company. Therefore, initiatives to upcycling were seen as a chance for the business to develop but also as a necessity to survive.

"[...] that it is a high risk to continue to put that much landfill that we do today and that might be impossible in the near future due to new regulations."

"[...] there could be a complete ban on landfill. In most countries it is already banned but you can get a permit. But what if the permit issuer decided not to reissue it?"

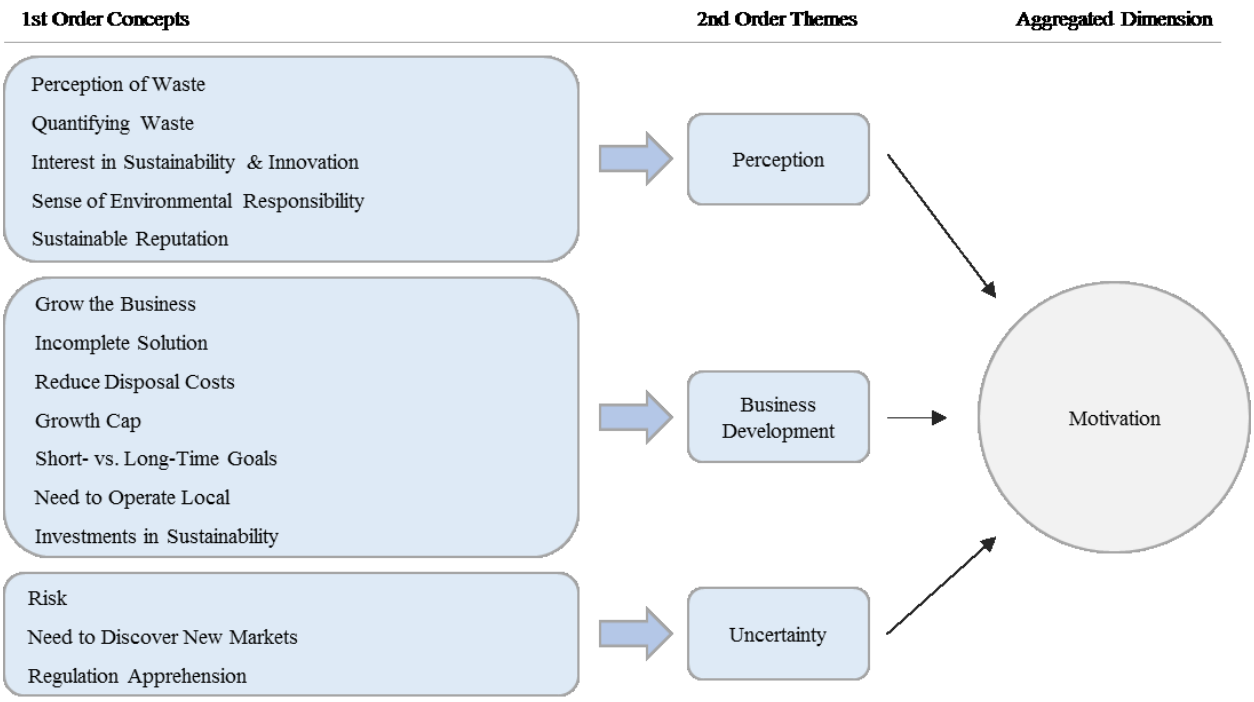

Figure 7 - Data Structure Motivation, adapted framework from Gioia et al. (2012)

4.3 Support

4.3.1 Leadership

When top management buys-in to a movement it sets the tone for the entire organization. Case employees that worked with upcycling felt that they had a green light to invest their time and energy into upcycling because their new management supported the goal of upcycling. By management keeping the pressure on upcycling BMI, employees felt that the Upseries project was more than just something to be left on the backburner, but something that needed their regular attention and efforts, causing them to push developments forward.

"[...] extremely important, without that push from the top it's impossible."

Due to the wide agenda of top management, they may not be able to give sustainable projects that are outside of their regular business the attention that they need. Thus, leadership can

quickly turn into a barrier; if employees see those at the top treating projects as a distraction, they will do the same.

"[...] it's been up in executive management team but, you know, you always have a long list of things."

A way to overcome the barrier of leadership focusing their attention elsewhere is to have a champion in the organization that is able to keep the pressure on developments and supply the necessary support to employee initiatives. The importance of having a champion was universal amongst our interviewees from the case company. This is a generalized finding since upcycling waste needs to look for market applications beyond the regular business, thus a champion supplies support when top management's focus is on the mainstream business.

"And since [sustainability manager] came in, things have moved on rapidly. I mean, before we were just aware that we had a lot, but no one really did anything."

4.3.2 Resources

Time and money - it is not a unique aspect of upcycling BMI that there needs to be employees with the time to work on it and money to invest in equipment to make it happen. Upcycling cannot be treated by management as something that will happen for free just because it works with the waste that they are already producing. Just like any other project there will need to be some investment to make things happen.

"I think the owners should open up their wallet and make this happen. How can we make this happen without investment. Fix it without any money, I think it is the same in many other companies. [...] I wish there were more people."

"You need to have people on board and it's not a quick fix, you need machines you need that. But once you have those. We have a lot of material, waste material, that we can use."

4.3.3 Focus

When a company is in a rapid growth period, where margins are high and the possibilities are endless, the focus of the company tends to be capturing as many growth opportunities as possible. During this time period there is little time or incentive to look internally and focus on the waste that is being produced.

"The money, we got paid per produced kilo out, was enough to cover all the way. So we were making good margins, even if we produce a lot of [waste]."

However, when margins start to shrink and growth isn't as readily achievable employees have more time to focus on upcycling BMI. It is during these times that upcycling can lead to competitive advantages and new market opportunities while lowering the costs that the company needs to spend on disposing of waste.

Operations and finance teams tend to either work with waste every day or at least see the numbers they are losing from it, so focusing on waste is not a huge switch for them. Sales, on the other hand, are used to marketing the end product and focusing on the properties that make it attractive to clients. It has been a major problem in the case company's upcycling initiative that the sales team lacks focus on selling the waste product. They would rather sell the premium products where they can earn more money on, have the experience to troubleshoot problems easily, and do not have any negative perceptions about selling a waste product.

"[Sales] are also trained and focused on what we do in the markets, where we are active, so this is maybe something new. Not that easy."

"[...] [sales] would like to earn as much money as possible. So why sell this when they have the premium stuff?"

The case company had dedicated salesmen for industries that require a high degree of knowledge and focus outside of the core competences of the company. Due to the waste product needing to

find a market outside of the core business, it would promote the development to have a salesman dedicated to marketing the product and bring focus to the sales team.

"[...] we are going back from one size fits all to more dedicated sales people and this is not really different. It is a completely different application."

Finally, in terms of sustainable initiatives, upcycling is only one part of the puzzle. It competes with measures to reduce waste that effectively lower the amount of material that the upcycling business has access to. So even employees, that were focused solely on sustainability had to balance their focus across a variety of initiatives. However, the key for most employees was to see upcycling as part of a final solution, even if it could not solve every sustainable problem by itself.

"That (balancing efforts to reduce waste and efforts to upcycle) goes hand in hand. I mean, first priority is to stop producing waste. Second is to whatever we produce, we need to take care of."

4.3.4 Communication

There needs to be good communication throughout the organization when you are trying to challenge views on what waste can be for the company. It is common not to actively communicate how much waste the company is actually producing because it is not something to be proud off. Communication is needed to not only raise awareness about how much waste the company is producing, but also to send a message that there is a large amount of uncaptured economic value being destroyed with that waste.

"We start with one project that is to generate as little (waste) as possible, which was very slow because nobody understood here in the organization, why should we do this. [...] It is greater awareness about losses and where you can gain economical benefits."

"But I think that the awareness, because this is not something we're proud of. But I think that our competitors are in the same situation, but you don't scream out this these statistics, because it stays amongst [case company]"

4.3.5 Market Demand

More and more clients are seeking sustainability from their suppliers, especially customers in industries that have environmental reputations. Upcycling is a very attractive solution to meet this demand from clients as it makes the main products more sustainable. The main product as the waste is reused in a new product, and of course the upcycled product has a relatively small CO2 footprint on its own.

"All customers in all those markets you will not be able to provide anything to them if you are not working with this (sustainability). Okay, so, so if we want to be part of those types of industries, which is very interesting, growing industries is something that you just have to take seriously."

However, the market knows they want sustainable solutions, but they want sustainable solutions that they can actually use. The fact that the upcycled product is made from a certain waste limits the amount of applications that it can be used for. Thus, identifying the niche where the upcycled product is able to compete can be a challenge.

"[...] the startup was not really so smooth because let's say we didn't have the market ready yet."

4.3.6 Governmental Regulation

From our literature review we expected governmental regulation to be an important factor, but we found there was none to be had from our case study. Upcycling is too new at this time to have any regulations aimed directly at it.

"[The government] basically gave order to the industry to develop (sustainability) and enhance the environment, but today I think in fact, in many cases, they have a less importance."

"[...] there is no money for big companies."

It was more the fear of the government creating legislation that would make upcycling necessary in the future that was important, which was covered in Chapter 4.1.

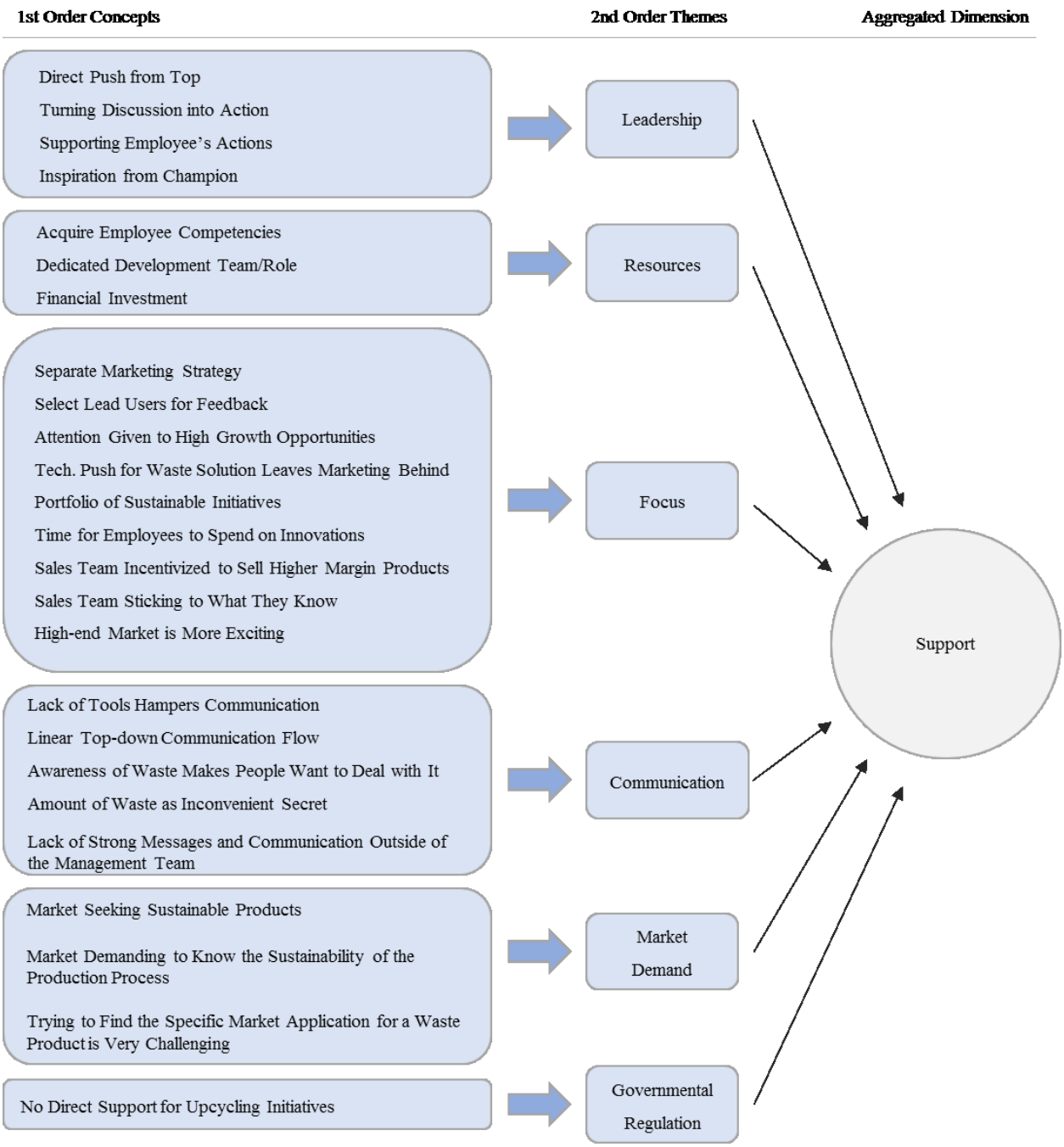

Figure 8 - Data Structure Support, adapted framework from Gioia et al. (2012)

