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Faculty of Behavioral, Management and  
Social Science

## Corporate Effectuation: An explanatory study about the Application of Effectuation in a large established company

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## **ABSTRACT**

The purpose of this study is to explain company specific conditions in order to apply entrepreneurial thinking and acting especially the logic of Effectuation in a corporate context. The space industry currently experience a boom in the commercialization of space technologies and the goal of a public access to space resulting in several small and medium sized emerging innovative space companies increasing competitive pressure. Therefore, space companies have to keep pace in this uncertain and fast developing market and should increase their innovative power to stay competitive. Seeking at innovative leadership and power in the space industry, companies apply planning and analysis approaches but only limited entrepreneurial thinking and acting. To enhance the innovative power and the overall performance of the firm, the dynamic and learning logic of Effectuation embedded in entrepreneurial thinking and acting, is explained in a specific space company.

After literature research, conditions for corporate Effectuation are identified and serve as underlying conditions for data collection. Qualitative data is gathered through 15 semi-structures interviews with participants positioned in innovation related and non-innovation related departments. After transcribing the interviews, data is analysed with the qualitative data analysis tool atlas.ti using template analysis and consolidating interview answers and comments. After three revised templates, the final template was created including the resulting conditions of applying Effectuation in a corporate context. The final conditions are separated in four different groups: organizational culture, organizational structure, human capital, and innovation. Organizational culture factors are: failure treatment, experimentation, top management support, and freedom to innovate. Organizational structure factors identified are the following: number of hierarchical levels, organic management style, flexibility, and separate organizational structure. The group human capital factors include: means-driven, controllability, risk assumption, use of contingencies, cooperation, pro-activeness/ motivation, capabilities, rewards, and an open mind-set. Lastly, innovation related factors include: time availability, communication, rules and routines, active involvement of employees, and access to resources/ expert knowledge.

This thesis contributes to the application of entrepreneurial thinking and acting in a corporate context especially focusing on Effectuation and its development towards framework conditions for applying this logic in large companies. Practically, the thesis offers managerial implications on how to use entrepreneurial processes to enhance the innovative and competitive power as well as the overall firm performance.

# TABLE OF CONTENTS

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| ABSTRACT .....                                                                  | II  |
| TABLE OF CONTENTS .....                                                         | III |
| LIST OF FIGURES AND GRAPHS .....                                                | V   |
| LIST OF TABLES .....                                                            | VI  |
| 1 Introduction .....                                                            | 1   |
| 2 Literature Review .....                                                       | 6   |
| 2.1 Literature Approach.....                                                    | 6   |
| 2.1.1 Literature Collection .....                                               | 6   |
| 2.1.2 Literature Analysis .....                                                 | 7   |
| 2.2 Challenges in Managing Innovations .....                                    | 8   |
| 2.3 Corporate Entrepreneurship.....                                             | 9   |
| 2.4 Causation and Effectuation.....                                             | 13  |
| 2.5 The Application of corporate Effectuation .....                             | 23  |
| 2.6 Conditions for the application of Effectuation in a corporate context ..... | 25  |
| 3 Methodology .....                                                             | 30  |
| 3.1 Research Design .....                                                       | 30  |
| 3.1.1 Data Collection and Strategy.....                                         | 30  |
| 3.1.2 Sample and Time Horizon.....                                              | 33  |
| 3.1.3 Data Analysis .....                                                       | 37  |
| 3.2 Ethical Considerations .....                                                | 43  |
| 4 Results and Discussion.....                                                   | 44  |
| 4.1 Participants and Group Comparison.....                                      | 44  |
| 4.2 Challenges in Strategic Entrepreneurship and Innovation .....               | 46  |
| 4.3 Application of corporate Effectuation .....                                 | 52  |
| 4.4 The Extent of using Corporate Effectuation.....                             | 59  |
| 4.5 Conditions of Implementing Corporate Effectuation .....                     | 62  |
| 4.5.1 Organizational Factors .....                                              | 63  |
| 4.5.2 Human Capital Factors.....                                                | 71  |
| 4.5.3 Innovation Factors.....                                                   | 76  |
| 5 Conclusion.....                                                               | 80  |
| 5.1 Managerial and Theoretical Implications .....                               | 83  |
| 5.2 Limitations and Future Research .....                                       | 85  |

APPENDICES..... VI  
REFERENCES..... XX

## LIST OF FIGURES AND GRAPHS

|                                                                                                                                                                                                                                                    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1 A model of corporate entrepreneurship context (Kuratko, 2010: 130).....                                                                                                                                                                   | 11 |
| Figure 2 Goal Orientation versus Mean Orientation (Sarasvathy, 2001b:3).....                                                                                                                                                                       | 15 |
| Figure 3 Framework of Prediction and Control (Wiltbank et al., 2006: 983).....                                                                                                                                                                     | 16 |
| Figure 4 Expected return versus Affordable loss (Faschingbauer, 2010: 52).....                                                                                                                                                                     | 18 |
| Figure 5 Suicide Quadrant of Effectuation (Sarasvathy, 2001b: 7) .....                                                                                                                                                                             | 19 |
| Figure 6 Contrasting the textbook (causal) model of marketing with effectuation (Sarasvathy, 2008: 39) .....                                                                                                                                       | 20 |
| Figure 7 Dynamic model of Effectuation (Sarasvathy, 2008: 101) .....                                                                                                                                                                               | 22 |
| Figure 8 Framework Conditions for implementing Effectuation in a corporate context (adapted from Morris and Kuratko, 2008; Johansson and McKelvie, 2012; da Costa and Brettel, 2011; Grichnik et al., 2010; Blekman, 2011; Sarasvathy, 2001a)..... | 26 |
| Figure 9 Template Analysis for this research (based on King, 2012).....                                                                                                                                                                            | 39 |
| Figure 10 Code Family Structure .....                                                                                                                                                                                                              | 40 |
| Figure 11 PAVE strategies (adapted from Wiltbank et al., 2006: 983) .....                                                                                                                                                                          | 42 |
| Figure 12 Conditions on applying Corporate Effectuation .....                                                                                                                                                                                      | 80 |
| <br>                                                                                                                                                                                                                                               |    |
| Graph 1 Distribution of Preferred Strategy according to number of participants .....                                                                                                                                                               | 60 |
| Graph 2 Distribution of PAVE groups according to number of participants.....                                                                                                                                                                       | 61 |

## LIST OF TABLES

|                                                                                           |    |
|-------------------------------------------------------------------------------------------|----|
| Table 1 Comparison of Causation and Effectuation (adapted from Kraaijenbrink, 2008: 3) .. | 14 |
| Table 2 Literature Overview .....                                                         | 29 |
| Table 3 Research Design of this thesis.....                                               | 30 |
| Table 4 Interview participants list.....                                                  | 36 |
| Table 5 Group Analysis (adapted from King, 2012:434).....                                 | 45 |
| Table 6 Group of Challenges in Innovation .....                                           | 51 |
| Table 7 Group comparison for Application of Effectuation .....                            | 56 |
| Table 8 Comparison of PAVE groups.....                                                    | 61 |
| Table 9 Effectuation distribution according to group comparison.....                      | 62 |
| Table 10 Group comparison analysis for Organizational Culture.....                        | 66 |
| Table 11 Group comparison for Organizational Structure.....                               | 69 |
| Table 12 Group comparison for Effectual Factors .....                                     | 72 |
| Table 13 Group comparison for Other Factors .....                                         | 75 |
| Table 14 Group comparison for Innovation Factors .....                                    | 78 |
| Table 15 Summary of eliminated and included factors of template analysis.....             | 82 |

# 1 Introduction

In order to keep pace with fast developing markets and new emerging markets corporations have to promote and sustain competitive advantages (Covin and Miles, 1999:47). Corporate and strategic entrepreneurship are drivers of corporate growth and wealth creation (Ireland, Kuratko and Covin, 2003) whereas strategic entrepreneurship involves both opportunity seeking and advantage seeking resulting in an enhancement of firm performance (Ireland, Hitt and Sirmon, 2003:963). “Corporate Entrepreneurship provides potential means for revitalizing established companies” (Zahra and Covin, 1995:44) whereas “[...] entrepreneurial attitudes and behaviours are necessary for firms of all sizes to prosper and flourish in competitive environments” (Barringer and Bluedorn, 1999: 421). Therefore, it is of advantage for established companies to integrate entrepreneurial behaviour, acting and decision making in their corporate context (Grichnik, 2010).

However, approaches to corporate entrepreneurship are mainly based on planning and analysis approaches as well as ready-made business plans. This might be not applicable for all companies as several established companies are strategically planning based and risk averse. Especially established companies in the space industry currently experience a boom in the commercialization of space technologies aiming at the publicly availability of space and the exploration of Mars (Howell, 2015). Focusing this, several small and medium sized emerging innovative space companies opening up new markets and new opportunities and increasing the competitive pressure in this industry. Therefore, established space companies have to keep pace in this uncertain and fast developing market and should enhance their innovative power to stay competitive and to increase the firm performance. Seeking at innovative leadership and power in the space industry, companies apply planning and analysis approaches but only limited entrepreneurial thinking and acting. To enhance the innovative power and the overall performance of the firm, the dynamic and learning logic of Effectuation embedded in entrepreneurial thinking and acting is explained.

In order to address a learning approach of corporate entrepreneurial processes and to integrate entrepreneurship in the studied company, the logic of corporate

Effectuation is studied in this thesis. Effectuation is a logic of entrepreneurial expertise describing the decision making and problem solving process of expert entrepreneurs (Sarasvathy, 2001b). This logic was a breakthrough in the entrepreneurial decision making and entrepreneurial process literature which was achieved by Sarasvathy (2001a) with her findings about teachable and learnable principles of expert entrepreneurs. Research on corporate Effectuation encompasses for example Marketing, R&D, Strategic Management, technology-based Ventures, Business planning and Founders (Faschingbauer, 2010: 226, Johansson and McKelvie, 2012; Wiltbank et al., 2006; Brettel et al., 2011). Brettel et al. (2011) explored a positive relationship between the use of Effectuation and R&D project success (process output and process efficiency) especially adapting affordable loss, partnerships and contingencies.

However, only little is researched about conditions of applying Effectuation in an established company. Blekman (2011) focuses on business modelling and corporate effectuation stating that companies should stay strategically flexible in business modelling including stakeholders pre-commitment and co-creation. In addition, Blekman (2011) combines reframing, which is a method to predict and create radical product innovation and services (2011:121), with corporate Effectuation including cooperation and centring the product end-user. Furthermore, Blekman (2011) emphasizes the learning aspect of the effectual logic linking it to the personal development of employees in corporations learning how to think and act effectual on the basis of the own live path (2011:173). Because of missing conditions for applying Effectuation, conditions are adapted from corporate Entrepreneurship grouping those in organizational culture factors (failure treatment, project evaluation, experimentation, and top management support), organizational structure factors (number of hierarchical levels, organic management style, and flexibility) and human capital factors (effectual factors, high level of education, position in top management, pro-activeness, individual attitude and capabilities) (Ireland and Webb, 2007; Hornsby et al., 1999; Kuratko et al., 1990, Hornsby et al., 2002; Covin and Miles, 2007, Sarasvathy, 2001a; Moroz and Hindle, 2011, Ireland et al., 2003).

### *Research Goal and Research Question*

As stated above, corporate entrepreneurship provides several factors positively influencing entrepreneurial behaviour and processes in a corporate context. However,



factors positively influencing Effectuation in a corporate context is only little researched. Explaining specific conditions for corporate Effectuation and enabling managers to apply this relatively logic to their company benefiting from enforced competitive advantage and possibly new revenue streams for the company is the identified research gap. Summarizing, the following research problem was identified: the conditions of the application of Effectuation in the context of entrepreneurial processes in large international corporations is barely researched.

Resulting from the research problem, the study has the following three goals:

- Understand deeply peoples´ understanding, interpretation, motivation and experiences about Corporate Venturing and Innovation processes within the company (Ahmed & Shepherd 2006)
- Explain already existing effectual processes within Innovation processes
- Explain employees´ and managers´ opinion on the necessity and conditions of implementing the logic of Effectuation in the corporate entrepreneurship process of the space company.

