



**LUND UNIVERSITY**  
School of Economics and Management

## **Environmental antecedents and their influence on the tension between exploration and exploitation**

*The case of sustainability as a special example of environmental dynamism in the context of a technology-driven company*

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## Abstract

**Title:** Environmental antecedents and their influence on the tension between exploration and exploitation: The case of sustainability as a special example of environmental dynamism in the context of a technology-driven company

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**Keywords:** Environmental Antecedents; Sustainability; Exploration and Exploitation; Tension; Trade-off.

**Research question:** How does sustainability as a special case of environmental dynamism influence managerial and organizational antecedents and thereby the tension of exploration and exploitation within a technology-driven company?

**Methodology:** The research was conducted as a single-case study in an international composite core material company. This case study is characterized by pursuing the qualitative research approach, which follows mainly the inductive paradigm, however, some deductive elements were used as well. Therefore, the theory was inductively derived from data, which was primarily collected through conducting semi-structured interviews.

**Theoretical perspectives:** This thesis focuses on the concept of environmental antecedents and their influences on the tension between exploration and exploitation. Therefore, the study examines how sustainability as a special case of environmental dynamism, which is a subcategory of environmental antecedents, influences the mentioned tension by provoking changes in the trade-off of a firm to support either exploration or exploitation. The aim is to contribute by providing a framework to increase the understanding of the relation between environmental antecedents and the tension of exploration and exploitation.

**Conclusions:** By providing empirical evidence to this field of research, the most valuable contribution of this thesis is to analyze the interrelation between environmental antecedents and the tension of exploration and exploitation by using qualitative research methods. In addition, the study reveals the necessity for taking on a holistic perspective in the case of research in this field, based on the identified interplay of different kinds of antecedents, mainly environmental, organizational and, managerial. Finally, sustainability as a special case of environmental dynamism requires certain actions from companies to enable them to benefit from seizing opportunities provided by the topic of sustainability. Therefore, to evoke the potential of sustainability, organizational and managerial changes are required, especially in order for the explorative attitude of sustainability to come into effect. Thus, it calls for a holistic integration.

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*ES LEBE EUROPA.*

# Table of Contents

<b>Chapter 1: Introduction.....</b>	<b>1</b>
1.1 Background .....	1
1.2 Problem Discussion.....	2
1.3 Case Company.....	4
1.4 Research Purpose .....	5
1.4.1 Research Question.....	6
1.5 Outline of the Thesis .....	7
<b>Chapter 2: Literature Review .....</b>	<b>9</b>
2.1 Exploration and Exploitation - A knowledge based definition .....	9
2.2 Reaching the Balance of Exploration and Exploitation.....	9
2.2.1 The Tension between Exploration and Exploitation .....	9
2.2.2 Modes of balancing Exploration and Exploitation .....	11
2.2.3 Exploration and Exploitation on different levels of an organization.....	14
2.3 Environmental, Organizational and Managerial Antecedents as main influence factors of the tension between Exploration and Exploitation.....	15
2.3.1 Environmental antecedents.....	15
2.3.2 Organizational antecedents.....	17
2.3.3 Managerial antecedents .....	19
2.3.4 Isolated perspective on antecedents of previous research .....	19
2.4 Sustainability as a specific environmental antecedent .....	20
2.5 Relation of the Theoretical Concepts .....	22
<b>Chapter 3: Method .....</b>	<b>24</b>
3.1 Research Design and Process .....	24
3.1.1 Epistemology and Ontology .....	24
3.1.2 Research Strategy, Approach and Design .....	24
3.1.3 Research Process .....	25
3.1.4 Generalization .....	25
3.2 Data Collection.....	26
3.2.1 Interviewee Selection .....	26
3.2.2 Interview Guide and Interview Preparations .....	28
3.3 Data analysis.....	30
3.3.1 General Approach for the Data Analysis.....	31
3.3.2 Specifically applied Approach for the Data Analysis .....	32
3.4 Summary of our Research Methods .....	34
<b>Chapter 4: Findings.....</b>	<b>35</b>
4.1 General Findings .....	35

4.2 Triggers for Sustainability.....	36
4.3 Characteristics of Sustainability.....	39
4.4 Temporal Differentiation of the Findings.....	43
4.4.1 Prevailing Mindset as representation of $T_0$ .....	43
4.4.2 Organizational and Managerial Changes as representation of $T_1$ .....	47
4.5 Trade-offs and the influence on the Tension of Exploration and Exploitation .....	52
4.5.1 Trade-off caused by the Prevailing Mindset and supported through the Characteristics of Sustainability.....	52
4.5.2 Trade-off caused by Organizational and Managerial Changes.....	55
<b>Chapter 5: Analysis and Discussion.....</b>	<b>57</b>
5.1 Everything is based on Managerial Decisions.....	57
5.2 Analysis of the identified Relations between Aggregate Dimensions.....	57
5.2.1 Trade-off: The tendency towards Exploitation based on the Prevailing Mindset .....	60
5.2.2 Trade-off: Organizational and Managerial Changes as Groundbreakers for a more Explorative Tendency.....	60
5.3 The Necessity for Organizational and Managerial changes to force Momentum for Exploration in the Case of Sustainability.....	61
5.3.1 The conflict of Firm’s Short-term Orientation and the Long-term Perspective of Sustainability.....	61
5.3.2 The conflict of Investment Decision-making and the Misperception of Sustainability .....	62
5.3.3 The conflict of Dependency on Individuals and the Need for a holistic Integration of Sustainability.....	62
5.3.4 The conflict of Integration into the Main Business and the Need for Separation of Sustainability.....	63
5.4 Discussion of the generalized Framework .....	64
<b>Chapter 6: Conclusion and Implications.....</b>	<b>68</b>
6.1 Conclusion.....	68
6.2 Limitations.....	69
6.3 Recommendations for Future Research.....	70
6.4 Managerial Implications.....	71
<b>References .....</b>	<b>72</b>
<b>Appendix .....</b>	<b>VII</b>
Appendix 1: Semi-Structured Interviews: Interview Guide.....	VII

## List of Figures

Figure 1: The Paradoxical Association between Exploration and Exploitation.....	11
Figure 2: Modes of Balance - Exploration-Exploitation.....	14
Figure 3: Levels of Analysis: Exploration and Exploitation.....	14
Figure 4: The framework of exploration and exploitation in relation with antecedents .....	23
Figure 5: Example of an elaborated Data structure using the multi-step approach by Gioia .....	32
Figure 6: Data structure “Triggers for sustainability” .....	38
Figure 7: Data structure “Characteristics of sustainability”.....	42
Figure 8: Data structure “Prevailing Mindset” .....	46
Figure 9: Data structure “Organizational Change”.....	49
Figure 10: Data structure “Managerial Change” .....	52
Figure 11: Data structure “Trade-off caused by prevailing mindset & characteristics of sustainability” .....	54
Figure 12: Data structure “Trade-off caused by organizational and managerial changes” .....	56
Figure 13: Model of the tension of exploration and exploitation and the influence of sustainability on that tension.....	59
Figure 14: Generalized model of the tension of exploration and exploitation and the influence of sustainability .....	66

## List of Tables

Table 1: Environmental antecedents.....	15
Table 2: Overview of selected interviewees .....	27
Table 3: Description of the structure of the Interview guide .....	29
Table 4: Key Research Methods.....	34

# Chapter 1: Introduction

## 1.1 Background

General speaking, nowadays, sustainability within society gains enormous attention and is a major force that shapes our daily life and behavior. Therefore, the scarcity of resources pushes our common mindset towards a mindset of sharing, reusing and recycling, to use resources in a more effective and efficient way (Edwards, 2005). In that respect, previous research elaborated on the relationship between corporate social responsibility, which is in a close relationship with sustainability, and the innovativeness of a firm (Luo & Du, 2014) and figured out a positive relationship between both paradigms. In addition, as several surveys reveal, “sustainability nears a tipping point” (Kiron, Kruschwitz, Haanaes & Velken, 2012:69), and thus, reach high attention in many companies as well when it comes to the topic of implementing sustainability characteristics into the firm strategy. Moreover, sustainability itself can be seen as a new bifurcation point, based on the impact that this topic has not just on companies but also on the whole society (Tidd & Bessant, 2014; Miles, Munilla & Darr, 2009). Such a bifurcation point is characterized by changing the way of how a system works by changing the patterns within it (Black & Edwards, 2000). However, such a trend, especially when it represents a bifurcation point, requires a readjustment of the strategic direction of a company to guarantee long-term survival. This leads to the necessity to build-up strategic flexibility and adaptability, which can be described as the ability of a firm to reallocate resources and reconfigure processes (Zhou & Wu, 2010). This phenomenon about sustainability and strategic change concerns organizations, as they, as Penrose (1959) described, consist of resource bundles, and thus, have a natural scarcity. This natural scarcity creates a continuous conflict of resource allocation and, thereby, increases the tension between organizational activities for long-term survival (Pondy, 1967).

Looking at that point on the long-term survival of an organization and the associated competitive advantage, at least one framework characterized the discussion of acting in two areas to reach such a long-term survival, i.e. the framework of exploration and exploitation introduced by March in 1991. However, March (1991) defined these two terms in a quite broad sense and therefore creates space for discussions about the definition per se, the context in which it occurs, as well as the mode of handling these two activities. Even 26 years after the emergence of this framework, researchers pointed out that there is still space for further elaboration to understand the concept in total, especially the understanding of the trade-offs and interdependencies between the phenomena of exploration and exploitation and their antecedents (Lavie, Stettner & Tushman, 2010). In that respect, we define the term *antecedent* as a construct that triggers the contradictory activities – exploration and exploitation – and have different effects on them (Lavie et al., 2010). In that sense, we follow the classification of Lavie et al. (2010) and distinguish between environmental, organizational and managerial antecedents.

Furthermore, the mode of balancing exploration and exploitation is also a topic of discussion. Thereby, two principle concepts are opposing – *organizational ambidexterity*, describing the simultaneous

performance of both activities (Gibson & Birkinshaw, 2004), and *sequential managing/punctuated equilibrium*, describing a more sequential series (Gersick, 1991). Especially by following the work of Stettner and Lavie (2014), as well as Boumgarden, Nickerson and Zenger (2012) a new perception occurred that argues for a combination of different modes on different organizational levels to reach the overall balance of exploration and exploitation. This represents, therefore, a more dynamic perspective on the framework exploration and exploitation and especially highlights, the trade-off between exploration and exploitation and the associated tension as crucial for increasing the overall performance. To sum it up, it can be said that sustainability has become a major trend in society and is directly related to innovation; a new perception occurs that a combination of different modes of balancing exploration and exploitation increase the overall performance and thus focus on a dynamic perspective; and the still prevailing ambiguity in research of how antecedents influence the tension between exploration and exploitation; those points lead to the ongoing problem discussion and open up fields of interest.

## 1.2 Problem Discussion

In general, a lot of research has been done in the field of exploration and exploitation (March, 1991; Levinthal & March, 1993, Lavie et al., 2010, etc.) (see Chapter 2: Literature Review). However, as mentioned before, researchers have not yet found consensus about basic assumptions (Lavie et al., 2010). While March (1991:71) defined exploration and exploitation in a quite broad sense – *exploitation* is thereby defined as “refinement, choice, production, efficiency, selection, implementation, and execution,” and *exploration*, as something that is characterized by “search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation”. Levinthal and March (1993), on the other hand, use the definition: “Exploration – is characterised by the pursuit of new knowledge, of things that might come to be known.” “Exploitation – is characterised by the use and development of things already known.” (Levinthal & March, 1993:105). In addition, they tried to formulate the basic problem of an organization, which “is to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability. Survival requires a balance, and the precise mix of exploitation and exploration that is optimal is hard to specify.” (Levinthal & March, 1993:105)

Furthermore, the modes of balancing of exploration and exploitation – *organizational ambidexterity and sequential managing/punctuated equilibrium* – and relation to firm's performance is hardly discussed in research (e.g. Gersick, 1991, O'Reilly & Tushman, 2004, Gibson & Birkinshaw, 2004). Therefore, several concepts are examined and recommended. For example, the recommendations of Stettner and Lavie (2014), who recommend balancing across modes, which is characterized by a combination of ambidexterity on the management level and sequential managing on the corporate level, rather than within modes. And Boumgarden et al. (2012), who pointed out that the simultaneous application of different modes increases the overall performance. In addition, this balance can be seen as a stable point, which leads to the discussion in literature towards a more dynamic view on the tension between

exploration and exploitation, if the process to reach this balance has greater influence on the overall performance than the balance itself (e.g. Gibson & Birkinshaw, 2004; Lavie & Rosenkopf, 2006; Tushman & O'Reilly, 1996). Moreover, Lavie and Rosenkopf (2006), therefore, pointed out that reaching for balance between exploration and exploitation follows more a slow shift and not, as the punctuated equilibrium theory reveal, a rigorous transition. This is also in line with the finding of Boumgarden et al. (2012) that identified a dynamic manner of companies to reach a balance by simultaneously applying different balancing modes. Those findings increase the focus of further research on the trade-offs of exploration and exploitation that influences the tension in a continuous and dynamic way (Lavie et al., 2010).

At that point and even more interestingly, research on what the antecedents to the tension between exploration and exploitation are, have shown to be not yet fully elaborated as researchers are coming up with ever new antecedents. For example, Døjbak Håkonsson, Eskildsen, Argote, Mønster, Burton & Obel (2016), recently added emotions and previous performance of teams as antecedents. Moreover, some identified antecedents also lack empirical research e.g. environmental antecedents (Lavie et al., 2010). Therefore, and following the classification of Lavie et al. (2010), three main categories of antecedents exist, environmental, organizational, and managerial. Looking at that point on the objective of our study, especially environmental antecedents move into the focus of the present work and become an interesting field of further examination. Therefore, sustainability, which is a main component of a changing environment in the context of our case company, is an example for environmental antecedents. Specifically, it can be seen as *environmental dynamism*, which is according to Lavie et al. (2010), a subcategory of environmental antecedents and is defined “by the extent of unpredictable change in an organization’s environment rooted in changes in customer preferences, technologies, or market demand” (Lavie et al., 2010:118f).

Sustainability can be seen as a particularly interesting and special case, as it is a very sensitive topic that affects people’s life, but still has not reached the status of a new business imperative on the organizational level. To illustrate that, Kiron et al. (2012), for example, emphasize that sustainability is getting ever more important in many organizations, also for the reason that it can be used to improve a company’s image (greenwashing) (Delmas & Burbano, 2011). However, even though sustainability is indeed reaching a tipping point, in terms of the necessity for the survival of a company, it does not yet create a sense of urgency based on the still prevailing price-sensitive market. In consequence, it is not comparable to other forms of environmental dynamism, as for example, the trend towards the use of smartphones, which represents a dramatic transition.

However, if those sustainability efforts do not add to profits over time, “a sustainability agenda will likely fail to hold its traction in the enterprise” (Kiron et al., 2012:72). Furthermore, so far, it is unknown if sustainability as an environmental antecedent indeed influences the tension of exploration and exploitation, and more specifically, if it influences that tension in a special way, for example, by the means of organizational or managerial changes, and thus, leads to a distinct trade-off.

Moreover, Lavie et al. (2010) pointed out that environmental dynamism was only examined by simulation techniques, and thus, begs for real organizations as objects of study, and that additional research is needed in systematically studying antecedents to exploration and exploitation. Additionally, academic research has so far only studied the relationship between exploration and exploitation and the antecedents, but no research has been done on how the antecedents are influenced by each other, and thus, influence the tension in total. Therefore, there is a need for research with a holistic and integrated perspective.

In order to fill this research gap, we decided to dedicate this Master's thesis to furthering research on antecedents of exploration and exploitation. In particular, this thesis focuses on what Lavie et al. (2010) call environmental dynamism. This term includes sustainability, which we will examine in our case company, as an antecedent that influences the tension between exploration and exploitation in a specific way.

### 1.3 Case Company

The problem discussion within the field of exploration and exploitation and the demonstrated research gap was identified and examined within a case company, which leads to a research design of a revelatory single-case study. To be able to relate the research to a context, the object of the case study will be illustrated now by providing a short introduction of the case company.

The roots of the case company go back to the 1950's when an acquisition by the subsequent founder defined the paths of the future. In the 1960's, the case company as it is known today was founded and entered the composite core material market with a product that still accounts for approximately 80% of the revenue nowadays. The following years were characterized by different mergers, ownership changes and expansion of the product portfolio within the composite core material market, as well as by internationalization through new plants and sales subsidiaries.

Nowadays, the company is fully owned by a Swedish private equity company, has manufacturing sites globally and employs more than 1000 people. The main application fields of the core material are in wind energy, marine, aerospace and transportation and are supplemented by smaller niche markets as, for example, sports equipment.

As a consequence, the products are quite similar, in the way how they are used as a composite core material, which leads to relatively incremental improvements/innovations over time along the product-market interface with a majority of technological changes towards the properties.

One product that differentiates itself from the main products is *Ecoboard* (name was changed for reasons of anonymity). *Ecoboard* is a recycled product, made out of the production waste that occurs during the manufacturing process of the main product. In this thesis, *Ecoboard* is seen as a manifestation of sustainability projects and the strategic shift towards sustainability.

Nevertheless, a more exploitative attitude of the organization can be found in the case company, following Levinthal and March (1993) that quoted exploitation as an activity that relies on the current

knowledge base of the organization and leverages the existing skills and capabilities by examining the existing trajectory. Moreover, the internal knowledge is in close relationship with the technological competencies of the firm, and thus, serves as the fundament for competitive advantage. This leads to the statement that the company has superior technological competencies and capabilities. Moreover, in 2016, the case company restructured their executive board by creating a position with responsibility and accountability towards sustainability and redefined, therefore, their vision and strategy by including sustainability. This shift follows the common trends towards more sustainable businesses. The position was created directly as an expansion to the executive board, and thus, represents a strong commitment of the organization towards sustainability and ultimately led to a structural change, which might have an influence on the tension between exploration and exploitation as well (Lavie et al., 2010). Moreover, the new position was staffed by an external person with previous experience in the field of sustainability but in a different industry, which leads to a cultural and creative expansion according to the framework of Borghini (2005), and thus, can affect also the tension between exploration and exploitation (Lavie et al., 2010).

However, sustainability-driven activities are reinforced by launching an executive department for sustainability, and are compared with the common initiatives (technical product innovations), discontinuous towards the firm's capabilities and routines. In that respect, it challenges the dominant logic of the company, that is defined as the prevailing mindset of how an organization interacts with their circumstances and recognizes, filters information (Kuratko, Morris & Covin, 2011).

This path transition is in line with how Levinthal and March (1993) describe exploration and affect the tension between exploration and exploitation within an organization. Moreover, first observations within the case company identified especially the dynamic shift in the environment towards sustainability as a major force for the changes within the company, and thus, serves as our focus area of examination. At that point, the case company, especially with the mentioned newly occurred product logic serves as a interesting object of study to examine the framework of exploration and exploitation and the related environmental antecedents.

## **1.4 Research Purpose**

The purpose of this thesis is to contribute to the literature around the framework of exploration and exploitation to increase the understanding and knowledge by using the special case of sustainability and the associated changes within the case company, to show how an environmental antecedent influences the tension between exploration and exploitation.

Our case company made a strong shift towards sustainability, which can affect the balance of exploration and exploitation. However, in-depth research is needed to gain insights into the mechanisms of environmental antecedents and their subsequent consequences. Therefore, we aim, based on our empirical research, to inductively develop a model or framework that will explain the relationship between sustainability as environmental dynamism and the tension of exploration and exploitation, as

well as the relationship between environmental antecedents, specifically environmental dynamism, and other antecedents by applying a holistic and integrative perspective. Therefore, we use the subject of sustainability as a special case for environmental dynamism.

#### **1.4.1 Research Question**

Exploration and exploitation and its connected search for finding a balance between them, represent a very wide field of research, without further focusing on a more specific field, this thesis would not create any value. Therefore, in an iterative process, we tried to understand what makes our case company special and discovered that their lately shift towards sustainability makes an interesting case for examining how environmental antecedents, specific environmental dynamism, influence the tension between exploration and exploitation and how this antecedent influences other antecedents, specifically organizational and managerial. Based on Chapters 1.2 and 1.3 we pose the following research question:

***RQ: How does sustainability as a special case of environmental dynamism influence managerial and organizational antecedents and thereby the tension of exploration and exploitation within a technology-driven company?***

## 1.5 Outline of the Thesis

**Chapter 1: Introduction.** This chapter aims to provide a rich understanding of the research topic, as well as the purpose of this study. This is done by starting with a general introduction to the topics of sustainability, exploration and exploitation and the influences of especially environmental antecedents on the tension of those constructs. This is followed by the problem discussion that point out the necessity and importance to examine in this field of research. In addition, the objective of study is further elaborated to enrich the context in which this study takes place. Finally, the purpose of this study is defined to come up with a research question.

**Chapter 2: Literature Review.** This chapter aims to present all necessary research directions, theories and frameworks that are related to the research purpose. Therefore, the definition and understanding of the exploration and exploitation framework are discussed, which leads to the introduction of the concepts and perspectives of balancing exploration and exploitation. Thereafter, three different antecedents affecting the tension between exploration and exploitation are investigated and enriched by focusing on sustainability as a special environmental antecedent. Finally, the relation between the presented concept is illustrated and described.

**Chapter 3: Method.** In this chapter, the chosen methodology is described and explained in order to be transparent in how the research was conducted. Therefore, the chapter starts with depicting the research design, and elaborates on epistemology and ontology (interpretivism and constructionism). Following that, the research strategy, research process and the generalization of our research are described in detail. In the subsequent subchapter, the specific data collection methods used, are described, and information on the interviewee selection, the sample, and the justification of our interview guide are provided. Finally, the data analysis method is explained, to clearly depict the procedure of how the collected data was used and analyzed to come up with a grounded-theory model. Finally, the chapter ends with a summary of the key research methods applied in this thesis.

**Chapter 4: Findings.** This chapter presents the findings by following an inductive approach to categorize the derived data into themes. Therefore, the main sources of data are the conducted semi-structured interviews within the case company, which are enriched by the observations that were captured by field notes. The clustered themes are presented by providing a short description and an illustration of the data structure.

**Chapter 5: Analysis and Discussion.** This chapter puts the findings of Chapter 4 in relation to the literature described in the literature review. The aim is to discuss the empirical data that we found, relate it to existing literature and ultimately answer the research question. Thus, firstly, the identified relations between the aggregate dimensions are analyzed and described, following that step, a model is build that illustrates those relations. Subsequently, in the discussion part, several conflicts that have been found, are discussed, which lead to the final section of this chapter, where a generalized framework is developed and discussed in relation with literature.

**Chapter 6: Conclusion and Implications.** This final chapter concludes the study and highlights once again the most important findings. Furthermore, the chapter includes managerial implications and gives recommendations for further research. More important, it also refers to the limitations that go along with this study.

## Chapter 2: Literature Review

### 2.1 Exploration and Exploitation – A knowledge based definition

The basic definition of exploration and exploitation was formulated by March (1991). In his seminal article, he defined *exploration* as an organizational behavior, that is characterized by search, experimentation, and variation. *Exploitation*, on the other hand, is defined as something that enhances productivity and efficiency by means of choice, execution and variance reduction (March, 1991). However, these very broad definitions prompted discussions about whether it should be narrowed down to more specific ones (Lavie et al., 2010). Indeed, Levinthal and March (1993) developed more focused definitions by basing it on knowledge and learning. These more specific definitions have shown to fit the purpose of our thesis best. Therefore, we decided to use the following ones as the base of our writing: “*Exploration* – is characterized by the pursuit of new knowledge, of things that might come to be known.” “*Exploitation* – is characterized by the use and development of things already known.” (Levinthal & March, 1993:105). Although Levinthal and March’s work seems the most reasonable one for our thesis, there is a continuing discussion and debate about fundamental assumptions that were taken in March’s (1991) and Levinthal and March’s (1993) articles (Gupta, Smith & Shalley, 2006; Raisch, Birkinshaw, Probst, & Tushman, 2009). One very fundamental question that was brought up is: “Can exploration and exploitation coexist in organizations?” (Raisch et al., 2009:686). In connection to this essential question, Gupta et al. (2006) bring up another important point that has severe implications for management behavior: “Should organizations specialize in either exploration or exploitation, or seek a balance between these tendencies?” (Gupta et al., 2006:699).