4.4 Open Innovation

4.4.1 Product Development

In the product development stage, it was a large benefit for the case company to partner with a company that had competencies that they lacked, mainly making products out of non-uniform raw material. They were able to develop the product much faster by combining their knowledge of the waste with an innovative recycler that was able to work on the process to add more conformity to the end product. In addition, by having more partners in the development, the case company was able to share the investment of the project and lower their own risk by doing so. It was an important push to speed of the development of the project and make everyone feel more comfortable charting new territory.

"I think to be able to work with a company and like [company known for innovative recycling] for example that is huge. I mean, that's really good I mean it's obvious you could make everything in house, but I don't think that it's that easy. Yeah, easier to use some partners that you can do an investment together or do some part and they do some other parts."

4.4.2 Lead User

Since the upcycling venture introduces a new waste product in unfamiliar applications there needs to be an iterative process of diagnosing and curing problems. To do this there needs to be a large amount of communication between the company, supplying the upcycled product and the customer making use of it. Where customers for the mainstream products can expect the case company to have a large amount of expertise, the upcycling customers need to be prepared to be part of the development process. If they buy in to the process, their feedback supplies the upcycling company with the knowledge and motivation to create a novel product.

"I think yeah we don't have the expertise. We don't know really what we're talking about, because we always say that you should do this to test and nobody knows if it is to be good because it looks quite… yeah with in that direction."

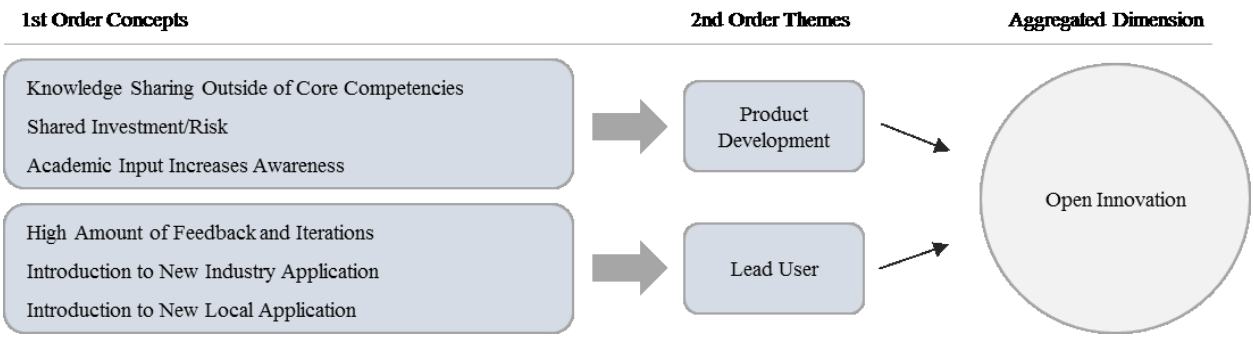

Figure 9 - Data Structure Open Innovation, adapted framework from Gioia et al. (2012)

5 Discussion

5.1 Evolution of Literature Base into Identified Dimensions

In our literature review we saw academics contribute to the field of sustainable BMI by gathering and sorting conditions into fields such as hard, soft, internal, and external that each has a long list of proposed findings. However, this has resulted in a fractured literature base full of loosely tied together attributes. Seen below are the eight sustainable BMI conditions we identified in our literature review without any attempt to make sense of how they relate to each other.

Figure 10 - Previously Identified Sustainable BMI Conditions

Too try and wedge the particularities of upcycling into the existing conditions would be like trying to force more chocolate chips into an already crumbling cookie. So instead of trying to fit our findings into the existing literature base, we instead use the literature base as inspiration in uncovering the conditions for upcycling and to build a more dynamic model. To achieve this, we have grouped out uncovered conditions into the following three groups:

- Conditions that forms the need and desire for upcycling BMI's - Motivation
- Conditions that keep upcycling BMI's from crumbling apart - Support
- Conditions that catalyze the upcycling BMI to produce a faster and stronger process - OI

For the rest of this chapter we will discuss how the composition of these dimensions interact and what they mean to upcycling BMI, concluding with a dynamic model showcasing the interactions. In addition, we will identify how both the existing literature base and particularities of upcycling play into each dimension.

5.2 Motivation at a glance

At the core of our findings is what shapes the motivation for the company to undertake upcycling and we will start off by exploring the dynamics between the themes of motivation. Motivation is not something new to the field of BMI as Assink (2006) already identified the lack of infusing an organization with motivation as a common flaw by managers who are attempting to be innovated. However, the complexities that interact within the field of motivation for upcycling have been explored only at a very shallow depth. Most prominently, Bocken et al. (2013) explained that upcycling fills the hole that other sustainable measures could not achieve by reducing the amount of non-recyclable material a company sends to the landfill. This point may be enough to garner some interest in upcycling, but our findings show that the complete motivation picture is more than just being an alternate solution to lower landfill quantities.

Too expand further on Bocken et al. (2013)'s thoughts on the motivation behind upcycling we can see how the perception can evolve from an inhibitor to a promoter. At first glance it can be a de-motivator as upcycling is not solving all of the company's sustainability problems at once: *"We have only one way to eliminate the waste that is [Upseries], we don't have any developments for getting the other half of the problem."* However, it turns into a promoter when the view is changed to a portfolio approach of sustainable initiatives: *"The first thing is to reduce the waste, of course, as far as possible, but we know that in a short perspective, we will not be able to do that. [....] That is why we also have to work on what values can the waste, that we create today, do in a new product."* Thus, upcycling can be seen as a missing puzzle piece that completes a sustainable portfolio. It can also be seen from the quote that upcycling works in the relative short term, which makes it much easier to see results from efforts right away.

While the point that Bocken et al. (2013) explores brings simplicity to the upcycling initiative, it does not touch on the hindrances to motivation, such as the negative perception or total lack of awareness of waste, which is what Laukkanen and Patala, 2014 found to be a major barrier. Waste tends to lie around the fringes of an organization; attention is focused on traditional growth opportunities and spreadsheets in the head office, while the blue workers that are close enough to see the problem only see a small portion of it. Compounding this blind spot is that even those with increased awareness of the amount of waste can fall into the familiar thought patterns of seeing it as a valueless substance best served with the usual end-of-pipe solutions (King and Lenox, 2002). Thus, one of the largest challenges is simply to get employees to understand just how large the waste problem is: *"when we realized how much waste we have and how much money that is, then it's sort of easier to understand why we have to do something."* It has been a watershed moment for many members of the case company when they realize how much value is available to be captured in what was thought to be previously valueless waste, driving them to pursue the upcycling initiative. As stated, motivation is the core of our findings, but in turn, the perception of waste is at the heart of the motivation.

Dyllick and Hockerts (2002) discussed that sustainability has been a goal of business since the 90's, but it was very clear from our case study that doing something sustainable was only a large source of motivation for a select few individuals. Whether it is the culture they were raised in or coming from concerns for future generations, these individuals with high intrinsic motivation for sustainability need little else as a reason to pursue upcycling than to know they will be decreasing the amount of waste going to landfills *"They simply want to do something about this problem. Most more on a personal level, they don't think it's okay that we are wasting so much, they wanted to give this a product a fair chance. Yeah, I think it is as simple as that. I really don't see any other motivation"*. However, it is not reasonable to expect that every employee in a company will have such a high natural affection for sustainability. To capture the motivation of the majority of the company there needs to be clear path to add economic value, on top of the social and environmental value. De Jesus and Mendonça (2018) have previously highlighted the importance of economic value, but to put it simply as one interviewee did; *"money always talks"*. When the organization that realizes just how much value they are letting leave their organization with waste, they will realize that upcycling is another means to drive business

development. Even an upcycling business that does not make a profit is still a source of economic motivation, as it would still lower the expenditures of the company by cutting disposal costs *"[...] we need to lower cost base and then waste became a big issue for two reasons. One, you did not get paid for it. Of course, and you needed to start to pay to get rid of it."* The economic measures, that upcycling combines with its more natural environmental impacts, reinforces the need for it throughout any organization with high waste.

Upcycling can also be seen as an introduction into markets that would previously have been inaccessible. It would hurt a company that tries to promote itself as a premium supplier if it started to also sell low quality goods, but when it started to market a waste good as a by-product or upcycled product, it suddenly has a distinction from the core products. This gives the company a chance to experiment in new markets, particularly low-end ones, without risking damaging their core business reputation *"[...] it is a product for a specific application, where you know the rest of our standard product doesn't really fit very well and that's exactly the perception that we like to transfer to the potential customers."* However, as exciting as the growth possibilities are for upcycling, there needs to be some management of expectations, due to the particularities of waste business models where the supply is independent of the demand; *"If we come up with something that will be a huge success. We cannot start to produce waste to meet that request. So that's the tricky part."* Thus, it ends up that while the growth possibilities are promoters for upcycling, the fact that growth is limited to the amount of waste that is produced limits its significance.

Finally, there is the promoter that upcycling gives to securing a future in an uncertain future, which conflicts with the existing literature base view on risk in sustainable BMI. The list of researchers identifying uncertainty as a large barrier is extensive (*Laukkanen and Patala, 2014; Jesusand Mendonça, 2018; Behera et al. 2012; Sosna et al.,2010)* however, they all differ from our case company in that their findings are dealing with risk in the medium to short term future. The case company found it to be a powerful motivator that the uncertainty of the long term future required them to hedge their exposure to regulation and landfill costs by lowering their waste; "*So if you look at risk, the risk of not being sustainable, I think it will overcome in the short term or midterm many other risk that you can think of*".