To achieve the stated research goals, the resulting research question is the following:

*What are the conditions for the application of Effectuation in a large corporation?*

For a detailed and investigative answer, the research questions is separated in three sub research questions:

1. What is the employees´ and managers´ mind set of strategic entrepreneurship, focusing on Innovation?
2. Which effectual principles are used in this company?
3. To what extent is Effectuation a solution for this company?

Those sub questions are the basis for the main research question and are answered sequential as it is first necessary to get to know the status-quo of the entrepreneurial process in the company, then analyse possibly existing effectual principles and lastly, explain determining framework conditions for applying Effectuation in the entrepreneurial process to benefit from its advantages in an possibly adapted approach.

The research question will be tackled in a qualitative approach undertaking qualitative and quantitative research. The quantitative research results in a short questionnaire aiming at better evaluating the interviewees' attitude towards strategic decision making and problem solving. Afterwards, the interviewees are asked semi-structured questions in an interview regarding the above study goals. The detailed methodological approach is explained in chapter 3.

Accomplishing those goals, this study possibly is an important step forward in Effectuation literature examining the effectual logic in the context of strategic entrepreneurship and Innovation in a specific large established company rather than start-ups. Furthermore, the company is analyzed regarding existing effectual artifacts and necessary conditions in order to apply Effectuation in the entrepreneurial process of the firm. Additionally, firm specific conditions on applying Effectuation could be helpful for other large firms in order to enhance the entrepreneurial process. Finally, a generalization of found conditions could be made for a theoretical contribution. Those aspects are further discussed in the chapters below.

### *Definitions*

*Effectuation*: Effectuation is a logic of entrepreneurial expertise describing the decision making and problem solving process of expert entrepreneurs (Sarasvathy, 2001b).

*Effectuation process*: "Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001b: 245).

*Causation process*: "Causation processes take a particular effect as given and focus on selecting between means to create that effect" (Sarasvathy, 2001b: 245).

*Innovation*: "Innovation is the process of engaging in behaviours designed to generate and implement new ideas, processes, products and services, regardless of the ultimate success of these new phenomena" (Unsworth, 2003:3) including both idea generation (creativity) and idea implementation (Unsworth, 2001:294).

*Corporate Entrepreneurship*: "is the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization" (Sharma and Chrisman, 2007:18).

### *Theoretical and Practical Contribution*

The thesis contributes to the corporate entrepreneurship literature as well as entrepreneurial processes and Effectuation applied in a corporate context.

In more detail, it contributes to entrepreneurial processes especially Effectuation and its value for large companies. Furthermore, the study examines the application of Effectuation in a corporate context applying corporate entrepreneurship literature to Effectuation literature as corporate Effectuation is barely researched. This leads to the last theoretical contribution examining corporate Effectuation, its principles and the application field of innovation regarding conditions for Effectuation.

In a practical manner, this thesis contributes to innovation and strategic entrepreneurship challenges in a specific space company giving managerial implications under which conditions to apply Effectuation in this corporate context and why it might be beneficial to apply it.

### *Structure of the Thesis*

First, the literature overview in the field of corporate entrepreneurship and Effectuation introduces the topic of the application of Effectuation and conditions for applying Effectuation in a corporate context.

Second, the methodological approach explains how data was collected and analysed and explains the sample of the study. Lastly, ethical considerations are made in order to ensure ethical standards over the whole study.

Third, the result of qualitative data are shown for each factor and in group comparison dividing the sample in three groups: initiators, experts, and contributor. In the result section, first the sample and groups are seen holistically and are analysed. After stating the results for challenges in strategic entrepreneurship and innovation, the results for the real application of the effectual logic in this company is analysed. Finally, the results for organizational, human capital and innovation factors are shown separately in order to enable a differentiated view on conditions of applying Effectuation in this company. After stating the results, those are discussed based on current literature on corporate entrepreneurship and strategic entrepreneurship literature after each family factor.

Fourth and last, conclusions are made stating managerial and theoretical implications as well as limitations and future research topics. .

## **2 Literature Review**

### **2.1 Literature Approach**

The literature review is elaborated in order to answer the raised research question and to acknowledge especially Saras Sarasvathys' research on Effectuation and Causation as well as continued Effectuation research. Furthermore, the literature review give insight in relevant previous research as well as emerged trends in that research field (Saunders et al., 2012: 73). Additionally, the literature review also aims at the following goals: avoidance to repeat studies, and the identification and recommendation on further research (Gall et al., 2006).

The literature review has the following structure: first it is explained how literature is collected, analysed, and selected. Second, the effectual logic is explained by means of comparison to the contrary causal logic in order to explain the effectual principles. And fourth, after discussing the application of the effectual logic in a venture and corporate context in the third step, chapter 3.5 analysis existing framework condition for the application of Effectuation in a corporate context.

#### **2.1.1 Literature Collection**

The literature collection was conducted in three steps.

First information about corporate and strategic entrepreneurship, and the logic of Effectuation in general were gathered to get an overview about the topic and its frame itself. Here, Google and Google Scholar were used for first information. In corporate entrepreneurship literature a variety of studies appeared. The main focus here was especially corporate entrepreneurship from high level papers and the paper of researchers very active in this field. In addition to that, several homepages about Effectuation, for example [effectuation.org](http://effectuation.org), [effectuation.at](http://effectuation.at) and [corporateeffectuation.nl](http://corporateeffectuation.nl) were found on the basis of general search. The homepage [effectuation.org](http://effectuation.org) gave insight in the topic and revealed several research topics and a literature guide which was used as a basis for further literature search. The found literature references and scientific papers on those respective websites was searched via University of Twente and Technical University of Berlin facilities using both Universities libraries database, their access to relevant scientific books and papers

from different sources, for example JSTOR, TU-Service, Springer, EBSCOhost Business Source Complete and Elsevier Science Direct.

Subsequently, the reference lists of respective articles were checked on relevant titles and paper abstract for further research. The article was collected in the research library if the article was closely linked to the theory of Effectuation, the application of Effectuation in ventures and large established firms and conditions of how to strategically implement the dimensions of Effectuation in an established company.

Third, merging with the second step, Google Scholar was used to search for key words and key word combinations to also find literature which combines internal Corporate Venturing and Corporate Effectuation and critical reviews on the effectual principles and applications. Key words were: Corporate Entrepreneurship, strategic entrepreneurship, firm performance, entrepreneurial behaviour, entrepreneurial attitude, Effectuation, causation, entrepreneurial decision making, start-up performance, prediction, control, (+internal) corporate venturing, employee innovation, uncertainty (+ large companies), new market creation, and opportunity creation, Effectuation conditions.

### **2.1.2 Literature Analysis**

The literature analysis is conducted in a first selection (relevance) and second analysis step (value) (Saunders et al, 2012: 108).

The first selection step was mainly based on different criteria which qualified a paper as general relevant. Selection criteria are:

- **Date of publication:** not older than year 2000 as newer research includes the latest findings (only applicable for Effectuation literature) and builds upon older research. But also dependant on the research intensity of the topic and breakthrough explorations, research before year 2000 was selected;
- **Ranking:** of the publishing journal: A+, B, C were selected using the VHBJourqual3 of the German Academic Association for Business Research (vhbonline, 2016)
- **Authors:** known in the research field and cited, mainly used in assessing Effectuation literature;
- **Abstract:** relevant topic and/ or research question, useful theory, useful results, similar or contrary findings or theories;
- **Key words:** see chapter literature collection 2.1.1;

- **References and citations:** relevant references and cited in other scientific papers (Saunders et al, 2012: 108).

As the literature on Effectuation, especially on corporate Effectuation, its application and framework conditions for the application is limited, those criteria were only a guideline for the literature selection. For corporate entrepreneurship literature, those criteria were fully applied as quite a lot of literature was available.

Second, the literature was analysed by reading the selected articles, evaluating the value of the paper: methodological approach, reliability and validity of results, conclusions, biases (Saunders et al., 2012: 108). Finally, relevant parts of the article were summarized and filed into possibly relevant literature review chapters of this study. Additional to the critical review of the articles and to also include already stated critical aspects about the research topic, the relevant articles were scanned for critical comments and were then critically considered.

## **2.2 Challenges in Managing Innovations**

“Innovation is the process of engaging in behaviours designed to generate and implement new ideas, processes, products and services, regardless of the ultimate success of these new phenomena” (Unsworth, 2003:3) including both idea generation (creativity) and idea implementation (Unsworth, 2001:294). Managing innovation in corporations is challenging starting with the questions of “What has to be managed” (Bessant, 2003:761) focusing on innovation processes of opportunity and potential innovation search, selection, resource allocation and implementation (Bessant, 2003; Tidd and Bessant 2009). The next challenge in managing innovation is the questions of “Why change” (Bessant, 2003:762) meaning the continuously change in technologies, processes and products in order to keep pace with fast developing markets and increased competitive pressure. However, “What to change” (Bessant, 2003:762) emphasises the importance of an innovation portfolio and the awareness of different innovation possibilities and positioning (2003:762). Next, Bessant (2003) states the challenge of understanding innovation in terms of different views on innovation for example seeing innovation as R&D capability, technology advance or meeting customer needs (Bessant, 2003:764) influencing the outcome of the innovations. Building company specific innovation routines characterizes the challenge of building an innovation culture (Bessant, 2003:763). Those routines are

for examples routines in continuous search for innovation (recognizing), matching innovations with strategic goals (aligning), and the ability to develop innovation through resource access (generating) (Bessant, 2003:765). The next challenge - continuous learning - focuses on routines facing the environment of innovation, for example “cross-functional team working” (2003:765) and “early involvement of all relevant functions” (2003:765). The challenge “high involvement innovation” (Bessant, 2003:766) states that innovation cannot be separated from the operational level but need creative problem solving (2003:766). Also ambidexterity and managing discontinuity is a challenge in managing innovation meaning that there need to be a balance between exploring new products and processes and exploiting existing ones. Lastly, a challenge of innovation is eliminating firm isolation and enhance cooperation activities with other firms to share knowledge and develop ideas cooperatively (Bessant, 2003:770).

Summarizing, firms are facing several challenges in managing innovation resulting in difficulties to set up an innovation framework in the company and not fully exploited innovative ideas. However, those challenges in managing innovation can also be decreased with the implementation of entrepreneurial processes as well as thinking and acting.

### **2.3 Corporate Entrepreneurship**

This chapter approaches corporate Entrepreneurship especially entrepreneurial processes in order to embed and lead to the main topic of corporate Effectuation.

Corporate Entrepreneurship is an entrepreneurial process that contributes to “promoting and sustaining corporate competitiveness” (Covin and Miles, 1998:47). Several researchers have stated the positively related influence of corporate entrepreneurship on firm performance and company survival especially in competitive environments (Miller, 1983; Lumpkin and Dess, 1996; Dess, Lumpkin and McGee, 1999). “Rather, virtually all organizations—new start-ups, major corporations, and alliances among global partners—are striving to exploit product-market opportunities through innovative and proactive behaviour” (Lumpkin and McGee, 1999:85). Summarized by Kuratko (2010), for several reasons, firms have started to implement entrepreneurial processes and entrepreneurial behaviour in order to enhance innovativeness (Baden-Fuller, 1995), profitability (Vozikis et al., 1999)