### 2.2 Reaching the Balance of Exploration and Exploitation

As stated in the problem discussion (Chapter 1.2), the common understanding in the literature is that a balance between exploration and exploitation should be reached to secure long-term survival and increase the overall performance of the company. Therefore, this chapter will elaborate on this discussion and will highlight the different direction of research, findings, and assumptions.

#### 2.2.1 The Tension between Exploration and Exploitation

Following the discussion about reaching long-term survival, authors argue, in the context of the framework exploration and exploitation, to aim for a balance between exploration and exploitation (e.g. Gupta et al., 2006; Gibson & Birkinshaw, 2004). Therefore, the question arises, why the reaching of this balance is so difficult for organizations. Looking back at the previously elaborated definition of March (1991) and the extended understanding according to Levinthal and March (1993), a contractionary nature of both activities can be identified – exploration and exploitation. Thus, the two very different processes cannot be combined in a single process model here, to balance and handle, on the one hand, a stabilizing characteristic and, on the other hand, a destabilizing character (Birkinshaw & Gibson, 2004).

The main challenge for the organization, in terms of comparison of the incremental, efficiently controlled management process, which is usually limited to short-term goals and the entrepreneurial management manner that has a long-term orientation, encourages failure and requires fast response to pursue the two activities in parallel. To cope with this challenge, usually, a dual process model is required with two concurrent processes (Raisch & Birkinshaw, 2008). The duality requires also a duality in strategy to avoid potential inertia between both activities (Raisch & Birkinshaw, 2008). Therefore, we assume, a duality in strategy can decrease the tension between them or can help to reach a balance by including a more explorative or exploitative component. Combine this knowledge with insights from real organizations, the reality rather mirrors a continuous trade-off between exploration and exploitation and the associated expected outcome, especially both activities are campaigning for resources (Lavie et al., 2010). Thereby, the trade-off is defined as the consideration of a firm to support exploration or exploitation (Lavie et al., 2010). This trade-off requires decisions regarding the resource allocation, to support activities within the prevailing mindset and trajectory, which leads to the use and development of existing knowledge, and thus, could create the risk of becoming too narrow-minded (Leonard-Barton, 1992), or to support activities that are more explorative, and thus, ask for the creation and development of new capabilities and skills, which may be required in the future to reach long-term survival (Holmqvist, 2004).

Thereby, following the definition according to Levinthal and March (1993) and the previous outline, the trade-off between exploration and exploitation also includes the direction of a firm of reaching stability or adaptability. Therefore, exploration, and thus, the use and gathering of new knowledge increase more the adaptability of a firm by including external perspectives and insights and fosters the organizational learning (Cohen & Levinthal, 1990; Daghfous, 2004). While on the other hand, exploitation is in close relation with stability and inertia based on the exploitation of things that are already known (Zhou and Wu, 2010; Lewin, Long & Carroll, 1999). Overall, the trade-offs represent a managerial component that is always affected by changes in the antecedent, and thus, represent the importance of this construct according to the framework of exploration and exploitation.

Those facts lead to the assumption that between exploration and exploitation a continuous tension exist. Therefore, this tension can be mainly described by the weight in resource allocation to support exploration rather than exploitation and vice versa. This procedure of allocating and reallocating resources, is based on the nature of the ever-changing environment, and thus, the related requirements towards a firm, a more dynamic process rather than a static one, and thus, requires flexibility. Moreover, the resource scarcity foster the campaigning for resources of both activities, which leads to the necessity to build-up strategic flexibility and adaptability, which is described as the ability of a firm to reallocate resources and reconfigure processes (Zhou & Wu, 2010). Following this, Zhou and Wu (2010) also identified that especially the strategic flexibility of a firm affects the relationship between technological capabilities and exploration in a positive way, which will be further elaborated in the Chapter 2.3.2.

In addition, more and more the attention shifts to a dynamic view on the balance of exploration and exploitation by arguing that the striving of an organization towards a balance demonstrate more a process of balance rather than a notion (Gibson & Birkinshaw, 2004; Lavie & Rosenkopf, 2006; Tushman & O'Reilly, 1996). This view goes back to the assumption that reaching an equilibrium will be inefficient by the dead of the system (Black & Edwards, 2000). Thereby, each point in time can be seen as a status of the tension between exploration and exploitation that represent the current ratio of exploration and exploitation within the company. Following this and with the overall goal to reach the balance of exploration and exploitation, organization derive therefore certain actions from the current status, e.g. engage more in exploration when the current status represents a more exploitative emphasis within the organization, to counteract an imbalance and consequently reach a balance over time (Lavie et al., 2010).

Looking therefore at the outcome of both activities, which are both necessary for long-term survival, a relation can be identified, which leads to a paradoxical association between exploration and exploitation, which is demonstrated in Figure 1. Lavie et al. (2010:116) describes that association as “exploration and exploitation are at odds”. This supports, moreover, the existence of trade-offs between exploration and exploitation.

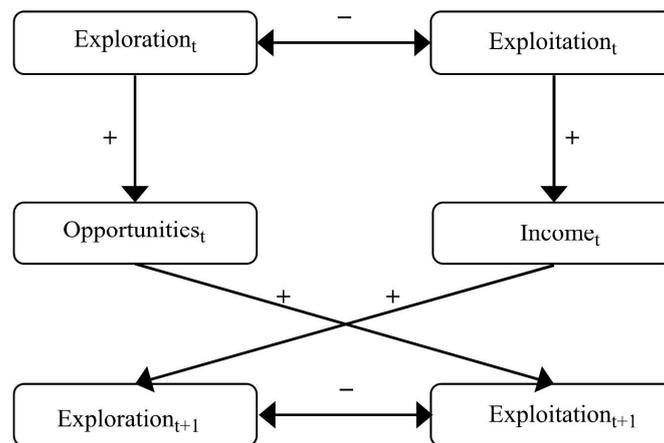


Figure 1: The Paradoxical Association between Exploration and Exploitation (Lavie et al., 2010:117).

### 2.2.2 Modes of balancing Exploration and Exploitation

In connection to the previous subchapter, the following paragraphs outline the modes in balancing and point out that the tension between exploration and exploitation is seen as the main influencer of those modes. Moreover, the outlined discussion about the definition of the terms exploration and exploitation is, as previously described, a key towards a holistic understanding of this framework. Nevertheless, certain discussions or directions are also held about how the recommended balance should be managed (e.g. Gupta et al., 2006; Gibson & Birkinshaw, 2004). In line with the previous discussion about the tension between exploration and exploitation and to address this issue, the literature discusses several methods to balance exploration and exploitation for reaching a dual process model. Since the framework

was introduced by March (1991), three main research directions, which are relevant to this thesis, occurred that all tried to provide a comprehensible method for balancing exploration and exploitation:

- (1) *contextual ambidexterity*: which describes the simultaneously managing of both activities by providing an organizational context that nurtures these activities (Gibson & Birkinshaw, 2004);
- (2) *structural ambidexterity*: which describes the simultaneous managing of both activities by separating both activities, and thus, building up two separate units (O'Reilly & Tushman, 2004);
- (3) *sequential managing/punctuated equilibrium*: managing both activities by alternating between the two activities in a sequential manner (Gersick, 1991).

Overall, two main streams within this discussion can be identified and can be seen as the bottom line for further elaboration: the sequential or simultaneous management of exploration and exploitation. Going back to March (1991) and the constitutive work of Levinthal and March (1993), a simultaneous operation of exploration and exploitation is not possible, since both activities are opponent and court for the same resources. In line with this argument and by following the overall logic behind both terms, it can be assumed that the mutuality itself requires a sequential procedure. As previously discussed, exploration creates the opportunity for a firm to exploit this opportunity, and thus, in turn, releases financial resources to explore new spaces. (Lavie et al., 2010)

However, this approach calls for a sequential organizational alignment over time, which is determined by the market activities and results in an emerging complex flow and change, and getting in terms of the on-going dynamic changes in the environment to an intensive expense for an organization.

On the other hand, organizational ambidexterity tries to provide a framework for the simultaneous operation of exploration and exploitation at the individual level, as contextual ambidexterity argues, or at the corporate level of an organization, as the structural ambidexterity describes (Lavie et al., 2010). Therefore, structural ambidexterity argues for the separation of both activities based on the fact that they are concurrent, and thus, are not compatible in one unit of a firm (O'Reilly & Tushman, 2004). At that point, Christensen (1998) shows that these two processes must be pursuing a structural separation, in order to reach efficiency and effectivity in both activities. Nevertheless, structural separation calls for capabilities within the top management to manage both simultaneously and introduce multiple tight linkages between both units by promoting a common view and strategy, to guarantee a collective development direction (O'Reilly & Tushman, 2004).

On the opposite, contextual ambidexterity requires the ability to explore and exploit on the group or individual level, and thus, shifts the complexity from the corporate level towards the individual decision ability by “simultaneously demonstrate alignment and adaptability across the entire business unit” (Gibson & Birkinshaw, 2004:209). This contextual ambidexterity also calls for the fact that the human being has from the ground up the ability to pursue both activities simultaneously, especially manager

(Gibson & Birkinshaw, 2004; He & Wong, 2004; Mom et al., 2007). At that point, looking back at the environmental dynamism and the fact that businesses, and thus, their employees, are in continuous exchange with their circumstances, this requires and challenges the ability to be ambidextrous on the individual level (Smith & Tushman, 2005; Brehmer, 1992; Smith, Binns & Tushman, 2010).

At that point, Gupta et al. (2006) examined both basic modes to reach a balance between exploration and exploitation and applied therefore a systematic view, which leads to the assumption that ambidexterity can be identified by examining the comprehensive domain level of an organization, while punctuated equilibrium can be identified by examining the individual or sublevel of an organization. By following this assumption, it can be assumed that both mechanism – ambidexterity and sequential management – can occur within an organization at the same time. Moreover, comparing the theoretical concepts with the prevailing doing within the case company, it creates the awareness to follow not only one theoretical concept but rather to expect a multiple combination of all three concepts. Therefore, a mixed approach can be an efficient way for reaching the balance of exploration and exploitation. This assumption is also in line with newest findings according to Boumgarden et al. (2012), which examined two case companies retrospective and identified a vacillation of explorative and exploitative structure of the whole organization, which increased the long-term performance, while simultaneously ambidexterity was identified on the group/individual level increasing the short-term performance. Combining both modes together increased the overall performance of the case companies. This finding is also supported by Stettner and Lavie (2014) and serves as origin for our further investigations. This assumption also follows the modern contingency theory which describes a dynamic and continuously adjustment rather than applying a static view (Zajac, Kraatz & Bresser, 2000). The continuous alignment goes back to the reconfiguration and reallocation of resources to support exploration rather than exploitation, and vice versa, to adapt towards the changes internal as well as in the organizational environment (Siggelkow, 2002). Therefore, this represents more or less the tension between exploration and exploitation, which is triggered by the internal and external antecedents.

In addition, a clear separation and classification between the modes of balancing should be essential to the analysis and the examination to reach validity. Figure 2 illustrates the different modes of balancing and the distinction between the previously mentioned two main streams – simultaneous and sequential.

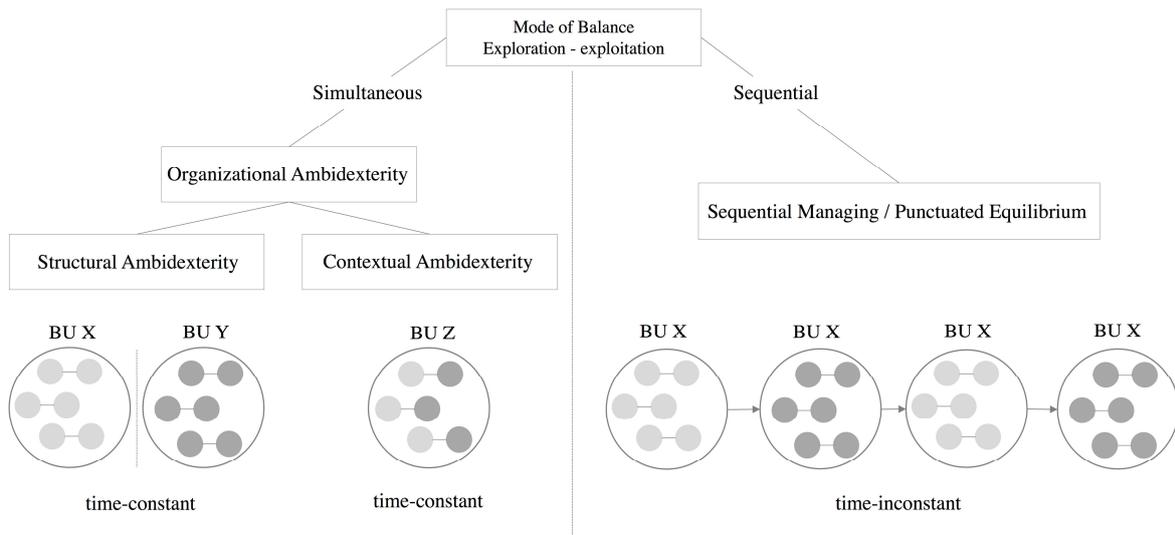


Figure 2: Modes of Balance – Exploration-Exploitation (own figure referring to Schudy (2010:5,7)).

### 2.2.3 Exploration and Exploitation on different levels of an organization

Looking at the different modes of balancing exploration and exploitation, it becomes clear that this concept is applicable in different contexts and can be analyzed on different levels within and outside a company. Figure 3 demonstrates an overview of the different levels of analysis. This figure is based on the literature review of Lavie et al. (2010:112) and only demonstrates the need for differentiation. Therefore, in line with the modes of balancing, a clear separation and classification of the analyzed levels is essential. Limited due to our research design (single-case study), the examination will be focused on the organizational, the group and the individual level of analysis.

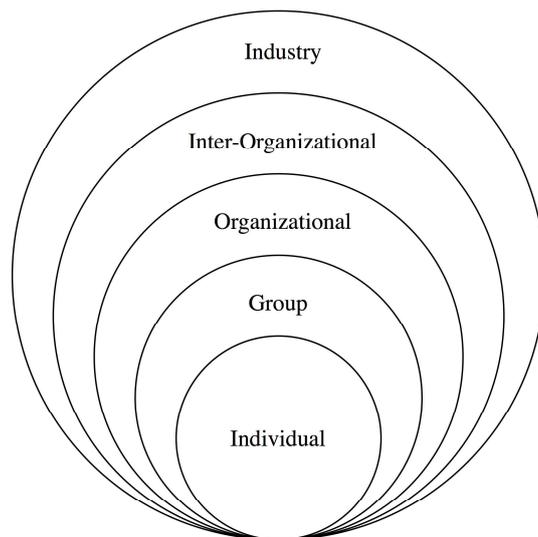


Figure 3: Levels of Analysis: Exploration and Exploitation (own figure referring to Lavie et al. (2010:122)).

## 2.3 Environmental, Organizational and Managerial Antecedents as main influence factors of the tension between Exploration and Exploitation

The previously described tension between exploration and exploitation and the related trade-off of a company are mainly driven by factors that are within an organizational context, externally as well as internally located. Therefore, in the literature three main antecedents are discussed and distinguished, i.e. environmental, organizational, and managerial antecedents. Moreover, as it can be derived from general academic perceptions around the interrelation between different constructs within organizations, this clear distinction of antecedents will be questioned and discussed in Chapter 2.3.4. However, first, the three kinds of antecedents are further elaborated in the following chapters.

### 2.3.1 Environmental antecedents

Following the basic theories in economics, it can be said that businesses are a part of the market equilibrium (e.g. Adam Smith and his work '*Wealth of Nations*'), and thus, are in a perpetual exchange with their environment. In addition, researchers pointed out significant differences in how firms engage in exploration and exploitation across industries (Lavie et al., 2010). Based on this, the environmental context of an organization can be seen as a major influence factor on the doing of a firm. Auh and Menguc (2005) argue, therefore, that an adjustment of exploration and exploitation should take place in the case of changes of the environmental conditions of a firm. Therefore, Lavie et al. (2010) identified antecedents in the literature, which could be bundled under the term of environmental antecedents, which influence the tension between exploration and exploitation and are located and caused outside the company. This category consists of four subcategories: environmental dynamism, exogenous shock, competitive intensity and appropriability regime. Therefore, Table 1 gives a short overview of the four subcategories, as well as a short description of those, which will be further elaborated afterward.

Table 1: Environmental antecedents.

<b>environmental antecedents</b>	environmental dynamism	Unpredictable changes of customer preferences, technologies or changes within the market equilibrium that are within the control horizon of organizations.	Dess & Beard, 1984; Lavie et al., 2010
	exogenous shock	Unpredictable changes in the organization environment that are unexpected and can't be influenced by any organization.	Meyer, 1982
	competitive intensity	"Competitive intensity refers to the extent to which organizations are likely to maintain zero-sum relations with one another as they compete for the same pool of limited resources."	Lavie et al., 2010:120; Barnett, 1997
	appropriability regime	"The extent to which the environment enables organizations to appropriate value from their innovations defines the appropriability regime"	Lavie et al., 2010:120

Looking at the differentiation of environmental antecedents, presented in Table 1, first, we will discuss the subcategories that are not directly related to the purpose of this study and reveal how they influence the tension between exploration and exploitation. Starting with the subcategory *exogenous shocks*, which is connected to the unpredictable changes in the environment of organizations that are unexpected and cannot be influenced by any organization as such (Meyer, 1982). It affects the tension in a way, as those *exogenous shocks* represent transformations that are often revolutionary. This revolutionary attitude can lead to an obsolescence of existing skills or/and technologies (Romanelli & Tushman, 1994; Tushman & Anderson, 1986), and thus, entails a reaction of an organization affecting the tension between exploration and exploitation (Lavie et al., 2010).

*Competitive intensity*, thereby, refers to the markets as such, representing limited areas, and thus, lead a fortiori to competition between organizations (Barnett, 1997). Therefore, and as Porter (1980) argues, this leads to the maturity of a market with less organizational slack, which is reached by an exploitative tendency of organizations, and thus, vice versa calls for explorative activities to secure a competitive advantage (Levinthal & March, 1993).

Besides this, the *appropriability regime* influences the tension between exploration and exploitation in that way, as it represents a static condition set by regulations or in the case of weak *appropriability regimes* by missing regulation for the protection of intellectual property rights (Teece, 1986). Looking therefore at the influences on the tension between exploration and exploitation, organizations as such having less motivation to be active in exploration in the case of weak *appropriability regimes* that represent insufficient conditions to benefit from explorative activities. In other words, the Schumpeterian rent (Sautet, 2016) as a motivation does not fully come to fruition.

Following our research purpose, we are focusing on *environmental dynamism*, which describes and consists of unpredictable changes of customer preferences, technologies or changes within the market equilibrium, located within the control horizon of organizations (Dess & Beard, 1984; Lavie et al., 2010). Therefore, as in Chapter 1.1 and afterward in 2.4 elaborated, sustainability triggers a change in the behavior and preferences of the whole society, and thus, is defined, in the context of this work, as an example of environmental dynamism. In general, Levinthal and March (1993) and Lewin et al. (1999) already pointed out a modest interplay between exploration and exploitation and environmental dynamism. Following, thereby, the perceptions of Jansen, van den Bosch and Volberda (2006), a clear relation between the kind of innovation, explorative or exploitative nature, and the environment was empirically determined. In dynamic environments, explorative innovations are more effective than exploitative ones, and vice versa, in more competitive markets, exploitative innovations are more effective in the case of financial performance, which is the main focus of companies with high competitive intensity, according to the downward spiral (Jansen et al., 2006). However, the authors examined the effectiveness of the different kinds of innovation in the context of different environments and therefore, open up the question how those two components are caused. In addition, Lewin et al. (1999) arguing for a theoretical framework, which suggests that the adoption in strategy and in the

organization (exploration and exploitation) coevolve with environmental changes in the population of firms. Moreover, to manage and to cope with the uncertainty caused by the dynamic environment, organizations must support explorative activities by resource allocation (Lichtenthaler, 2009) to benefit from the emerge of new opportunities (Li, Lin & Chu, 2008).

By reviewing literature, specifically focusing on this kind of antecedent, a need for further examination of environmental dynamism as an antecedent can be identified, based on the lack of research on real organizations (e.g. Davis, Eisenhardt & Bingham, 2009; Kim & Rhee, 2009; Lant and Mezias, 1992). Moreover, looking deeper into the research methodology of the literature around environmental dynamism, a common approach can be identified. Most use a survey that includes items based on Dill (1958) and Volberda and van Bruggen (1997), and therefore, did not examine one specific environmental dynamism but rather the management perception about the changes in the environment and the frequency of changes in general. Therefore, a lack of research can be identified that focus just on a specific environmental dynamism.

### **2.3.2 Organizational antecedents**

Following Penrose's (1959) theory of the resource-based view, it can be assumed that organizations in the same industry differ exclusively by their bundles of resources. This led to the belief that the tension between exploration and exploitation is mainly driven by the organization itself.

Going along with the resource-based view, the amount of technological capabilities that an organization possesses does influence the tension between exploration and exploitation as well. Tinoco (2014) examined that relationship and concluded that there is a positive correlation between a company's technological capabilities and exploration. In addition, Zhou and Wu (2010) also supports this result but expand this view by introducing an u-shaped relationship between exploration and technological capabilities. Thereby, absorptive capacity theory argues that technological capabilities foster exploration by the search for new opportunities, which is in line with Tinoco (2014). In contrast, following the theory of organizational inertia, Zhou and Wu (2010) identified a negative relation based on organizational blindness and the associated searching in the same field. Zhou and Wu (2010) also pointed out that the strategic flexibility of a firm (reallocation of resources and reconfiguration of processes), which is necessary according to trends in the environment, has a positive impact on the previously mentioned relationship between exploration and technological capabilities. This strategic flexibility is described to have an indirect effect on explorative activities, just by combining strategic flexibility with other organizational capabilities (Zhou & Wu, 2010).

Following the classification of Lavie et al. (2010), six sub-antecedents are bundled under the term of organizational antecedents, i.e. absorptive capacity, slack resources, organizational structure, organizational culture and identity, organizational age and organizational size.

Looking at the situation in our case company, the change in organizational structure makes the antecedent *organizational structure* very interesting to our research. The structure of an organization mirrors in large parts the resource allocation, locus of control within a company and responsibilities

towards different activities that foster exploration or/and exploitation (Jansen et al., 2006). Furthermore, Zakrzewska-Bielawska (2016) pointed out that the organizational strategy and structure is in a close relationship with both activities – exploration and exploitation. Therefore, the direction of impact between strategy and structure is rooted in the prevailing doing of an organization (Zakrzewska-Bielawska, 2016). Here, a lack of qualitative research can be identified as well as the question arise how the interdependencies between strategy and structure influence the tension between exploration and exploitation. On the same line with resource allocation, the antecedent of *slack resources* needs to be mentioned. Slack resources are defined as excess resources available to an organization (Nohria & Gulati, 1996). However, there is no consensus among researchers whether slack resources have a positive or negative relationship on exploration and, in turn, exploitation (Lavie et al., 2010).