At the heart of the matter, upcycling represents a tool to turn a glaring weakness of the company into a strength. Much like an athlete that spends time working on their weaknesses will make them much more robust and able to compete in a changing landscape, just as a company upcycling their waste will "*secure the sustainability of [case company's] operation*" as the world changes around it. However, motivation of a company can easily shift from positive to negative as a result of events, thus in the next section we will discuss how these motivations can be strengthened by the dynamics with the support dimension.

5.3 Support at a glance

After the core motivational conditions of BMI for upcycling have been described, our focus changes to the environmental conditions they are embedded in. Due to the whimsical nature of motivational aspects, a protective layer of supporting conditions comes into play for adhesiveness, making the model eventually less sensitive to events that destroy motivation. The existing literature base often equalizes the term 'Support' with conditions as such, supporting the overall process to innovate the BM. However, they ignore actual dynamics within conditions that can influence another as our research found. As for clarification of these terms, we use 'supportive conditions' as an indirect supportive or non-supportive condition for BMI for upcycling, essentially keeping motivational conditions together by affecting them. When elaborating on those interactions, we initially base on motivational themes, being passively influenced by supportive ones.

5.3.1 Interactions and Stabilizers for Perception - 1

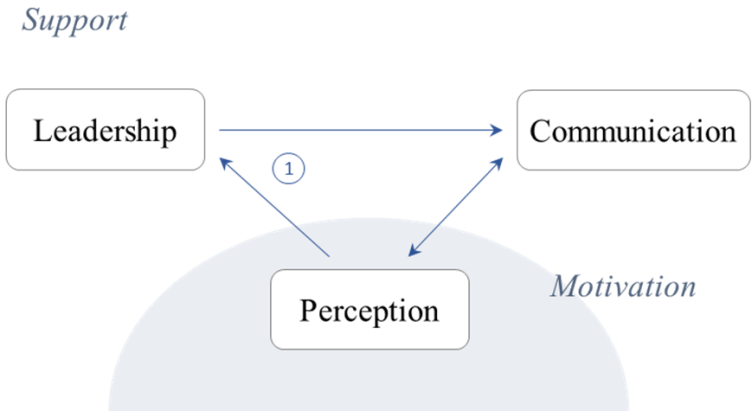

Figure 11 - Interactions and Stabilizers for Perception – 1

As previously described, perception is a strong condition for motivation. It can be fostered through a well-functioning and transparent communication, both, throughout the company and externally to customers. *"This is not a low-end product [...] and that's exactly the perception that we like to transfer to the potential customers".* Internal communication can interact with the employee's perception in a way that their understanding of upcycling can be specifically addressed and changed. Communication elements like sustainability reports or presentations help to communicate the severity and necessity of the matter and raise awareness. *"He also went out to all the sites and had presentations for people in different sites. And I think that's where the most important communication takes place."* and *"[...] it's very clear when you look at the GRI-report." Therefore, a strong communication is essential to change and create a perception for waste and involving employees in the process of BMI. "It has changed like 180 degrees in this three years."*

On the other hand, not communicating in an appropriate way or challenges like language barriers and lack of communication tools, can lead to misperception, naivety or ignorance, which can slow down the BM transformation. *"God, I should actually know much more about this. I feel... I'm never talking about it."* and *"[...] they should have been informed throughout the group years and years and years back, because there were, of course, some people that knew about this."* Moreover, the interaction between communication and perception are of a reciprocal nature. As communication is stabilizing perception, so perception can decide the way of communicating. A negative perception of waste can lead to a hesitant communication and even

concealment of facts, due to inconvenient reputation because of waste. *"I'm sure that half of the people in [the case company] don't know that. But of course, the reason for that is, this is not something we scream about."*

Quantifying waste in real terms (identifying with either volume measurement or lost monetary value) and actively increasing the awareness of those terms, turns out to be a very powerful mechanism to positively influence the perception of other employees. Communication is here the crux of this looping effect, being significantly receptive for quantifications of waste. In this way, perception can foster itself via looping through communication, accelerating and supporting the process. *"You need to start to say how much are we losing! Because if you start to think instead on how the [swear], how much are we are sending out on the scrap yard. You can start to measure.. than you realize that it is hundreds of millions that we just send out on the [swear] yard, without doing anything."* and *"As soon as you've put dollars on it and there was a lot of dollar signs and you realize, oh gosh, we have to do something about this."* Agreeing with Egelyng et al. (2017)'s work, another way perception determines communication is the chosen terminology and the way of using the word waste. *"[...] we should not say that it's a waste material. That's completely wrong."*

As perception is new to the field of BMI for upcycling, so is communication as we defined it and consequently also the relation between them. Going back to the literature Laukkanen and Patala (2014) identified awareness and understanding as conditions for BMI for creating value from waste, which does have significant relations to our findings. Laukkanen and Patala (2014), however, only scratch the surface of BMI for creating value from waste, with no further differentiation or elaboration. For this reason, our research gives much more context in aiding the understanding of the specific role that communication plays as a BMI condition for upcycling.

Nonetheless, there is a third variable that can come into place within the dynamic between perception and communication, which is leadership. Leadership mechanisms like support, empowerment, or being a champion, can influence the employees' perception in an indirect but drastic way. Communication comes here into place as a transmitter between them, intensifying or hampering effects of changed perception. *"I didn't know that we had so much waste as we did*

and working with [sustainability manager] with anything and from this product, with Upseries, has opened my eyes a lot." and *"I think that if you have a sales manager that doesn't believe it, then the sales people will not sell it. So you must get people involved. You must train them or inform them or make them see [...]"* and *"We could have been better communicated from the executive management team, what are our intentions. What do we want to achieve with sustainability [...]"* and *"[...] we (management team) are pretty much basing it on a cascading information [...]"*

As discussed in Chapter 5.2, the motivation section, some employees have a greater affinity for sustainability or innovation than others. When this higher affinity occurs within a leader, it can be a powerful encouragement throughout the organization. *"He [head of sustainability] lives what he believes. And I think you need to be because we need people like him."* This is aligning with Laukkanen and Patala (2014), who identified lack of encouragement to innovativeness; and also leadership and management, to be conditions for BMI for general sustainability. However, they did not identify them as conditions specifically for creating value from waste. Our research therefore shows that there should be special emphasize on leadership in the field of creating new value from waste or BMI for upcycling. Moreover, new dependencies and dynamics have been found, identifying communication and perception as additional cornerstones, facilitating an important impact on the implementation of BMI for Upcycling.

5.3.2 Interactions and Stabilizers for Business Development - 2

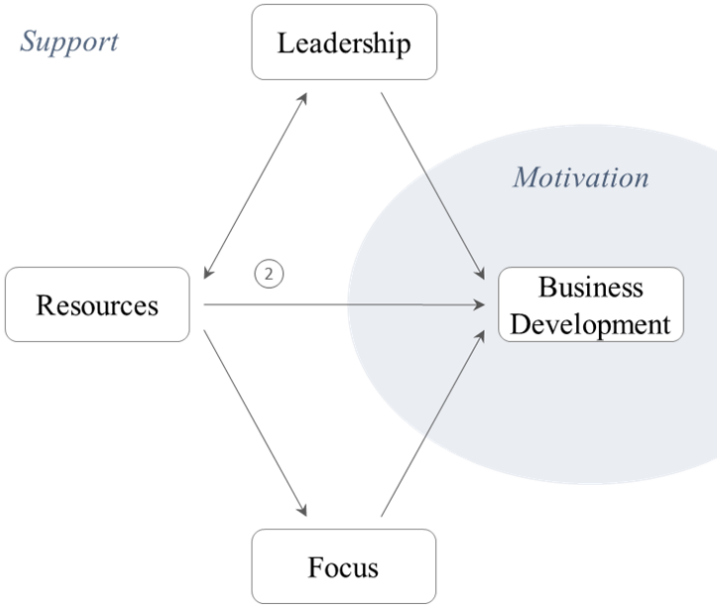

Figure 12 - Interactions and Stabilizers for Business Development – 2

Switching our views to the motivational aspect of Business Development we found it was stabilized by three proximate supportive conditions, which are leadership, resources and focus.

Methods and forms of leadership were found to determine decisions and strategies concerning the overall business development of a firm, giving direction and a necessary push. The orientation towards sustainability from the owner and top-management was to especially have the power to trailblaze the path for future ambitions of upcycling. *"It was actually our owners, [ownership group], has started an initiative with CSR (Corporate Social Responsibility)."* and *"[...] that's where the pressure came from and started - from the owners."* and *"[...] very sensitive to such topics sustainability in [ownership group], it's definitely a target, something they commit to, they want us to be committed."* and *"This is definitely a push, and it is from me (CEO). Yeah, because I said we need to do something, this cannot go on."* Again, these insights give relevantly more insight into the actual relation of leadership than identified by Laukkanen and Patala (2014), being tailored to the aspect of business growth.

When identifying required resources that are necessary to renew a BM for Upcycling, there are significant interactions to business development. As highlighted in Chapter 4.2.2, setting up a

waste product comes with certain contradictions between reducing waste and establishing a growing business from waste. Waste as the main resources of the waste product is of course of high importance. This resource is limited to the main product's excess material implying that to grow the business of upcycling, more resources will be needed that could only be supplied, if the core business is simultaneously growing with overall higher productions. *"So we are also trying to minimize our waste, so we cannot grow [Upseries] to the sky."* and *"We cannot start to produce waste to meet that request."* The challenge of a growth cap like that in the context of BMI for upcycling, has not been mentioned in previous literature before and creates a new understanding of how resources, needed for BMI for upcycling, can affect the overall business development and vice versa. Also, short-termism comes into place when prioritizing resource allocation and resource saving, which was previously identified by Assink (2006) as barrier for BMI but also as condition for BMI for sustainability by Laukkanen and Patala (2014). As Carayannis et al. (2014) found the picture becomes more complicated when the company starts to think about how to achieve BMI sustainably by seeking methods that balance short term vs. the long term. While we saw in Chapter 5.2 that upcycling was considered a short-term solution compared to waiting for a technological revolution that reduced waste, there are still lead times in developing the upcycling process. *"You need to have people on board and it's not a quick fix, you need machines you need that. But once you have those. We have a lot of material, waste material that we can use."*

In the previous paragraphs we found resources and leadership to be supportive conditions for the development of a company in the context of upcycling. In addition, there is a reciprocal relationship between leadership and resources, setting their individual relations to business development into new consideration. Soft resources and intangible assets are an important part of attracting the necessary human resources, especially at the management level. Depending on those assets, certain leadership qualities can evolve, fostering business development and eventually BMI for upcycling *"[...] if you want to develop the business and an area. So we wanted a broader, a broader skill set"* and *"bring in someone [...] who had worked with these, with quality and other companies, ways of working, I mean, you know, bring in value."*. On the other hand, top-management and ownership is empowered to allocate and prioritize hard resources like budget and machinery, which can limit or enhance approaches for business

development. *"I think the owners should open up their wallet and make this happen. How can we make this happen without investment?"* and *"I have got, and I still have, quite a lot of criticism from the owner, like is this really necessary?"* Assink (2006) has identified this condition as a risk barrier for BMI for management to commit resources to new projects. He sees this condition as severe as the risk in recovering an adequate return of invested resources grew as projects became more distant from what the company was experienced in. However, this risk was not identified as a major condition in our case study as managers labeled is as insignificant compared to the risk of not doing anything.