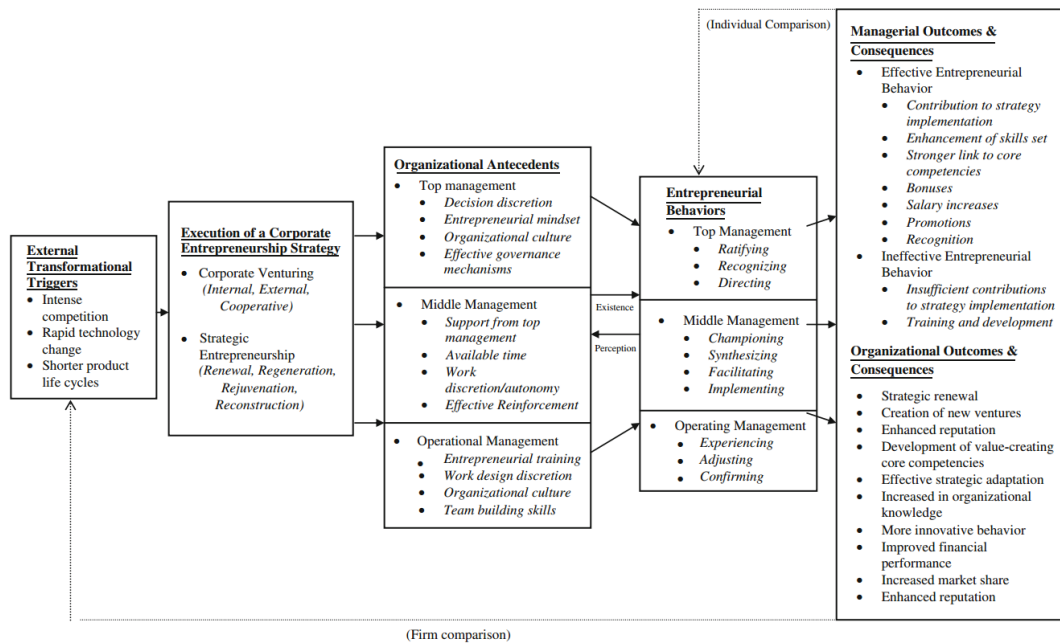
and strategic renewal (Guth & Ginsberg, 1990). As a main characteristic, corporate entrepreneurship can be divided in two domains: corporate venturing, which is the “adding of new business [...] to the corporation” (Kuratko, 2010: 130) and strategic entrepreneurship, which means “the exhibition of large scale or highly consequential innovation” (Kuratko, 2010:130) in order to gain competitive advantage. The main difference between those domains is how profitable growth is generated by a company, namely by adding new business (corporate venturing) or by strategical efforts of innovation to gain competitive advantage. Corporate Venturing on the one hand, can appear in three different ways: internal corporate venturing, cooperative corporate venturing, and external corporate venturing (Kuratko, 2010:130). Internal corporate venturing indicates that the company still owns the internal created business for the purpose of entering a new market or the development of a product which differs to the existing products (Kuratko, 2010; Robert and Berry, 1985). External corporate venturing means the investment or acquisition of an external created venture in order to complement existing products or services or diversify in other markets. Lastly, cooperative corporate venturing is the collaborative development of a business which is shared with one or more other companies in cooperation (Kuratko, 2010: 131).

Contrary, the second domain of corporate entrepreneurship, strategic entrepreneurship, does not necessarily include the creation of new business but concentrates on the exploitation of the current competitive advantage and simultaneously on the exploration of innovation for future competitive advantage (Ireland and Webb, 2007:15). Especially in strategic entrepreneurship, innovations are emphasised which are for example changes in products, strategy, organizational structure, processes, or capabilities (Kuratko, 2010:134). Those are closely linked to the strategical direction towards competitive advantage of the firm and can include several entrepreneurial initiatives and opportunity and advantage seeking behaviour (Ireland, Hitt and Sirmon, 2003:963; Kuratko, 2010:134). The transformational performance of a company by strategic entrepreneurship especially innovation can be seen from the internal (internal transformation related to products and services) and the external point of view (transformation relative to industry competitors) (Kuratko, 2010:134). Strategic Entrepreneurship can for example take the following shapes: strategic renewal (redefinition of relation to market and competitors and how to compete), sustained regeneration (regularly introduction of new products or regularly



entering new markets), domain redefinition (diversification in other than the current product or service domain), organizational rejuvenation (changes in processes, structures, capabilities) (Kuratko, 2010: 132; Covin and Miles, 1999; Covin and Miles, 2007; Ireland and Webb, 2007).

The following Figure 1 shows a model of a corporate entrepreneurship context developed by Kuratko (2010).



**Figure 1 A model of corporate entrepreneurship context (Kuratko, 2010: 130).**

The model of corporate entrepreneurship context of Kuratko (2010) is a representation of relations and conditions within corporate entrepreneurship and is adapted from current research and finding from literature on corporate entrepreneurship.

Factors triggering transformational change are depicted besides others with intense competition resulting in the need of a sustainable competitive advantage, rapid technology change and shorter product life cycles resulting in a shorter time frame for the exploitation of current competitive advantages. After corporate entrepreneurship is triggered, the management will decide on the execution of a corporate entrepreneurship strategy in terms of corporate venturing and/ or strategic entrepreneurship which was already explained above. Next, specific organizational factors are needed to pursue corporate entrepreneurship. Those can be regarded on three organizational levels: top management, middle management and operational

management. Within those management levels, specific factors enhances the implementation of the corporate entrepreneurship strategy and entrepreneurial behaviour. For top management those factors are: decision discretion (tolerating failure, delegating authority), entrepreneurial mind set, organizational culture, and effective governance mechanisms. For the middle management, those influencing factors are the following: support from top management, available time, work discretion/ autonomy, effective reinforcements (Kuratko, 1990; Hornsby et al., 1999; Hornsby, 2002). Third, on the operational management level antecedents are for example entrepreneurial trainings, organizational culture and team building skills. Resulting from those factors in action, entrepreneurial behaviour can be created within the three management levels if the organizational antecedents are also perceived by employees. The entrepreneurial behaviour is the action of corporate entrepreneurship resulting in for example ratifying, recognizing and directing (top management), championing, synthesizing, facilitating, and implementing (middle management), and experiencing, adjusting, and confirming (operating management). Resulting from this entrepreneurial behaviour, outcomes and consequences can be divided in managerial and organizational outcomes. Managerial Outcomes and effective entrepreneurial behaviour is the contribution to strategy implementation, enhancement of skill set, salary increases, stronger link to core competencies and promotions whereas ineffective entrepreneurial behaviour is training and development of people and insufficient contribution to strategy implementation. Organizational outcomes result in strategic renewal, effective strategic adaption, increase in organizational knowledge, and more innovative behaviour beside others.

Summarizing, corporate entrepreneurship contributes to competitive advantage (Covin and Miles, 1998:47) and firm performance (Miller, 1983; Lumpkin and Dess, 1996; Dess, Lumpkin and McGee, 1999). In addition, the entrepreneurial context depicted by Kuratko (2010) shows the relationship between transformational triggers, corporate entrepreneurship strategy, organizational antecedents, the related entrepreneurial behaviour and resulting entrepreneurial outcomes and consequences on managerial and organizational level.

## 2.4 Causation and Effectuation

After focusing on corporate entrepreneurship literature, this thesis now emphasises entrepreneurial acting as part of corporate entrepreneurship focusing on the two main logics for entrepreneurial acting Causation and Effectuation (Sarasvathy, 2001a). Furthermore entrepreneurial processes are described in order to integrate entrepreneurial acting.

Entrepreneurial processes are “all the functions, activities, and actions associated with perceiving opportunities and creating organizations to pursue them (Bygrave, 2004:7). Describing a dynamic model of entrepreneurial processes, Sarasvathy (2010) focuses on the visible and learnable elements of entrepreneurial behaviours (Moroz and Hindle, 2011:804). Especially expert entrepreneurs who are characterized by effectual behaviour, are seen as being able to create opportunities and create new ventures and new markets (Sarasvathy, 2001). The following chapter focuses on Effectuation as entrepreneurial behaviour enhancing competitive advantage and firm performance. In order to define and explain the effectual logic precisely, Effectuation is compared with the complementary but contrary causal logic.

“Causation processes take a particular effect as given and focus on selecting between means to create that effect” (Sarasvathy, 2001a: 245) meaning that the entrepreneur aims to achieve a specific pre-defined goal. Opposed to that, the “Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means” (Sarasvathy, 2001a: 245). Within the effectual logic the goal is not pre-defined but variable and flexible according to given means available for the entrepreneur. The chef metaphor of Sarasvathy (2001a: 245) illustrates the difference: A chef in the kitchen on the one hand can cook a meal by following a recipe, look for the ingredients needed, buy them and cook the dish. On the other hand, the chef could look which utensils and ingredients he has available in the kitchen, decide for a menu and cook it. This process reflects Effectuation as the chef acts and thinks depending on available means and resources. The first process is a more causal approach because the chef acts and thinks goal-oriented because he has the goal to cook one specific meal for which he needs specific ingredients. In fact this example neglects several characteristics of Causation

and Effectuation as the chef is neither interacting with other chefs or guests nor considering contingencies during cooking or any other dynamism (Sarasvathy, 2001a: 245). Nevertheless, it shows the main characteristic of thinking and acting goal- (Causation) and mean- (Effectuation) oriented.

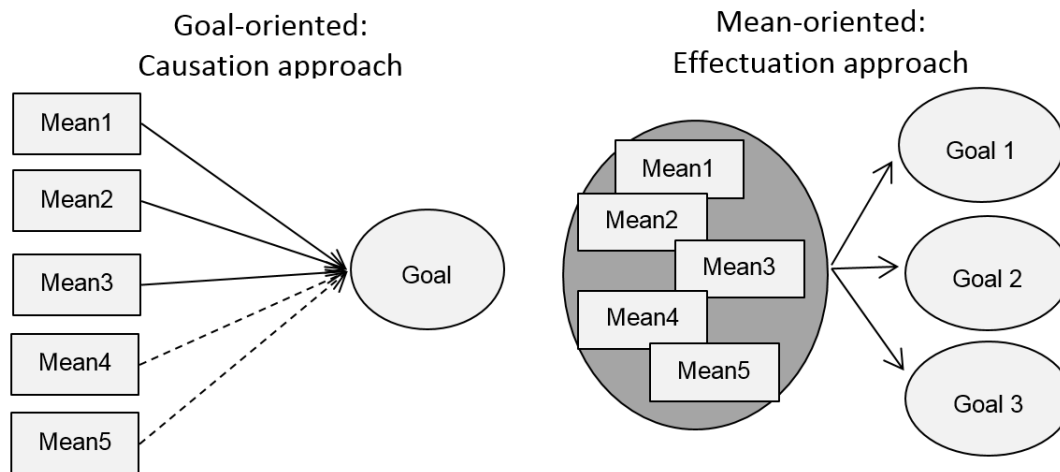
The following Table 1 Comparison of Causation and Effectuation (adapted from Kraaijenbrink, 2008: 3) shows the five main differences between the two complementary logics which are explained in detail below.

| <i>Dimension</i>                                       | <b>Causation model</b>                                       | <b>Effectuation model</b>                        |
|--------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|
| <i>Starting Point</i>                                  | Ends are given                                               | Means are given                                  |
| <i>Assumptions on future</i>                           | Predictability means controllability                         | Controllability reduces need to predict          |
| <i>Predisposition towards risk</i>                     | Expected return                                              | Affordable loss                                  |
| <i>Appropriate for Attitude towards the unexpected</i> | Existing products and markets<br>Avoidance of the unexpected | New products and markets<br>Use of contingencies |
| <i>Attitude toward outside firms</i>                   | Competition                                                  | Cooperation                                      |
| <i>Type of model</i>                                   | Linear                                                       | Cyclical                                         |

**Table 1 Comparison of Causation and Effectuation (adapted from Kraaijenbrink, 2008: 3)**

#### *Ends versus Means*

As the cooking metaphor indicates, the effectual thinking and acting Entrepreneur first thinks of the existing means he already has available and decides for actions on the basis of variable goals which can be achieved with those pre-set means. Causation on the other hand emphasizes the pre-set goal as starting point and the selection of needed resources in order to achieve that specific goal. Only if the entrepreneur has well defined the specific goal he is able to determine the means necessary to achieve this goal. The following Figure 2 Goal Orientation versus Mean Orientation illustrates the difference between the two logics.