A further subcategory of organizational antecedents is *absorptive capacity*, which is defined by the organization's ability to recognize, assimilate, and apply external knowledge internally (Cohen & Levinthal, 1990). Therefore, the literature argues that the absorptive capacity increases the interaction of organizations with their environment (Cohen & Levinthal, 1990), and therefore, pushes the firm towards a proactive behavior that results in more explorative approach (Lavie & Rosenkopf, 2006). Looking at the previously discussed results of Zhou and Wu (2010) and Tinoco (2014) and the concept of technological capabilities, which are represented by embedded routines of a firm, absorptive capacity can be seen as the subcategory for the phenomena around technological capability. Nevertheless, as Zhou and Wu (2010) pointed out, technological capability can also hinder explorative activities, which is argued by the organizational inertia and can be underpinned by understanding that organizations comprehend new knowledge based on their knowledge base, and thus, limits the effectiveness of absorptive capacity (Cohen & Levinthal, 1990)

Moreover, looking at the *organizational culture and identity* as antecedents of exploration and exploitation, it becomes clear that the expansion of the executive board can be seen as an increase in the variety if the expansion is made with an external filling of the job. Therefore, this assumption follows the framework of Borghini (2005), who argues for, that the organizational creativity increases by integrating new perspectives and values, and thus, rely on the organizational culture and learning theory. Thereby, each new external perception triggers a shift of the cultural components as attitudes, values, and beliefs, and thus, change the shared mindset and create new mental models (Morrison, 2000; Borghini 2005). In addition, an explorative culture is represented by the increase of flexibility in structure and resource allocation (Matthyssens, Pauwels, and Vandenbempt, 2005), and thus, is connected to the ability of strategic flexibility, that is discussed by Zhou and Wu (2010) and has an influence on the relation of exploration and technological capability.

Further organizational antecedents are organizational age and organizational size, which do not require further explanation.

### **2.3.3 Managerial antecedents**

Nevertheless, also the managerial behavior is a major force in the context of exploration and exploitation (Miles & Snow, 1978). This antecedent represents the behavior towards resource allocation that is mainly driven by the traits and learning abilities of managers e.g. risk-aversion foster exploitation (Lewin, Long, & Carroll, 1999). This was also confirmed by Mishina, Pollock and Porac (2004), who identified a reduction in exploration by the increase of risk aversion.

More specifically, Lavie et al. (2010) define managerial antecedents as “cognitive and behavioral inclinations of an organization’s senior-management team, that may influence the organization’s tendency to explore vs. exploit” (Lavie et al., 2010:124).

Thereby, some scholars examined the top management behavior and the associated leadership in the case of fostering exploration or rather exploitation (Jansen, Vera & Crossan, 2009). In addition, Vera and Crossan (2004) pointed out that the characteristics of the management, especially leadership skills, can influence the tension between exploration and exploitation. For example, this tension can be influenced by the entrepreneurial behaviour of a firm, and thus, lead to assumption that, vice versa, the change in top management team towards a transformational leadership, which influences the entrepreneurial behaviour of a firm in a positive way (Ling, Simsek, Lubatkin & Veiga, 2008), has a greater influence on the tension between exploration and exploitation.

Others argue that the top management team behavior and complexity foster the way how organizations act ambidextrous (e.g. Carmeli & Halevi, 2009). In line with this, Torres et al. (2015) point out that there is an influence of the top down knowledge inflow on the ambidexterity of individual middle managers. In contradiction, Mom et al. (2007), pointed out that, especially the top-down knowledge inflow has only influence on the exploitation activities of middle managers, while bottom-up and horizontal knowledge foster explorative activities. This relation was only one-dimensionally attested – direct influence on exploration or exploitation. Overall, the literature represents a consensus that the support of the top management is key according to empower and drive projects forwards, as well as to overcome internal resistance (Rothwell, 1992; Van Der Panne, Van Beers, Kleinknecht, 2003). Combined with the previously described results of Torres et al. (2015), further research should focus, therefore, on how this antecedent influences the tension between exploration and exploitation.

### **2.3.4 Isolated perspective on antecedents of previous research**

O’Reilly and Tushman (2011), well-known authors in this field, tried to recommend methods for senior managers to reach ambidexterity grounded in qualitative case studies. This generalization is in our point of view, a wrong signal by trying to simplify the complex and dynamic system around the framework exploration and exploitation. The set of antecedents, which were previously described and their interdependencies are essential, and thus, create a specific context for each case (Lavie et al., 2010). Moreover, the research about the examination of the influence of antecedents on the tension of exploration and exploitation and the related trade-off has only focused on the direct influence by applying an isolated perspective without considering interdependencies between different antecedents

(Lavie et al., 2010; Marín-Idárraga, Hurtado González & Cabello Medina, 2016). At that point, the relationship between different, in our case called, antecedents were examined in a general context e.g. strategy and structure (Chandler, 1962), environment and behavior (Dill, 1958). Therefore, the research lacks in examining these relationships between different antecedents in the context of exploration and exploitation.

## **2.4 Sustainability as a specific environmental antecedent**

Sustainability, in the context of this thesis, takes on the common viewpoint of the three pillars, i.e. Economy, Society, Environment (Cato, 2009). On the same line, Elkington (1994) introduced the concept of the triple-bottom-line with its three imperatives or 3Ps (Profit, People, Planet). The triple-bottom-line concept requires companies to create three different and separate bottom lines. Besides the common measure of corporate profit, measures of how socially responsible and how environmentally responsible a company is, are introduced. This understanding of sustainability (triple-bottom-line) builds the foundation for this thesis and is in line with the understanding of the case company.

In the corporate context, tasks and actions connected to sustainability are often summarized under a firm's "Corporate Social Responsibility". The United Nations define it as a "management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders" (UNIDO, 2017: s.p.). This definition is tightly connected to our understanding outlined above, and therefore on the same line.

Specific literature in the field of sustainability/CSR in the context of antecedents to exploration and exploitation is rather scarce. Luo and Du (2014) claim to have published the first scientific article in this specific research field. The article concludes that there is a positive relationship between Corporate Social Responsibility (CSR) and firm innovation, and thus, identified CSR as an antecedent to innovation. Furthermore, the authors provide evidence for managers that backs up the argument that expenditures on CSR should be perceived as capital investments rather than costs (Luo & Du, 2014). Therefore, the article of Luo and Du (2014) broadens our current understanding of business returns to CSR. Of course, there are much more articles around the topic of CSR or sustainability, however, none besides Luo and Du (2014) seem to specialize on the relationship between sustainability and firm innovation. However, there are also interesting statements that can be taken out of some more general articles around sustainability. For example, there is research suggesting that "sustainability is nearing a tipping point" (Kiron et al., 2012:69), which would mean that it reaches high attention of implementing it into the firm strategy in many companies. Furthermore, a survey, that was conducted by the MIT Sloan Management Review in collaboration with the Boston Consulting Group, shows a quite interesting result. In this survey, conducted in 2011, almost 70% of the respondents agreed that a sustainability strategy is an approach to reach competitiveness and classified it as necessary (Kiron et al., 2012).

Moreover, the topic sustainability has also some extensive influence on the entire organization. In line with the previously mentioned survey and the ubiquitous importance of sustainability in society, the

awareness of shareholders and stakeholders, in general, increased as well, which can be seen as a major force for organizations to engage in sustainability (Seuring & Müller, 2008). To be more specific, stakeholders require new attributes of products and evaluate products not just on conventional criteria, but rather expand those by including the impact on environment and society (Pujari et al., 2003; Maxwell & Vander Vorst, 2003). This calls for new products and the exploration of new fields and opportunities. But not only the products or services are affected by the topic of sustainability, also processes are pushed towards a more effective and efficient way of producing, to reduce the impact on the environment, and at the same time, impact the cost-side as well, by making processes leaner (lean management) (Kleindorfer, Singhal & Van Wassenhove, 2005). Overall, those changes within the company are related to organizational learning, and therefore, are also affected by the topic of sustainability (Siebenhüner & Anold, 2007). Following at that point the definition of Levinthal and March (1993), that learning is a part of the exploration and exploitation construct, which is similarly, in close relationship with absorptive capacity (Cohen & Levinthal, 1990), sustainability has become an interesting objective of study.

Moreover, following this movement towards sustainability, Maletič et al. (2014) tried to frame the concept of exploration and exploitation into the context of corporate sustainability. By reviewing the literature in the research field of exploration and exploitation and in the research field of corporate sustainability, they developed a framework that can help to understand the relationship between sustainability and performance in a better way. Thereby, the authors anchored the two constructs of exploration and exploitation in the sustainable context – sustainability exploration and sustainability exploitation. Moreover, the authors also argue, which is in line with our Chapter 2.2, that the main enablers for sustainability activities are the “top management support, integration of sustainability into vision and strategy, and establishing a sustainability-centred culture” (Maletič et al., 2014:189). However, this framework also serves as a starting point for further research, based on the pure theoretical development without any empirical testing. Furthermore, a holistic perspective and examination is not recommended as the authors, as previously mentioned in the discussion of articles, took an isolated perspective on the antecedents and the framework of exploration and exploitation. Moreover, as described in Chapter 2.3.1, environmental antecedents were mostly examined by using simulations and, especially environmental dynamism lacks in differentiation between general perception and specific cases that call for further research.

In addition, sustainability is a very sensitive topic within the society and in the context of an organization. The term “sustainability” and the related concepts are increasingly used for misleading customers about the company’s environmental performance. Environmentalists call that phenomena “greenwashing” (Delmas & Burbano, 2011). Companies engaging in greenwashing, market their products or services as “green products”, although this label is not conforming with reality and simply deceives customers. Delmas and Burbano (2011) define the term greenwashing as “the intersection of two firm behaviors: poor environmental performance and positive communication about environmental

performance.” (Delmas & Burbano, 2011:65). As a result of these deceiving activities of marketing departments, consumer confidence in green products dropped significantly, which has a considerable influence on companies who engage in truthfully environmental activities. This leads to the fact that not all companies apply the sustainability in a holistic way.

Moreover, by considering literature that aim to understand success factors for sustainability in the context of society (e.g. Pappas, Pappas, & Sweeney, 2015; Senge, Smith, Kruschwitz, Laur, & Schley, 2010), the assumption of a direct influence of sustainability on the tension between exploration and exploitation can be further supported. Thereby, the literature argues for an interrelation between individuals and the success of sustainability. Therefore, individuals and the related community network are critical for a society shift towards sustainability (Pappas et al. 2015). On the same line, the change in the behavior of an individual is triggered by the circumstances and community itself and vice versa (Senge et al., 2010), and therefore, can represent a direct linkage between an environmental dynamism and the individual behavior. As a result, it should be questioned if sustainability directly influences the tension of exploration and exploitation, at least on the individual level, how this tension is affected, and/or if sustainability influences that tension in an indirect way, by the means of other changes within the organization that affects the trade-off between exploration and exploitation.

## 2.5 Relation of the Theoretical Concepts

To provide a better understanding of the relation between the introduced theoretical concepts, Figure 4 illustrates the framework, in which the present research takes place.

First, in the center of Figure 4, the tension between exploration and exploitation is highlighted. This tension is, therefore, represented by the trade-offs towards supporting exploration or exploitation. However, as sustainability is seen as a special case of environmental dynamism, a direct influence based on changes in the individual behavior can be assumed and should be considered. Thereby, this tension is influenced by three antecedents, i.e. organizational and managerial antecedents within the company, and environmental antecedents outside the company. At that point, environmental dynamism is a subcategory of environmental antecedents and is represented in our case by the shift in the environment of a firm towards sustainability. Managerial antecedents are, therefore, classified by the *leadership style*, *risk-aversion* (behavior) and *knowledge inflow*, and organizational antecedents, by *structural changes*, *culture and identity*, that covers partial strategic flexibility, *slack resources*, and *openness/absorptive capacity*, that includes and is influenced by the technological capabilities of the firm.

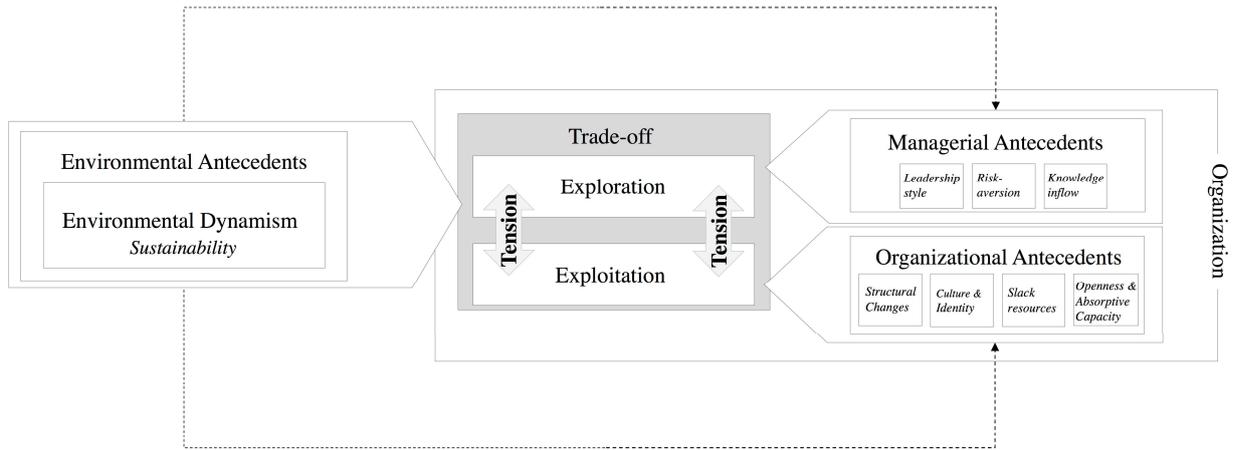


Figure 4: The framework of exploration and exploitation in relation with antecedents.

## Chapter 3: Method

### 3.1 Research Design and Process

#### 3.1.1 Epistemology and Ontology

We, as researchers in social sciences, examine organizations and companies that are created by people, and thus, are social constructs. As these social constructs, which we study and observe, are influenced by social actors (by people), that means research in social sciences can never be objective, in contrast to natural science (Bryman & Bell, 2011). We relate to this philosophy as *interpretivism*. In our thesis, this means that we need to keep in mind, that even though there was a strategy shift towards sustainability on the organizational level, it always comes down to the actions taken by individuals, which are in turn dependent on their personal beliefs. As a result, researching social constructs might demand some adaptation of the research methods (Bryman & Bell, 2011). One example for this statement can be found in the broad range of data collection methods used in qualitative research, which is necessary to adapt to the specific social environment. Therefore, we make use of different methods, as it can be seen in Chapter 3.2 - Data Collection.

In line with our epistemological stance of interpretivism, our research relates to *constructionism* as a research ontology. Constructionism suggests that social phenomena are not only constructed by people but undergo a steady process of change, as well. The categories that people create, help them to understand the complex natural and social world (Bryman & Bell, 2011). In our thesis, such a category can be, for example, '*sustainability*'. Constructionism argues that the meaning of this category is socially constructed through interactions, and therefore, varies according to the specific time and place (Bryman & Bell, 2011).

#### 3.1.2 Research Strategy, Approach and Design

This thesis follows a *qualitative research strategy*, in other words, this means that our work is "concerned with words rather than numbers" (Bryman & Bell, 2011:386). As it is in our case, qualitative research is most of the times characterized by taking interpretivism as epistemological position, constructionism as ontological position and an inductive view as research approach (Bryman & Bell, 2011).

As a result of the inductive view, we aim to generate new models and frameworks to get a better understanding of how environmental antecedents influence the tension between exploration and exploitation. In a more general sense, an inductive research approach aims to generate new theory, in contrast to the deductive approach, which is testing existing theory (Bryman & Bell, 2011). However, in our thesis, we do not apply a pure form of an inductive approach, as we included some deductive elements in form of theory and initial observations to find our research topic (see Chapter 3.1.3 for descriptions of deductive elements used).

As for the overall research design of our thesis, we use a *single-case study design* (Bryman & Bell, 2011). To be more specific, this thesis focuses on a case study in a single company with the inclusion of a sub-case study in the form of the *Ecoboard* as a manifestation of sustainability projects and the strategic shift towards sustainability. The fact that it is a single-case study means that it entails a very detailed analysis of a single case, which allows studying phenomena in depth and within real-world context (Bryman & Bell, 2011). In that respect, our case study needs to be seen as a revelatory case. A revelatory case is characterized by the existence of “an opportunity to observe and analyse a phenomenon previously inaccessible to scientific investigation” (Yin, 2009:48).

### 3.1.3 Research Process

Bryman and Bell (2011) draw up the typical inductive research process as one, where data collection is done before any theory is developed or tested. However, in our case, we cannot claim that we followed this inductive process entirely. The reason for that can be found in the fact, that after initial data collection through informal interviews, field notes, company documents and observations, a first extensive literature review helped us to find interesting research topics that matched with observed patterns and concepts at the company (see Chapter 2). After further observations and further readings in specific literature, research gaps were identified, which in turn, gave direction for formulating an adequate research question (see Chapter 1). However, this was not a gradual process, but rather an iterative one, going back and forth between observations/interviews and literature. As a result, the research question was changed a couple of times.

Following these initial activities, the data collection process started off by setting criteria for the selection of interviewees. Once interviewees for the semi-structured interviews were selected, an interview guide was created to enable an effective data collection process. The collected data was subsequently analyzed following the multi-step approach by Gioia et al. (2013). This resulted in a data structure which was then used to build theory, following the grounded theory approach (Gioia et al., 2013).

### 3.1.4 Generalization

Our case company, although unique in some ways, can be seen as a common B2B company in a highly competitive market environment. Furthermore, the strategic shift towards sustainability is a move that can be found in many other businesses nowadays, as it became a main trend as we discussed already in Chapter 2.4 (Kiron et al., 2012). For those reasons, we think that our case study can be a “great teaching case [...] predicated on finding the specific case [that exemplifies a general principle that can be taught as a transferable generality” (Gioia et al., 2013:24).

Although some researchers might argue against the generalizability of our research, Yin (2009) confirms that generalizations from case studies are valid, as long as they concern theoretical propositions and not populations (Yin, 2013). Therefore, the outcome of our inductive research, in the form of theories,

models, or frameworks, can be transformed to other companies or contexts. This form of generalization is called *analytic generalization*, according to Yin (2009).

## 3.2 Data Collection

In general, as we chose a single-case study design, we conducted an in-depth analysis which focuses on collecting internal data, in order to answer our research question. The data collection methods, used in this thesis, changed considerably with the progress of our work.

Initially, data was collected through informal interviews, observations, telephone conferences/ meetings, field notes, company documents, presentations. The information gained from these sources were primarily used to define the focus and scope of our thesis. However, some of these methods were applied throughout the later stages, as well. Especially, informal talks and observations proved to be very valuable. In a later stage, semi-structured interviews were the main source of data for our research. These semi-structured interviews provided us with the foundation for building theory, as it is described in the concept of grounded theory (Bryman & Bell, 2011).

This approach of using different data collection methods and sources should enhance the validity of our research. Bryman and Bell (2011) refer to this concept as *triangulation*.

### 3.2.1 Interviewee Selection

The selection of interviewees required careful consideration on what criteria each interviewee should be selected on. These criteria should be formulated to facilitate the process of finding the ‘right’ interviewees to answer our research question. Therefore, as this represents a strategic, non-probability form of sampling, we apply the concept of purposive sampling in our thesis (Bryman & Bell, 2011).

In order to be selected as an interviewee, criterion 1 must be fulfilled, and in addition, either criterion 2 and/or 3. These criteria are defined in the following:

**Criterion 1:** Employees of the case company located in Sweden or Italy

Our thesis has its explicit focus on the organizational, group and individual level within our case company. Therefore, this criterion excludes, for example, employees from the owner company, as those persons are outside of the organization’s boundaries. The reason for limiting our scope of potential interviewees to employees in Sweden and Italy is that we have better access to employees located in these two countries and, in addition, had already first informal talks with them. More importantly, the main strategic decisions and sustainability actions are taken at these two locations.

**Criterion 2:** Involved in strategic decisions in relation to sustainability

In this way, we include everyone who has or had a say in strategic decisions towards sustainability, which is our objective of study (environmental dynamism).

**Criterion 3:** Directly working with or part of the *Ecoboard* history

According to the Executive Vice President of Sustainability, the product *Ecoboard* and its recent rising importance inside the company, can be seen as a main activity towards sustainability within the case company. Moreover, this thesis is elaborated within the context of *Ecoboard*, which is the focus of our business development project, that we worked on in parallel to this thesis.

Table 2 represents an overview of the selected interviewees, their position in the case company, the criteria they meet and the date of when the interview was conducted.

Table 2: Overview of selected interviewees.

Interviewee	Position	Criterion 1	Criterion 2	Criterion 3	Date of interview
Interviewee 0	VP Sales - India & Middle East	X	X		March 20 <sup>th</sup> , 2017
Interviewee 1	Operations Manager Italy	X	X	X	March 21 <sup>st</sup> , 2017
Interviewee 2	Market Segment Manager - Industry & Transport	X	X	X	March 23 <sup>rd</sup> , 2017
Interviewee 3	Chemical and Pilot Labs Italy	X		X	March 29 <sup>th</sup> , 2017
Interviewee 4	Group Business Development Manager	X	X		March 29 <sup>th</sup> , 2017
Interviewee 5	Sales/Marketing Director Italy	X		X	April 3 <sup>rd</sup> , 2017 (VCON)
Interviewee 6	Group VP Sustainability	X	X	X	April 4 <sup>th</sup> , 2017
Interviewee 7	Sales Coordinator Europe/Africa	X		X	April 5 <sup>th</sup> , 2017
Interviewee 8	President & CEO	X	X		April 6 <sup>th</sup> , 2017
Interviewee 9	Group Product & Marketing Manager	X	X	X	April 6 <sup>th</sup> , 2017
Interviewee 10	Research Engineer	X		X	April 12 <sup>th</sup> , 2017
Interviewee 11	Group CTO	X	X		April 18 <sup>th</sup> , 2017
Interviewee 12	Group CFO	X	X		April 20 <sup>th</sup> , 2017

Context interview:

Interviewee 13	Investment Manager Owner company		X		March 27 <sup>th</sup> , 2017
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The context interview is not directly relevant to answering our research question but has been conducted to understand the context of replies received by our selected interviewees. Therefore, that interview has been excluded and it represents an exception from the selection criteria (e.g. Interviewee 13 did not fulfill Criterion 1, as the person is from outside the case company).

### 3.2.2 Interview Guide and Interview Preparations

In order to conduct semi-structured interviews with the above selected interviewees, an interview guide was prepared (Bryman & Bell, 2011) (see Appendix 1). Bryman and Bell (2011) define an interview guide as “a list of questions on fairly specific topics to be covered” (Bryman & Bell, 2011:467). However, as we are talking about semi-structured interviews, the questions should be formulated in a way so that the interviewee has “a great deal of leeway in how to reply” (Bryman & Bell, 2011:467). Therefore, attention must be paid to the formulation of the questions in the interview guide. First of all, the questions should not be leading, which means that the interviewee should not be directed into a specific field by asking a question that has a quite obvious answer or direction in which to answer (Bryman & Bell, 2011). Furthermore, the questions should be formulated to cover the areas of interest, that have been outlined in Chapter 1, but at the same time should not be too narrow, as this would close off alternative avenues that might arise during the interviews. This narrow approach would be contradictory to the iterative nature of qualitative research (Bryman & Bell, 2011).

Obeying the previously mentioned rules for an interview guide, our guide is basically divided into two parts. With the first one being explorative and the second one being semi-structured. The explorative, first part should stimulate the interviewees to reflect on the most critical events/actions taken within the case company in connection to sustainability. Subsequently, the semi-structured, second part, digs deeper into the respective subtopics. The respective parts will be described in more detail in Table 3 below.