To conclude the dynamic system of interactions and stabilizers for business development we now introduce the interactions of focus. By setting focus, a company is able to control their operations in a strategic way. For the common good of the organization, it determines sales strategy in a way to maximize return. Special attention is traditionally given to high growth opportunities *"we were making good margins, even if we produce a lot of crap"*. Certain products like waste products that might not be fully align with this strategic approach tend to be excluded. *"We have a sales force to sell something that this is [a part of the case company's visionary attributes] and [another part of the case company's visionary attributes] and now we come with something else and maybe they are not fully compatible with that."*

Beside a strategic focus, there is also an operational one, initiated by intentions to keep the company running. Contingent upon those intentions and goals, a focus can be set on how much time employees are allowed to spend on other areas besides their daily business, like innovations, sustainability and establishing upcycling. Although employees are personally motivated to work with an upcycled product, some employees *"haven't been able to spend so much time on this"* due to a shifted focus and too little slack in their operational focus. *"It's too much work, too heavy, because we have all the other stuff we need to do. Yeah, because we need to fill up this machine, you know, and we need to have more of that. And then this is coming."* This condition has been established in a similar way as a barrier for BMI for sustainability in Eichen et al. (2015) but is referred to as culture-related barriers that reinforce the status quo.

Eventually the focus of an organization is also dependent on the resources it can commit to specific goals. The previously discussed sales and operational business strategies combine with resources to determine the level of organizational focus. As we differentiate resources again in tangible and intangible ones, especially the latter were found to have strong implications on the organizational focus. Time as an intangible resource can limit employees to set their own focus on operational tasks for upcycling. *"[...] in bigger companies you would probably have like 15% or 20% of your working time that should be dedicated innovation. We don't have that luxury as there are too few people."* This line is highlighting already another aspect of human resources, which are too few employees with too little focus on the waste product. A major finding has been the importance of dedication of employees working on Upseries. Positioning dedicated people, focusing solely to work on the BM transformation for upcycling, can relieve deficits in both time and focus of employees doing daily operations. *"You should have a project group, with sales and some marketing people, technically, but with environmental people to really get the right focus on this and get the community to do that part."*

5.3.3 The Role of Market Demand - 3

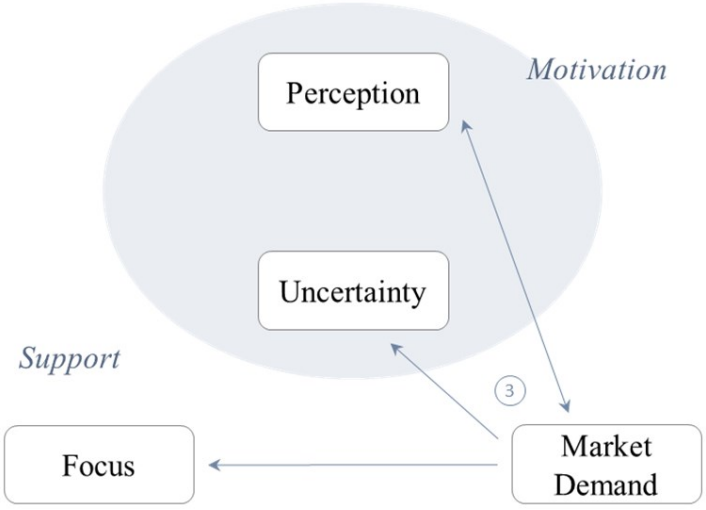

Figure 13 - The Role of Market Demand – 3

Market demand as an external condition outside the organization's borders is actively influencing several conditions within the organization, stabilizing or destabilizing the motivational core and its surrounded supportive condition, in which it is also embedded in. Although market demand as an external condition can usually not be influenced by

organizational conditions, a reciprocal interaction was identified, in which a sustainable perception demands also for sustainable solutions and vice versa. On the one hand, employees can be motivated by an appreciable demand for the waste product. They can start to perceive upcycling as something purposeful when they realize that there is some demand to capture actual economic value from. *"So, but I think it's much better now we have had many different customers [...] that are interested. So, I think we are onto something."* However this facilitating effect vanishes as soon the market demand fails to appear and old perceptions continued to prevail. *"[...] and suddenly it becomes interesting. People want to get involved in it as long as they can actually make money with it."* and *"I think definitely customers are a source of motivation."*

On the other hand, market demand is steered by its own perception of waste. A positive perception of waste is expressed by a higher market demand. *"Several customers they were really excited with the benefits for their manufacturing process, along with the whole green aspects of the product."* And vice versa: *"[...] or that some customers would have put down their foot and said no [swear] way I`m buying from you if you don't sort your [swear] (waste)."* This finding has its roots in previous literature as Bossle et al. (2016) have already identified the affect the market can have by pressuring suppliers to be sustainable.

The challenge to find a suitable market for a waste product, outside the company's core applications was perceived as rather strong inhibitor. Further research on that has shown that an uncertain demand for innovative goods or services can be a main barrier, hindering innovation in a company (Coad, Pellegrino and Savona, 2015). If the demand is to be realized, companies are confronted with another challenge, when it comes to guaranteeing supply and quality standards. Markets expect reliable suppliers, who can lower their lead times of consistent products. With a product made from waste, and subsequently relying on the rest of the core product production process, an upcycling company does not have the flexibility to upcycle any volume the market demands for. Therefore, companies can be hesitant to react to market demands, due to an apprehension of not being able to adequately supply clients in the future. *"We are committing with customers in the same time we are saying it is not our future"*. This contradiction appeared also to be relevant for quality standards, when the company was hesitant due to lower quality

properties and the fear of a reflecting bad reputation. *"[...] some of the material we have sent out has been a disaster. [...] because what we ship has our face on it also. So if we ship out bad materials reflects back to the company."* Since market demand has strong impacts on focus, this condition can be a challenge when shifting from high-end and premium to upcycling. *"He was more working to try to convince our sales guys to sell the material. But they sold the prime material and they didn't want to sell this [swear] (waste) [...]"*

5.3.4 Governmental Regulation as approved condition from existing literature - 4

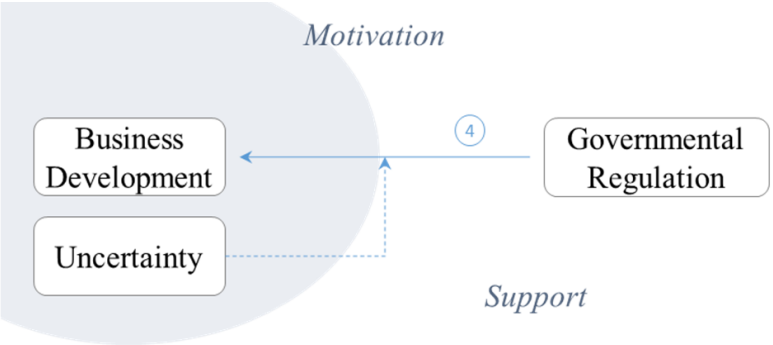

Figure 14 - Governmental Regulation, Mediated by Uncertainty

Governmental regulation or governance is a recurring theme already found by Carayannis et al. (2014), Bossle et al. (2016); and Jesus and Mendonça (2018) and was well discussed as a condition for BMI for sustainability. This conditions extends to creating value from waste, as stricter legislative pressure (and supportive economic incentives) were found to be supportive to creating value from waste (Laukkanen and Patala, 2014). Our research partly confirmed these findings, as current government regulations had a general impact, if not a specific impact for upcycling. *"I think definitely that loose legislations they have been much tougher on how we handle waste the way it's done. So I think it's it definitely important to have entire agenda."* and *"I mean, we can see now that there are permits now that say that we are not allowed to put anything more on the on the dump yard."* However, when looking at the specifics of upcycling government regulations were only significant to business development if uncertainty was used as a mediator. The current regulations are very weak when addressing upcycling specifically, but apprehensions of regulation that might be introduced in the future created a very strong motivation for upcycling in the company *"For [the case company] this is a huge risk for producing landfill. And the risk is that the cost could go up dramatically, there could be a*

complete ban on landfill. In most countries it is already banned but you can get a permit. But what if the permit issuer decided not to reissue it?"

5.4 Open Innovation

Now that we have set the field for what motivates a company to pursue upcycling and what keeps it supported during the venture, we can now explore the condition that speeds the process up. Just as Slotegraaf (2012) predicted, it is the rise of OI that has made upcycling more attainable than ever before; "*[...] it (OI) was crucial otherwise we would have had other problems".* It is important all along the value-chain, innovating with both clients and suppliers, and we will explore the interactions with the earlier dimensions.

Open innovation, during the development process with a partner that brings new core competencies to the table, affects aspects of a company's motivation and their ability to support those motivations. As uncertainty was found to an inhibitor in the short term by Jesus and Mendonça (2018), any attempt to add clarity in the immediate future can be seen as a promotion. Teaming with partners that have expertise in areas where knowledge is lacking, helps to clear away some of the murkiness about the short-term future that comes from lacking expertise; *"I think we don't have the expertise. We don't know really what we're talking about, because we always say that you should do this to test is all said and nobody knows if it is to be good because it looks quite yeah with in that direction".* At the same, having another company focusing on parts of the project that are most foreign, diminish the hindrance that comes from the company not being able to focus on those foreign areas. This demotion of hindrance repeats itself when it comes to the barrier of investment explored by Jesus and Mendonça (2018), as the investment can now be shared with another *"I mean it's obvious you could make everything in house, but I don't think that it's that easy. Yeah, easier to use some partners that you can do an investment together or do some part and they do some other parts."* OI effectively adds an extra step to get over some of the previously defined barriers and, as a result, catalyzes the entire process.

To shift the perspective to clients and customers, we see that new areas of the previous dimensions come into play. Egelyng et al. (2017) feared the negative perception of waste was

severe enough that they avoided the term altogether (instead calling it a co-stream) when they were trying to stimulate market demand for upcycling ideas. We see this again in our case company as they were very careful in transmitting only their positive perceptions of waste to their potential clients; *"This is a product that is specific for your needs. It's not some kind of a low quality or whatever"*. Just as with eco-industrial parks, that Chertow (2000) researched, use close proximity and specific solutions for each application we found the selection of local lead users was very important; *"[...] selling things in China and selling things in Europe and selling things in America is three different types of markets and three different ways of selling*" and *"[Upseries] is specially designed for a local market. I mean to export [Upseries] overseas is something that doesn't work"*.

While this limitation to local markets can be viewed as a hindrance to motivation coming from business development and market demand, it is necessary to keep costs from adding up and ensure close communication as new innovations are undertaken with lead users.

OI's most powerful aspect is that it modifies the existing barriers to be more easily passed. While it is not inconceivable that a company would eventually be able to build a successful upcycling BMI without any OI, the time and iterations it would take represent a truly daunting undertaking. We will explore more generally the overall interaction of the three identified dimensions in the next section.

5.5 Discussion of the generalized framework of conditions for BMI for upcycling

The fully realized dynamic model consists of three dimensional conditions that have the power to either promote or hinder upcycling BMI. At the center of the model resides motivation which is the engine that creates or destroys the desire to complete the journey that upcycling represent. To keep the engine running throughout the process it lies in a supportive network that reinforces or diminishes the various components of motivation. The fuel of the dynamic model is open innovation that allows the process to take place in an acceptable time frame. These three dimensions create a simplified model that can easily be generalized to other forms of radical sustainable BMI.