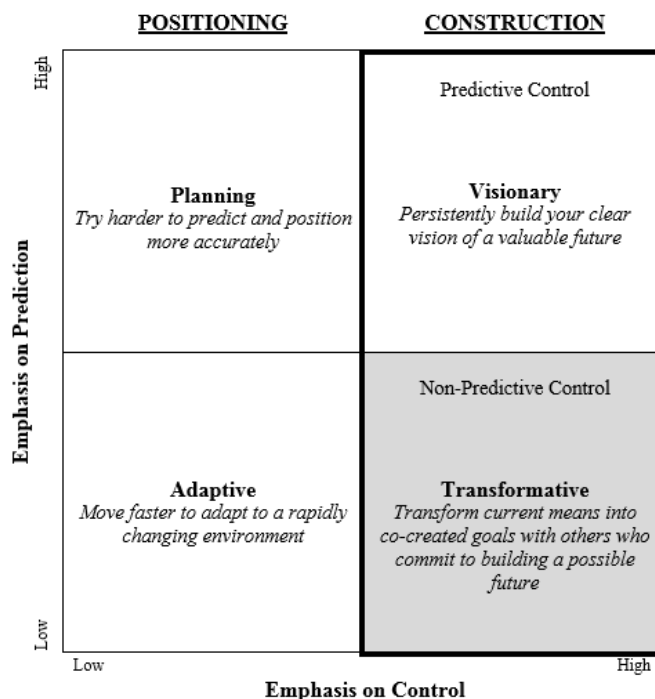
**Figure 2 Goal Orientation versus Mean Orientation (Sarasvathy, 2001b:3)**

Thus, the central point in the Effectuation theory is the Entrepreneurs “initial position” (Blekman, 2011: 42) and “three categories of “means”: they know who they are, what they know, and whom they know – their own traits, tastes, and abilities; the knowledge corridors they are in; and the social networks they are part of” (Sarasvathy, 2001a: 250). The first mean describes the character of the Entrepreneur, its identity, values, preferences and its culture. To know who one is brings great advantage in the situation of uncertainty and benefits as basis of decision making on the individual level (Faschingbauer, 2010: 39). On the firm level, given means are for example human, physical and organisational resources; on the economical level given means are beside others technologies and demographics (Sarasvathy, 2001a: 250). The second mean - what an entrepreneur knows - describes the subjective knowledge of the actor for example education, professional career, problem solving activities, success and experiences during the own life as well as physical health (Faschingbauer, 2010: 41). Those circumstances influence how the entrepreneur thinks, decides and which way he will go. Third, given means depend on whom the entrepreneur knows, his own network including proponents, opponents, potential clients or guests and suppliers who’s feedback influence the decision making process as the entrepreneur depends on other opinions and behaviour in a network world.

### *Prediction versus Control*

The second characteristic and difference between the two logics is the assumption on the predictability of the future. Causal thinking entrepreneurs assume a certain

predictability of the future while analysing opportunities in a specific market, segmenting the market and planning marketing activities (Barich and Kotler, 1991). Whereas effectual thinking entrepreneurs do not predict an uncertain future but try to control it (Sarvasvathy, 2001a: 252). Hence, the focus of Effectuation lies in those aspects which are controllable because the entrepreneur does not need to predict them. By implication, Effectuation is most fruitful in an uncertain environment with high controllability and low predictability (Kraaijenbrink, 2008: 4) which can be classified in the following Figure 3 Framework of Prediction and Control (Wiltbank et al., 2006: 983) as non-predicative control and transformative approach which is explained below.



**Figure 3 Framework of Prediction and Control (Wiltbank et al., 2006: 983)**

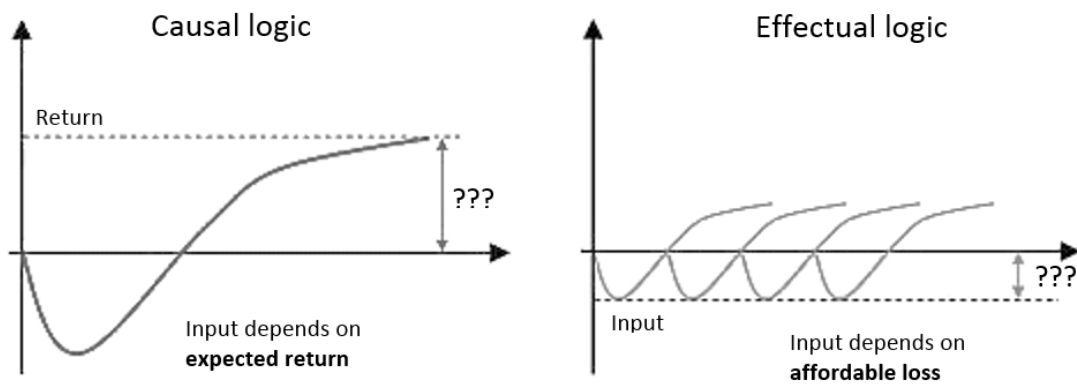
Figure 3 Framework of Prediction and Control (Wiltbank et al., 2006: 983) shows the different dimensions of prediction and control in a matrix. On the one hand, with a low emphasis on control, studies on strategic management divide future perspectives in planning and learning schools (Brews and Hunt, 1999: 891-892) where the planning school is based on goals followed by needed means and the learning school as a more adaptive approach where goals and means are linked. In both approaches the firm put the emphasis on positioning with a low emphasis on control and a high emphasis on prediction based on an exogenous environment (Mintzberg and Waters,

1985: 259). Thus, firms with a low control approach put its emphasis on positioning in the existing market.

On the other hand, with a high emphasis on control, construction centres the “means – ends relationship” (Wiltbank, 2006: 989): the firm views the environment more endogenous rather than exogenous. Prediction plays a minor role when it comes to controlling the future as “To the extent that we can control the future, we do not need to predict it” (Sarasvathy, 2009: 91). Control is to “directly working to create and influence the evolution of market elements” (Wiltbank et al., 2006: 987). The visionary quadrant is characterized by high control and high prediction meaning that the firm and its environment is based on visions of future possibilities and the actively implementation (Wiltbank et al., 2006: 990). The transformative approach, emphasizing low prediction and high control, represents the logic of Effectuation which can be characterized as “action-oriented, inter-subjective, and non-predictively” (Wiltbank et al., 2006: 991) converting existing firm resources into new goals. Sarasvathy (2009) named this non-predictive control “Pilot-in-the-pane” (p.91) because the effectual thinking and acting entrepreneur is his own pilot constructing the future based on own experiences and resources and not as someone driven and influenced by another pilot (exogenous environment and market dependency).

#### *Expected return versus Affordable loss*

The next characteristic and difference between Causation and Effectuation is the view on risk. The goal of a causal thinking entrepreneur is the maximization of return and the pre-calculation of needed investments in order to start-up the venture. Contrary, the goal of the effectual thinking entrepreneur is to assess the worst-case loss as affordable (Chandler et al, 2011: 377) unless the loss is affordable the entrepreneur is not taking the risk (see Figure 4 Expected return versus Affordable loss (Faschingbauer, 2010: 52).



**Figure 4 Expected return versus Affordable loss (Faschingbauer, 2010: 52)**

Figure 4 Expected return versus Affordable loss (Faschingbauer, 2010: 52) reveals the outside-in perspective of the causal logic as the external environment of risks and opportunities are given; this is most suitable in a stable and predictable environment in order to choose the best alternative (Faschingbauer, 2010: 52). The effectual logic is a more inside-out approach because the entrepreneurs' decision depends on the individual (network-) evaluation of the importance and value of the possible result and loss in case of failure.

Sarasvathy underlines the focus “on experimenting with as many strategies as possible with the given limited means” (2001a: 252) in order to construct many possible alternatives for the future rather than limit oneself for expected returns. Hence, effectual lead start-ups are seen as experiments only investing on the basis of reasonable results and with inherent losses (Chandler et al, 2011: 380).

Especially towards affordable loss literature is questioning this characteristic of Effectuation it could also be possible that an entrepreneur acts goal-oriented but only invest what he can afford to lose or vice versa that a mean-oriented entrepreneur possibly intent to maximize future returns (Kraaijenbrink, 2008: 4). Furthermore, literature has revealed that the affordable loss principle probably has no significant impact on venture performance (Read et al, 2009: 538). This aspect will be further discussed in Chapter 5.

#### *Existing products and markets versus new products and markets*

The next difference between Causation and Effectuation is the mind-set towards existing and new markets. As mentioned above, the causal logic concentrates on analysing markets and plan how to increase return in the best position on the market. Thus, Causation focuses on existing markets concentrating on either existing



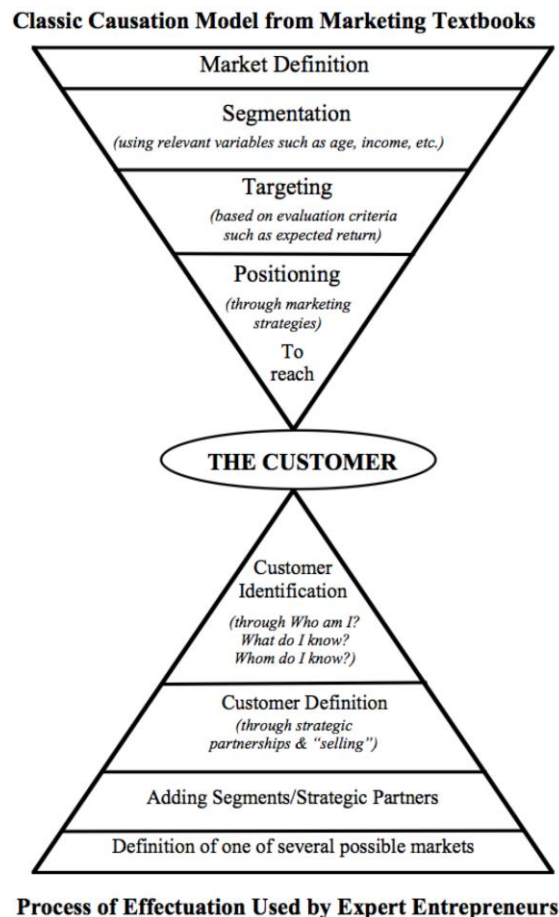
products (market penetration) or new products (product development) (Ansoff, 1965). Whereas Effectuation concentrates on the creation of new markets (Sarasvathy and Dew, 2005: 543) and he so-called suicide quadrant as here the entrepreneur has two uncertain factors: one is the uncertainty about the new market and the second uncertainty is the new product which are both not known at all.

|                  | Existing Market | New Market       |
|------------------|-----------------|------------------|
| Existing Product |                 |                  |
| New Product      |                 | Suicide Quadrant |

**Figure 5 Suicide Quadrant of Effectuation (Sarasvathy, 2001b: 7)**

In literature this clear distinction is also criticized because an entrepreneur could possibly also act effectual in an existing market while experimenting and interacting with others in order to create new products and benefiting from existing means and resources (Kraaijenbrink, 2008: 5). Thus, Kraaijenbrink summarizes that the effectual principles could also possibly be applied in existing markets and product (2008: 5). Additionally, new markets and products could also be developed through market and customer behaviour analysis (Causation) and create revolutionary changes (ibid).

Figure 6 Contrasting the textbook (causal) model of marketing with effectuation (Sarasvathy, 2008: 39) below illustrates the reversal causal logic based on first segmentation, targeting, and positioning on a market whereas the effectual logic is based on stakeholder identification through available means and resources, stakeholder definition through partnerships and the final definition of possible markets (Sarasvathy, 2008: 38).



**Figure 6 Contrasting the textbook (causal) model of marketing with effectuation (Sarasvathy, 2008: 39)**

*Avoidance of the unexpected versus usage of contingencies*

Causation and Effectuation differ also in the attitude towards the unexpected: the causal approach here focuses on minimizing and avoiding the unexpected and trying to reach the goal despite of unforeseen contingencies (Sarasvathy, 2008: 89). On the opposite, the effectual approach uses contingencies in order to develop the venture and to see those as opportunities which can be leveraged and used to control (2008: 90). Sarasvathy argues that not the contingency itself is the advantage but the entrepreneurs' effort to leverage it (2008: 91).