In addition, by following our research purpose and to ensure a holistic examination of our research question, we asked within each topic area for differences between different organizational levels. This follows the logic of the interviewee selection that considers interviewees on different organizational levels. These questions are not too specific, and therefore, allow the interviewees to describe the situation from their own point of view, without being strongly influenced by the interviewers. In addition, there is no strict order of questions that must be adhered to, our interview guide is rather grouped into topic areas within which the order of questions can be altered, which allows the interviewer to adapt to the actual course of the interview.

In agreement with all interviewees, interviews were recorded and subsequently transcribed for analysis (Bryman & Bell, 2011). In that way, the data collected during the interviews could be secured and researcher's own interpretation could be avoided by putting it down in writing.

The choice of location was left to the interviewee, however, we made restrictions concerning the noise level at the chosen location, which should not be too high and additionally the interview must take place in a private setting (Bryman & Bell, 2011). The interviews with selected employees located in Sweden took place in-person, either in their own office or in a conference room of the case company. The interviews with the interviewees from Italy were as far as possible conducted in-person, however, one of the interviews needed to be done via video conference (VCON). In addition, anonymity was offered to the interviewees, but as Gioia et al. (2013) suggest, there were no veto rights allocated to the interviewees concerning the content and publication of our thesis. Before starting with conducting the interviews, the interview guide was tested on a company-intern person (Interviewee 0) that, however, was not part of the sample.

In the following Table 3, the structure of the interview guide will be presented and it will be elaborated on the reasoning for the structure.

Table 3: Description of the structure of the Interview guide.

<b>PART 0</b>	
Introduction	Introduction of the interviewers, the purpose and the context of the research and a broad explanation of the research field. Thereby, the interviewees should understand the context and the reasoning for the interview better. Moreover, the introduction helps to reach a comfortable and pleasant interview atmosphere. (Bryman & Bell, 2011)
'Facesheet' information	Background and general information about the interviewees to reach a contextual understanding. Therefore, the 'facesheet' information are of general (name, age, etc.) and specific nature (job position, years in the company, etc). (Bryman & Bell, 2011)
<b>PART 1</b>	
Explorative	In this part, the interviewers are introducing the interviewee into the first part of the actual interview by using an explorative approach. This approach should stimulate the interviewees to reflect on the most critical events/actions taken within the case company in connection to sustainability.
<b>PART 2</b>	
Semi-structured	Part 2 is characterized by more structured questions compared to Part 1 and needs to be seen as only loosely connected to the former part, which is explicitly communicated to the interviewee. The semi-structured questions should be formulated in a way so that the interviewee has " <i>a great deal of leeway in how to reply</i> " (Bryman & Bell, 2011:467). Special attention has been paid to the formulation of the questions, as the questions should not be leading (Bryman & Bell, 2011). The topic areas outlined and described below are based on what we want to find out based on our research purpose and are additionally based on the Literature review (Chapter 2).

Topic area 1: Understanding the tension between exploration and exploitation within the company
The aim of this subheading is to understand the tensions between exploration and exploitation within the case company. Thereby, the questions are related to the Chapter 2.2.1 and aim for data about the topic exploration and exploitation according to Levinthal and March (1993), the resource allocation according to Lavie et al. (2010), the strategy and approach for innovation (Raisch & Birkinshaw, 2008), and the short-term/long-term orientation according to Holmqvist (2004). However, we are aware that not all interviewees can provide us with data about all topics.
Topic area 2: Environmental Dynamism: Sustainability in the context of the case company
The aim of this subheading is to understand the role of sustainability within the case company and serves, on the one hand, as a bridge to Part 1, and on the other hand, as foundation/direction for the subsequent course of the interview. Depending on the answers of the interviewees, the interview leads either to Topic area 3 or Topic area 4.
Topic area 3: Direct influence of sustainability on the tension
The aim of this subheading is to understand the direct influences of sustainability on the tension between exploration and exploitation. Therefore, the questions aim for getting data about the topics that are previously mentioned in Topic area 1 and explicitly highlight or ask for changes in the behavior along the organizational levels.
Topic area 4: Indirect influence of sustainability on the tension
The aim of this subheading is, in contrast to Topic area 3, to understand the indirect influences of sustainability on the tension between exploration and exploitation. Moreover, this topic area was subdivided into <i>organizational antecedents</i> and <i>managerial antecedents</i> . Thereby the questions are related to Chapter 2.3 and aim for data in the case of <i>organizational antecedents</i> about the topics: structural changes according to Jansen et al. (2006), culture and identity according to Miles and Snow (1978), slack resources according to Nohria and Gulati (1996), openness/absorptive capacity according to Cohen and Levinthal (1990), and in the case of <i>managerial antecedents</i> about the topics: leadership style according to Jansen et al. (2009), risk aversion (behavior) according to Lewin et al. (1999) and knowledge inflow according to Torres et al. (2015) and Mom et al. (2007). However, we are aware that not all interviewees can provide us with data about all topics.

*The interview guide includes questions that serve as reminders for the interviewer and those are written italic. Moreover, bullet points (same font and size) represent follow-up questions.*

### 3.3 Data analysis

The data analysis represents the procedure of how the data was used and analyzed to end-up with theory that is grounded in the data. Therefore, first, we describe the general approach of the data analysis according to Gioia et al. (2013), which is then followed by the description of the specific usage and analysis.

### 3.3.1 General Approach for the Data Analysis

For analyzing the collected data, we use the multi-step analysis approach suggested by Gioia et al. (2013). This approach is characterized by starting out by separately analyzing each interview and ultimately culminates in aggregated dimensions. The resulting ‘static’ data structure should then be used to build an inductive, generalizable model, that is grounded in the data collected (Gioia et al., 2013). We consider Gioia’s multi-step model the most suitable one for our thesis, as it allows us to cover in detail all individual opinions, beliefs, and experiences of the interviewees. Thereby, we minimize the risk to overlook some important information that could lead, subsequently, to interesting themes and trends. Once specific themes have been found, the subsequent step is to distil these themes into *aggregate dimensions* (Gioia et al., 2013:20). In conclusion, through this multi-step process, we are able to recognize patterns that in the end can be put into relations and an inductively derived theory might be built (Gioia et al., 2013).

The first step in the process is to analyze each interview isolated. Therefore, a coding strategy was used to study the transcribed interviews. At this stage, a big number of terms and concepts is desirable and no effort should be put into distilling categories. In addition, the expressions used by the interviewee should be transferred and applied in the codes as well (Gioia et al., 2013). Only at the end of this first step, efforts should be put into seeking similarities and finally group those themes together.

The second step is characterized by the attempt to distil terms into more abstract concepts. Thereby, the number of themes is reduced considerably by aggregating those together. At this stage, particular focus should be put on *nascent concepts* that have not yet been subject to extensive research (Gioia et al., 2013:20).

The last step is to condense these concepts further into *aggregate dimensions*. This step might not always be possible as theoretical saturation could have already been reached after the second-order themes (Gioia et al., 2013).

These three steps ultimately result in a full data structure (see Figure 5 for an example). The resulting data structure illustrates the process of distilling themes and concepts and additionally gives an overview of the most important dimensions (Gioia et al., 2013). Furthermore, the data structure contributes to the need for transparency, which qualitative research is normally lacking, by showing explicitly the sequential decisions taken over the whole process (Bryman & Bell, 2011).

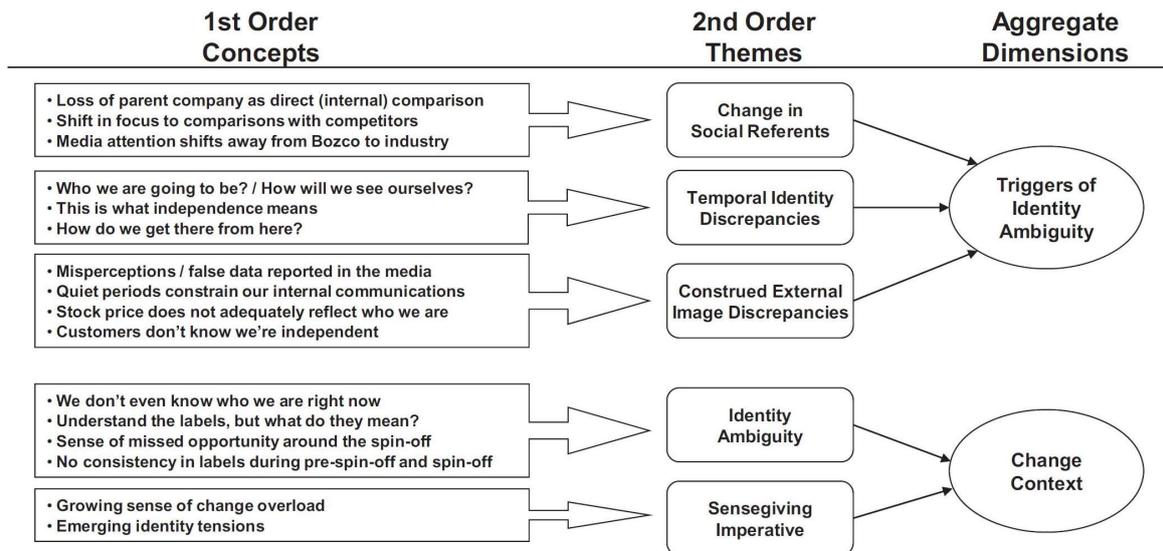


Figure 5: Example of an elaborated Data structure using the multi-step approach by Gioia et al. (2013) (Gioia et al., 2013).

Following the grounded theory approach, the elaborated data structure is subsequently used to inductively build theory. According to Gioia et al. (2013), this happens by turning the *static picture* – data structure – into a *motion picture* – model, framework (Gioia et al., 2013:22). This so-called *motion picture* can be created by building and explaining relationships between the distilled concepts (Gioia et al., 2013).

### 3.3.2 Specifically applied Approach for the Data Analysis

Overall, the above outlined multi-step analysis approach suggested by Gioia et al. (2013) was followed quite strictly. In total, our 12 conducted and transcribed interviews led to an overwhelming amount of data. This data, in turn, were analyzed and resulted in more than 270 first-order concepts. In order to cope with this 'flood' of first-order concepts, clustering and colour-coding methods were used to distil those concepts further to second-order themes. This step proved to be very challenging and time-consuming, as we struggled with finding the balance between information and abstraction. The resulted 29 themes were then condensed to 7 aggregate dimensions, which are further elaborated in the next chapter and then put in relation in Chapter 5.

For our interview guide, which is divided into different parts, and therefore aims for topic-specific data (described in Chapter 3.2.2), we gathered different kinds of data that are explicitly assigned to specific constructs that were presented in the literature review and are related to our research purpose and question. Therefore, we classified the data on basis of general and specific events within the company, for example, statements related to the sustainability project 'Ecoboard', that was revived by the structural change, were classified as trade-offs that are caused by organizational and managerial changes. Moreover, the statements are all related to certain events within the company and, therefore, an event-based analysis method was applied.

At this point and with the focus on our research question, the classification of statements that are related to an influence on the trade-off between exploration and exploitation are key to our data analysis. Therefore, for the classification, we went back to literature and assigned the different statements/data along the common constructs within the literature, for example, the source of inspiration that can, on the one hand, be based on developing and using internal knowledge, and thus, refer to exploitation and, on the other hand, be based on the use of external knowledge and the leaving of the common trajectory of the company that refers to exploration (see definition exploration and exploitation Chapter 2.1 and 2.2). On the same line, statements related to the resource allocation and long-term/short-term orientation were classified and assigned to the constructs of exploration and exploitation. Nevertheless, statements/data that are not clearly classifiable or can be seen under both activities of exploration and exploitation were bundled under a certain second-order theme.

Overall, the data analysis followed an iterative process, and therefore, the steps were characterized by going back and forth between the context, data, and literature.

### 3.4 Summary of our Research Methods

The following Table 4 gives an overview of the key research methods applied in this thesis.

Table 4: Key Research Methods.

Dimension	Design	Explanation
Research Strategy	<ul style="list-style-type: none"> <li>Qualitative</li> </ul>	The qualitative research strategy is “concerned with words rather than numbers” (Bryman & Bell, 2011:386).
Epistemology	<ul style="list-style-type: none"> <li>Interpretivism</li> </ul>	Research can never be objective as such and methods need to be adapted when examining social phenomena, according to Bryman and Bell (2011).
Ontology	<ul style="list-style-type: none"> <li>Constructionism</li> </ul>	Organizations are social constructs, which are build by people acting within the organization (Bryman & Bell, 2011).
Approach	<ul style="list-style-type: none"> <li>Inductive</li> </ul>	Our approach, however, is not exclusively inductive as we rely on theory and initial observations in order to find our research topic (deductive elements). Still it is mostly inductive, which means that we generate new theory rather than test existing theories (Bryman & Bell, 2011:27).
Overall Research Design	<ul style="list-style-type: none"> <li>Single-case study design</li> <li>revelatory</li> </ul>	This thesis focuses on a case study in a single company with the inclusion of a sub-case study in form of the <i>Ecoboard</i> .
Generalization	<ul style="list-style-type: none"> <li>analytical</li> </ul>	Result is a generalizable theory.
Methods of Data Collection	<ul style="list-style-type: none"> <li>Company documents</li> <li>Informal interviews (internal &amp; external)</li> <li>Field-notes</li> <li>Semi-structured interviews</li> </ul>	Details of how we plan to collect data can be found in Chapter 3.2.
Methods of Data Analysis	<ul style="list-style-type: none"> <li>Framework of Gioia et al. (2013)</li> </ul>	For analyzing the collected data, the framework of Gioia et al. (2013) was followed. It consists of 1st-step analysis, 2nd-step analysis and aggregation.

## Chapter 4: Findings

### 4.1 General Findings

The data collection and analysis revealed that there was a shift towards sustainability in our case company over the last few years. We find that there was a variety of triggers that led to the emergence of the sustainability topic in our case company (Chapter 4.2). Moreover, we find that sustainability takes on many characteristics, revealing interesting results (Chapter 4.3). Following that, also the context or as we named it, the prevailing mindset, influences the tension of exploration and exploitation (Chapter 4.4.1). Thereby, this prevailing mindset is quite company specific, however, simply put, this variable can take on only three major characteristics, i.e. a tendency towards exploration, a tendency towards exploitation, or a balance between exploration and exploitation. The findings also show that there have been changes in the organization, as well as in the management (Chapter 4.4.2) of the case company in the past, that were caused by sustainability. Chapter 4.5 describe the trade-offs that are caused by the prevailing mindset (Chapter 4.5.1), on the one hand, and by the organizational and managerial changes (Chapter 4.5.2), on the other hand. Through the trade-offs, the connection to the tension of exploration and exploitation becomes obvious, which represent the key findings for answering our research question. It is important to mention, that based on the dynamic examination, first empirical analyses take place in those chapters (Chapter 4.5.1 and 4.5.2) to increase the understanding of the findings.

Those aggregate dimensions are grouped into distinct sub-headings. Chapters 4.2 and 4.3 stand on their own and no further separation is needed. Following that, in Chapter 4.4 a temporal differentiation of the findings was made to emphasize the different points in times they relate to. While 4.4.1 stands for  $T_0$ , so the point in time before the organizational and managerial change in the case company, 4.4.2 describes  $T_1$ , so the changes and its outcomes as such. The subsequent Chapter 4.5 then is divided into the two trade-offs described above, which again represent two different points in time ( $T_0$  for the trade-offs caused by the prevailing mindset,  $T_1$  for the trade-offs caused by the organizational and managerial changes). At this point, it is important to mention that the findings showed to be slightly different than what we aimed for in our Interview guide (see Chapter 3.2.2), which subsequently resulted in the adaption of our research question.

In the following paragraphs of Chapter 4, the aggregate dimensions and respective second-order themes are described in more detail. In addition, the second-order themes are backed up with some quotes from the interviews (*written in italics and with quotation mark*) that should act as evidence for our findings. The quotes that are presented within this chapter are not referenced to specific interviews, as we promised anonymity to the interviewees. Therefore, a consideration between a distinct mapping by excluding the roles of the interviewees, on the one hand, and the importance of the role for the validity of the sample by excluding a distinct referencing, on the other hand, was made and resulted in the second procedure.

## 4.2 Triggers for Sustainability

This aggregate dimension includes different themes that can be seen as the main triggers for sustainability as environmental dynamism that represents unpredictable changes of customer preferences, technologies or changes within the market equilibrium that are within the control horizon of organizations (Dess & Beard, 1984; Lavie et al., 2010). Therefore, four main drivers are identified: *Ownership, Market, Society, and Strategy and Individual Values*. Those four drivers are elaborated in more detail in the section below. Moreover, in the past, sustainability was not focused by the case company at all, according to interviewees, and thus, represent a change in the importance of sustainability within the organization. *“I've been to twelve years but in the beginning was no focus at all, no sustainability.”*

The reason for that was explained by not having been pressured by the society and by the fact that the business went well, margins were high and waste disposal costs were insignificant, as well as the prioritization was not given. *“I didn't find that we really looked into [sustainability], I tried to push for some environmental questions, that's part of it, and I think that we didn't really have time to prioritize it that much.”* In addition, looking at the market side, customers have only a limited willingness to pay for sustainability. *“The problem is many times when you're working with these things it is that people are interested in sustainability as long as it doesn't cost.”* Furthermore, also national differences are mentioned, and thus, lead to different levels of awareness in the case of sustainability within a society. *“Sweden is driven quite heavily about sustainability issues”*. Nevertheless, as mentioned before, the aggregate dimension represents the main triggers for sustainability that are described and presented in the following paragraphs and are illustrated in Figure 6.

**Ownership triggers sustainability:** The ownership situation played a big role and contributed in triggering sustainability. Therefore, this second-order theme was separated from more general themes as market or society. The case company is owned by a private-equity company. This private-equity company demanded from all companies in their portfolio to implement sustainability initiatives and make use of sustainability KPI's, which then need to be reported to the owners. Thereby, the owners benefited by having an attractive portfolio of “green” companies. Moreover, the relation between the company and the owners is frequently mentioned, and thus, supports the separation and classification as a distinct second-order theme.

*“This [sustainability] came from the owners”*

*“about sustainability, basically our owner said you need to meet you know you need to meet up with the requirements”*

*“I think that we have got a lot of help from our owners [sustainability], that pushed for the questions”*

*“I mean our owner is a stock market company they want to have a profile [...] Increasing push for us to do, to take the opportunity we have to show that we can improve in this area [sustainability]”*

**Market triggers sustainability:** The market in which the case company is operating in, increasingly demands proof of sustainability performance. Customers that are demanding such proof, and competitors that are following the trend, created pressure, and thus, triggered sustainability. Therefore, this second-order theme represents all statements that are related to the closer environment of the organization, especially the markets that are targeted by the company, as well as the associated customers and competitors within those markets.

*“So you can see it when the market force you in a way, is driving sustainability believe it or not.”*

*“One of the driving forces in the composite revolution is the need for more sustainable solutions”*

*“Then it also became important for us because it's a market that we want to grow with, the same for the aerospace.”*

*“More and more you know customers, big customers are asking, to prove the performance, to show what we are doing [with sustainability]”*

*“You really start to lose to some customers, now if you don't show that [sustainability], you are on that, but if you are not oriented to that [sustainability], then with some big customers, this will just kill you”*

*“They [competitor] started to raise the question [sustainability] within the industry and they also started to push us and the other companies. So, they must have had a big impact of course.”*

**Society triggers sustainability:** In the same way as the market, society and many other stakeholders become more environmentally conscious, and therefore, require proof of sustainability performance. Therefore, this second-order theme bundles all other first-order concepts that are not distinctly classifiable, and thus, serve as an umbrella second-order theme. To be more specific, for example, banks and investors are included in this theme, although they are not part of the daily operations of a company, or in other words, are not part of the market as such. However, society is quite sensitive towards this topic due to the rise of greenwashing-scandals. This means companies need to truthfully take care of their environmental performance. Moreover, society as such, is a quite holistic term and can not be completely separated from other triggers for sustainability, which is also highlighted by an interviewee.

*“The society in total ask for sustainability the other is just a consequence of that”*

*“It is the people themselves and other institutions like banks. No bank invests in a new coal mine, doesn't happened.”*

*“More and more the community is, the surrounding stakeholders are involving us in projects or expecting us to do something [sustainability projects]”*

*“It's important for investors and bankers looking at the company that we take environment as a serious topic”*

*“Also, there is need to be authentic if you support an industry that were supposed to be green, you have to be green downstream where we have”*

**Strategy and individual values trigger sustainability:** This theme shows the importance of individuals who have the power to make strategic decisions. In our case company, such individuals changed the strategy towards sustainability, introduced a new mindset in the company, and thereby, triggered sustainability. Therefore, these individual decisions are closely connected to the values and own beliefs of individuals, and thus, in turn, reveals that sustainability is also a topic that highly depends on individuals.

*“It was CEO! I think CEO has a very clear picture of this [sustainability], and we have the same picture of what we need to do on that”*

*“There was also a change between the CEO [according to the sustainability strategy]. Previous CEO was very focused on first class, high-class sales, while (name new CEO) was more focused, in general, selling the company as environmentally”*

*“It was a change of mind, you know, or an evolution of a company thought [shift to sustainability]”*

*“We’re speaking about new attitude, a new way of considering the business”*

*“We have talked about sustainability a lot as being part of our strategy”*

*“OK then (name of the plant manager) maybe decide it to take the sustainability project in because he believe in it”*

*“From my investment on the site, he gets a basket, he can use from it”*

Figure 6 represents the data structure in relation to the triggers for sustainability.

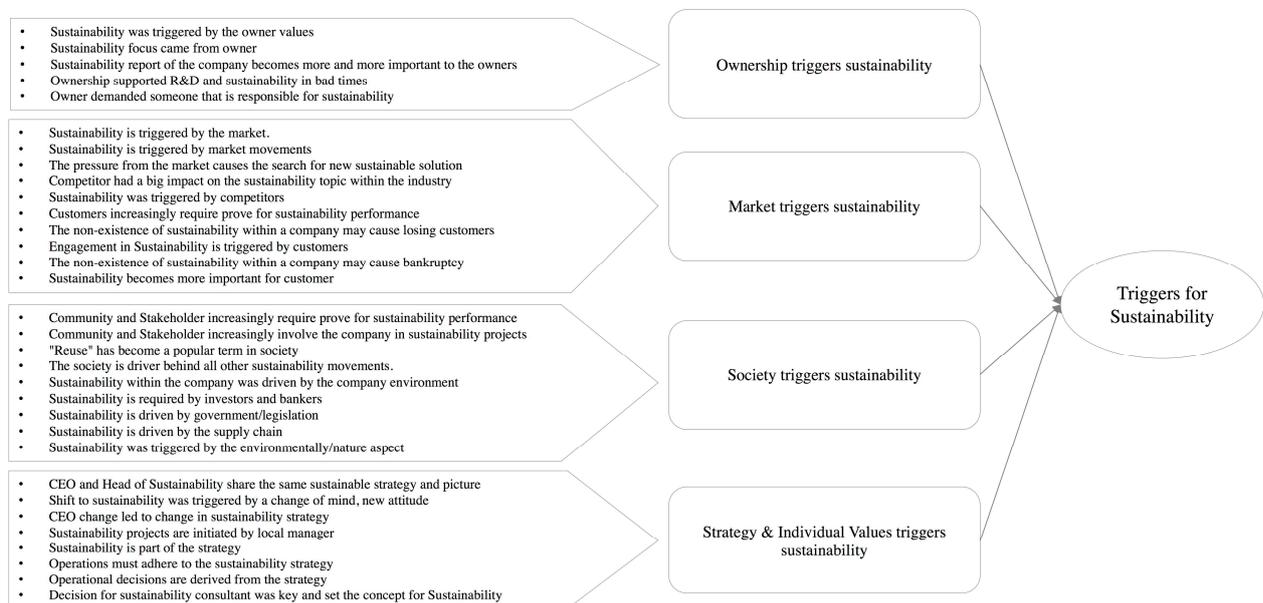


Figure 6: Data structure “Triggers for sustainability”.