To give context to the model in the specific field of upcycling we have included the themes that dictate the interactions of between the three larger dimensions. While these themes are not generalizable to all forms of radical sustainable BMI, they are necessary to successfully navigate the conditions of upcycling.

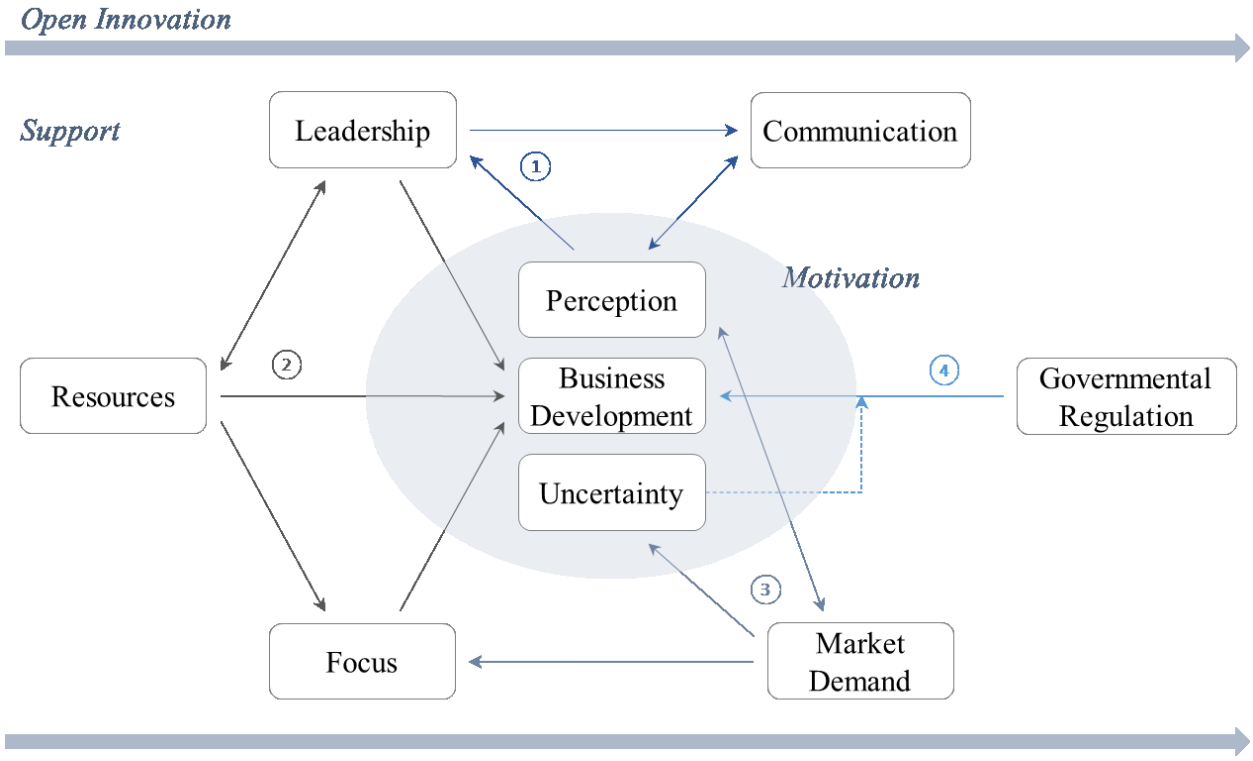

Figure 15 - Conditions and Interactions for BMI for Upcycling, an Inductive Dynamic Model

6 Conclusion & Implications

6.1 Conclusion

BMI continually allows companies to adapt to the changing landscape of the world's markets. In the past decades, the need to do BMI sustainably has become increasingly important as the awareness of environmental and social values has risen. Literature, responding to this trend, has identified a diversity of conditions to implement these sustainable forms of BMI. While turning out numerous conditions, the web of interacting knowledge has become too widespread to be considered a concise guide for interested readers to learn about the conditions. Furthermore, the incremental BMI changes, like recycling, tend to be the sustainable initiatives that managers employ, leaving radical forms of sustainable BMI underutilized. The weak links of existing literature need to be consolidated and strengthened if a useable roadmap for the conditions, promoting and hindering radical forms of BMI are to be understood and increasingly implemented.

To achieve the sought-after simplicity and precision we studied radical sustainable BMI through the lens of upcycling. Upcycling was chosen due it being a journey of considerable interest in our case company and because it can easily be justified as a radical sustainable BMI, reflected in a novel value proposition as it converts previously valueless waste into a product that encompasses the three pillars of sustainability; economic, environmental, and social value. Our research was guided by the previously identified conditions of the sustainable BMI literature base, expecting to confirm some of the conditions, while also discovering new conditions that were specific to the case of upcycling. Once these conditions were identified, they were sorted into three distinct dimensions to bring a simplicity that the current literature base lacks. The three dimensions; motivation, support, and open innovation, spread light on the ways to promote (or conversely inhibit) the drive of an organization to upcycle, the ability to allow that drive to flourish into a business development, and to make the process much quicker.

While the founding of these aggregate dimension was built upon existing literature, the dynamics of how they interact with each other were heavily shaped from new themes that were unveiled through our research. The perception of waste within the company was key to unlock the

motivation for upcycling, but it also had far reaching impacts as that perception is easily passed on to potential clients and shape their interest in the waste product. Uncertainty of sustainable BMI, labeled as an inhibitor in previous literature, evolved into a promoter under our research as upcycling was able to hedge the risk a company faces from an uncertain future that is becoming increasingly hostile to waste. Finally, the focus, the company was able to put on the upcycling venture, was found to be a large inhibitor if it was not addressed, as new innovations, waste, and social and economic values, are all parts of upcycling that are not within the normal day-to-day focus of the firm.

6.2 Managerial Implications

This research provided a comprehensive overview of the conditions, promoters and inhibitors that interact in the pursuit of upcycling. This better aids managers, who wish to pursue upcycling and particularly the ones that have the technological capability of creating an upcycled product, but do not yet have the experience to surround the product in a suitable BM. The findings not only help manager with what to expect, but also help them to navigate barriers that arise from their journey. Managers can maximize the successes of their ventures by knowing these conditions and the ways they interact with each other. In addition, the visualized model is very simple, so managers can easily root themselves in the perceived theory before diving into the nuances of each dimension outlined from the research.

Upcycling needs to start with creating a motivated workforce that will tackle the challenges of upcycling head on. Creating this motivation is made up of shaping the perception of waste, rationalizing the potential business growth, and identifying the role upcycling plays in hedging the company's long-term exposure to risk. This motivation is required for the workforce to buy into the new frames of thought required in upcycling.

With this motivation in place, it needs to be surrounded with support to make sure it does not die out as the challenges become significant. This support can come from many places; leadership within the firm, market demands, or government regulations (although the government regulation specific to upcycling are currently lacking). The support needs to allow for the project to have the necessary resources and focus to take the ideas and findings from the whiteboard to

the real world. This resources and focus must, in particular, extend to the sales force as they are the interface between the company and clients.
The upcycling initiative can be made significantly easier by partnering with other companies through open innovation. These companies should be selected to provide the competencies that organization currently lacks. This allows for sharing of knowledge, which cuts down on the amount of iterations needed to learn the correct lessons. Furthermore, it allows for sharing of resources, cutting down on the required investment.

Together these three dimensions create the field in which the conditions needed for upcycling interact. A manager that has sufficient skill and knowledge in these areas can create a competitive advantage for his/her firm by capturing a form of radical sustainable BMI while the competition is still looking for marginal improvements.

6.3 Limitations

Our aim throughout the entire study is to be as open as possible to ensure reviewers with transparency (Bryman and Bell, 2011). To aid this transparency we will now discuss the limitations and potential weaknesses of our research.

This case study is restricted, by its nature of being a single case study, to some key limitations in terms of external validity or generalizability of the findings (Bryman and Bell, 2011). For this reason, we cannot entirely ensure our identified conditions and their relations to apply to any company that is operating within a different industry, country or business context. Furthermore, while conducting this research it is inescapable to have been biased by the theory we have been working with. However slight that bias may be, frameworks and concepts guiding this thesis could have had an influence on how we proceeded in analyzing and interpreting our data. As authors and researchers of the study there is also the chance that we have "become wrapped up in the world view of the people they are studying" (Bryman and Bell, 2011). According to Bryman and Bell (2011), 'going native' refers to a bias, caused by losing sight of what is the actual matter of the study. Although we have sought to limit this phenomenon, we cannot dispel concerns entirely.

Due to time and resource constraints, a holistic review of literature around the theoretical constructs and prevailing conditions to which this study contributes, cannot be entirely ensured. We opened the field of observation with BMI for sustainability as the initial point and continued from there with further in-depth literature analyses on prevailing barriers, facilitators, and trends. Surrounding areas like BM, Innovation and BMI have been defined and scanned to understand the context the research is embedded in. However, the research does not allow comparing our findings in depth with specific conditions in the field of BMI, to give an example. Moreover, for the selection of relevant articles and sources of literature, we reference back to Bryman and Bell (2011), who state that decisions on the inclusion or exclusion of literature can be biased due to the nature of qualitative research.

With selecting semi-structured interviews as the main source of data collection, interactions with humans can cause certain biases and limitations. Especially with regard to sustainability as an increasing duteous perceived component in today's society, interviewees might have been biased in their responses to appear with more discernment about the matter. Bryman and Bell (2011) describes this phenomenon as social desirability bias, which can cause a distortion of data. Furthermore, it is to be noticed that some interviewees have been previously interviewed by other students about a similar topic, approximately one year before this research was conducted. There is reason to assume that some of our interviewees might have been able to learn from those past interviews and might have, in their eyes, optimized their responses, reactions or behavior. In consideration of that, there is a chance our observations could be slightly biased in respect, as our three criteria for interviewee selection in Chapter 3.3.4 would have resulted in similar interview candidates. In addition, we intended to investigate on conditions for BMI for upcycling on a managerial level likewise as on an employee level. Unfortunately, one interview with an employee was cancelled at short notice and could not be repeated due to time constraints, which is why our findings, with an eventual employee-manager ratio of 4:6, could be biased towards the managerial perspectives.

As for specific limitations for our research due to the case company, the aim of this study was to explore the conditions promoting or hindering a company's ability to BMI for upcycling by

conducting an empirical single-case study. This examination was based on the process of renewing an existing BM and consists of time fragments before and after conditional changes. Since the process of BMI for upcycling is an ongoing process in the case company, we could be lacking on the importance of some conditions that may grow in relevance when the process is fully completed.

6.4 Future Research

As stated previously, the inductive and iterative style of our qualitative research is naturally limited in its external validity, or generalization as further described in Chapter 3.5 (Bryman and Bell, 2011). Additional empirical data of a different research design and/or different industries and business contexts could contribute to further verification, complementation, criticism, or even rejection of the thesis. Nevertheless, the conducted framework allows future literature to explore more models and conditions in this relatively untouched field, as upcycling becomes more common and of greater interest in the twenty-first century from an economic and environmental point of view. But at the same time, our findings reveal that upcycling is also deeply anchored in previous concepts and fields like general BMI and that there is a need for a holistic approach uncovering more synergies to fully understand the matter of subject. So far, our framework can be seen as a first scientific model in the field of upcycling, helping managers to succeed their ambitions of creating value from waste with upcycling by transforming a current BM into a sustainable future.