*Competition versus Cooperation*

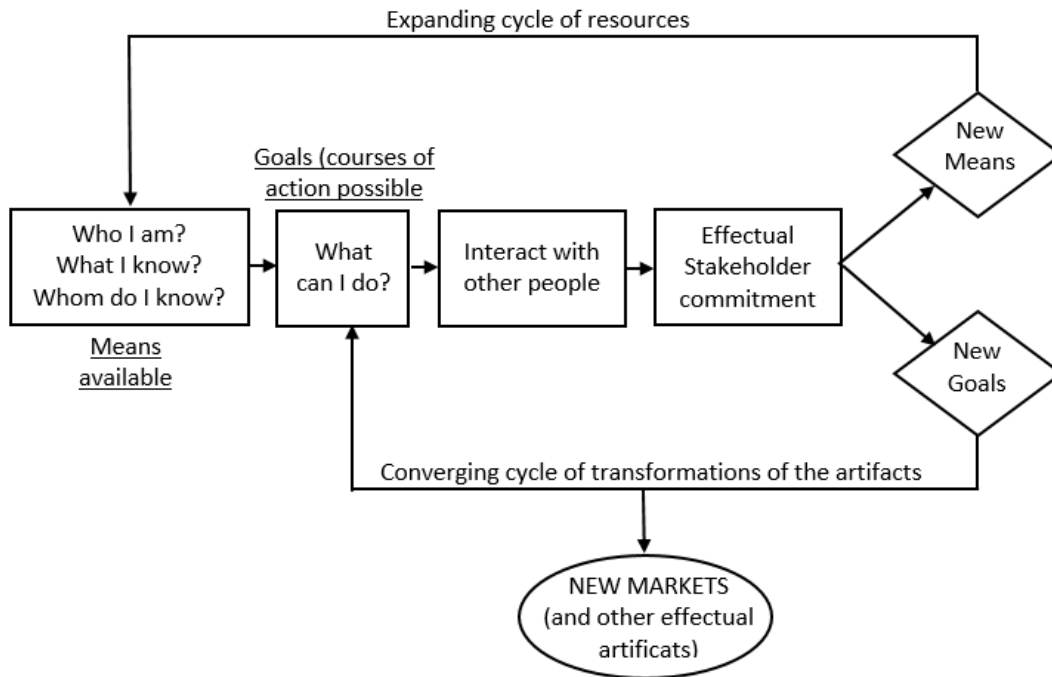
Next, Causation and Effectuation differ in the attitude to the outside environment of the firm. In the causal approach firms compete, benchmark and put effort in competitive analysis in order to evaluate others competitive advantage, unique selling propositions and strategies. Contrary, the effectual approach focuses on

cooperation and pre-commitments from different stakeholders to reduce uncertainty (Sarasvathy, 2008: 88). Therefore, effectual thinking entrepreneurs strive to find stakeholders (potential customers, employees, suppliers, investors, and people with complement means etc.) which actively take part in shaping the venture after committing to it (2008: 88). The created external and internal partnerships reduce uncertainty while adding new means and resources which has a positive significant impact on venture performance (Read et al., 2009: 538) whereas reviewers point out the disadvantages of cooperation as shared returns and profits and potential in sharing intellectual property in later stages (Kraaijenbrink, 2008: 6).

### *Linear versus Cyclical*

Lastly, Sarasvathy (2001a) distinguishes Causation and Effectuation in its “context of relevance” (p.251): the causal process is applicable in static, linear, and independent environments whereas effectual processes assume a dynamic, non-linear, and ecological environment. Distinguishing entrepreneurs in novices and expert, Sarasvathy describes a way of how expert entrepreneurs act and emphasizes the “change based nature of entrepreneurship by considering the difference between parts of the entrepreneurial process “(Moroz and Hindle, 2011:804).

Figure 7 Dynamic model of Effectuation (Sarasvathy, 2008: 101) summarizes in an illustration on the one hand all above mentioned aspects of Effectuation (means, control, affordable loss, new products and markets, contingencies, cooperation) and on the other hand emphasis the dynamic character of Effectuation.



**Figure 7 Dynamic model of Effectuation (Sarasvathy, 2008: 101)**

Summarized, the effectual thinking entrepreneur follows an inside-out approach first taking into account which means and resources he has already available (means) and thinks of possible actions with an input which the entrepreneur can afford to lose (affordable loss). Then, the entrepreneur accesses his own network and tries to find stakeholders who pre-commit to the possible venture (cooperation) and add new means and resources and possibly new goals on the basis of commitment (control) and use of contingencies (contingencies). Resulting in a cycle (cyclical), new markets are possible to be created (new market creation).

The distinction between the linear causal and the cyclical effectual logic is also discussed and criticized in literature as it may be too simple to say that all causal process are linear as it could be an iterative process as well. Furthermore, the means – oriented Effectuation process is not per se cyclical (Kraaijenbrink, 2008: 6) as this depends on the characteristic of contingencies and partnerships.

## 2.5 The Application of corporate Effectuation

In this sub-chapter, the application of corporate Effectuation is examined stating the five core principles of Effectuation in a corporate and start-up context and summarizing recent research on corporate Effectuation.

### *Five core principles of Effectuation*

The bird in hand principle reflects the means-orientation of a person. Projects, especially R&D projects, in established companies are mostly goal-oriented (Blekman, 2011:146) because an internal set-up project most of the time aims at a specific goal with specific budget allocations and project plan. Within the effectual logic, employees on the one hand know their own characteristics and preferences, know their own knowledge and capabilities and connect to their own network.

Next, the Affordable loss principle reflects the acceptable risk a person can adopt. In corporations, the employee is embedded in a company not actively facing losses of this company, meaning that if an employee has an idea asking the company for budget to implement it, there are no monetary losses to be accepted for the employee but a loss of reputation. In ventures on the other hand, it's the entrepreneurs' shares and reputation that could be lost by failure. Thus, only investing, not only monetarily, what the entrepreneurs can afford to lose is even more essential in ventures as it possibly means surviving. In a corporate context, the employee is evadable safe from losses.

Next, the lemonade principle reflects using contingencies for further development of an idea (Blekman, 2011:150). In a corporate context, uncertainties and contingencies are mostly tried to be reduces as the goal might not be reached under different circumstances than assumed. An entrepreneur on the other hand can use contingencies to further develop the idea into a profitable business idea.

The crazy quilt principle is characterized by a pre-commitment of stakeholders to the idea and the associated additional means. In a corporate context partnerships are common on different levels for example using open innovation and project collaboration for developing or supporting ideas and projects. For ventures, the network is important to get feedback on the idea and to get a certain pre-commitment in order to gain means and resources and to develop the idea further.

Lastly, the pilot in the plane principle characterises the emphasis on control rather than prediction to shape an uncertain future. As already discussed above, many established companies are used to try to predict the future with market and customer analysis. But trying to create a completely new market within an existing large firm is rather rare. For expert entrepreneurs, controlling the future is, beside the other four principles, the key to success (Sarasvathy, 2001).

#### *Recent literature on corporate Effectuation*

In literature corporate Effectuation is only little researched.

Wiltbank et al. (2006) involved as one of the first researchers Effectuation in a corporate context discussing decision making with a high emphasis on control rather than prediction (2006:984).

Next, da Costa and Brettel (2011) researched employee Effectuation based on individual and organizational factors influencing the entrepreneurial behaviour of the employee. The authors found a positive relationship between pro-activeness and a high appreciation of unexpected events as the only significant relationship for the effectual logic within the individual factors (pro-activeness, personal persistence, internal locus of control). Furthermore, they found a positive relationship between higher top management support and a higher means-orientation as well as a higher appreciation of unexpected events in the organisational factors (work discretion, time availability, management support, rewards and reinforcement) (2011:559-560).

Blekman (2011) extended Effectuation to a corporate context describing and analysing practical examples of companies applying Effectuation like Starbucks, Virgin Galactic and Rabo Bank. Furthermore, he developed a corporate Effectuation mind-set examining organizational components relevant for corporate Effectuation for example: top management support, organizational structure, people development, integration in the operational processes and information systems. Blekman also put emphasis on business modelling (more flexibility), reframing (centring the user of a product) and personal development (learning of Effectuation) in a corporate context (2011).

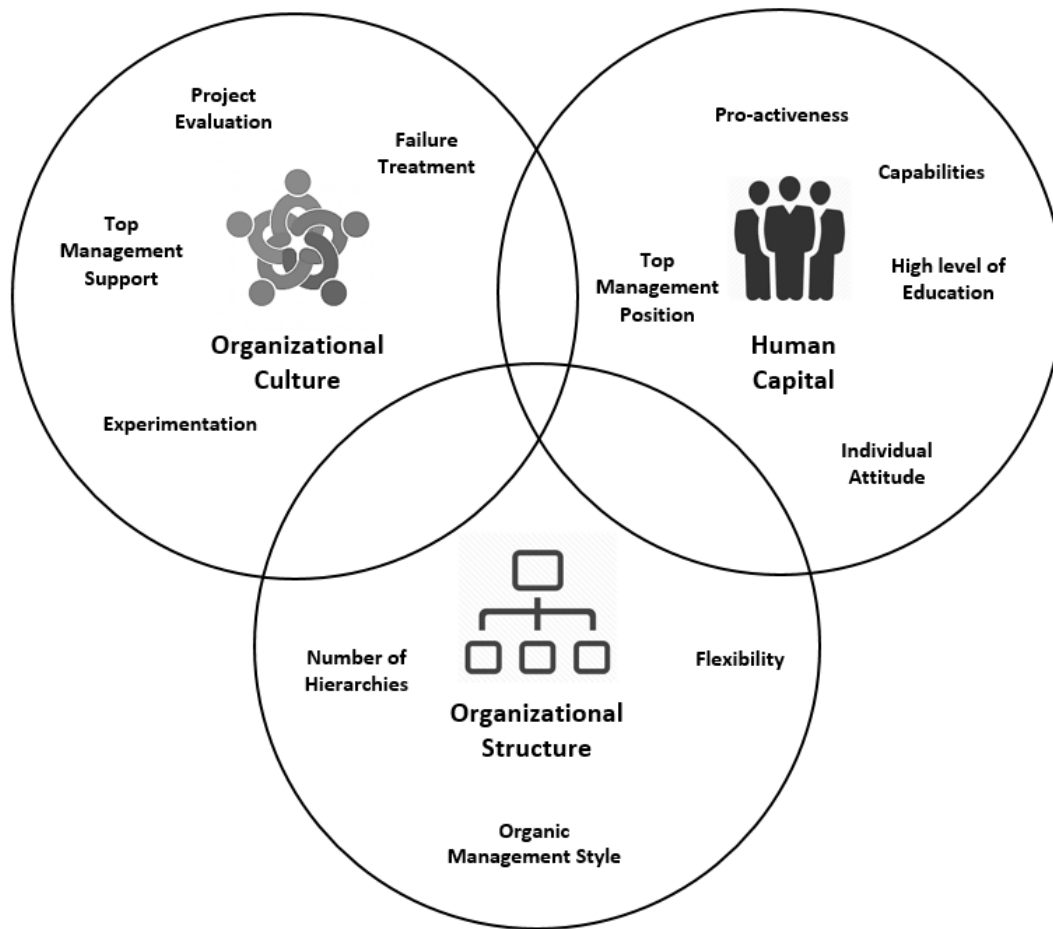
Next, Brettel et. al. (2012) researched the impact of entrepreneurial action on R&D project performance. The study investigated Effectuation and Causation dependent on the degree of innovativeness as driver for uncertainty. A positive relationship was found between the application of Effectuation – means, affordable loss, partnerships, and acknowledge the unexpected- and project success - process output and process

efficiency - in the context of high innovative projects. However, there could no relationship been found between means-driven R&D projects and its positive impact on high innovative degree R&D projects and its process output and as well as its negative impact on low innovative R&D project and process efficiency (2012:171) which leaves space for discussion.

Johansson and McKelvie (2012) studied the role of human capital and the organizational environment in applying Effectuation and Causation for developing new opportunities (2012:1). Concerning human capital the authors only found a positive relationship between a position in top management and Causation, affordable loss, flexibility, and experimentation but not related to pre-commitment (2012:5). Regarding the organisational environment, both entrepreneurial culture and reputational capital (attractiveness to investors, customers, suppliers and employees (2012:6)) were found as positively related to the use of Effectuation (2012:9).

## **2.6 Conditions for the application of Effectuation in a corporate context**

Conditions on how to implement Effectuation in a corporate context is barely researched (Johansson and McKelvie, 2012:1). This chapter summarizes the literature based and proved conditions of Effectuation in a corporate context. Those can be divided in two categories: Organisational and Human Capital factors (da Costa and Brettel, 2011; Johansson and McKelvie, 2012). Figure 8 illustrates and summarizes literature based conditions of corporate Effectuation allocated to the two categories. Three of the conditions match for both categories as they are of relevance for the organization itself and human capital. Those three are: reward and recognition, people development and top management support which are further described and explained below.



**Figure 8 Framework Conditions for implementing Effectuation in a corporate context (adapted from Morris and Kuratko, 2008; Johansson and McKelvie, 2012; da Costa and Brettel, 2011; Grichnik et al., 2010; Blekman, 2011; Sarasvathy, 2001a)**

### *Organizational Culture*

The organizational environment of the firm is represented by goals, attitudes and assumptions that are also connected to the decision making of corporate individuals (Simon, 1997). Thus, regarding Effectuation and decision making under uncertainty, environmental factors have to be considered as influencing factor (Johansson and McKelvie, 2012:5).