### 4.3 Characteristics of Sustainability

The findings show that sustainability has quite specific characteristics that make the subject unique in case of requirements towards organizations, how it should be implemented and handled. Thereby, the data reveal six main characteristics. Those six characteristics are mainly responsible for the reaction of the company while implementing sustainability. Looking at a more general level, sustainability is a very common term in the all-day-life, however, it still is a concept that gets misinterpreted in many cases. However, the economic importance and profitability go back to the main definition of sustainability that is defined as a concept with three pillars: economic/profit, society/people, and environment/planet (Cato, 2009; Elkington, 1994). In the following paragraphs, short descriptions of the respective second-order themes are presented and subsequently illustrated in Figure 7.

**Economic importance:** The findings indicate that the economic importance in the case of sustainability is a quite crucial characteristic. This means sustainability initiatives must go hand-in-hand with profit. One interviewee even defined sustainability as long-term profitability. In other words, according to this theme, sustainability is not just pursued for ethical reasons, but rather for economic reasons. Therefore, it is also related to the second order theme *Efficiency & Closed Loop* (see below), as they both include the concept of efficiency. However, the difference can be found in the fact that *Efficiency & Closed Loop* needs to be seen as the overall target of optimization and resource-efficiency, in contrast to the *Economic importance* theme, which stands for the profit-orientation.

*"Sustainability is long-term profitability"*

*"Yeah, it has to [be profitable], otherwise it's not sustainable"*

*"It's not enough to have a good solution for to be sustainable, you need to have the money with you, as well, to make it happen"*

*"The thing is now that sustainability and money goes hand-in-hand"*

*"Sometimes the sustainability was contradictory to earning money, but now I don't see that. It is actually working together"*

*"It's becoming a contributing side, so you can both market it and you can reduce the cost of the waste, you can, so it's contributing to our business rather than not being consider something that's all costing money"*

*"So you can't do one thing without the other [sustainability & earning money]"*

**Branding and Credibility:** This theme emphasizes that sustainability is undoubtedly connected to marketing and branding activities, this can be explained by the high importance in the market and society. At the core of every sustainability project are the people. Therefore, *Branding & Credibility* that is in a close relation with people, has been identified as a characteristic of sustainability as well. Furthermore, connected to this characteristic, it is important to mention the concept of greenwashing, which is a way of companies to mislead people about their environmental performance. Thereby, these characteristics, which represent a great opportunity for companies, are mainly the reason that sustainability is quite misperceived, not just in the society, but also within companies. Moreover, this also leads to a one-sided implementation and to disregarding the holistic concept (with all three pillars).

*“Then it's used in argumentation with our customers, they are willing to pay for something that is more sustainable”*

*“It's becoming a contributing side [sustainability], so you can both market it and you can reduce the cost of the waste, you can, so it's contributing to our business rather than not being consider something that's all costing money”*

*“Behavior has changed in Sales and Marketing to include these arguments”*

*“This is [sustainability], in my eyes, the best, let me say, even marketing message”*

*“We are trying to do, of course to capitalize in that in our marketing and so on”*

**Efficiency and Closed-Loop:** The data also reveal that sustainability strives for optimization, which is also anchored in the literature, in the way that sustainability has to do with using resources in an effective and efficient way (Edwards, 2005). Therefore, the characteristics cause mainly the reaction of a company to make processes more resource-efficient. In that way, sustainability is characterized as something that increases efficiency, and thus, reduces costs. In addition, it is something that lowers the environmental impact of a company.

*“It is a way to take care of all our resources, human beings, and environment, in the best way. And strive to optimize, to optimize”*

*“We are trying to focus on the projects like waste reduction and efficiency. We trying to focus on also high-ethics.”*

*“Forcing us to be more efficient is a way of being more sustainable”*

*“Many little initiatives... instead of throwing away the old pallets in waste, we use them, give them to a guy, repair them and send them back”*

*“Or installing those switches that the light shot off from alone once nobody is the room”*

*“[sustainability] To reuse something”*

**Need for cultural change:** This theme represents the importance of a cultural change within the organization that is necessary and is highlighted in our data. According to this theme, the concept of sustainability should be a part of the daily doing of each individual, which also points out that it is necessary to include everyone in this change. However, cultural change is not just a “switch on”, as an interviewee pointed out, it is rather related to a long journey that is associated with cultural change. Therefore, sustainability affects the mindset and behavior, and it follows something that can be called “evolution”. This is in line with the common perception in the literature that a cultural shift is more a generative process (Morrison, 2000; Borghini, 2005).

*“A lot of sustainability comes through culture”*

*“We have to work strongly on the culture”*

*“Using all these initiatives, these campaigns used to show behaviors, different behaviors”*

*“On my personal doing, definitely, but I definitely see an awareness within my colleagues as well, just in daily life and daily discussions”*

*“It was a change of mind, you know, or an evolution of a company thought”*

*“We’re speaking about new attitude, a new way of considering the business, more ethical”*

*“Some colleagues didn’t think that the sustainable project could be a, let me say, a primary product, or an important product, but because we they were trained to sell characteristics, you know, for the last 15 years”*

*“We still need to do a lot more small things on the individual perspective [to reach a sustainability culture]”*

**Differ from “normal” projects:** The data collected indicates that sustainability projects differ considerably from “normal” projects. To be more specific, they are distinctive in parts that are essential and pivotal in terms of how to handle that project. For example, sustainability projects are difficult to quantify, unpredictable, have longer payback horizons, have a different product logic, etc. These characteristics differ from how “normal” projects look like and are to be handled. As a result, due to the newness of sustainability projects, internal resistance might arise in the organization. In general, this characteristic of sustainability is found to be very prominent amongst interviewees.

*“And not necessarily we are able to quantify the payback, so that must be also a certain trust”*

*“So it’s [sustainability project] been totally unpredictable because it was more than what can we do, let’s see what happens here, make something”*

*“[Sustainability project] that would be a normal investment case, but what I think we will find when we do the investment case is that, our return on investment time will be longer than the sort of normal investments”*

*“Normally customers come to us, but with the Ecoboard, we have to tell them, to use our product”*

*“The problem here is that our sales force they are for they are focused on the selling the strongest, the best product to a certain group of customers. And here suddenly we have a secondhand product that we need to find somewhere.”*

**Misperceptions:** The data shows that sustainability as a concept is quite often misunderstood, which can be explained by the broadness of the concept as a whole. For example, it is sometimes still seen as a “hippie”-thing, which represents the narrow definition of sustainability as environmentalism. Furthermore, the findings show as well that there is resistance inside of the organization against sustainability products. Looking at the market side, people/customers are often not willing to pay more for sustainable products. Therefore, this characteristic is closely linked to the above-mentioned characteristics of *Economic importance*, *Need for cultural change* and *Differ from “normal” projects*.

*"...this topic [sustainability] is it's it's very it's so big but in some people's mind I think it's like a hippie, because you can't really touch it"*

*"The problem is many times when you're working with these things it is that people are interested in sustainability as long as it doesn't cost"*

*"Ecoboard was a sort of poor brother, you know, when it was born"*

*"Yeah, [there was resistance] but I believe that it was also badly communicated"*

Figure 7 represents the data structure in relation to the characteristics of sustainability.



Figure 7: Data structure "Characteristics of sustainability".

## 4.4 Temporal Differentiation of the Findings

As mentioned in Chapter 4.1, a temporal differentiation of the findings in this chapter is made. The reasoning behind this decision lies in the different points in times the two subheadings relate to. While Chapter 4.4.1 - *Prevailing Mindset* stands for  $T_0$ , so the point in time before the organizational and managerial change in the case company, Chapter 4.4.2 - *Organizational and Managerial Changes* describes  $T_1$ , so the changes and its outcomes as such.

### 4.4.1 Prevailing Mindset as representation of $T_0$

#### *Prevailing Mindset*

As Bryman and Bell (2010) highlight, the context, in which a research is examined, is quite important. The following aggregate dimension represents and describes the context of the organization. Therefore, and with regard to our research question, the context of the organization became a major part of the entire examination. This led to the inclusion of the context as an aggregate dimension that is named prevailing mindset. The prevailing mindset, or in other words, the employee's opinions and way of thinking, is found to be one of the main influences when it comes to sustainability and the tension of exploration and exploitation. This prevailing mindset is in line with the discussion in literature about the dominant logic that stands for the patterns that a company follows (Kuratko et al., 2011). Moreover, the importance of this aggregate dimension is also argued by the discussion that the tension between exploration and exploitation is mainly depending on the trade-offs that a company makes, which are anchored in the prevailing mindset (see Chapter 4.5.1).

Therefore, this aggregate dimension is identified by the following second-order themes, *Basis of investment decision-making*, *Resources & Capabilities*, *Prevailing approach for development*, *Strategic Orientation*, and *Organizational Structure*.

In the following paragraphs, short descriptions of the respective second-order themes are presented and illustrated in Figure 8.

**Basis of investment decision-making:** The prevailing mindset of deciding over investments is characterized by a short-term orientation. According to the data, short payback on investments is required in order for an investment to be granted. The underlying foundation of that is the liquidity of the company that appears to be the bottleneck. Overall, this leads to the fact that the payback of a project is the key investment criterion. Moreover, the decision over investments is bundled within an investment committee that prioritizes the projects according to the mentioned *Basis of investment decision-making*.

*"It's not enough to have a good idea, you need to show a payback"*

*"Right now, we only approve investments that have a payback of about 6 to 9 months"*

*"Usually they want a very short payback on the investment"*

*"Yeah I would say there is a big chance for that. That the payback is most important"*

*“We have a long list, you can say of investment that we wanna like to make and then we have a much smaller amount that we can spend”*

*“The company has some millions per year, that they can invest in stuff. So they sit down and prioritize those, which is most important”*

*“It constraint that we have liquidity, that we have actually available funds for it. And when we have the available funds for it, we have to prioritize in investments here or there. I mean that I would say is the bottleneck”*

*There are many applications coming up and there are all of them are basically either of their cost driven to reduce costs or for a certain process or it is then driven by by some kind of environment or a trend”*

**Resources & Capabilities:** The data shows that in the case company a lot of resources are allocated to R&D activities. Thereby, the data that occurred from the semi-structured interview was especially in this case supported by observations that were captured by field notes. For example, it was quite surprising that the company makes only little use of IPP (Intellectual Property Protection), based on the high degree of tacit knowledge on the technological side, especially in the production. Moreover, the main competence, and therefore, a main part of the competitive advantage of the firm was described as *“application knowledge”*, to apply the technology and products in the right way. Furthermore, it became obvious that a big share of technological capabilities is located and accumulated in the R&D department. This investment is also seen as the innovation strategy of the entire group. Moreover, the R&D is distinguished by the prevailing target of research and development. Therefore, resources are allocated more towards development that can be seen as continuous improvements, and therefore, it is connected to the second-order theme *Prevailing approach for development*.

*“Operation is lot around R&D”*

*“I think that our innovation strategy is our investment into R&D”*

*“We have a R&D department, looking at the polymer side of our product, to innovate and make a better, a better performing product”*

*“We are quite a lot and also spread but it's always good with chemical engineers”*

*“Business Developer is a limited resource, so we need to focus him on some strategic directions [...] I think, currently we do not have any plans to invest more in that”*

*“This competence at all is what differentiate us from the competition. The competition doesn't have this”*

**Prevailing approach for development:** The prevailing approach for development can also be seen as the way how the case company goes about developing new products and processes. The data shows in this case, that customers are the main source of innovation and small but continuous improvements are the predominant way of innovating by using and developing the internal knowledge. Developments pushed by R&D are mostly in the field of further developments of the materials that are the base of the products, and are long-term oriented, according to the interviewees.

*“We have not been really really good at innovation for quite some time we have an extremely good at, what do you call it, harvesting opportunities”*

*“But I am still stuck, we are a lot of continuous improvement, building on what we are”*

*“So we have developed and developed what we have, quite a lot!”*

*“We have something called research but it is close to development I would say.”*

*“Which is most important and there is a lot of maintenance needed, and improvements of current production, that will take a lot of that money”*

*“Think a lot of our customers work with innovation [...] We help them to do that but we don't necessarily innovate on your own [...] I think we do a lot of continuous improvements. It happens that we do innovation but it doesn't happen every week. “*

*“Too much internal, unfortunately, so we do too much internal and we need to go more outside I think.”*

*“[Question of prevailing source for inspiration] Incremental or for sure we are in the first one.”*

*“[Question of prevailing source for inspiration] The first one. Yes.”*

*“It is very rare for us it is normally it is just innovation it is just we take what the mankind knows something that we do something different.”*

**Strategic Orientation:** The findings show that the current ownership situation and overall strategy of the case company are that closely interrelated that a distinction is not possible or desirable. Therefore, this theme is named *strategic orientation*. It influences the prevailing mindset by restricting resources available, risks that can be taken and tasks that should be pursued. According to the data collected, the owners do not always share the same vision as for how the company should develop in the future. As a result of the ownership influences described above and mentioned by the interviewees, the overall strategy of the case company is found to foster exploitation.

*“I think the owners they are not so risk-willing, to just invest and go and do a lot of greenfield approaches and just trial-and-error, that is not the kind of owner we have today”*

*“If we had another owner that would more see, maybe see the bigger picture, ... a concept, that is called: A Composite Revolution”*

*“[Owners] must have a sort of template that this is how we want our companies to work and you have to develop that department or you have to start this department.”*

*“[Owners] are also driving the companies with certain strategic guidelines and sustainability is one of the basic one”*

**Organizational Structure:** This theme of organizational structure and the related structural change that took place in the case company affect and form the prevailing mindset as well. To be more specific, in addition to the creation of a Head of Sustainability, another important structural change was performed by introducing the position of a Business Development Manager. Our data shows that this change led to a more long-term and explorative orientation, which thereby influences the prevailing mindset. On the same line, this job position enables the organization to look into strategic, long-term projects.

*"[...] is a pure business development manager for totally new businesses that we are not in"*

*"[Business Development Manager] this position is to really, really focus on totally new things that our normal sales organization don't have the time to do"*

*"We decided to put some resources aside to work with developing the business for a bit long term. And this was ... become the head of Business Development"*

*"[Business Development Manager] is a limited resource, so we need to focus him on some strategic directions"*

*"[Business Development Manager] can take whatever resources are in different departments and just create something new"*

Figure 8 represents the data structure in relation to the prevailing mindset.

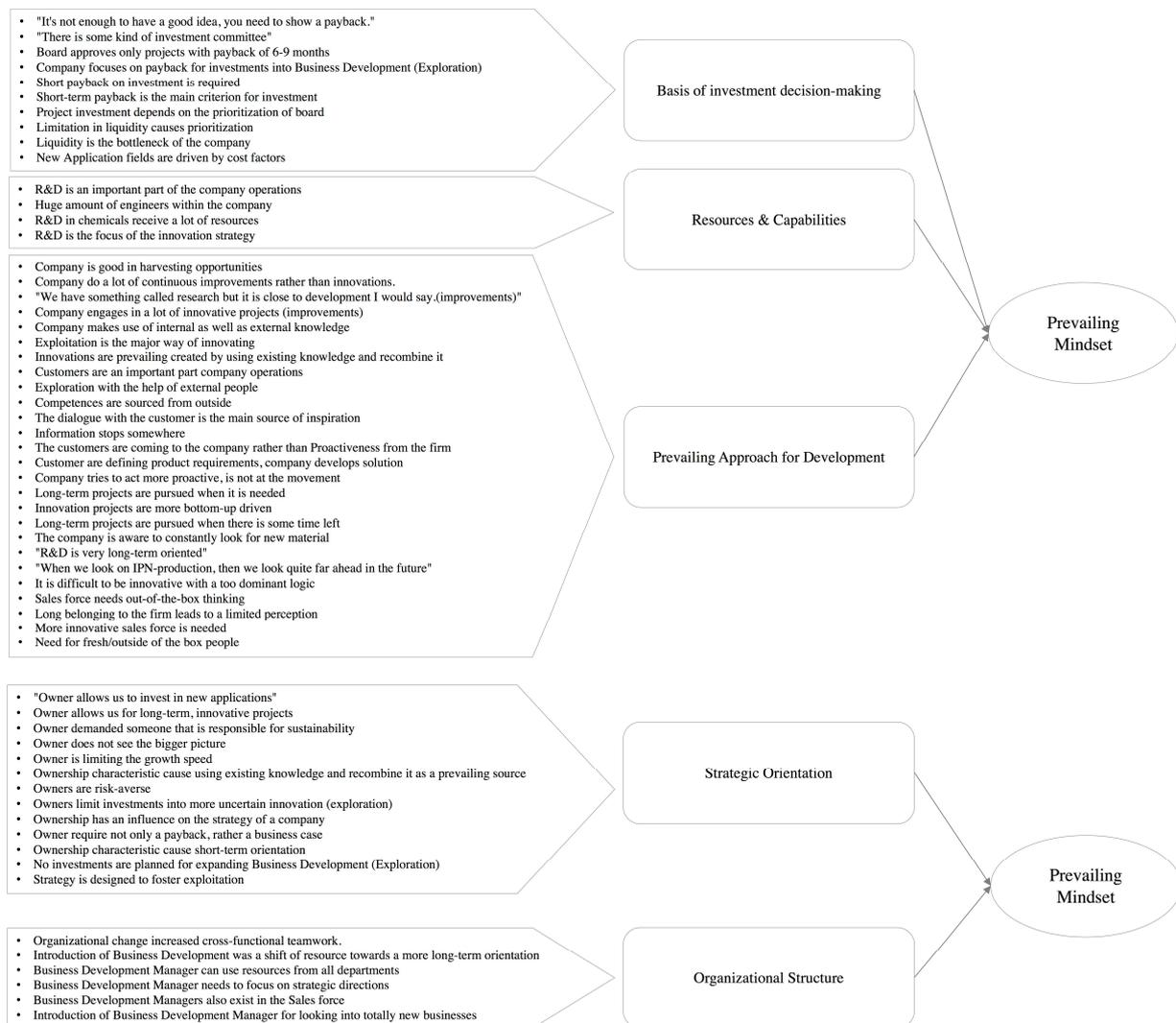


Figure 8: Data structure "Prevailing Mindset".

#### 4.4.2 Organizational and Managerial Changes as representation of T<sub>1</sub>

##### *Organizational Change*

The data also highlights that the implementation of sustainability within a firm causes organizational changes. Thereby, these organizational changes are represented by changes in the structure, culture, and in the openness of the organization. Statements that are not distinctly classifiable are bundled under the second-order theme *General*. In the following paragraphs, the respective second-order themes are presented and subsequently illustrated in Figure 9.

**Structural Change:** This theme is found most prominent amongst the organizational changes. Interviewees regularly mentioned the importance of structural change, i.e. having a person who is responsible on the Top-Management level. The creation of Head of Sustainability, therefore, was seen as a clear sign for the new focus on sustainability. In addition, a change in the position of CEO was highlighted by some interviewees. This change also caused a change in the strategy of the company, which is in line with the causality between structure and strategy of a firm (Chandler, 1962). Moreover, also the necessity for separation of sustainability from the operation is highlighted by the data.

*“It [sustainability] doesn't work so we need to have a basically a separate driver for the this which is not connected with the ongoing business in the same way so we can force on momentum ...to get power to do something.”*

*“That is really on the outside their comfort zone and there is in this context was basically that we had to start a new part of the company that is doing it because otherwise it would just focus on the main product”*

*“When Head of Sustainability was employed, it was a clear sign”*

*“I found it positive to know, that there was someone what's with the things going on.”*

*“[Why sustainability was so underperforming] We didn't have that kind of... we didn't have a Head of Sustainability before”*

*“it's important to give their right focus, the right visibility, the right ownership to teams to the production workers,”*

*“CEO change, led to change in sustainability strategy”*

**Cultural Change:** A change in the corporate culture is found to be an important part of the overall change as well. Therefore, small initiatives or daily doing lead to rethinking, and thus, also affect the culture by involving sustainability on a day-to-day basis. Especially, the mentioned small things are in the case of a sustainability culture as it is outlined by the data. However, it was shown that such a change towards a more sustainable culture is not yet finished in the case company. Overall, these perceptions, the relation between environment and behavior of a firm, is in line with common findings around these two constructs as Dill (1958) reveals.

*“[The change in culture towards sustainability] So but it takes time you know and but if take all these small steps. You have to take all small steps”*

*“These (waste separation) are things that are not the change in the world but you know it's creating the mindset”*

*“In my daily job, I'm thinking to avoid some loss of energy, some loss of resources”*

*“I feel sustainable, but we need to look at everything here. You know in the daily life”*

*“And not necessarily we are able to quantify the payback [in the case of sustainability], so that must be also a certain trust. To my experience, I see this more and more”*

**Change in Openness/Absorptive Capacity:** The findings show that sustainability contributes to a shift towards opening up the company. It is acknowledged by the interviewees that outside-knowledge is essential for implementing sustainability, and partnerships are required. This means that sustainability influences an organization by shifting it towards a more collaborating entity. In addition, data shows that sustainability fosters companies to absorb external knowledge in a bigger quantity, in order to complement the existing internal knowledge.

*“we don't know everything, very far from it, but we include people externally, that are skilled in the issues and in the subjects”*

*“[Head of Sustainability] is also going out and running to different companies suddenly there pop-up something”*

*“Yes. Absolutely [we opened up]. Because as I said, like 10 years ago, I started to work on approaching innovative products and then I was not even allowed to speak to my colleagues about it”*

*“I think, that we also see that we need to have the knowledge of also outside, because we are not that big of a company, and we have to have the knowledge and then we also have to share [...] in order to work with this sustainability consultant, we had to give all knowledge that we have internally, to them as well. And that is new”*

*“Also looks outside of the company, not only looking inside, but how do they do in the industry, [...] just looking outside”*

*“we are working with two such external consulting companies to help us to look from the outside on things”*

**General:** This theme includes all first-order themes that are of general nature, and therefore, cannot be assigned to a specific theme among the aggregate dimension of organizational change. Interviewees, for example, mentioned, that sustainability affects the strategy of a company and this happens on all levels of the organization.

*“Sustainability began to become a high focus in the agenda ... [you can] see that in the organization”*

*“Sustainability began to become a high focus in the agenda ... [you can] see that in the strategy”*

*“[...] before, now [...] and every site has a sustainability manager”*

Figure 9 represents the data structure in relation to the organizational change.

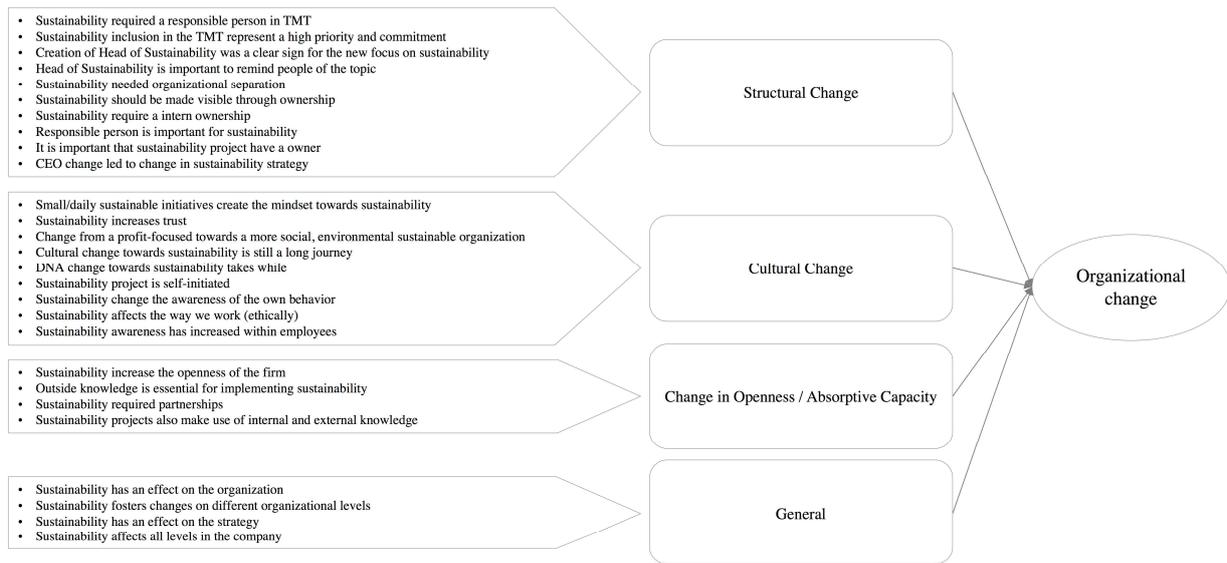


Figure 9: Data structure “Organizational Change”.