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Appendix 1 – Definitions

Term	Explanation	According to
Conditions	- Factors, barriers/drivers/facilitators, en- and disablers - Neutral	
Business Model Innovation for Sustainability	Meeting all of the pillars (economic, natural, and social) allows for sustainable and synergistic gains and contributes to a sustainable development of the company	Dyllick and Hockerts (2002) Elkington (1999)
Archetypes	Groupings of mechanisms and solutions that may contribute to business model innovation for sustainability	Laukkanen and Patala (2014)
Eco-Innovation	The production, assimilation or exploitation of a product, process, service or business method that is novel to the organization. It results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use compared to relevant alternatives.	Kemp and Pearson (2007)
Eco-efficiency	- where both economic and environmental gains are achieved - a valuable part of a corporate strategy, but insufficient as the sole concept - achieved by delivery of competitively priced goods/services, satisfying human needs and bringing quality to life, while progressively reducing ecological impacts throughout the life-cycle	Ghisellini, Cialani, and Ulgiati (2016) Welford (1997) DeSimone and Popoff (1997)
Closed-loop system	Allow for what was once waste to be transformed into the input of a new process, which is where upcycling and recycling fit under	Carrillo-Hermosilla, del Rio Gonzalez, and Könnölä (2009)
Recycling	Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes within the same BM	Conclusion of different definitions
Upcycling	The act of innovating a new business model to transform a valueless (non-recyclable waste) material into a relatively high value material	Conclusion of different definitions

Appendix 2 – Interview Guide

As for explanation:
Questions with a black dot are focused questions whereas white indented dots can be potential follow up questions, if more elaboration is needed.

Part A - Introduction

Introduction

Confidentiality, recorded, free to skip questions

Background information

With Upseries as an upcycled product, we would like to investigate on the process the company has gone through, while creating a new BM for Upseries.

Facial Sheet

- Would you please introduce yourself?
    - Name
    - Age
    - Work experience
    - Position within the company
    - Role within the company
    - Years in the company

Part B - Questions

Understanding of the concepts

Values

- Can you shortly explain what 'creating value from waste' means to you in general and what the company approach towards is? (expected to touch upon economic, environmental and social value)
    - Is this definition in line with the common understanding within the case company?
    - Which business strategies are you currently using and is it successful/efficient?
    - And if not, why and what strategies do you think would work better?

Creating Value from Waste

- When we think about waste we also see initiatives to reduce it. Is it challenging to balance the effects of reducing and upcycling?
- What is recycling for you? Upcycling? Where do you see the difference and challenges of each?

Differentiation

- In which way was it (the implementation of recycling) different to than it is now with upcycling? (touch strategies, BM, employees, costs, efforts)

Part B1 - Before Commercialization

The idea behind

- When was the first time you got in touch with the idea of Upseries? And what were your initial impressions/thoughts and reactions about it?
    - How did you perceive the company's reaction?

Expectations

- What did you or the company expect from the product?

Perception

The idea of Upseries had been prevailing unimplemented in the company for over 2 years.

- Why do you think was that?
- What are the challenges that you perceived in integrating Upseries in the way the case company does business?
- Was it the same with recycling? Why not?
- Do you perceive the mentioned challenges, you were confronted with before, differently now?

Part B2 - After Commercialization

Change and Transition

- What was mostly necessary to realize the idea of Upseries from your point of view that made the company capable of implementing a BM for Upseries?
- Have you observed any other changes in the commitment to Upseries or upcycling in your department?
    - internal: motivation; incentives; external: resources, new knowledge

a. Conditions (BMI for Sustainability)

Financials

- Was a different approach needed to evaluate the financial viability of the Upseries project compared to traditional investments? Why?
    - If not, why is it harder to justify funding for upcycling?
    - Why haven't there been any more investments in Upseries?
    - For the investments that have been made for Upseries, do you think the company has been able to profit/gained some value on them? Why not? Can you think of some other value? Or even for others?

Risk and Uncertainty

- Was there more uncertainty in the development of Upseries? If so, did the additional risk affect the development?
    - How does that impact the way the company seeks new opportunities in sustainability?

Strategy

- How did the company's prevailing strategy affect the development of Upseries?
    - Is there a difference in strategy now? Or do you consider Upseries and the process of upcycling now to be part of the case company's strategy?
    - Can you distinguish here between long-term and short-term goals?
    - What are the challenges in working with long-term goals for creating value from waste?

Culture

- How does Upseries match with the company's culture?
    - How is your perception of the internal (and external) communication about Upseries?

- How encouraged is the company to innovativeness in general and towards Upseries?

Motivation (Internal)

- What do you think, was the internal motivation of the company to develop upcycling and Upseries? How and why did it change over time?
  - Where did the motivation come from?
  - How did the perception of waste play into the motivation of the organization and was there a different level of interest compared to "premium" products?
- How are extrinsic motivation factors like incentives affecting Upseries?
  - How would an adjusted incentive-systems change the situation and who would be the target?

Knowledge

- In your opinion, what is the level of knowledge on upcycling in the company and how has it developed?
  - Are there any specificities what kind of knowledge was of the matter? (tacit/explicit, industry/sales strategy etc.)

Leadership/Management

- How important do you consider the support of a high level manager in endeavors of developing Upseries?
  - What are your thoughts of what would happen if that support was not there?

External

Government & Market

- How are market/government regulations & incentives in waste treatment affecting how you do business?
  - Any incentives to choose upcycling over other methods?
- Did you feel pressure from clients, suppliers, or competitors to become more sustainable through upcycling?
  - Did you just want to catch up to others or did you want to lead?

b. Conditions (BMI for Sustainability for Upcycling)

Open Innovation

- How important was it to work with other companies in innovating?
    - Was it more important because it was outside your core business?
    - What did working with other companies lead to?

Sustainability

- What is your opinion of social and environmental benefits play into upcycling? Are they "nice-to-haves" or are they drivers?

The Outcome

Looking at the recent development with [current customer of Upseries]...

- How do the "results" of the upcycling activities, fit or not fit your above mentioned expectations?
- What is still need to be done with Upseries?
    - Why is it not done yet?
- What are your key learnings after implementing Upseries?
- In what sense might Upseries be a special case for upcycling (in terms of conditions)?

Part C

Closing Questions

- So, what is the future challenge for the case company to change for Upseries?
- Do you have anything more to add? Do you feel we have missed anything?
- Or do you have a conclusion you would like to share with us?

Thanks and goodbye

Appendix 3 – Complete Data of Gioia Method

Direct Quotes From Interviews	1st Order Concepts	2nd Order Themes	Aggregated Dimension
This is a product that is specific for your needs. It`s not some kind of a low quality or whatever.	Perception of Waste	Perception	Motivation
This is not a low end product, it is a product for a specific application, where you know the rest of our standard product doesn't really fit very well and that's exactly the perception that we like to transfer to the potential customers.			
But they sold the prime material and they didn't want to sell this shit, basically right			
[...] it (Upseries) is not sexy enough, I think.			
[...] when we realized how much waste we have and how much money that is, then it's sort of easier to understand why we have to do something.	Quantifying Waste		
[...] that is to measure the waste people produce because then we can see who it is, that's producing more waste than others [...]			
But also seeing how much production. The waste is a lot of money laying there. Right. So I think that knowledge around in the company is very important. And then I think it's easier to build up a project like this			
No one knew how much waste we had. I think that they should have been informed throughout the group years and years and years back, because there were, of course, some people that knew about this.			
[...] it is from financial point of view if you create a lot of waste but it is also to understand where we can improve			
As soon as you've put dollars on it and there was a lot of dollar signs and you realize, oh gosh, we have to do something about this.			
You need to start to say how much are we losing! Because if you start to think instead on how the [swear], how much are we are sending out on the scrap yard. You can start to measure than you realize that it is hundreds of millions that we just send out on the [swear] yard, without doing anything.			
[...] it's very clear when you look at the GRI-report			
We start with one project that is to generate as little [waste] as possible, which was a very slower because nobody understood here in the organization, why should we do this. [...] It is greater awareness about losses and where you can gain economical benefits [...]			
I didn't know that we had so much waste as we did and working with (name of head of sustainability) with anything and from this product, with Upseries, has opened my eyes a lot.			
[...] what has happened during the last three years is that we have, you know, everybody in the company is aware of it			
We have more awareness of how much waste we actually have,			

that's a good starting point			
I think that one of the biggest problem is a huge amount of waste, we create and we are not able to handle it in environmental friendly. I think that this one of the top questions for [the case company] to solve			
I have worked a lot with authorities around or permits, the way we handle our waste and where we can put it. I have been aware of it a long time but I don't think the whole company has been.			
For me as working with the environment to things and having all this contacts with authorities, not daily, but often it was natural to put it up on the agenda for many ways for many perspectives.			
But I think that the awareness, because this is not something we're proud of. But I think that our competitors are in the same situation, but you don't scream out this these statistics, because it stays amongst [the case company].			
I'm sure that half of the people in [the case company] don't know that. But of course, the reason for that is, this is not something we scream out about.			
I would say we have in general and globally with all the waste we have, that is the turning point now where we really started digging into how we should use all the waste that that we create. So I would say mandatory in all perspective.	Sense of Environmental Responsibility		
sustainability and environment coming more and more on everyone's agenda and I think it just has to fit			
I have two sons they shouldn't remember me as one that filled the world with rubbish, rather someone that leaves a better planet.			
[...] it will be the future of the planet earth is one where either we will recycle and recycle or not, we cannot just leave and go to Mars or whatever.			
[...] it is a market really that comes to us now and ask for solutions for them, to improve one way or the other. It could be from pure environmental reasons but normally it is the combination of the cost and also maybe to enhance from an ecological sustainability point of view.			
[...] not really to make a lot of money but to secure the sustainability of our operation			
[...] you can say that all of this is driven by environmental reasons			
We are taught in that sense since we are small you take care of your [waste] and they I mean it is different. so there's an issue in the society.			
[...] that you really want to change this and the view you're concerned about the planet. I don't have any solution to what to do to those that don't want to see it now and make a big change.			
[...] there's a lot of people who are very enthusiastic about the material. They're proud of the material.			
[...] it was very, very clear that sustainability is a part of our strategy in a total different way than it has been before			
[...] another report we need to create you know in our annual report you need to have a sustainable report but they don't see the			

the benefit. Yeah, but you know all the new startups, they'll take the sustainable, you know, they created by young guys you know in their 20s early 30s and they see I mean I'm all the older people older than me.			
There is a lot of things to invent to put something from your new ideas, some improvement that not a necessarily part of the design or is already design.... they feel very happy and proud to be here	Interest in Sustainability and Innovation		
There's a lot of interesting things happening so it's almost like, even though we've been around for a long time, it's almost in a certain sense, it's like a start up and I think that`s great fun			
[...] not really to make a lot of money but to secure the sustainability of our operation.			
Most of the motivation comes from ourselves, again, towards this target of these minimizing carbon footprint campaign that has been led by [Sustainability Manger], the head of sustainability and quality.			
All companies today talk about sustainability, but not many companies can say that what you produce is actually something that, you know, saves energy, it's sustainable material	Sustainable Reputation		
There is a lot in it for us when it comes to both earning money but also from my perspective, from a branding perspective.			
[...] but then they start looking at it and they realize there's something more to it than that. Working with sustainability has been very, very good for us from a branding perspective			
The issue is that we need to sort it out because that is what we live on. And if we cannot solve this problem we have a huge issue going forward because then we will not be credible as a sustainability-company right.			
But for me it's more of also the discussion of really understanding that the material we have is from a selling point, sustainable material. We didn't do that before. we didn't have those kind of selling points and cetera and we see that there is a lot of interest for that			
[...] or that some customers would have put down their foot and said no [swear] way I`m buying from you if you don`t sort your shit. But it would have been in the end, it would have come up.			
[...] we're not very strong in branding not internally and not externally. And I think that sustainability has actually become one part of our branding.			
When it comes to the sustainability as a whole as we have been working with it the last couple of years, as we are not very good in internal branding or external branding. It has become our branding			
It (sustainability) has become our branding. So it's I mean almost every interview we have, we get questions about it. So, I mean, this is a selling point for us. People, who, you know, haven't heard of us, they go in and start looking at us and people are interest in an environment and are concerned about our environment and suddenly wow this is actually interesting you know so they might say, oh, plastic (not exciting)..god [...]			
[...] from the business point of view is it's making this company profitable and sustainable.			