The first main organizational factor is the organizational culture which is a set of shared cognitive means, values, belief, norms and assumptions (Sackmann, 1991). An organizational culture is shaped by historical and present developments and can only be influenced in the long-run (Grichnik et al., 2010:372). Furthermore, employees problem solving and decision making is influenced by the organizational culture as basic assumptions learned and proved during problem solving are possibly taught to new employees as best practice (Schein, 2004:17). Entrepreneurial culture



as a form of organizational culture “offers an environment characterized by creativity and openness, which constitutes a good breeding ground for effectual logic” (Johansson and McKelvie, 2012:6). Thus, a higher entrepreneurial culture is positively related to the use of the effectual logic (Johansson and McKelvie, 2012:6). Part of the organizational culture also encompasses *failure treatment* towards employee mistakes (Grichnik, 2010). A fair *evaluation of project* goals which could not have been reached by the employee influence the entrepreneurial employee initiative as failure has a positive impact on the learning curve (Grichnik, 2010:374). Many companies. A not-acceptance of failure results in a demotivation and fear of failure for the employee. For implementing the effectual logic, a positive failure treatment is important as Effectuation encompasses experimenting with certain means and resources.

*Experimenting* also means trial and fail until it works. In an organization with a low acceptance of failure, for example in companies adapting lean management, experimenting and failure is not part of the companies’ culture (Grichnik et al., 2010:374).

The organizational culture is also closely related to *top management support*. If also the middle management is aware of desired entrepreneurial action they can support employees towards entrepreneurial behaviour for example with access to resources, available time, recognition in budget allocation and autonomy in resource allocation (Grichnik, 2010:374). Those aspects are relevant for an entrepreneurial culture and the application of Effectuation (da Costa and Brettel, 2011). Da Costa and Brettel (2011) found out a positive relationship between top management support and means-orientation supporting the importance of top management support (559). However, they could not find a positive relationship between a strong reward and reinforcement system and a strong focuses on expected returns (2011:560). This does not imply a negative relationship between reward and the application of Effectuation why it is an included factor in this study.

### *Organizational Structure*

The second main organizational factor - organizational structure – considers the fact of an adequate organisational structure with communication channels and a control system (Grichnik, 2010:371).

The *number of hierarchical levels* and the resulting flexibility (higher level of hierarchical levels means a lower flexibility) influence employee initiatives. Slevin and Covin (1990) stated a relationship between management style (entrepreneurial and conservative) and the organisational structure (mechanistic and organic) whereas an *organic organisational structure* and an entrepreneurial management style enhance an effective, entrepreneurial organisation. This means that an organisation facing a dynamic environment should deploy a flexible and entrepreneurial thinking management style in order to be successful (Grichnik, 2010:371). By implication, the resulting structure should be *flexible* and organic as well and should allow corporate members to meet without hierarchical limitations (Blekman, 2011:191). In addition, the resulting flexible and diverse corporate processes where innovations are not seen as a responsibility of R&D but of all departments, corporate Effectuation has a chance to be implemented (Blekman, 2011:194).

#### *Human Capital*

As the basis of Effectuation research is the decision making process of expert entrepreneurs (Sarasvathy, 2001a), individual traits of employees and expertise play an important role as conditional factor. Individual traits of employees are reflected in the five core principles of Effectuation which were discussed in chapter 3.3. Besides those influencing factors, several more individual factors influence the implementation of corporate Effectuation. Those are first, the education of the employee. Johansson and McKelvie (2012) found a positive relationship between a high level of education and the use of the causal logic which is further discussed in chapter 7. Furthermore, Johansson and McKelvie (2012) proved the positive relationship between a position in top management and the use of the effectual logic (2012:5).

The next human capital factor is pro-activeness tested by da Costa and Brettel (2011) and described as individual anticipation of future opportunities (ibid). They found a positive relationship between high personal pro-activeness and a higher appreciation of unexpected events (2011:4) which supports experimenting and the use of contingencies in the effectual logic.

Lastly, the individual attitude and capabilities characterize a corporate Entrepreneur (Grichnik, 2010:366). Mainly the attitude towards having an influence on compositions within the organisation and the conviction that an employee has the ability to control the future have an impact on an entrepreneurial mind set (Grichnik

et al., 2010:366). Summarizing, the following tables shows the stated factors and the related literature:

| <b>Main Factor</b>       | <b>Factor</b>                 | <b>Literature</b>                                                                |
|--------------------------|-------------------------------|----------------------------------------------------------------------------------|
| Organizational Culture   |                               | Hornsby et al., 1999                                                             |
|                          | Failure Treatment             | Ireland and Webb, 2007                                                           |
|                          | Project Evaluation            | Ireland and Webb, 2007                                                           |
|                          | Experimentation               | Ireland and Webb, 2007; Sarasvathy, 2001a; Johansson and McKelvie, 2012          |
|                          | Top Management Support        | Kuratko et al., 1990; Hornsby et al., 2002; daCosta and Brettel, 2012            |
| Organizational Structure |                               | Kuratko et al. 1990                                                              |
|                          | Number of Hierarchical Levels | Johansson and McKelvie, 2012                                                     |
|                          | Organic Management Style      | Ireland and Webb, 2007                                                           |
|                          | Flexibility                   | Ireland and Webb, 2007, Johansson and McKelvie, 2012                             |
| Effectual Factors        |                               |                                                                                  |
|                          | Means-driven                  | Sarasvathy, 2001a                                                                |
|                          | Controllability               | Sarasvathy, 2001a; Arend, 2015                                                   |
|                          | Risk Assumption               | Ireland and Webb, 2007; Sarasvathy, 2001a; Moroz and Hindle, 2011; Kuratko, 1990 |
|                          | Use of contingencies          | Sarasvathy, 2001a                                                                |
|                          | Cooperation                   | Ireland and Webb, 2007; Sarasvathy, 2001a                                        |
| Other Factors            |                               |                                                                                  |
|                          | High level of Education       | Johansson and McKelvie, 2012                                                     |
|                          | Position in Top Management    | Johansson and McKelvie, 2012                                                     |
|                          | Proactiveness                 | daCosta and Brettel, 2012                                                        |
|                          | Individual Attitude           | daCosta and Brettel, 2012                                                        |
|                          | Capabilities                  | daCosta and Brettel, 2012                                                        |

**Table 2 Literature Overview**

### 3 Methodology

The goal of this thesis is to explain framework conditions for implementing Effectuation in a corporate context and raise a theoretical framework as this is missing in the latest Effectuation literature (Eisenhardt and Graebner, 2007: 26). Therefore, this study is a qualitative explanatory study with the goal of answering the research question and developing a theoretical framework.

#### 3.1 Research Design

The research design is influenced by the underlying research philosophy having an impact on the researchers’ understanding of knowledge (Johnson and Clark, 2006) and on how to develop and characterize knowledge (Saunders, 2012:127). The underlying philosophy of the researcher in this thesis is realism as the focus here lies on explaining within the context of the space company and the interaction between the researcher and the interviewee (Saunders, 2012).

The research design of this study is summarized in the following table which is further explained in the below chapters.

|                        |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| <i>Philosophy</i>      | Realism                                                                                               |
| <i>Data Collection</i> | Qualitative research: Semi-structured interviews and short questionnaire                              |
| <i>Strategy</i>        | Embedded case study                                                                                   |
| <i>Sample</i>          | 15 employees from a space company working different innovation and non-innovation related departments |
| <i>Time Horizon</i>    | Cross-sectional                                                                                       |
| <i>Data Analysis</i>   | Template analysis in atlas.ti                                                                         |

**Table 3 Research Design of this thesis**

##### 3.1.1 Data Collection and Strategy

This research is primarily a qualitative approach with quantitative research whereas the qualitative data is the primary source of data and the quantitative data has a support function. This approach is common in case studies to collect and analyse data (Yin, 2009). A case study is chosen in order to enable a good understanding of the context of the research (Eisenhardt and Graebner, 2007) and to answer the stated research question asking a “what?” questions in a sufficient way (Yin, 2009).

Furthermore, qualitative data generated in 15 interviews is supported by quantitative data generated by a questionnaire with 12 questions and 4 possible answers each. A qualitative approach with the support of quantitative data is chosen for this study because of the following reasons (Brymann, 2006: 106; Creswell and Plano Clark, 2007; Molina-Azorin, 2010):

- Explanation: the quantitative data of the questionnaire helps explaining the findings of the interview data as the interviewees evaluation in the PAVE test and the resulting preferred PAVE strategy indicated the subjective view on the adaption of Effectuation in the company and deliberated conditions for implementing Effectuation to enhance entrepreneurial processes and innovation,
- Understanding: better understanding of complex research phenomena of framework conditions for the implementation of corporate Effectuation in a corporate context,
- Credibility: enhanced integrity because qualitative data is supported by quantitative results,
- Diversity: greater diversity of views on the research,
- Offset: offset of the weaknesses of both methods and draw on the strength of both.

#### *Qualitative data: Interviews*

The interviews are conducted in a semi-structured approach to generate a wide range of data input and to enable the interviewee to think freely, independently and to develop an own collection of thoughts and answers for the asked interview questions. For the interview questions see Appendix A.

The interview questions were developed based on the current literature of corporate entrepreneurship, strategic entrepreneurship and Effectuation. The questionnaire is divided into three parts:

1. Personally identified challenges with innovation and innovation initiatives within the firm,
2. Application of Effectuation in innovation on the personal, employee, and company level,
3. Conditions for implementing corporate Effectuation in this company.

Generally, the questions were asked openly to encourage the interviewee to think freely and start speaking freely. Getting started, a short introduction of the topic is given and the interviewee is asked about his experiences with innovation initiatives and personally identified issues with it. Second, participants are induced to think about their own experiences with Effectuation and the application of Effectuation on the personal level, employee level and company level. This part is designed openly as the interviewee needs some time to think of the possibly new topic of Effectuation, its principles and their own perspective. In order to support the interviewee, the logic of Effectuation and its' principles is shown during the whole interview. In the case the interviewee does not understand single aspects of the principles, those are explained again. Third and after being fully into the topic, interviewees are asked to think of circumstances and conditions they can imagine to act effectual and what should be changed to enable effectual behavior on different levels. As this is the most demanding part, the interviewees are first asked open-ended questions and if necessary are getting support by key points of the literature in order to enable the interviewee to think in different dimensions and circumstances of Effectuation, which was for most of the interviewees a completely new logic. The key points were developed based on the literature and the researchers' assumption based on his experience in the company. For the open question for framework conditions those key points were: top Management support, flexible processes, separate organizational structure, access to resources, capabilities, tools, development of peoples' skills, attitude, knowledge, recognition, reward, failure treatment For organizational and personal conditions those key points were based on the four core principles of Effectuation: budget allocation, partner acquisition, use of existing resources, and flexibility of goals. To sum up, the participants has the opportunity to give further comments on the discussed topic.

Based on the newness of corporate Effectuation, possible requests on participants' answers and to ensure that interviewees deliberate the questions, a face-to-face interview was conducted taking approximately 30 to 45 minutes. All interviews followed this semi-structure, were electronically recorded and were conducted within 7 weeks. Every participant signed the declaration of consent (see Appendix B) before the interview, ensuring confidentiality, an anonymous analysis of data and the record of the interview. Additionally, before the interview, every participant was again

informed that the interview will be recorded. After the interview, the records were checked and transcribed.

#### *Quantitative data: Questionnaire*

The questionnaire (see Appendix D) is called PAVE test and was developed by Faschingbauer (2016). The test is based on the PAVE strategies: prediction, adaption, vision, and Effectuation describing the preferred strategy in decision making and problem solving (Faschingbauer, 2016) (see Figure 3). Before using this test Faschingbauer was asked for permission of using the test in this study via email. After confirmation, Faschingbauer also sent more information on the test, the method how to do the test and the analysis method which is explained in the chapter Data Analysis below.

10 points per question had to be distributed. Thus, one answer can be weighted from 0 to 10 points while a higher score means a higher accordance to the person). 10 points can also be distributed to one single answer (Faschingbauer, 2016).

The questionnaire was sent to every participant prior to the interview via email to ensure on the one hand an independent and on the other hand from the interviewer and the interview questions unaffected completion of the questionnaire. However, nine participants completed the questionnaire right before the interview and six participants completed the questionnaire prior to the interview. Although the interviewer did not interrupt during completion and the pure fact of attendance of the interviewer could have possibly biased the results.