### *Managerial Change*

Besides the organizational change, the data also reveal changes in the managerial behavior of the case company that are caused by the implementation of sustainability. Therefore, a change in the management characteristics, in the proactiveness and empowerment of employees, is demonstrated by the data, as well as changes in the basis of investment decision-making and in the knowledge flow. In the following paragraphs, the respective second-order themes are described and in Figure 10, the data structure is presented.

**Change in Management Characteristics:** The data also demonstrate that in the case of the implementation of sustainability, the awareness of the management towards the topics changes. This was triggered, on the one hand, by the owner itself, but as well, by the expansion of the top management team with an external person, the characteristics changed. In addition, with the change of CEO, sustainability became a key characteristic of the top management team. Therefore, the data point out that the leadership changed from a more margin-oriented to a healthy growth-oriented one, which can be seen as a more sustainable orientation. Nevertheless, the awareness within the company is created by making use of training and, in addition, by transforming employees by leading transformational.

*“It seems like the leadership maybe hasn't, in the past, didn't really understand that it was growth, that we should be looking at, maybe we're just doing really healthy margins and hope that it will go on forever”*

*“I think, that leadership also understood that one of the driving forces in the composite revolution is the need for more sustainable solutions”*

*“Employees involved in classroom to learn, what it is [sustainability]”*

*“I'm trying to create a little bit crisis by myself to get people to do thing, to start, to rush up we talk about burning platform. We tried to create a burning platform, so people understand. It is a good way to create momentum for growth and innovation”*

*“The awareness is very much in the management team”*

**Change in Proactiveness & Empowerment:** According to this theme, sustainability acts as a medium to empower people and make employees and managers more proactive. This pattern was also mentioned frequently in connection to sustainability projects in particular.

*“People has taken own initiatives to focus on these questions”*

*“What we are trying to do (with Ecoboard), empower our people”*

*“I like to try something else (help Head of Sustainability)”*

*“It creates the feeling, I'm not just a worker [...] I am also taking care about the planet”*

*“There, we are discovering a couple of talents [...] they can free, they are invention”*

*“We have to adjust our tactics every week”*

**Change in the Basis of Investment decision-making:** This theme shows the change in the basis of decision-making for investments. In general, it becomes obvious that the investment decision-making is still mainly driven by payback times. However, according to the interviews, sustainability increasingly becomes a criterion for strategic investment decisions. In addition, data shows that it also changes the way project targets are formulated, as the role of sustainability is increasing.

*“So it's [sustainability] more a criteria to select the investment, the strategic actions”*

*“This [sustainability] is more and more coming into the criteria to choosing investments to give directions”*

*“So yes, on all the levels. Also in like project descriptions and targets, it is [sustainability] something that is, maybe not included everywhere, but definitely included much more frequently than earlier”*

**Change in knowledge flow:** The findings indicate that sustainability changes the knowledge flow inside companies. First of all, this change can be seen by the kind of knowledge that is now shared among the organization. For example, the topic of sustainability has been communicated a lot more and thereby finally also reached the lower levels of the company hierarchy. Communicating sustainability extensively is seen as something very essential by many interviewees. Data shows that this communication can take various forms, as for example, trainings, meetings, sharing best-practice examples, etc. Furthermore, it can be seen from the data that sustainability fosters the creation of certain knowledge networks inside the organization. On top of that, data shows that through the emergence of the sustainability topic, knowledge sharing was fostered across units.

*“everybody has been educated [in sustainability]”*

*“need for a first step that is communication, training, that's what we have been doing since two years”*

*“we're constantly get reminders and posting on the intranet [sustainability training]”*

*“So I think that they have to have this local meetings. You have to say again and again and again”*

*“we should inform, inform, inform, inform, nothing but inform”*

*“There is this network among the sustainability managers every month more or less”*

*“There will be short-time face to face meetings. And that's an important, you know, best practice sharing, moment, project synergies for a company like we are it's very important to share.”*

*“I think, that we also see that we need to have the knowledge of also outside, because we are not that big of a company, and we have to have the knowledge and then we also have to share. Of course, there are things that we don't want to share, that we don't want to publish, but, I mean, in order to work with this sustainability consultant, we had to give all knowledge that we have internally, to them as well. And that is new, and we also have been working on doing a sustainability report, that is actually our first try to follow the standards that exist within the area”*

Figure 10 represents the data structure in relation to the managerial change.

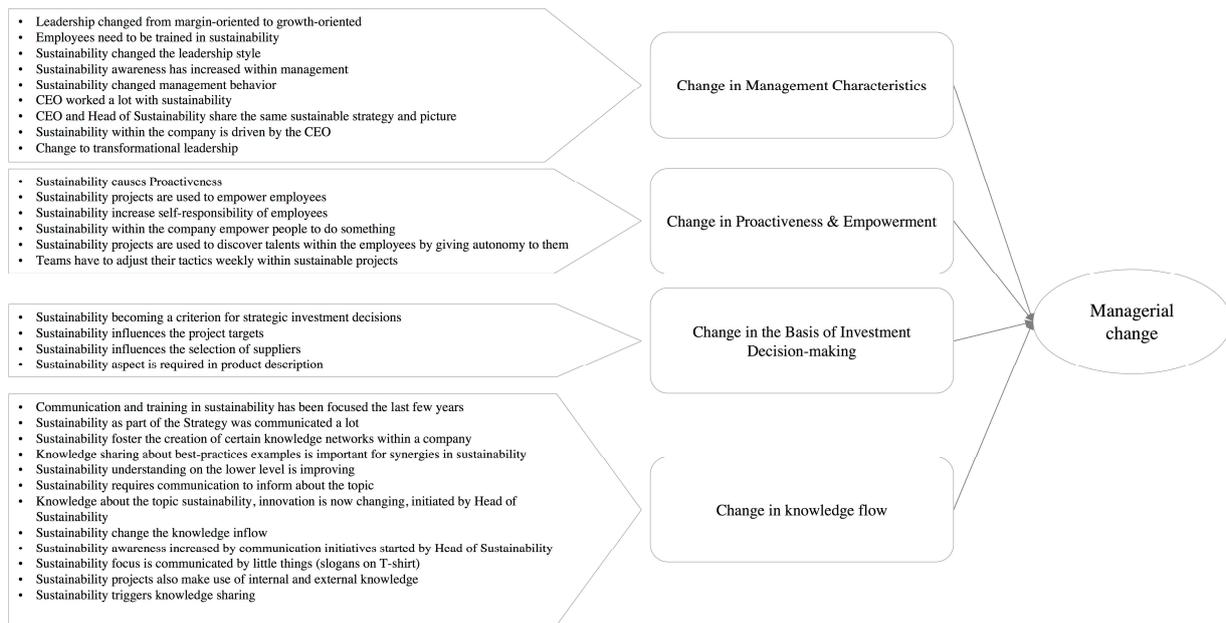


Figure 10: Data structure “Managerial Change”.

## 4.5 Trade-offs and the influence on the Tension of Exploration and Exploitation

In connection to the influences on the tension of exploration and exploitation, it is found that there are several trade-offs that need to be considered. Those trade-offs then influence if sustainability fosters more exploration or exploitation. In addition, it is important to mention that the following descriptions of the trade-offs inevitably comprise analytical traits, as well. However, the analytical parts are limited to analyzing empirical findings and it is not yet put into relations with literature, as this is reserved for Chapter 5.4.

### 4.5.1 Trade-off caused by the Prevailing Mindset and supported through the Characteristics of Sustainability

The data reveal that the trade-off between exploration and exploitation that is caused by the prevailing mindset shows to be tightly influenced by the characteristics of sustainability. Therefore, this aggregate dimension is a combination of characteristics of sustainability and the prevailing mindset of the organization. To be more specific, actions and decisions that are triggered by the characteristics of sustainability and that are shown to be more exploitative, need to be understood as supporters for the exploitative nature of the prevailing mindset. For example, the first-order theme ‘Sustainability triggers the company to focus more on efficiency’ is directly supportive for the second-order theme of prevailing mindset *Strategic orientation*, which is characterized by a short-term and risk-averse orientation, and therefore exploitation.

Overall, this aggregate dimension needs to be seen separated from the trade-offs that are caused by the structural and managerial changes. The result of these trade-offs, i.e. either being more explorative or exploitative, are key to this thesis and therefore are further elaborated in this chapter.

In the following paragraphs, descriptions of the respective second-order themes are presented and illustrated in Figure 11. It is important to mention that the classification of first-order themes to either exploitation or exploration has been done with the help of typical attributes and characteristics that were discussed in Chapter 2 - Literature Review.

**Exploitation:** The data shows that exploitation is mainly triggered by the prevailing mindset in the organization, which is supported by the characteristics of sustainability. Therefore, the first-order themes of Figure 11 are sustainability related, but at the same time part of the prevailing mindset of the organization. Thus, our data shows that sustainability does not create slack resources. On the same line, sustainability strives to optimize and triggers the company to focus more on efficiency. Furthermore, sustainability fosters production process improvements, which is a clear indication for exploitation as well. In addition, the findings show a prominent theme in the statement that sustainability is about ‘reusing something’.

*“[Sustainability] It is a way to take care of all our resources, human beings, and environment, in the best way. And strive to optimize”*

*“I have to do my daily job, also when I have some time, I work on Ecoboard...”*

*“[slack of resources?] the money was spent by the [name of plant] unit. Meaning, we have a budget that we finance through our profit, our cash flow”*

*“Forcing us to be more efficient is a way of being more sustainable”*

*“We are trying to focus on the projects like waste reduction and efficiency. We trying to focus on also high-ethics.”*

*“[to reach sustainability] it is a lot around the process, the production process”*

*“[sustainability] ...reuse something...”*

*“Many little initiatives... instead of throwing away the old pallets in waste, we use them, give them to a guy, repair them and send them back”*

*“Follow this kind of philosophy, so reuse, avoid doing new production and rest, scraps in the warehouse”*

*“[influence of sustainability on long-term influence?] No, I don't think that that has an impact”*

**No clear distinction:** This theme is characterized by the fact that the respective first-order themes cannot be specifically allocated to one or the other (exploration or exploitation). The findings show, for example, that sustainability is becoming part of the skills, and that sustainability triggers the search for new solutions. However, they can result in both, either exploration or exploitation, therefore, these first-order themes are categorized into this theme.

*“It (sustainability) is becoming part of the skills”*

*“We are looking to see if we can find other types of chemicals. Or other types of products that it is not that easy.”*

*“I think that will be a differentiator, if competition do not have the same. [sustainability]”*

**Exploration:** The data shows that there is a lack of evidence for exploration that is triggered by the prevailing mindset. Sustainability in that respect, initiates some exploration, however, those effects are mitigated by the prevailing mindset. Therefore, the first-order themes of Figure 11 are sustainability related, but as mentioned before, significantly influenced by the prevailing mindset, which in turn makes it to a theme that is mainly formed by the prevailing mindset. The findings show that sustainability is basically *“long-term profitability”* and that it is situated mainly outside of the comfort zone. Another theme that clearly relates to exploration, is that sustainability has/needs long-term orientation/long-term perspective.

*“It [sustainability] means “long-term profitability”*

*“That is really on the outside their comfort zone and there is in this context was basically that we had to start a new part of the company that is doing it because otherwise it would just focus on the main product”*

*“the quick fix today ... Now you have people working more long-term with this. That's needed”*

Figure 11 represents the data structure in relation to the trade-off caused by the prevailing mindset and supported through the characteristics of sustainability.

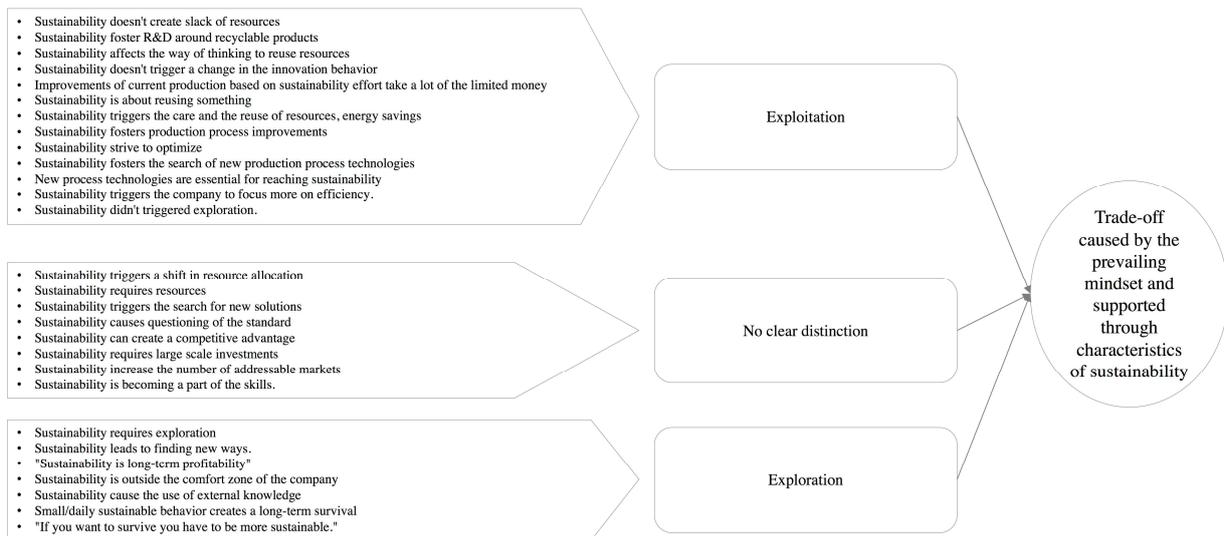


Figure 11: Data structure “Trade-off caused by prevailing mindset and characteristics of sustainability”.

#### 4.5.2 Trade-off caused by Organizational and Managerial Changes

From the data, we can see that sustainability has affected or caused organizational and managerial changes. Those changes are influencing the tension of exploration and exploitation in the way that they affect the trade-off based on the changes in the managerial decisions. Thereby, as mentioned in Chapter 3.4.2, the findings are filtered by using a sustainability project as a criterion that was revived by the organizational and managerial changes. By weighting the second-order themes, a tendency towards exploration can be identified. In the following paragraphs, descriptions of the respective second-order themes are presented and illustrated in Figure 12.

**Exploitation:** The data shows that with the organizational and managerial changes also exploitative characteristics occur, or in other words, they are limiting explorative initiatives. In our specific case, exploitation is triggered by sustainability, as such projects mainly aim to reuse or improve something, but do not have any slack resources that can be used to explore more outside of the own trajectory. Therefore, not the organizational and managerial changes itself trigger exploitation, but it is rather triggered by the limitation in resources.

*“Head of Sustainability has to find the money somewhere”*

*“I don't have any budget [as Head of Sustainability]”*

*“Head of Sustainability, let say don't decide about investments or resources or projects, we have to drive them and have our superior [Region Manager] as sponsor”*

*“They are many investment that we want like to do [context of sustainability projects], but we can not, because we have to choose”*

**No clear distinction:** The theme occurs through data that are not clearly classifiable due to the general nature of some statements. Therefore, first-order themes as ‘Sustainability effort are more organized/structured now’ do not provide a clear characteristic that allows a classification towards exploration or exploitation. Business potential can be seen in both ways, following the common trajectory and use internal knowledge and develop this, or going outside of the common mindset and leave old patterns.

*“It's [sustainability] more organized today, what they do and should focus on”*

*“We have a lot of to invent there [sustainability]”*

*“It's [sustainability] actually a business potential in it, and that thinking”*

**Exploration:** The explorative nature that comes with the sustainability project (Ecoboard), which is presented by the data, relates to the development of a more explorative space, breaks down limitations, that occurred over time and are constituted in the prevailing mindset. Therefore, the approach of sustainability projects foster the creation of problem-solving capabilities by looking outside-of-the-box, which represent a distinct explorative characteristic. In addition, various sustainability projects showed

explorative traits in the process of how they were approached. On the other hand, the Head of Sustainability (structural change) is now encouraging a more explorative innovation strategy. This also goes hand-in-hand with the *Characteristics of Sustainability* as such, as it requires a separation of the sustainability activities from the operations, and thus, reveal the achievement of a structural ambidexterity to manage explorative and exploitative initiatives simultaneously.

*“They really show talent. They become creative, they become trouble-shooter”*

*“[Sustainability project] It's really a learning exercise”*

*“[Restrictions of doing] It's a lot up to the Head of Sustainability”*

*“[Sustainability project] Maybe that is not innovative in the market, but the process is really innovative”*

*“[Sustainability project] It was an innovation when it was developed to make a product out of this, that was something new. Now it needs more innovative marketing thinking and product usage thinking.”*

*“Ecoboard, we try my segment and it's not working but this is part of the life”*

Figure 12 represents the data structure in relation to the trade-off caused by organizational and managerial changes.

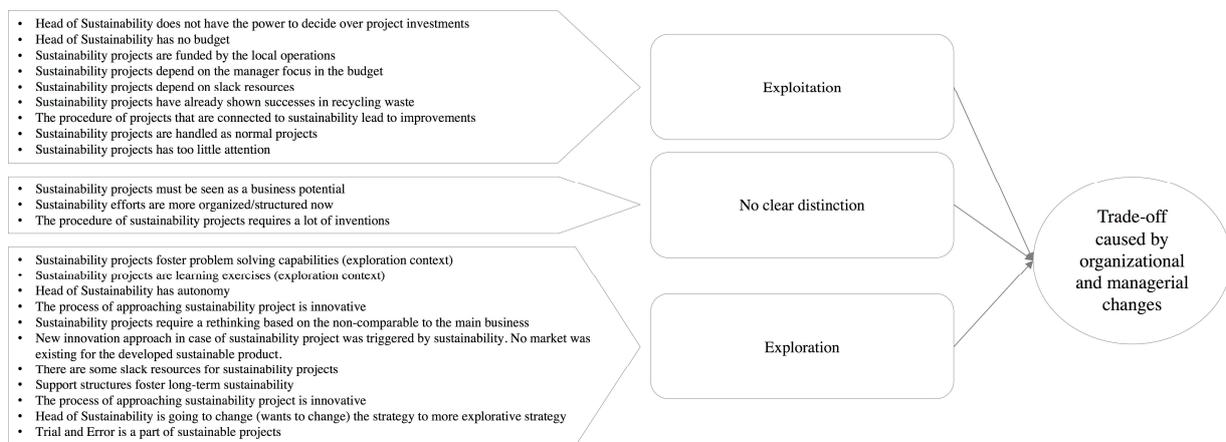


Figure 12: Data structure “Trade-off caused by organizational and managerial changes”.

## Chapter 5: Analysis and Discussion

### 5.1 Everything is based on Managerial Decisions

Overall, it can be said that the tension between exploration and exploitation, as it is discussed in the literature, is mainly driven by the trade-offs that are anchored in the managerial decisions of an organization (Lavie et al., 2010). Following this, the question arises, how can the tension be influenced by an antecedent without affecting the managerial behavior of a firm?

Therefore, this question leads to the following paragraph that reveals the importance of discussing the effect of sustainability on the trade-off between exploration and exploitation. Looking therefore at the characteristics of sustainability, a balance between explorative and exploitative preferences can be assumed. With this perception and the principle of resource scarcity of a company (Penrose, 1959), the explorative characteristics of sustainability can not take place without resource reallocation that is mostly characterized by organizational changes. Therefore, and coherent with our findings, it leads to the fact that sustainability as such, without any organizational or managerial changes, only result in exploitative activities. Thereby, and with respect to our case company, which is currently rather exploitation-oriented, the trade-off that is influenced by the characteristics of sustainability, without considering the organizational and managerial changes, can be seen as a supportive mechanism that supports the prevailing mindset by acting in the same direction, towards exploitation. With the organizational change and the associated changes in the managerial behavior, a shift towards a more explorative tendency could be identified. This can be argued with resource reallocation and the creation of the necessary space for activities that are directly connected to the daily business. Moreover, and in relation to the differentiation of the findings and associated assignment of those to two points in time ( $T_0$  and  $T_1$ ), before and after the organizational changes, the supportive, exploitative characteristics of sustainability takes place as long as no resource reallocation in the form of organizational changes happen.

As this paragraph points out, the managerial behavior, or in other words, the trade-off is the main influence factor on the tension between exploration and exploitation. This fundamental principle should always be considered. However, a direct influence of environmental dynamism based on changes in the individual behavior, as it is outlined in Chapter 2.4, is not shown by the data, and therefore leads to a specific focus on the trade-offs.

### 5.2 Analysis of the identified Relations between Aggregate Dimensions

The analysis is based on the previously identified aggregate dimensions and the associated data structure. This analysis, therefore, follows a fluent process with forward-backwards maturity to transform the static data structure into a “dynamic grounded theory” (Gioia et al. 2016:26). Thereby, this dynamic process leads to the following model, which is illustrated in Figure 13 and reveals

interesting dynamic relationships, showing that the themes and aggregate dimensions are interrelated and connected.

To be more specific, the “grounded theory” model in Figure 13, shows the environmental antecedent “sustainability/environmental dynamism” and the respective trade-offs influencing the tension of exploration and exploitation. Furthermore, by using a dynamic view, the two distinct trade-offs ‘Trade-off caused by the Prevailing Mindset and supported through the Characteristics of Sustainability’ and ‘Trade-off caused by Organizational and Managerial Changes’, also describe two different points in time. The former one, including the prevailing mindset, marks the situation of how it was before changes in the organization and management were introduced ( $T_0$ ). As a consequence, the relations between the organizational and managerial changes and the tension of exploration and exploitation stand for the result of the introduced changes ( $T_1$ ) (which are indicated by the dotted lines).

In that respect, sustainability, on the one hand, with its characteristics that support the prevailing mindset, and on the other hand, with its connected organizational and managerial changes, creates trade-offs, that subsequently influence the tension of exploration and exploitation by promoting either the one or the other. Thereby, a clear distinction of the effects on the tension of exploration and exploitation that are caused by the organizational and managerial changes is not possible based on the available data and should, therefore, be further elaborated in future research. Only a combined tendency towards exploration and exploitation can be identified (marked with + in the model). The lack of data and the resulted revealing of the tendency is applied in two cases of trade-offs. Going one step back, the model in Figure 13 also shows what triggers for the shift in sustainability could be found in the case company. In the following, the most essential relations between the dimensions will be analyzed and described in more detail.