We need to be and be seen as a sustainable company and then you cannot run your operations with a very high waste level.			
[...] it (Upseries) will not be 100% a solution. It can be a 50% solution because part of the waste cannot be turned into [Upseries] so we need more than that.	Incomplete Solution	Business Development	
We have only one way to eliminate the waste that is [Upseries], we don't have any developments for getting the other half of the problem.			
We have prioritized some machines (before Upseries) due to the fact that if we continue cutting the block this way, there will be even more waste [...]			
And so say double action on this regard: first to minimize the creation of waste during the production process. And second, how to, when it's unavoidable to produce waste, how to recycle that waste.			
[...] our strategy and of course Upseries is one part of it is a product of it now. It's a solution rather.			
The first thing is to reduce the waste, of course, as far as possible and but we know that in a short perspective, we will not be able to do that. So, we will remain with waste that has to be taken care of in another way that we do today. So, that is, yeah. That is why we also have to work on what values can the waste, we create today do in a new product.	Growth Cap		
Again back to the risk of still continuing producing waste as the goal is not to completely put the waste count to zero because we can't see that they'll solutions in the near future.			
[...] it will be in any case, a positive, positive challenge because it will mean that we are reducing our wasting production. It's always positive. I don't think it will be a really serious challenge for the midterm, maybe for the long term, hopefully for the long time.			
There would be nothing left. So we are little bit were holding back a little bit, because we're a little bit afraid to go into something, then maybe we can't deliver.			
[...] when you're producing a material of waste in a way because it's not easy to just, okay we want more			
[...] sales people who are telling other salespeople that you do not have to sell it cause we are already sold out. We're sold out the everything that we can produce and we do not have the capacity			
If we come up with something that will be a huge success. We cannot start to produce waste to meet that request. So that's the tricky part			
Okay, we have we said we had a certain amount of waste but we of course want to reduce.			
We do what we can to reduce it. So we can't go out and market this product and say, Come and buy as much as you want, because we don't have as much as we want. So the tricky part has been to find a solution where our amount of waste and the product need is on par			
[...] but the way we produce the material, there are also limit how much we can reduce it because we need to cut off the excess, we need to cut off. so we will always have waste			

So where can you sell that you know find that spot where you are very welcome contribution to that more good but that market doesn't depend on it			
[...] and a customer that can replace his current product with this making again you know how to win win but if he doesn't get this from us. You have a second source of supply that he's happy with.			
So we are also trying to minimize our waste, so we cannot grow [Upseries] to the sky.			
[...] and then you need to you need to fix the company fast. I mean, you need to you know get cost out immediate, you know, get rid of, you know, can you get rid of buildings, you know, run to can get rid of people can you renew negotiating or raw material prices and things like that in both ways is a business if you can turn it into a sellable product but it takes time, you know, somebody needs to try it.	Short- vs. Long-Term Goals		
[...] that would put us in a position to have some sort of negotiating power to say we are going to stop it but we need a few more years as you can see we have already started			
It takes those couple of months until you know if it's a failure or if it's still a possibility.			
We are committing with customers in the same time we are saying it is not our future			
I mean slowly but surely, hopefully will faze out those customers, which is a bit of a strange dynamics			
[...] we are taking it as a cost but the future is that waste is a source of profit	Reduce Disposal Costs		
Normally it is the combination of the cost and also maybe to enhance from an ecological sustainability point of view			
[...] is top priority to reduce the waste, both from financial point of view goes hand in hand with also better environment			
You know, you start looking at the way we are a cost, you know, we need to lower cost base and then waste became a big issue for two reasons. One, you did not get paid for it. Of course, and you needed to start to pay to get rid of it.			
[...] we run a business so waste is a big opportunity.	Grow the Business		
[...] we are taking it as a cost but the future is that waste is a source of profit.			
Now you also have to look at it as an opportunity for new businesses [...]			
I mean this is more a kind of business development now than a development of a product.			
[...] something broader in the group. Maybe be local solutions that may be even better than what we have here	Need to Operate Local		
We have a CTO organization of I think there are globally like 46 People spread out and I think there is a good thing that they are spread out because they are close to the customers. Sometimes I think we lack real strong technical hub, you know, because when you're a team, you can develop much more so the hub would be one in (production site 1) and one in (production site 2) because that's where we have most of the engineers and the CTO people.			

[...] makes this different than the rest of our portfolio is a product that should be close as close as possible to the factory			
Upseries is specially designed for a local market. I mean to export Upseries overseas is something that doesn't work.			
I think that they are working on to get the one person in charge of it like a product. And it shouldn't be one. It should be one in Italy and one in Sweden.			
The other plants should start looking into this now. Finding local customers. The transport costs would eat up all the small profits. So look for local. As local as possible. And then the struggle of the quality of the product. Someone should work on that to make the quality even better and some kind of control			
If you see in other areas around the world, it is in fact capital that has also started to vote, when the awareness woke up. Nobody wants to invest money in something that is doomed from environmental point of view.	Investment in Sustainability		
[Budget wise,] I have got and I still have, quite a lot of criticism from the owner, like is this really necessary, because normally in a company we all have now to obey to European law in Europe where we are			
They are financial guys. They have no clue about what is going on. they count money and of course from the money point of view we spend much more money on this than any other company			
I think the owners should open up their wallet and make this happen. How can we make this happen without investment. Fix it without any money, I think it is the same in many other companies. Only imagination stops you. I wish there were more people			
So we're doing everything we can. Sometimes, I think it can be hard because you need to invest, to be able to make the Upseries. Yeah, it’s even though you have the solutions.			
You need to have people on board and it's not a quick fix, you need machines you need that. But once you have those. We have a lot of material, waste material, that we can use.			
[...] some of the material we have sent out has been a disaster. So there is no control and so we need someone that's are in charge of it. Because what we ship has our face on it also. So if we ship out bad materials reflects back to the company.	Risk	Uncertainty	
We are committing with customers in the same time we are saying it is not our future			
We can supply some but do not expect me to be your future, don't expect me to be there forever. That's the tricky part of the development			
So if you took out risk the risk of not being sustainable, I think it will overcome in the short term or midterm many other risk that you can think of, especially stuff like landfill			
But then that way would have been driven by the authority that is the must [...]. I mean, we can see now that there are permits now that say that we are not allowed to put anything more on the on the dump yard. So it would have come out eventually.	Regulation Apprehension		

[...] you know, it can be that the authorities say that you cannot throw away waste.			
[...] that it is a high risk to continue to put that much landfill that we do today and that that might be impossible in the near future due to new regulations.			
For (the case company) this is a huge risk for producing landfill. And the risk is that the cost could go up dramatically, there could be a complete ban on landfill. In most countries it is already banned but you can get a permit. But what if the permit issuer decided not to reissue it?			
I mean it's to me it's necessary to find a solution to it, to survive as a company.			
So I think it comes, it comes from that basic global problems that we face today and that we risk to face much more in the near future.			
[...] otherwise we don't know where to put our waste. Okay, maybe it's not for now but in the next 10 years I expect this to really be a must.			
But the thing is that sometime soon our community is going to say no more landfill. So, we have to solve this problem. And the problem now is that the Upseries we're producing is only in Italy. It's the only Italian waste, we are using.			
[...] expect some difficulties to market it but also when finding the correct market it has several good properties that could be valuable outside our market.	Need to Discover New Markets		
a bit worried about the difficulties to market into an accurate business as it as it is a bit outside our normal or regular basis but happy with and satisfied with the product created in quite a simple way			
I am often Asked by our sales guy if we have something cheap and no specific property. I see all this waste. Why don't we try something			
[...] our product was too good. So [the case company] is not delivering in what we call the filler market			
[...] always the temptation to replace our older foam			
We have done something different and must be another market and other application			
I would assume that our Upseries could also be used for, I mean, our customer who doesn't want that high quantities			
You cannot sell a Mercedes and a Scoda in the same shop, it doesn't work			
So, but I think it's much better now we have had many different customers in different applications that are interested. So, I think we are onto something.			
I think that the customers that are buying it, they don`t know what they're buying, they know what the quality of it.			
We should have known the markets that are interested.			
It was actually our owners, [owners name], has started an initiative with CSR [Corporate Sustainability Report].	Direct Push from Top	Leadership	Support

This is definitely a push, and it is from me (CEO). Yeah, because I said we need to do something, this cannot go on. It is environmental sustainability it kills and we should have a face of being working with sustainability.			
[...] where the pressure came from and started from the owners			
[...] very sensitive to such topics sustainability in (ownership group) definitely a target something they commit to, they want us to be committed.			
Extremely important without, without that push from the top it's it's impossible.			
No one really knew how to sell it, how to talk to the customers, there was one person who was dedicated to identifying sales. That person was constantly faced with issues that he didn't know how much capacity he had, how much he could sell. He wasn't sure about the pricing, and then for other reasons he wasn't successful, maybe he was more fighting against the sales organization than working together [...]	Turning Discussion into Action		
There was a lot of talk in little action and I can't say why he didn't succeed and it wasn't only his fault and so on but we decided to....well he left the company [...]			
We discussed this (Upseries/sustainability) in the in the EMT in our executive management team [...]			
[...] it`s been up in executive management team but you know you always have a long list of things			
He started then a lot of projects and they said here's what with the schools and so forth to sign, see what the [swear] shall we do with it. And now it has started a little bit to start up.			
I think it would have when you know it was tough times and he didn't get the right support from top management [...]	Supporting Employee's Actions		
[...] since [Sustainability Manager] has been also personally appointed by the management team in [the case company] to do something so he has some target then the support became even stronger [...]			
[...] being active in the group level not only yeah approving the expenses. He's [Sustainability Manager] more than that.			
I think that if you have a sales manager that doesn't believe it. Then the sales people will not sell it. Yeah, so you must, you must get people involved. You must train them or inform them or make them see but once.			
He [Sustainability Manager] lives what he believes. And I think You need to be because we need people like him. All of us needed that really make it their daily work to try to convince	Inspiration from Champion		
He also went out to all the sites and had presentations for people in different sites. And I think that's where the the most important communication takes place			
I think now that we have [Sustainability Manager] it has been a big help. Informing and educating people about this, but Upseries is just one small thing in all of it.			
And since [sustainability manager] came in, things have moved on rapidly. I mean, before we were just aware that we had a lot, but			