### **3.1.2 Sample and Time Horizon**

The participants of the study were employees from a space company from different departments within the company in order to get as much data as possible for this qualitative research within the limited time frame of this thesis. Therefore, a cross-sectional study was chosen in order to meet the time requirements of the thesis. 17 interviews were conducted whereas only 15 interviews were analyzed as emerging during the interview, two participants rejected to answer around 80% of the relevant questions. The number of interviews was determined by recurring answers and stagnating new data input for the research.

Participants for the interview were selected as follows:

First, and as Space System with its 15.000 employees is a huge network of potential participants, those were narrowed down with the help of the researchers' network within the company and several recommendations of potential participants from innovation initiatives, as well as second tier recommendations meaning that several recommended potentials gave recommendations on potential valuable interviewees in the innovation field. This snowball sampling is among others effective in a field where potential participants are likely to know each other (Vogt, 2011:368). Especially in the innovation environment of the space company this is the case as influencers and experts know each other because of complementary departments or conferences. The most valuable result of the snowball sampling was that especially a wide range of contributors was hard to find as the company has many innovation initiatives with several contributors. Resulting, the snowball sampling was valuable to get access to a wide range of participants. Additionally, participants had to fulfill the requirements that they either are or were involved in an innovation initiative or are influencing innovation within the space company because of their position or expert role. Five potential participants were eliminated before the second step because they did not match with one of the mentioned requirements. With the help of the snow ball sampling and the mentioned requirements, a list of potential participants of 20 employees was created

Second, all potential participants got an email asking for the participation in the research and containing the research topic, research question and design, as well as a short introduction to corporate Effectuation and its potential benefits for the company, and the declaration of consent. After one week, an email was sent in order to remind potential participants.

Third, after three weeks, the selection was completed by the status of participation. Two potentials were not available, one employee rejected because of time issues and 17 employees confirmed to take part in the study. Two interviews were not considered in the analysis as they refused to answer around 80% of the questions and the remaining answers were no new data input. In total, 15 participants took part in this study.



The role of the interviewees ranged from project managers (nine interviewees), program managers (four interviewees) to contributors (five interviewees) whereas three interviewees carry out two different roles being a project manager and a contributor.

The name of the department was generalized as well in order to keep the participants anonymously and to make sure that an interviewee cannot be identified because of logical combining of role and department. Thus, departments vary between Business Development (five interviews), R&T/ R&D: Research and Technology and/ or Research and Development (four interviews) and different projects (six interviews). Business development and R&T/ R&D can be roughly seen as Innovation departments while the department projects are non-innovation related engineering projects. Within the project departments, the interviewees engage or engaged in innovation, strategic entrepreneurship, and idea generation. The distribution of 9:6 Innovation related and project departments should deliver reasonable results in analysis because it can be assumed that those interviewees participating in innovation initiatives (contributors) and those who influence an innovation initiative (initiator and expert) have different points of view on the application of Effectuation and framework conditions in order to implement corporate Effectuation in the company.

Thus, the final participants can be assigned in three groups.

- I: Influencer with a high impact on the design and implementation of innovation and entrepreneurial processes within the company,
- E: Experts from R&T and innovation, and
- C: Contributors to innovation and entrepreneurial processes, who primarily took part in one of the space companies' innovation initiative.

Table 4 shows an overview about the employees who participated in the interviews.

| <i>Interviewee</i> | <b>Role of Interviewee</b>    | <b>Department</b>    | <b>I<sup>1</sup></b> | <b>E<sup>2</sup></b> | <b>C<sup>3</sup></b> |
|--------------------|-------------------------------|----------------------|----------------------|----------------------|----------------------|
| <b>1</b>           | Project Manager               | Business Development |                      | x                    | x                    |
| <b>2</b>           | Project Manager               | Business Development |                      | x                    |                      |
| <b>3</b>           | Project Manager + Contributor | Project              |                      |                      | x                    |
| <b>4</b>           | Program Manager               | Project              | x                    |                      | x                    |
| <b>5</b>           | Project Manager               | R&T/ R&D             | x                    | x                    | x                    |
| <b>6</b>           | Project Manager               | R&T/ R&D             | x                    | x                    |                      |
| <b>7</b>           | Project Manager               | R&T/ R&D             | x                    | x                    |                      |
| <b>8</b>           | Contributor                   | Project              |                      |                      | x                    |
| <b>9</b>           | Contributor                   | Business Development |                      | x                    | x                    |
| <b>10</b>          | Project Manager + Contributor | Project              |                      |                      | x                    |
| <b>11</b>          | Program Manager               | R&T/ R&D             | x                    | x                    |                      |
| <b>12</b>          | Project Manager + Contributor | Project              |                      |                      | x                    |
| <b>13</b>          | Program Manager               | Business Development | x                    | x                    |                      |
| <b>14</b>          | Project Manager               | Business Development | x                    | x                    |                      |
| <b>15</b>          | Program Manager               | Project              |                      |                      | x                    |

**Table 4 Interview participants list**

Five participants were working in business development, six participants were working in different engineering projects, and four participants were employed in research and technology and/ or research and development. Three participants had a position as program manager meaning that they were either head of a department or leading more than one project. Nine interviewees were project managers leading one specific project, six people were took part in an innovation initiative whereas three of them were also a project manager and one participants was also a program manager. Finally, the interviews were conducted with 11 male and four female employees which could possibly cause a gender bias in the analysis.

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<sup>1</sup> Group: Influencer (I)

<sup>2</sup> Group: Expert (E)

<sup>3</sup> Group: Contributor (C)

### 3.1.3 Data Analysis

In the post-interview phase data was analyzed for each type of data separately. Afterwards, the results were compared with each other.

#### *Qualitative Data: Interview*

The challenge in analyzing qualitative data is on the one hand to interpret words which can imply multiple and unclear meanings and on the other hand to explain, analyze, synthesize and transform a mass of electronic files (Saunders et al., 2012:546). Therefore, template analysis is used as it is a “more flexible technique with fewer specified procedures, permitting researchers to tailor it to match their own requirements” (King, 2012: 428). As proposed by Lewins and Silver (2009) CAQDAS<sup>4</sup>, especially the qualitative data analysis software Atlas.ti is used to conduct template analysis.

Next, the technique of template analysis is described based on the research and analysis of King (2012) and Saunders (2012):

First and before starting the interviews, codes based on the literature are grouped in codes with higher- and lower order constituting the initial template (see Appendix F). “Coding is the process of attaching a label (code) to a section of text to index it as relating to a theme” (King, 2012:431). Therefore, the initial template was divided in three main groups: challenges in innovation, application of Effectuation, and condition for corporate Effectuation. The first group challenges in innovation was created based on the researchers’ experiences with innovation initiatives of the company. The second group application of Effectuation, reflects the five core principles of the effectual logic based on the research of Sarasvathy (2001). The third group, conditions for corporate Effectuation, was divided in two main groups based on the literature: organizational factors and human capital factors. Furthermore, the organizational factors were divided into the organizational culture and the organizational structure again separated into sub factors of this group. The human capital factor was also split into two sub groups: effectual and other factors separating the effectual logic from other influencing human capital factors.

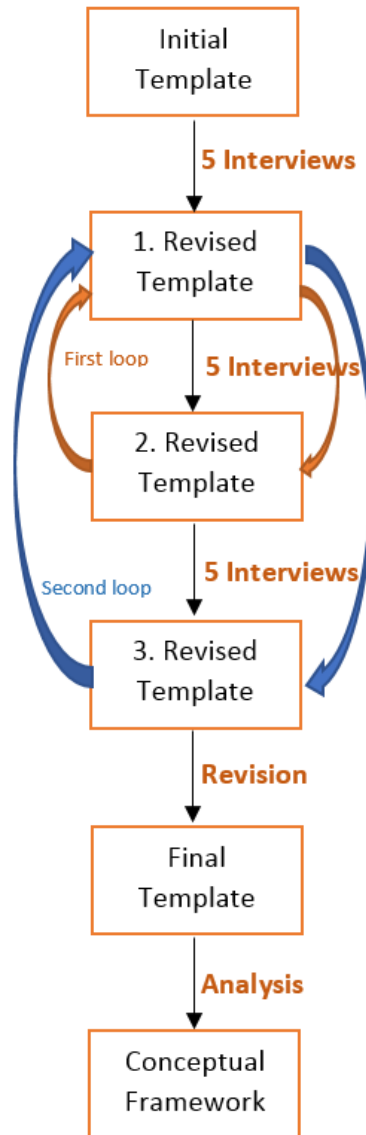
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<sup>4</sup> Computer Assisted/Aided Qualitative Data Analysis Software

Second, the initial template was revised after conducting the first five interviews. Codes with no matches were eliminated whereas frequently occurring new codes were added to the template. After every fifth interview the template was revised again resulting in one initial template and three revisions. Even a change of hierarchy of a code, a completely new introduction of a code or even the elimination of a code is possible in this adaption process. A code was eliminated when only one participant quoted one on this code. This was conducted during the whole template analysis. In the second and third revision, extra loops to prior revision steps were implemented in order to validate the implications of new codes. Resulting, prior interviews are double checked for new codes.

Third and after collecting and analyzing all data carefully, the template was used as an analytical basis and revised again for the conceptual framework in order to explain key conditions and relationships in the data.

Figure 9 illustrates the described template analysis and the process to a conceptual framework for this research.



**Figure 9 Template Analysis for this research (based on King, 2012)**

The analysis of the final template was done as follows:

First, in atlas.ti seven code families were generated according to their corresponding main factor. Code families are characterized by only one sub level factor. The code families are: challenges in innovation, application of Effectuation, organizational culture, organizational structure, effectual factors, other factors, and innovation factors. Super family codes were then generated in order to allocate specific code families to a higher level of family. Super code families are characterized by two sub levels factors. The two code families, organizational culture and organizational structures were allocated to a super family code named organizational factors. The same was done for the code families effectual factors and other factors named human

capital factors. The two super family codes and the family code innovation factors were finally allocated to conditions for corporate Effectuation as head family. This relation is shown below in Figure 10.

Green: Family Code,  
 Red: Super Family,  
 Blue: Head Family.

|                                                |                                       |
|------------------------------------------------|---------------------------------------|
| <b>1 Challenges in Innovation</b>              |                                       |
| 1                                              | Inflexible Processes                  |
| 2                                              | Budget Allocation                     |
| 3                                              | Demotivation                          |
| 4                                              | Lack of Vision                        |
| 5                                              | Risk Aversity                         |
| 6                                              | Coordination of Processes             |
| 7                                              | No flexible organizational structure  |
| 8                                              | No Reactiveness                       |
| 9                                              | Age Structure                         |
| <b>2 Application of Effectuation</b>           |                                       |
| 1                                              | Bird in Hand                          |
| 2                                              | Affordable Loss                       |
| 3                                              | Lemonade                              |
| 4                                              | Crazy Quilt                           |
| 5                                              | Pilot in the Plane                    |
| <b>3 Conditions for Corporate Effectuation</b> |                                       |
| 1 <i>Organizational Factors</i>                |                                       |
| 1                                              | Organizational Culture                |
| 1                                              | Failure Treatment                     |
| 2                                              | Experimentation                       |
| 3                                              | Top Management Support                |
| 4                                              | Freedom                               |
| 2                                              | Organizational Structure              |
| 1                                              | Number of Hierarchical Levels         |
| 2                                              | Organic Management Style              |
| 3                                              | Flexibility                           |
| 4                                              | Separate Structure                    |
| 2 <i>Human Capital Factors</i>                 |                                       |
| 1 <i>Effectual Factors</i>                     |                                       |
| 1                                              | Means-driven                          |
| 2                                              | Controllability                       |
| 3                                              | Risk Assumption                       |
| 4                                              | Use of contingencies                  |
| 5                                              | Cooperation                           |
| 2 <i>Other Factors</i>                         |                                       |
| 1                                              | Proactiveness/ Motivation             |
| 2                                              | Capabilities                          |
| 3                                              | Reward                                |
| 3 <i>Innovation Factors</i>                    |                                       |
| 1                                              | Time Availability                     |
| 2                                              | Communication                         |
| 3                                              | Rules and Routines                    |
| 4                                              | Active Involvement of employees       |
| 5                                              | Access to Resources/ Expert knowledge |

Figure 10 Code Family Structure

### *Quantitative Data: Questionnaire*

As already stated, the questionnaire has a support function in the complex qualitative data analysis. Thus, the quantitative data analysis concentrates on valuable analysis supporting qualitative data with PAVE distributions and frequencies in order to be able to discuss the resulting framework conditions of the interviews. The researcher disregards especially, beside others, distributions and frequencies of single answers and significance tests. Thus, the quantitative analysis is not a complete quantitative analysis.