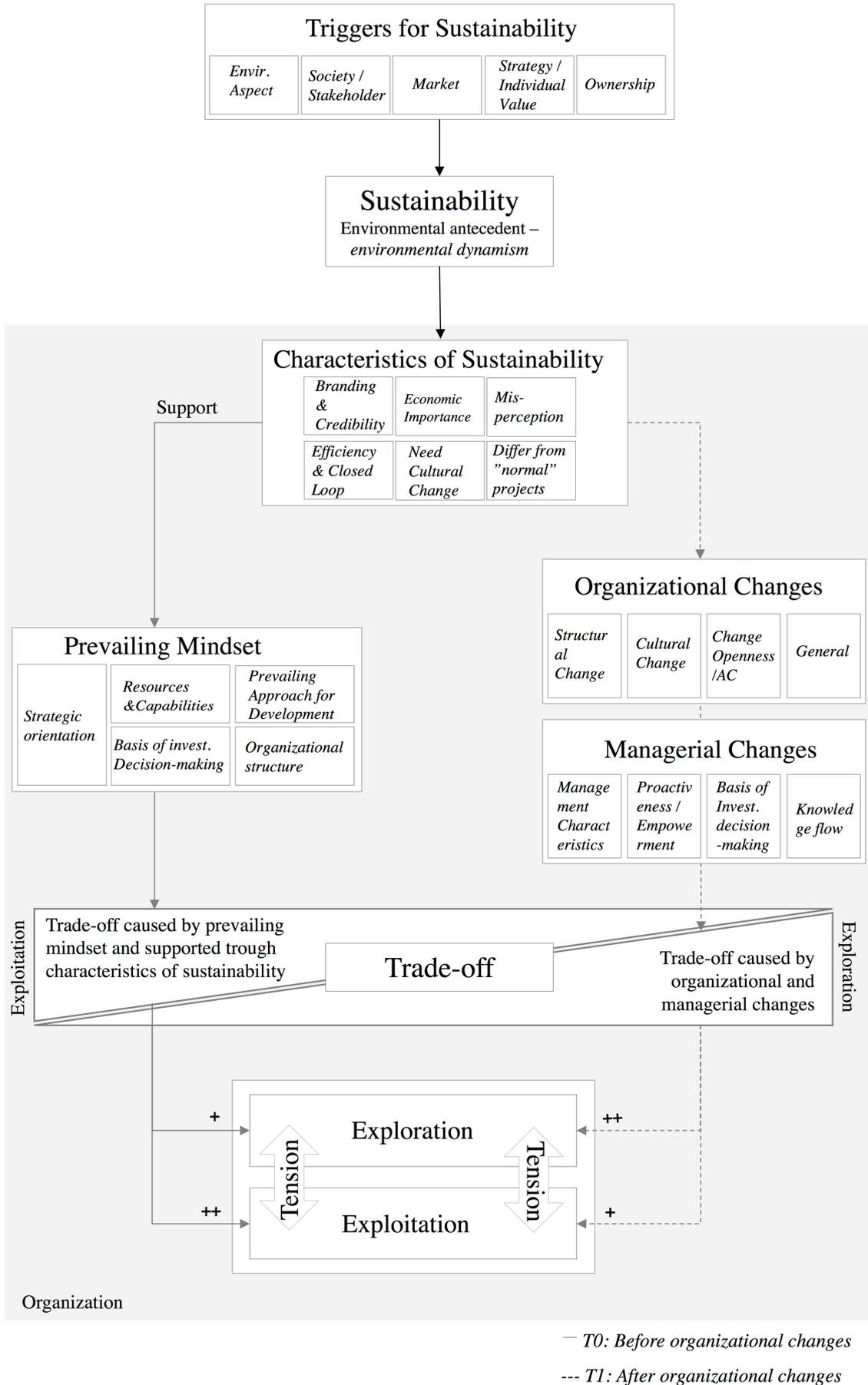


Figure 13: Model of the tension of exploration and exploitation and the influence of sustainability on that tension.

### 5.2.1 Trade-off: The tendency towards Exploitation based on the Prevailing Mindset

This relation plays an important role as it describes how the existing mindset inside of an organization influences the tension between exploration and exploitation. The prevailing mindset is, amongst others, characterized by the *strategic orientation, organizational structure, prevailing approach to development, resources and capabilities*, and the *basis of investment decision-making*. Therefore, by the means of the data that was gathered during the data collection phase, it can be concluded that the prevailing mindset is fostering more exploitation than exploration. The following two quotes should act as examples for this conclusion: “...with different owners, I think, when it comes to innovation, you can probably do different things... [more exploration]” and “...if you're too much in the dominant logic, it's also very difficult to be innovative...”.

### The supportive function of Sustainability Characteristics towards Exploitation

This relation describes how the specific characteristics of sustainability act as a supportive function for exploitation, rather than exploration, and thus, influence the tension. Sustainability, therefore, is characterized by the *economic importance, branding & credibility, efficiency & closed-loop, need cultural change*, and by the *differences from 'normal' projects*. Looking at the data collected, it can be seen that sustainability in a direct way, again fosters and positively influences exploitation more than exploration by supporting the prevailing mindset towards exploitation. Empirical evidence can be found, for example, in the following two quotes: “...we did it [sustainability initiatives] because we want to be sustainable on all that, but we wouldn't have done, if we didn't make some money out of it too...” and “...we are trying to do, of course to capitalize in that in our marketing and so on...”.

In addition, this can be seen in connection to the prevailing mindset as well, which is believed to act mitigating towards exploration (in case the prevailing mindset is exploration-oriented). This could be partially confirmed by the ongoing revealing of conflicts. However, the exact shares of the respective influences are not the objective of this research and need more detailed examination in future research, as previously mentioned.

### 5.2.2 Trade-off: Organizational and Managerial Changes as Groundbreakers for a more Explorative Tendency

This relation represents how sustainability indirectly, over the changes in the organization and management, influence the tension. Organizational changes include *structural changes, cultural changes, changes in the openness and absorptive capacity*, and *general*. Managerial changes include *management characteristics, proactiveness/empowerment, basis of investment decision-making*, and *knowledge flow*. By the means of these two introduced changes, sustainability indirectly triggered a change in the tension between exploration and exploitation, compared to the state  $T_0$ . This indirect influence showed to foster more exploration than exploitation, which is in contrast to the previously mentioned influence. Empirical evidence for that conclusion can be found in the following three statements: “...when [Head of Sustainability] was employed, it was a clear sign and on focusing on

*environmental issues...*” and “...we simply produce too much waste or we must find a way to use it in a more sustainable way...” and “...I think, that was also the new, sort of leadership, that took over, ... I think, that leadership also understood that one of the driving forces in the composite revolution is the need for more sustainable solutions...”.

As a result, in our model, the organizational and managerial changes, that were caused by sustainability, was found as the only influence factor that fostered more exploration than exploitation. The prevailing mindset and the supportive function of the sustainability characteristics, as such, were found to foster exploitation. Moreover, this causality between organizational and managerial changes and the tendency towards more exploration is elaborated more in detail in Chapter 5.3, based on the argumentation that conflicts between the characteristics of sustainability and the prevailing mindset emerge quite naturally.

### **5.3 The Necessity for Organizational and Managerial changes to force Momentum for Exploration in the Case of Sustainability**

Following the logic of the model, several conflicts can be identified that originate from the characteristics of sustainability, the prevailing mindset and the tension of exploration and exploitation, and thus, point out the necessity for organizational and managerial changes to force momentum for more explorative initiatives in the case of sustainability. In the following paragraph, the most intriguing conflicts will be discussed in more detail.

#### **5.3.1 The conflict of Firm’s Short-term Orientation and the Long-term Perspective of Sustainability**

According to our case company and the related ownership situation (case company is owned by a private equity company that is looking for profit maximization), the business within the firm is mainly driven by costs. Therefore, the return-on-investment and the associated payback of projects are relatively high and short, respectively, and thus, lead to a short-term orientation. “*You cannot, you know, cannot plan for a long-term horizon when you have an ownership like that, on the other you need to accept it so but we do have a short-term perspective for sure.*” From that point of view, a conflict emerges with the nature of sustainability as it is characterized by a more long-term oriented perspective. “*Sustainability is long-term profitability*”. A separation or a special treatment is not the case, and thus, leads to the competition of “normal” projects and sustainability projects. “*Ecoboard things, ... that would be a normal investment case*”. Based on this, an investment committee is deciding on a final list of projects that are further examined. Referring here to the prevailing investment criteria, payback, a beforehand exclusion is inalienable, and thus, leads to a downgrading of sustainability in total. “*The payback is most important*”; “*And if I said earlier, that sustainability is long-term profitability, we have a problem*”.

However, in the case of cost-saving targets, sustainability activities are further examined e.g. process technologies. Those projects are further pushed based on the fact that they increase efficiency, and thus, save costs. Another point of view that should be considered is that sustainability is more connected to “*small things/doing*” that are less investment intensive, i.e. waste separation, for example. In contrast

to that, more explorative activities are suppressed by the longer-payback and necessity for investments that are connected to uncertainty. This resource allocation is mainly driven by the prevailing mindset as it is not directly influenced by sustainability.

### **5.3.2 The conflict of Investment Decision-making and the Misperception of Sustainability**

Moreover, the downgrading of sustainability can be also seen in relation to the misunderstanding of sustainability as a one-dimensional concept that only focuses on the environmental pillar. This leads to the perception that people and profit get left out. *“This topic is it's it's very it's so big but in some people's mind I think it's like a hippie, because you can't really touch it”*. This wrong perception may lead to a lower priority of sustainability for the future of the company. This fact of necessity for the future points out that sustainability also refers to a sustainable cost structure of a company (sustainability pillar of profit), and thus, require, in the case of our objective of the study, more long-term investments. Thereby, this partial misunderstanding can serve as a misleading base for the investment decision-making and therefore calls for an efficient information and communication strategy. *“VP Sustainability has a big job to informing because I think that the people don't really know how important it is and what he is doing”*; *“So I think that information, but in the right form”*.

### **5.3.3 The conflict of Dependency on Individuals and the Need for a holistic Integration of Sustainability**

In addition, sustainability initiatives also depend on the individual decisions and values, as well as on slack resources. For example, decisions on sustainability initiatives are up to the plant manager but are restricted by the yearly budget that was approved by the board/investment committee. *“It works like this they have a plan and they have budget for the company they take expenses they said that they are take two thousand expenses OK then the plant manager maybe decides it to take the Ecoboard in because he believe in it.”* Therefore, and by following the financial approval steps, according to the magnitude of the investment, the own values and beliefs of the plant operator in a project are key for further examination. Thereby, a basic amount of slack resources is non-scheduled for sustainability, which is contradicting to the need for slack resources in the case of sustainability, and therefore, is in close relation to the short-term orientation of the firm and to the main criteria for investments, short payback, which was elaborated before. Or in other words, sustainability is propelled by the individual decision to spend some time and money on it, thus, depends on the economic situation of the company. *“Now when we are ramping up, or the economy all over the place is pretty good, then we can afford to look into stuff like this”*; *“I have to do my daily job, also when I have some time, I work on Ecoboard ...”*.

At that point, the values of the top management team, and thus, the characteristics of them were enhanced with a sustainability part by nominating a CEO/President that has a long history in sustainability and therefore, led to higher engagement and contention of the company with the topic of sustainability. *“Previous CEO was very focused on first class, high-class sales, while the new CEO was more focused, in general, selling [name of case company] as environmentally.”* *“It was the CEO*

*decision, it was the CEO decision*". This further reveals the necessity for cultural change in values, behavior, and awareness towards sustainability.

#### **5.3.4 The conflict of Integration into the Main Business and the Need for Separation of Sustainability**

Furthermore, besides the sensitive characteristics of sustainability and the rather moderate resource allocation to those projects, sustainability is also facing resistance within the company, especially in the case of Salesforce activities. Therefore, based on the differences in cost structure, product performance and product logic (low margins and markets outside of the common trajectory of the firm) compared to the main business, the salesforce is mainly focusing on the main activities and also set their priorities there. *"We have been around for a very long time, I think. So that's the problem with Ecoboard too, everyone in the organization is so focused on traditional sandwich and it's about weight savings, and all that if something comes in from the side, it's very difficult for everyone, to rethink, how can we use this"*. This is partially caused by the prevailing mindset, to sell high-performance core material. The given lack of resources pushes sustainability initiatives more into a minor matter, which is further facilitated by the misunderstanding of the whole topic. This resistance or the occurred inertia between main business and sustainability initiatives led to the separation, which is represented by the organizational change towards the creation of the job position of Head of Sustainability. *"It doesn't work so we need to have a basically a separate driver for the this which is not connected with the ongoing business in the same way so we can force on momentum ...to get power to do something."*; *"That is really on the outside their comfort zone and there is in this context was basically that we had to start a new part of the company that is doing it because otherwise, it would just focus on the main product"* This transition is also supported by the necessity for ownership and responsibility of sustainability tasks, to set a clear sign within the company for the importance of sustainability. *"It's important to give their right focus, the right visibility, the right ownership to teams to the production workers"*. Moreover, looking at that point on the previously mentioned differences in project logic, sustainability also causes an expansion of the skill base of each employee to rethink their daily doing and to approach projects in a different way, which led eventually to a process that is discontinuous to the firm, and thus, create inertia.

In general, those conflicts and the related needs, lead to an affected trade-off towards exploitation rather than exploration in the case of the characteristics of sustainability, as it is supportive towards the prevailing mindset of the company. As a result, it seems that the prevailing mindset mitigates the effects that sustainability potentially has on the trade-off between exploration and exploitation.

## 5.4 Discussion of the generalized Framework

The following discussion develops a more general framework on basis of the previously identified model (Chapter 5.1). This framework will be discussed by considering other literature around the topic of the tension between exploration and exploitation. Therefore, due to the lack of knowledge and the lack of a holistic view in the literature about antecedents and, especially environmental antecedents, the generalized model (Figure 14) generated in this thesis represents a detached framework, that should serve for further research in this field.

Nevertheless, in our literature review, we revealed that the tension between exploration and exploitation has three main antecedents that affect the trade-offs between both concepts. They can be of environmental, organizational, and/or managerial nature (Lavie et al., 2010). Thereby, a lack of a holistic view in the literature on those antecedents was identified (e.g. Lavie et al., 2010; Marín-Idárraga, Hurtado González & Cabello Medina, 2016). This isolated perspective is therefore in contradiction to common research that argues for an interrelation between those constructs e.g. strategy and structure (Chandler, 1962), environment and behavior (Dill, 1958). Moreover, we also pointed out that the tension is mainly influenced by the trade-off that a company faces, and thus, is directly connected to the managerial decisions. This led to an examination of direct and indirect influences between an antecedent and the trade-offs of exploration and exploitation. According to our research question *'How does sustainability as a special case of environmental dynamism influence managerial and organizational antecedents and thereby the tension of exploration and exploitation within a technology-driven company?'* our findings reveal that a relation between the tension of exploration and exploitation and sustainability as a special environmental dynamism exists, and vice versa, sustainability affects the tension in a special way within a firm.

Nevertheless, as it is discussed in literature (e.g. Pappas et al., 2015, Senge et al., 2010), the success of sustainability as such, is mainly depending on individuals and the associated community network, and thus, represent an interrelation between sustainability and individuals. Based on that, we argued in Chapter 2.4 that sustainability is a special case of environmental dynamism that can have a direct influence on the tension between exploration and exploitation on the individual level (see Chapter 2.2.3: Exploration and Exploitation on different levels of an organization). However, it should be mentioned that the data does not provide clear evidence that justifies a distinction between direct and indirect influences of sustainability on the tension between exploration and exploitation. Thereby, an explanation for the non-locating of the direct relation between the tension and sustainability can be found in the same research field of influences for individual behavior changes. In accordance with the observations within the firm and the fact that the individual behaviors are mainly driven by interactions with the own circumstances, which is represented in our case by the organization as such, it can be assumed that reaching a trigger point in the society in sustainability has to be included in the organization as well, to influence the working behavior of employees. Therefore, a transfer of the sustainability movement into the organization, allows individuals, in turn, to transfer their private sustainable behavior onto a

professional level within the firm. Those thoughts are in line with the perception of Morrison (2000) and Borghini (2005) who posit that individuals extend the organizational culture by including personal traits, capabilities, and experience, but at the same time, individuals are influenced by the culture, or in other words, by the prevailing mindset. Therefore, and as Maletič et al. (2014) point out, the “top management support, integration of sustainability into vision and strategy, and establishing a sustainability-centred culture” (Maletič et al., 2014:189) can demonstrate and enable a trigger point within the organization. Moreover, this also highlights the necessity for a holistic integration, including organizational and managerial changes, of sustainability that influences the mindset of a company, and thus, creates space for a more individual development that allows explorative initiatives.

Moreover, following the argumentation of Borghini (2005), who argues for an enhancement of the organizational creativity by integrating new perspectives and values, which in turn, influence the culture as well as the prevailing mindset. In that way, and based on the fact that the trade-offs that influence the tension between exploration and exploitation are interrelated, this leads to a more dynamic perception of the generated model. Therefore, this learning process of new knowledge creation, value and competence appropriation follows a generative process that is represented by the organizational change that causes a new equilibrium by integrating new external perspectives (Morrison, 2000; Borghini 2005). In our case, this causes a new equilibrium of the tension between exploration and exploitation and points out the importance of the top management team characteristics. Moreover, those findings also lead to the assumption that companies gain superior capabilities to handle environmental dynamism, based on the learning experiences of a company that were gained during the adaption to environmental dynamism. Therefore, this demonstrates a backward-relation from the trade-offs as such, towards the ability of a firm to react on environmental dynamism.

Moreover, as highlighted in Chapter 5.1, the tension is mainly influenced by the trade-off, which is directly connected to the managerial behavior of a firm (Lavie et al., 2010). That underpins the necessity to have a more holistic perspective on the antecedents and the influence on the tension of exploration and exploitation. Thereby, and especially in the case of sustainability, the influence on the trade-off is mitigated by the prevailing mindset based on the non-existence of the sense of urgency in the case of sustainability. A necessity to include and follow the concept with all three pillars of sustainability – profit, people, environment – is not necessary, as Kiron, et al. (2012) pointed out that sustainability still nears a tipping point, and five years later, this tipping point is not yet reached. Moreover, the data shows a clear connection between sustainability as an environmental antecedent and the other antecedents. In the light of our findings and the generated framework, an interference between antecedents, and thus, the direct and indirect relation to the trade-off to support more exploration rather than exploitation, and vice versa, could be identified. Looking thereby, explicitly on sustainability as an environmental antecedent, the effects on the trade-off are influenced or caused by the characteristic itself, as well as by the prevailing mindset of the company. Therefore, the question arises, to what extent the generated framework is applicable in a general way. Thereby, the framework in Figure 13 should be seen more as

a dynamic model that argues for and demonstrates the different trade-offs that are involved within the tension between exploration and exploitation. For example, if the prevailing mindset of a company is distinctive towards a more explorative one, sustainability would act in a contradictory way without any organizational or managerial changes. Sustainability might help the explorative company to reach a balance between exploration and exploitation by fostering exploitative initiatives focused on resource-efficiency through further developments in process technologies, for example.

Moreover, our findings support the argumentation of Tinoco (2014) and Zhou and Wu (2010) that argues for a relation between the tension of exploration and exploitation and technological capabilities. Especially, the relation between exploration and technological capabilities and the influence of the strategic flexibility of a company are in line with our findings (Zhou & Wu, 2010). Therefore, the organizational change and the associated reallocation of resources and reconfiguration of processes is represented by the expansion of the Board of Directors, as well as by the separation of the sustainability department from the operations. This strategic flexibility, as Zhou & Wu (2010) define, increases the positive effects of technological capabilities on exploration. Simultaneously, the organizational inertia that is created by dominant logic and technological capabilities can be observed as well within the case company, and thus, support the findings of Zhou and Wu (2010) adequately.

As a result, we identified the following generalized model in Figure 14, as one that summarizes and generalizes the findings of our empirical research by explaining the relations between sustainability as an environmental antecedent (environmental dynamism), characteristics of sustainability, prevailing mindset, organizational/managerial changes, trade-offs and the tension of exploration and exploitation. Therefore, and in comparison, with the more specific model in Chapter 5.2, the value is added by deriving the specific case to a more general one that allows an utilization of our findings. Moreover, the supportive, as well as the balancing function of the exploitative tendency of sustainability, is shown.

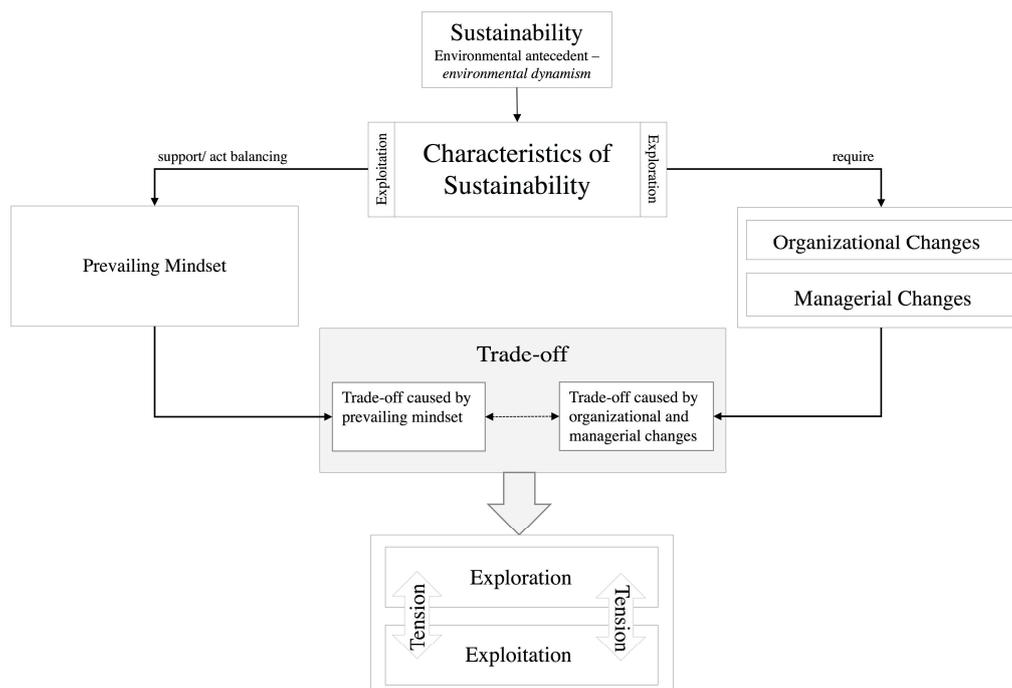


Figure 14: Generalized model of the tension of exploration and exploitation and the influence of sustainability.

In the model in Figure 14, sustainability as an environmental antecedent is visible inside the organization by the characteristics attributed to the concept. Therefore, on the one hand, sustainability with its characteristics has more explorative attributes that call for organizational and managerial changes, as it is highlighted by the following quote, *“That is really on the outside their comfort zone and there is in this context was basically that we had to start a new part of the company that is doing it because otherwise it would just focus on the main product”*, on the other hand, sustainability as such triggers the use of resources in an effective and efficient way, *“Sustainability is optimize”*, and thus, also includes exploitative attributes. Looking at the latter one, the exploitative nature can support the prevailing mindset or in the case of an explorative prevailing mindset, act balancing towards the trade-off between exploration and exploitation. Thereby, the exploitative nature does not require organizational or managerial changes, since those optimizations are cost driven, and thus, go hand-in-hand with the overall aim of organizations, to act profitable. Overall, the trade-off that is caused by the prevailing mindset and supported or balanced by the exploitative tendency of sustainability and the new trade-off that occurs through the release and reallocation of resources by the organizational and managerial changes, result in a new equilibrium of exploration and exploitation. Thereby, those trade-offs are interrelated and also reveal a backward coupling, which culminates in a dynamic framework.

Nevertheless, as discussed previously, the question arises to what extent the developed framework could be generalized based on the specific context of the case company that takes a major part of the framework as such. However, the framework and especially our data demonstrate that sustainability should be considered in a special way based on the unique characteristics that come with it. To “harvesting opportunities” as a firm in total, which are provided by the environmental dynamism sustainability, necessitates a holistic integration.