no one really did anything.			
He [Sustainability Manager] has really highlighted and really put focus on how much waste, there is in our production			
[...] bring in someone from outside who had worked with these, with quality and other companies, ways of work workings, I mean, you know, you bring in value	Acquire Employee Competencies	Resources	
If you want to develop the business and an area so we wanted a broader, a broader skill set			
[...] if we can gain millions of this. Why don't you get five people working full time to create that product	Dedicated Development Team/Roles		
So any new product needs some dedicated people to work with it to really get it out there			
[...] have some dedicated people working with products like that, I think that's key			
You should have a project group, with sales and some marketing people, technically, but with environmental people to really get the right focus on this and get the community to do that part.			
As I said again devoted people who can put hours in this and not just have it on the side. I think we should have someone just employed for that. [...] because that could be a benefit for the other plants we have one that knows how it can behave and help everybody. [...] It has come along way, but we need dedication.			
I'm not sure if it's the best way is that the same Salesforce panel both from, I don't know, maybe you should have a specific salesman for this [Upseries] type			
Could be also you can put it on your older sales guys and put them bonus on then I think it'd be more, but I think dedicated because of the fact go out to such other business			
So we're doing everything we can. Sometimes, I think it can be hard because you need to invest, to be able to make the Upseries. Yeah, it’s even though you have the solutions.	Financial Investment		
You need to have people on board and it's not a quick fix, you need machines you need that. But once you have those. We have a lot of material, waste material that we can use.			
I think the owners should open up their wallet and make this happen. How can we make this happen without investment? Fix it without any money; I think it is the same in many other companies. Only imagination stops you. I wish there were more people			
We are going back from one size fits all to more dedicated sales people and this is not really different. It is a completely different application.	Separate Marketing Strategy	Focus	
We have a sales force - they to sell something that this is stronger and lighter and now we come with something else and maybe they are not fully compatible with that			
We are also trained and focused on what we do in the markets, where we are active, so this is maybe something new. Not that easy			
I think yeah we don't have the expertise. We don't know really what we're talking about, because we always say that you should			

do this to test is all said and nobody knows if it is to be good because it looks quite yeah with in that direction			
So I think that we should keep it with one. So we do not get to the point where we do not have product to give to new customers. And this big customer have used it for a while and it knows what can happen if it's or if it's too fragile. It's just breaks apart or if it's density. And so I think once we know that we have a firm density that we can stand by	Select lead users for feedback		
We sat on superb properties and really you know premium products and then you need to sound something like this,			
Selling things in China and selling things in Europe and selling things in America is three different types of markets and three different ways of selling			
There was no pressure was no external pressure and the internal version was not there because the we were making enough money we were doing a lot of crap	Attention given to high growth opportunities		
Money we got paid per produced kilo out was enough to cover all the way. So we were making good margins, even if we produce a lot of crap			
We were not aggressive enough in the marketing, going to customers and putting the effort in there. That has slowed us down, kept us from ramping up	Technical push for waste solution leaves marketing behind		
No, no, no. That (balancing efforts to reduce waste and efforts to create something out of it) goes hand in hand. I mean, first priority is to stop producing waste. Second is to whatever we produce, we need to take care of	Portfolio of sustainable initiatives		
you need to create more focus on	Time for employees to spend on innovations		
No one really knew how to sell it, how to talk to the customers, there was one person who was dedicated to identifying sales. That person was constantly faced with issues that he didn't know how much capacity he had, how much he could sell. He wasn't sure about the pricing, and then for other reasons he wasn't successful, maybe he was more fighting against the sales organization than working together			
In bigger companies you would probably have like okay 15% of your working time or 20% of your working time should you know be dedicated innovation. We don't have that luxury as there are too few people.			
The last half year I haven't been able to spend so much time on this			
I think he said to himself I really want to do something about this	Sales team incentivized to sell higher margin products		
They simply want to do something about this problem. Most more on a personal level, they don't think it's okay that we are wasting so much they wanted to give this a product a fair chance. Yeah, I think it is as simple as that. I really don't see any other motivation any other monetary or maybe they just wanted to prove that it was possible to do and sales people I mean they like to win. So maybe that's been enough for them.			

They would like to earn as much money as possible. So why sell this when they have the premium stuff			
So to start to focus on something that you don't get you some much money there is so because of that I'm a little bit thinking this should be a dedicated sales guy for this.			
Our sales guys they have a huge challenge, because they might be an expert in building boats, right, but we asked them to sell a lot of other things in other segments	Sales team sticking to what they know		
[operations] can do a lot of things with the waste. And then I don't think the sales force was not interested at that time doing this. They were fully occupied: sell sell sell! what they were supposed to sell			
[...] but I think for the older sales, guys. It's too much work too heavy, because we have all the other stuff we need to do. Yeah, because they are. Yeah, we need to fill up this machine, you know, and we need to have more of that. And then this is coming. Okay. This also but don't give it give us so much money and it's new effort to remain			
This is not number one structure and I think that's why it's so hard for us to work with this I mean it's a pure mental thing, you know			
And then we found out how he is working. He is not trying to go out and sell to customer directly. He was more working to try to convince our sales guys to sell the material. But they sold the prime material and they didn't want to sell this [waste], basically right.	High-end market is more exciting		
It's [Upseries] not sexy enough I think			
All customers in all those markets you will not be able to provide anything to them if you are not working with this. Okay, so, so if we want to be part of those types of industries which is very interesting, growing industries is something that you just have to take seriously.	Market seeking sustainable products	Market Demand	
I think definitely customers are a source of motivation.			
You know, marine pleasure boats it's quite simple. It's guys that have some 30 employees or 20 employees and produce some boats and they do it in quite a dirty way and say don't care I always I think the bigger players does yeah			
Several customers they were really excited with benefit for their manufacturing process, alone with the whole green aspects of the product			
[...] but it is a market really that comes to us now and ask for solutions for them, to improve one way or the other	Market demanding to know the sustainability of the production process		
So, but I think it's much better now we have had many different customers in different applications that are interested. So, I think we are on to something.	Trying to find the specific market application for		
We should have known the markets that are interested			

We have customers that is of course an incentive	a waste product is very challenging		
the startup was not really so smooth because let's say we didn't have the market ready yet			
We had the business idea we had the material but still we were not good enough to find the right customers and then the right applications.			
when the industries then started to take it more serious and said, Oh [swear], we have a problem here, we need to sort it out, then the industry to get over and then you can say that you took first a technological view to see how can we sort out so we don't have polychlorinated organic farms and then the next step was okay and how can we make money out of this so I mean it was not a market pull, it was a little bit more the push internally . we are forced to do this, it increased our cost, How the hell are we make more money.			
[...] we have a challenge when it comes to communication in this company. We don't have any very good tools for communicating.	Lack of tools hampers communication	Communication	
This is the first company that I work with. For many years, that hasn`t got any intranet. We have something similar to an Intranet, but that's not very interactive.			
85% of our employees are blue colors working in production, they don't have their own computer. How do you reach them.. [...]			
[...] it's got the complexity of languages and people who don't have the computers.			
[...] communication in our company is not very good. It's got the complexity of languages and people who don't have the computers [...]			
We have a language problem because if you're working in an international company with let's say only engineer. So, so only yeah English is ok but we have five languages besides English in the company.			
[...] we are pretty much basing it on a cascading information [...]	Linear top-down communication flow		
[...] we have a meeting once a month and our with our top managers. So let's say 40 people 40-50 people. And that's the communication channel.			
[...] it's very clear when you look at the GRI-report	Awareness of waste makes people want to deal with it		
We start with one project that is to generate as little [waste] as possible, which was a very slower because nobody understood here in the organization, why should we do this. [...] It is greater awareness about losses and where you can gain economical benefits			
We have more awareness of how much waste we actually have, that's a good starting point			
I think that one of the biggest problem is a huge amount of waste, we create and we are not able to handle it in environmental friendly. I think that this one of the top questions for [the case company] to solve			
I have worked a lot with authorities around or permits, the way we handle our waste and where we can put it. I have been aware of it			

a long time but I don't think the whole company has been.			
For me as working with the environment to things and having all this contacts with authorities, not not daily, but often it was natural to put it up on the agenda for many ways for many perspectives.			
But I think that the awareness, because this is not something we're proud of. But I think that our competitors are in the same situation, but you don't scream out this these statistics, because it stays amongst [the case company].	Amount of waste as inconvenient secret		
I'm sure that half of the people in [the case company] don't know that. But of course, the reason for that is, this is not something we scream about.			
We could have been better communicated from the executive management team, what are our intentions. What do we want to achieve with sustainability, maybe. So I think that we could have done stronger message from the top management, I think it was. I mean, when we when we set our strategy.	Lack of strong messages and communication outside of the management team		
So we started off very well I think but then it's like you need to have the energy and you know the actions to really continuously communicate			
[...] we can always be better at communicating Upseries			
I think definitely that loose legislations they have been much tougher on how we handle waste the way it's done. So I think it's it definitely important to have entire agenda.	No direct support for upcycling initiatives	Governmental Regulation	
there is no money for big companies			
In the beginning it was yes because the we have this court for environmental permitting that gave a basically orders from the National Agency, an Environmental Protection Agency. They basically gave order to the industry to develop them and enhance the environment, but today I think in fact, in many cases, they have a less importance			
Maybe later there has been contact with other companies, but in the beginning it was really not. I`ve been doing it by ourselves.	Knowledge sharing outside of core competencies	Product Development	Open Innovation
They have similar interests than us and we need to have help to get it out in the market.			
[...] good new now when you start to work with the STENA recycling			
I think to be able to work with a company and like [other company] for example that is huge. I mean, that's really good			
[...] there would be benefits to having some special support.			
Yeah, it (Open Innovation) was crucial otherwise we would have had other problems. It was a lot of try and error but it turned out quite good.			
I mean, it has to be there (Network), nothing happens if we don't have that. This has to be pushed even further.			
I think the reason is probably that with such an odd product like that you will not get the funding and investment that you will get on your normal product	Shared investment/risk		

I mean it is it is an innovation and I think that it's easier to develop these products externally with some partners			
I mean it's obvious you could you can make everything in house, but I don't think that it's that easy. Yeah, easier to use some partners that you can do an investment together or do some part and they do some other parts.			
He started then a lot of projects and they said here's what with the schools and so forth to sign, see what the [swear] shall we do with it. And now it has started a little bit to start up	Academic input increases awareness		
That is also new that that we take students in for this works and that helps us open up our mind in other perspectives that we don't know about. So I think that really boosts our possibilities with Upseries. That's very crucial for how we will succeed.			
[...] when (intern students) did their thesis work or dug into the possibilities and when they had their presentation, it became a bit more alive			
So I think that we should keep it with one. So we do not get to the point where we do not have product to give to new customers. And this big customer have used it for a while and it knows what can happen if it's or if it's too fragile. It's just breaks apart or if it's density. And so I think once we know that we have a firm density that we can stand by	High amount of feedback and iterations	Lead User	
I think yeah we don't have the expertise. We don't know really what we're talking about, because we always say that you should do this to test is all said and nobody knows if it is to be good because it looks quite yeah with in that direction			
We sat on superb properties and really you know premium products and then you need to sound something like this,	Introduction to new industry application		
Selling things in China and selling things in Europe and selling things in America is three different types of markets and three different ways of selling	Introduction to new local application		