## Chapter 6: Conclusion and Implications

### 6.1 Conclusion

In this study, we have examined how sustainability as a special case of environmental dynamism influences the tension between exploration and exploitation within a technology-driven firm. Overall, our research represents an empirical case-study, thereby reacting to the gap in literature, which, so far, was focusing more on simulations. This can be seen as the most valuable contribution of this study to the research field of environmental antecedents. Moreover, the study also indicates that environmental antecedents, especially talking about environmental dynamism, differ from case to case, and thus, allows only a limited generalization of the influences of sustainability to other cases of environmental dynamism. In addition, a holistic view of the various antecedents has been applied and the relations between them were researched, which contributes to existing literature.

In the literature review, three main topics were discussed. First, the framework of exploration and exploitation with a deeper analysis of the balancing act that the literature prompt to increase the overall performance and reach long-term survival. Second, the concepts that occurred around the influences on the tension between exploration and exploitation that is narrowed to organizational, managerial, and environmental antecedents. Third, sustainability that acts as a special case of environmental dynamism, which is a subcategory of environmental antecedents. Based on these three main areas, a gap in research was identified, and thus, served as the basis for this study.

In the analysis, different characteristics of sustainability within a firm are presented that can more or less be divided into subgroups with more explorative or more exploitative attributes. Moreover, the analysis also reveals the importance or the momentum that is represented by the prevailing mindset of a firm, how they handle the tension between exploration and exploitation through trade-offs in a common way. Thereby, it should be mentioned that the trade-offs itself are the most influential factors when it comes to the tension between exploration and exploitation. This is based on the fundamental assumption that the tension, which occurs from the natural competition of activities based on the limitation of resources, is mostly driven by the decisions of the management to foster either exploration or exploitation. Therefore, this study does not show evidence for the indicated model of direct and indirect influences of environmental antecedents on the tension between exploration and exploitation as it was derived from the literature review. This led to an adjustment in the focus of this study towards the relationship between environmental dynamism and the trade-offs that influence the tension. However, the different characteristics of sustainability combined with the prevailing mindset evoke different actions, reactions or initiatives within a firm.

Starting with the more exploitative attributes of sustainability, we can see that those are implemented within the mindset without considerable changes on the organizational or managerial side. This is based on the main aim of sustainability to use resources in an optimal way and represent a relatively resource-

efficient procedure, which results in a support function, on the one hand, or in a balancing towards the prevailing mindset, on the other hand.

On the contrary, the explorative attributes of sustainability require organizational or/and managerial changes to stimulate the explorative force, which in turn, requires additional resources.

Nevertheless, and as it was indicated above, the tension is influenced by the trade-off of the company as such. Thereby, the exploitative attributes lead to an adjustment of the trade-off that is mainly driven by the prevailing mindset and is as previously mentioned supported or balanced by the implementation of sustainability. The trade-off that is created by the organizational and managerial changes caused by sustainability is in doing so, more explorative-oriented. But, this does not lead to a rivalry between the two different kinds of trade-offs, it should be seen more as a generative process that consists of interrelations between both trade-offs and results in a new equilibrium of exploration and exploitation that is dynamic in its existence.

## 6.2 Limitations

There are various indicators which possibly limit the conclusions that can be drawn from the presented study. Those limitations can be clustered into more general constraints that are coming along with the selected research method, qualitative research, and into more specific ones, that are more related to the study as such.

First, the nature of qualitative research is to understand social constructions and contextual interactions between those, this leads to unavoidable interpretation by the researcher itself (Bryman and Bell, 2011). Moreover, by selecting semi-structured interviews as the main instrument for data collection, which represent a direct interaction of interviewers and interviewees, social desirability bias might occur, and thus, might have an impact on the responses (Bryman and Bell, 2011). Nevertheless, looking at the systematic review approach for literature, also some limitations occur around the literature review, especially in the context of this study, as it is a student research project. Based on time and resource constraints a holistic review of literature around the theoretical constructs to which this study contributes, cannot be ensured. In addition, going back to the nature of qualitative research, biased decisions of inclusion or exclusion of articles for the literature review, cannot be avoided (Bryman and Bell, 2011).

Regarding the sample for the data collection, the influential character of qualitative research emerges again based on personal judgments, decisions, and selection criteria about who will be included or not (Bryman and Bell, 2011).

However, there are also some specific limitations that are related explicitly to this thesis. The aim of this research was to examine how environmental dynamism affects the tension between exploration and exploitation by conducting an empirical single-case study. This examination was based on the changes that happened in a small temporal distance to this research. However, as the changes are still ongoing, one limitation can be seen in the fact that the research could not capture the complete set of influences

of sustainability on the tension between exploration and exploitation, especially in the case of the organizational and managerial changes. Furthermore, the research is taking a retrospective view on the changes and influences, which leads to interferences according to interpretation and narratives from the interviewees (Bryman and Bell, 2011). Thereby, in our case, no clear distinction could be made in the extent to what organizational or managerial changes influence the tension between exploration and exploitation, as it was not shown in the data. Moreover, the influence of other environmental antecedents cannot be totally excluded (e.g. competitive intensity), based on the research on a real case organization. However, the data collection was targeting just asking for the influences of environmental dynamism, explicitly sustainability.

Besides that, as we examined the research question in a multinational context, we also had to conduct one of the interviews via video conference. Therefore, according to Bryman and Bell (2011), the quality of data that was gathered within this interview is 'inferior', as it limited us to gather specific data about the atmosphere or emotions, compared to face-to-face interviews (Bryman and Bell, 2011). Nevertheless, this limitation is rather minor in our case, based on the limited use and importance of the interview-context-information for our research. Another minor limitation can be found in our interview guide. Based on the inductive approach and the nature of grounded-theory, to develop a framework/theory/model out of the collected data, we could not expect and indeed did not get straight responses to the specific topics that we were first targeting (direct and indirect influence of sustainability on the tension between exploration and exploitation). Therefore, a limitation can be seen in that we could have superior data by having an additional iterative phase in our data collection. Finally, as the research follows a single-case study, the generalization of the developed framework is quite limited, especially as the prevailing mindset of the organization plays such an important role. Therefore, further research is needed to confirm or falsify our developed generalized model.

### **6.3 Recommendations for Future Research**

In relation to the above-mentioned limitations of our research, several opportunities for future research arise. Looking at the increasing importance of sustainability in companies, future research should add to our research by further examining the influences of sustainability as a special case of environmental dynamism on the tension between exploration and exploitation within real cases. This is necessary, as above mentioned, our study is just a single-case study and therefore limited in its generalization. On the same line, our study found that the prevailing mindset inside organizations play a very important role, therefore, further research on the prevailing mindset in connection to sustainability would create great value for this research field. Furthermore, studies are needed in looking into the relations of managerial and organizational changes and the tension of exploration and exploitation, and there specifically into the differences in effects between organizational and managerial changes. Besides that, as we reveal the necessity for a holistic integration of sustainability to create space for the individual development of more explorative activities, future research should focus on the influences of sustainability on the

individual level. Therefore, this could lead to additional managerial implications, for example, in the case of human resource management, to use sustainability explicitly for staff development. In the end, our framework can be seen as a first scientific model in this field (to the best of our knowledge), which should be further verified, added, confirmed, or even rejected.

#### **6.4 Managerial Implications**

One managerial implication of this study is that organizational and/or managerial changes are needed in order for sustainability to foster exploration within the organization. An important aspect of this implication is that those changes need investments that probably have longer payback periods than 'normal' investments. However, our study showed the importance of allocating resources towards sustainability in a way that makes the topic visible inside the organization. In our case company, this has been achieved by creating a job position which is located in the highest hierarchy level (Head of Sustainability, Member of the Board). In this way, as seen from our empirical data, employees realized and recognized the importance of sustainability. This organizational change was seen as a sign. In addition, the resource allocation should not be limited to the job position itself. A corporate funding that is connected to sustainability initiatives and is managed independently should be realized to create a certain autonomy and, therefore, increase the likelihood of the implementation of more long-term and explorative-oriented activities. However, this decoupling of explorative sustainability initiatives and the provision of additional funding should be in line and in close interaction with other initiatives as business development or innovation management.

Another managerial implication of our research can be seen in the need for communication and training, which was identified as a crucial mean in order to deal with resistance and challenge the dominant logic of employees. On the same line, due to conflicts with the main business, a separation of sustainability projects should be considered, especially when it comes to the salesforce of a company.

## References

- Auh, S., & Menguc, B. (2005). Balancing exploration and exploitation: The moderating role of competitive intensity. *Journal of Business Research*, 58, 1652-1661.
- Barnett, W.P. (1997). The dynamics of competitive intensity. *Administrative Science Quarterly*, 42(1), 128-160.
- Birkinshaw, J., & Gibson, C. (2004). Building Ambidexterity into an Organization. *MIT Sloan Management Review*, 45, 47-55.
- Black, J. A., & Edwards, S. (2000). Emergence of virtual or network organizations: fad or feature. *Journal of Organizational Change Management*, 13(6), 567-576.
- Borghini, S. (2005). Organizational creativity: Breaking equilibrium and order to innovate. *Journal of Knowledge Management*, 9(4), 19-33.
- Boumgarden, P., Nickerson, J., & Zenger, T. R. (2012). Sailing into the wind: Exploring the relationships among ambidexterity, vacillation, and organizational performance. *Strategic Management Journal*, 33(6), 587-610.
- Brehmer, B. (1992). Dynamic decision-making: Human control of complex systems. *Acta Psychologica*, 81, 211–241.
- Bryman, A., & Bell, E. (2011). *Business research methods* (3rd ed.). Oxford: Oxford University Press.
- Carmeli, A., & Halevi, M. Y. (2009). How top management team behavioral integration and behavioral complexity enable organizational ambidexterity: The moderating role of contextual ambidexterity. *The Leadership Quarterly*, 20(2), 207-218.
- Cato, M. S. (2009). *Green economics: an introduction to theory, policy and practice*. Earthscan.
- Chandler, A. D. (1962). *Strategy and Structure*. Chapters in the History of the Industrial Enterprise, Cambridge: MIT Press.
- Christensen, C. (1998). *The innovator's dilemma*. Cambridge: Harvard Business School Press.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128-152.
- Daghfous, A. (2004). Absorptive capacity and the implementation of knowledge-intensive best practices. *S.A.M. Advanced Management Journal*, 69(2), 21-27.
- Davis, J., Eisenhardt, K., & Bingham, C. (2009). Optimal structure, market dynamism, and the strategy of simple rules. *Administrative Science Quarterly*, 54(3), 413-452.
- Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64-87.
- Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly*, 29(1), 52–73.
- Dill, W. R. (1958). Environment as an influence on managerial autonomy. *Administrative Science Quarterly*, 409-443.
- Døjbak Håkonsson, D., Eskildsen, J. K., Argote, L., Mønster, D., Burton, R. M., & Obel, B. (2016). Exploration versus exploitation: Emotions and performance as antecedents and consequences of team decisions. *Strategic Management Journal*, 37, 985-1001.
- Edwards, A. R. (2005). *The sustainability revolution: Portrait of a paradigm shift*. New Society Publishers.

- Elkington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. *California management review*, 36(2), 90-100.
- Gersick, C. J. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of management review*, 16(1), 10-36.
- Gibson, C., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47 (2), 209-226.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16(1), 15-31.
- Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4), 693-706.
- He, Z. L., & Wong, P. K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, 15(4), 481-494.
- Holmqvist, M. (2004). Experiential learning processes of exploitation and exploration within and between organizations: An empirical study of product development. *Organization Science*, 15(1), 70-81.
- Jansen, J. J., Vera, D., & Crossan, M. (2009). Strategic leadership for exploration and exploitation: The moderating role of environmental dynamism. *The Leadership Quarterly*, 20(1), 5-18.
- Jansen, J. J., Van den Bosch, F. A. J., & Volberda, H.W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661-1674.
- Kim, T., & Rhee, M. (2009). Exploration and exploitation: Internal variety and environmental dynamism. *Strategic Organization*, 7(1), 11-41.
- Kiron, D., Kruschwitz, N., Haanaes, K., & Velken, I. V. S. (2012). Sustainability nears a tipping point. *MIT Sloan Management Review*, 53(2), 69-74.
- Kleindorfer, P., Singhal, K., Van Wassenhove, L., (2005). Sustainable Operations Management. *Production and Operations Management*, 14(4), 482-492.
- Kuratko, D., Morris, M. H., & Covin, J. (2011). *Corporate Entrepreneurship & Innovation*. Hampshire: Cengage Learning Emea.
- Lant, T.K., & Mezias, S.J. (1992). An organizational learning model of convergence and reorientation. *Organization Science*, 3(1), 47-71.
- Lavie, D., Stettner, U., & Tushman, M. L. (2010). Exploration and exploitation within and across organizations. *Academy of Management Annals*, 4(1), 109-155.
- Lavie, D., & Rosenkopf, L. (2006). Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49(4), 797-818.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13(S1), 111-125.
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, 14(S2), 95-112.
- Lewin, A. Y., Long, C. P., & Carroll, T. N. (1999). The coevolution of new organizational forms. *Organization Science*, 10(5), 535-550.

- Li, C. R., Lin, C. J. and Chu, C. P. (2008), The nature of market orientation and the ambidexterity of innovations. *Management Decision*, 46(7), 1002-1026.
- Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of management journal*, 52(4), 822-846.
- Ling, Y. A. N., Simsek, Z., Lubatkin, M. H., & Veiga, J. F. (2008). Transformational leadership's role in promoting corporate entrepreneurship: Examining the CEO-TMT interface. *Academy of Management Journal*, 51(3), 557-576.
- Luo, X., & Du, S. (2015). Exploring the relationship between corporate social responsibility and firm innovation. *Marketing Letters*, 26(4), 703-714.
- Maletič, M., Maletič, D., Dahlgaard, J. J., Dahlgaard-Park, S. M., & Gomišček, B. (2014). Sustainability exploration and sustainability exploitation: From a literature review towards a conceptual framework. *Journal of Cleaner Production*, 79, 182-194.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization science*, 2(1), 71-87.
- Marín-Idárraga, D. A., Hurtado González, J. M., & Cabello Medina, C. (2016). The Antecedents of Exploitation-Exploration and Their Relationship with Innovation: A Study of Managers' Cognitive Maps. *Creativity and Innovation Management*, 25(1), 18-37.
- Matthyssens, P., Pauwels, P., & Vandenbempt, K. (2005). Strategic flexibility, rigidity and barriers to the development of absorptive capacity in business markets: Themes and research perspectives. *Industrial Marketing Management*, 34(6), 547-554.
- Maxwell, D., van der Vorst, R. (2003). Developing sustainable products and services. *Journal of Cleaner Production*, 11, 883-895.
- Meyer, A. (1982). Adapting to environmental jolts. *Administrative Science Quarterly*, 27(4), 515–537.
- Miles, M. P., Munilla, L. S., & Darroch, J. (2009). Sustainable corporate entrepreneurship. *International Entrepreneurship and Management Journal*, 5(1), 65-76.
- Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational strategy, structure, and process. *Academy of Management Review*, 3(3), 546-562.
- Mishina, Y., Pollock, T. G., & Porac, J. F. (2004). Are more resources always better for growth? Resource stickiness in market and product expansion. *Strategic Management Journal*, 25(12), 1179-1197.
- Mom, T. J. M., van den Bosch, F. A. J., & Volberda, H. W. (2007). Investigating managers' exploration and exploitation activities: The influence of top-down, bottom-up and horizontal knowledge inflows. *Journal of Management Studies*, 44, 910-931.
- Morrison, A. (2000). Entrepreneurship: what triggers it?. *International Journal of Entrepreneurial Behavior & Research*, 6(2), 59-71.
- Nohria, N., & Gulati, R. (1996). Is slack good or bad for innovation?. *Academy of Management Journal*, 39(5), 1245-1264.
- O'Reilly, C. A., & Tushman, M. L. (2011). Organizational ambidexterity in action: How managers explore and exploit. *California Management Review*, 53(4), 5-22.
- O'Reilly, C. A., & Tushman, M. L. (2004). The Ambidextrous Organization. *Harvard Business Review*, 82 (4), 74-83.

- Pappas, E., Pappas, J., & Sweeney, D. (2015). Walking the walk: conceptual foundations of the Sustainable Personality. *Journal of Cleaner Production*, 86, 323-334.
- Penrose, E. (1959). *The theory of the growth of the firm*. Oxford: Blackwell.
- Pondy, L. R. (1967). Organizational conflict: Concepts and models. *Administrative Science Quarterly*, 296-320.
- Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: Free Press.
- Pujari, D., Wright, G., Peattie, K. (2003). Green and competitive Influences on environmental new product development performance. *Journal of Business Research*, 56, 657-671.
- Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. L. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, 20(4), 685-695.
- Romanelli, E., & Tushman, M. L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *Academy of Management Journal*, 37(5), 1141-1166.
- Rothwell, R. (1992). Successful industrial innovation: Critical factors for the 1990s. *R&D Management*, 22(3), 221-240.
- Sautet, F. (2016) 'Schumpeterian Rents', in Augier, M. and Teece, D. J. (eds) *The Palgrave Encyclopedia of Strategic Management*. London: Palgrave Macmillan UK, 1-3.
- Schudy, C. A. (2010). *Contextual Ambidexterity in Organizations: Antecedents and Performance Consequences* (Doctoral dissertation, University of St. Gallen).
- Senge, P., Smith, B., Kruschwitz, N., Laur, J., & Schley, S. (2010). *The necessary revolution: How individuals and organizations are working together to create a sustainable world*. New York, NY: Crown Business.
- Seuring, S., Müller, M., (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16, 1699-1710.
- Siebenhüner, B., & Arnold, M. (2007). Organizational learning to manage sustainable development. *Business strategy and the environment*, 16(5), 339-353.
- Siggelkow, N. (2002). Evolution toward fit. *Administrative Science Quarterly*, 47(1), 125-159.
- Stettner, U., & Lavie, D. (2014). Ambidexterity under scrutiny: Exploration and exploitation via internal organization, alliances, and acquisitions. *Strategic management journal*, 35(13), 1903-1929.
- Smith, A. (1937). *The wealth of nations* [1776].
- Smith, W. K., Binns, A., & Tushman, M. L. (2010). Complex business models: Managing strategic paradoxes simultaneously. *Long Range Planning*, 43, 448-461.
- Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16, 522-536.
- Teece, D. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy. *Research Policy*, 15, 285-305.
- Tidd, J. & Bessant, J. (2014). *Strategic Innovation Management*. New York: John Wiley & Sons Inc.
- Tinoco, J. (2014). Double dealing: The influences of diverse business processes on organizational ambidexterity. *Academy Of Strategic Management Journal*, 13(2), 87-110.

- Torres, J. P., Drago, C., & Aqueveque, C. (2015). Knowledge inflows effects on middle managers' ambidexterity and performance. *Management Decision*, 53(10), 2303-2320.
- Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31(3), 439-465.
- Tushman, M. L., & O'Reilly, C. A. (1996). The ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8-30.
- UNIDO (2017). What is CSR? Available online: <http://www.unido.org/csr/o72054.html> [Accessed: 12 February, 2017].
- Van der Panne, G., Van Beers, C., & Kleinknecht, A. (2003). Success and failure of innovation: A literature review. *International Journal of Innovation Management*, 7(3), 309-338.
- Volberda, H., & Van Bruggen, G. (1997). Environmental turbulence: A look into its dimensionality. Erasmus University Rotterdam.
- Yin, R. K. (2009). *Case study Research: Design and Methods* (4<sup>th</sup> Ed.). Thousand Oaks, CA: Sage.
- Zajac, E. J., Kraatz, M. S., & Bresser, R. K. (2000). Modeling the dynamics of strategic fit: A normative approach to strategic change. *Strategic Management Journal*, 21(4), 429-453.
- Zakrzewska-Bielawska, A. (2016). Perceived mutual impact of strategy and organizational structure: Findings from the high-technology enterprises. *Journal of Management and Organization*, 22(5), 599.
- Zhou, K., & Wu, F. (2010). Technological capability, strategic flexibility, and product innovation. *Strategic Management Journal*, 31(5), 547-561.

# Appendix

## Appendix 1: Semi-Structured Interviews: Interview Guide

### INTERVIEW GUIDE

Master's Thesis

Tim Gasser & Jürgen Schweigler

#### Introduction

- Thanks for participation
  
- Introduction of us and the research in general (not the topic and purpose)
  - students at Lund University - Master's in Corporate Entrepreneurship and Innovation
  - Business Development Project (finding application fields for *Ecoboard*) and Master's Thesis inside the case company
  - Right now we are in the Data collection phase
  - Research area that we want to investigate in our thesis:
    - Reasons for the change in the innovation behaviour of a firm
  
- We record the interview and subsequently transcribe it. Is that ok for you?
- Anonymous, so we do not mention your name in the thesis.

#### 'Facesheet' information

- Can you introduce yourself?
  - Name?
  - Age?
  - Education?
  - Work experience?
  - Position within the case company?
  - Role within the case company?
  - Years in the case company?

#### PART 1

Nowadays, sustainability has become a major topic within the society, (e.g. shift in the energy sector) people are more aware about their consumption, the sharing of things become a major trend and so on. In that case, companies within this environment are also affected, and thus, have to adapt or change their way of doing. Looking now on the last few weeks here within the case company, we can also see changes that are more or less incremental/radical to the organization.

Especially, along the last 5 years a lot happened within the case company. So we want to know from you how you look on this process of changes? What were the most critical events/actions taken over the years? What did change within the case company over time? Can you tell us the story from your point of view? Thereby, you can use this sheet of paper and this pencil to draw the changes and the process on the paper.

## **PART 2: QUESTIONS:**

### **Understanding the tension of Exploration/Exploitation within the case company: Main business**

- To start with the interview, can you shortly explain what ‘innovation’ means to you in general?
  - Is this definition in line with the common understanding within the case company?
- Switching to the company perspective, what would you say, how does the case company go about innovation in the main business (new products, services, processes)?
- Simplified it can be said that there are two areas of inspiration: 1) the use and development of things already known or 2) the pursuit of new knowledge outside of the regular trajectory. In that respect, what is the dominant source of inspiration?
  - *How do you involve the knowledge of customers?*
  - *Are you making use of customer knowledge?*
- How are the resources allocated between searching for new possibilities, products, new customers segments, on the one hand, and searching for solution to serve existing customers, current solutions and using present knowledge, on the other hand? Are there clear decisions about these two search directions?
- Looking at that point on the short-term/long-term perspective, what would you say about the prevailing force, are your main activities, especially towards innovation, more short-term focused or more long-term focused?

### **Environmental Dynamism: Sustainability in the case company context**

- Going now back to our first part, the changes over time, can you shortly explain what ‘sustainability’ means to you in general?
- How do you see sustainability within the case company environment?
- How did the case company react to the trend of sustainability?  
→ depending on answer, jump to RO1 or RO2

### **RQ1: Direct influence of Sustainability on the Tension**

- How does the trend towards sustainability affect the doing/behavior of your BU/Department/Team?
  - What changed over time according to previous asked questions?
    - *Have you observed changes in the commitment to sustainability in your department (internal: motivation; external: resources, new knowledge)*
    - *Understanding of innovation*
    - *Two areas of inspiration*
    - *Resource allocation*
    - *Long-term/short-term orientation*

## **RQ2: Indirect influence of Sustainability (Organizational and Managerial Antecedents)**

### ***Organizational Antecedents***

- What kind of consequences had the trend sustainability regarding the organization per se?
  - *Structural changes*
  - *Culture and Identity*
  - *Slack resources*
  - *Openness/ Absorptive capacity*

### ***Managerial Antecedents***

- Looking now more on the softer changes within the case company, do you see any changes in the doing/behaviour of the management within the case company, that were triggered by sustainability?
  - *leadership-style*
  - *risk-aversion*
  - *knowledge inflow*