The questionnaire was analyzed primarily using the proposed analysis method from Faschingbauer as he used exploratory data analysis and a coding scheme allocating every answer to one of the four PAVE strategies in different chronological order.

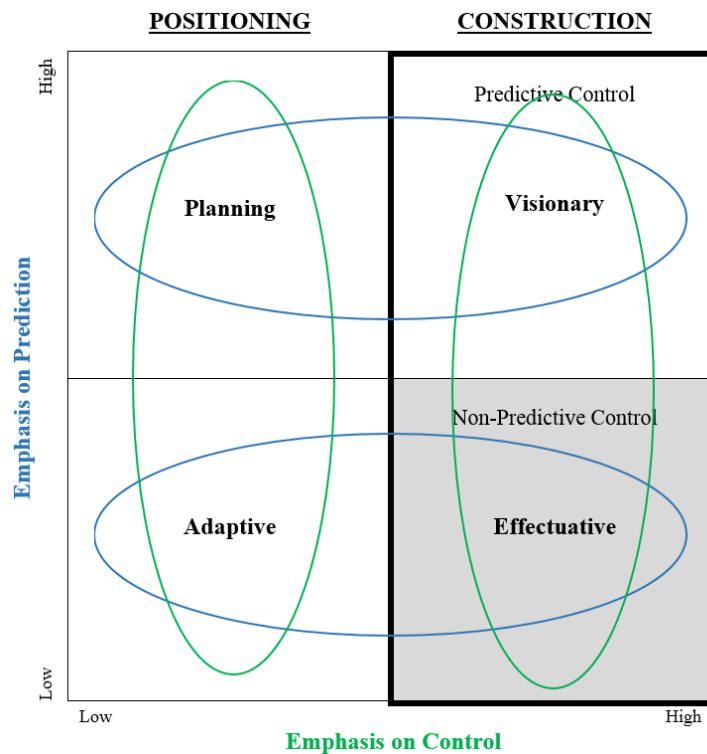
For analysis purpose, the distributed points ranging from 0 to 10 were counted and summed per strategy. Afterwards, groups of strategies were formed in order to classify the answers along the dimensions of prediction and control (see Figure 11 below for color code):

- **P+A**: low emphasis on control,
- **V+E**: high emphasis on control,
- **P+V**: high emphasis on prediction,
- **A+E**: low emphasis on prediction.

Afterwards, the preferred strategy was analyzed comparing those groups based on the degree of emphasis on prediction and control to analyze the groups along the dimensions of prediction and control:

- $(P+V) > (A+E)$ : more prediction preference than non-prediction,
- $(P+V) < (A+E)$ : more non-prediction preference than prediction,
- $(P+V) = (A+E)$ : equal preference for prediction and non-prediction
- $(P+A) > (V+E)$ : higher emphasis on control

Figure 11 shows the dimensional context of those groups in the PAVE matrix.



**Figure 11 PAVE strategies (adapted from Wiltbank et al., 2006: 983)**

The goal of this data is to support the qualitative interview data, to be a discussion point for answering the research question and to deliver possible reasoning for qualitative data. Thus, the analysis of the quantitative data is limited to useful and valuable analysis towards the support function. Therefore, the results are analyzed regarding highest and lowest values, distributions (strategy and groups) and frequencies. Additionally, results are shown in suitable distributions graphs and tables.

*Support of quantitative data to qualitative data*

The goal of the comparison is to prove and evaluate given answers on subjective points of view on the application of Effectuation on the individual and company level and the stated framework conditions for the implementation of corporate Effectuation in the company. The results of the interview data and simple data analysis of the questionnaire were therefore compared on the individual level and on the company level. On the individual level, the results were compared on regard of accordance of answers in the interview and preferred strategy resulting from the questionnaire. On the employee level as a unit, individual information were condensed and compared regarding accordance of the units' point of view on the



application of Effectuation and framework conditions. The support function is used in the discussion chapter.

### **3.2 Ethical Considerations**

This explanatory case study places high value on ethical considerations and standards because of the companies' emphasis on Innovation, new innovative initiatives and the strong internal effort to optimize and re-organize innovative processes of the firm. Ethical standards were set over all research sub-phases especially regarding participant protection, data protection, and responsibility for data analysis and reporting (Saunders et al. 2012: 208 - 257; Cooper and Schindler, 2006: 112 – 133):

This includes the carefully designed research with regard to potential harm and conflicting interests within the department and the whole company in terms of an informal risk assessment and conflicting interests.

Furthermore, the disclosure of the research purpose and design in the pre-interview phase with all relevant information was revealed to all participants that they were able to learn about the research, the purpose and decide whether or not to participate in the research itself. After the selection of potential interviewees, a short introduction of the research topic was sent to the group of participants via email. Sending it via email allowed the potential participants to think about the decision privately and without external influence of the researcher or the corresponding department within the company. This guaranteed a voluntary basis of all interviewees and the clarification of general questions beforehand. Lastly, the interviewees signed a declaration of consent to ensure data protection and confidentiality of the collected data (see Appendix B and Appendix C)

During the interview phase, the interviewees were prevented from coercion by respecting right to withdraw and the researchers' objectivity during the whole interview phase by concentrating on the relevant interview questions, the time, the relaxed atmosphere and trying to minimize emotions. Additionally, participants answers were treated confidential and anonymously.

In the post-interview phase, data was treated confidentially, anonymously, and objectively. Furthermore, the agreed consent on data usage and protection was considered. Finally and all over the research phase, physical and mental harm for participants and researcher was avoided (Saunders et al., 2012:236).

## **4 Results and Discussion**

The collected qualitative and quantitative data is analysed according to the methodological approach in chapter 3.1.3. In addition, the presentation of the results of the template analysis is done using an account structure around the main factors stating interview citations to illustrate the context (King, 2012:446).

This chapter is structured according to the literature review and the corresponding interview sections. First, an overview about the sample of the study and their division into the three groups: initiator, expert, and contributor is given. Second, the identified challenges in entrepreneurial processes and innovation are analysed in general and depending on the group placement. Third, the analysis of the application of Effectuation in the corporate context follows structured in a general analysis approach and group comparison. After the simple quantitative analysis of the PAVE questionnaire in order to support and discuss the purpose of the qualitative results, fifth, framework conditions for the application of corporate Effectuation follows according to organizational factors, human capital factors and innovation factors.

Finally, this chapter discusses the stated results on company specific innovation and corporate entrepreneurship challenges, the application of corporate Effectuation and the explained company specific conditions on applying Effectuation in the corporate context of a space company after each section. The results are furthermore compared with the existing literature in the field of corporate Entrepreneurship and corporate Effectuation. Comparing the results with existing literature, the aim is to evaluate and to support the results but aims not to find a generalizable approach. In addition, results are explained and considered critically.

### **4.1 Participants and Group Comparison**

As stated above in chapter 3.1.2 the sample of 15 participants, with a middle age of 41 years, are allocated in three different groups: initiators, experts, and contributors. Initiators are employees within or very close to innovation initiatives designing and managing innovation in the company. Experts are employees who have expertise through their deep experiences within innovation in and outside the company and who influence innovation and entrepreneurial processes in the company in different ways. Contributors are mainly engineers from projects who take or took part in an innovation initiative and who are seen by the company and the corresponding

department as innovative regarding both, technical and business innovation as well as process innovation. A participant can be classified in one or more group. Table 5 summarizes the groups and the number and characters of the sample.

| <i>Groups of Participants</i> | <b>Number of Participants</b> | <b>Characters of Participants</b>                                                                                |
|-------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b><i>Initiators</i></b>      | 7                             | 1 female, 6 male<br>Approx. age range: 35 – 57<br>Departments:<br>1 projects, 2 business development, 4 R&T/ R&D |
| <b><i>Experts</i></b>         | 9                             | 3 female, 6 male<br>Approx. age range: 26 – 57<br>Departments:<br>0 projects, 5 business development, 4 R&T/ R&D |
| <b><i>Contributor</i></b>     | 9                             | 2 female, 7 male<br>Approx. age range: 26 – 59<br>Departments:<br>6 projects, 2 business development, 1 R&T/ R&D |

**Table 5 Group Analysis (adapted from King, 2012:434)**

The sample consists of 11 males and four female participants which possibly cause a gender bias. Only one of the interviewees is part of all three groups. The reason for that lies in his age, work and innovation experience and past contribution to innovation initiatives and idea development. Five employees are classified as both initiator and expert as these two groups are related to each other because being an expert results mainly from inside or outside positions within and deep experiences with entrepreneurial processes, strategic entrepreneurship and innovation. Two participants are both expert and contributor and one participant is initiator as well as contributor. The number of participants of the last combination is only small because the sample indicates that it is unusual to on the one hand have a position in innovation and on the other hand contribute with an innovative idea in an initiative. Six people are classified only in one groups, mainly as contributor whereas one of them is exclusively an expert.

Analysing the groups, seven participants can be classified as initiators. Six of them are male and one of them is a female participant. The approximately age range is between 35 and 57. One person participated from a project department two from business development and four persons from R&T and/ or R&D as those

departments are influencing innovation initiatives and idea and technology development.

The next group consists of three female and six male experts, overall nine persons. Those are aged between 26 and 57 and are positioned in mainly business development (five participants) and R&D/ R&T (four participants). None of the experts are currently working for a specific engineering project.

The third group – contributors - encompasses nine participants with an approximate age range of 26 to 59. Two female and seven male participants are working for specific engineering projects (six people), business development (two people), and R&D/ R&T (1 person).

## **4.2 Challenges in Strategic Entrepreneurship and Innovation**

### *Results*

The main purpose of this section is to detect existing challenges in innovation and strategic *entrepreneurship* in order to analyse and discuss the application of Effectuation as well the framework conditions for the application of corporate Effectuation.

Starting the interviews, the initial template consisted of the challenges: inflexible processes, budget allocation and demotivation based on the researchers' experiences. After the first five interviews, seven additional factors were added to the factor challenges as they were mentioned at least once. These challenges were: lack of vision, risk aversion, no access to resources, no freedom to innovate, coordination of processes, no flexible organisational structure, and the cost factor,. Separate factors were opened as the new identified challenged did not fit to the existing three factors. After the next five interviews and for the second template, three codes were eliminated again as those were not mentioned anymore and had still only one quote: no access to resources, no freedom to innovate, and the cost factor. However, four codes were added to the template as they were mentioned at least once in the second interview group: reactiveness, age structure, no feedback, and workload. For the third template and after the final five interviews, no codes were added but two more eliminated as they were not stated in the final five interviews and remained with one quote: no feedback ad workload. For the final template, nine codes for challenges remained in the template.

In the final template, two of the three pre-existing challenges from the initial template were emphasised by the sample, which are demotivation and budget allocation with each six quotes in the sample. The factor demotivation is primarily characterized by employees who are discouraged to generate, develop or hand in ideas because of time restrictions, personal workload or a complicated and not clear idea and innovation handling within the company. Furthermore, ideas get rejected by top management for further development because of some unknown reason. If the idea is implemented by another company or entity several years later, the demotivation of employees rises:

*“[...] we are conservative we miss things. And for me and other people I know ideas are rejected for what seems for reasonable reasons and then one or two years later a competitor does it with huge success. And that is really frustrating” (Interviewee 9, code: demotivation).*

The factor budget allocation centralizes corporate investment difficulties. The problem here is that the company would like to plan its budget allocation to innovative projects even before they exist. However, innovative ideas emerge or deliberate but cannot be planned exactly and without deviations. Thus, the exact budget allocation of future ideas is rather difficult. In addition, especially in the high tech industry of space the technical development has the potential to generate high costs which has to be covered by the company. This trade-off between idea support and budget is described in this factor:

*The company wanted to know which innovative projects we could possibly submit one year in advance in order to plan the budget. This kind of budget allocation has nothing to do with reasonable innovation and short term developments of strategies, technologies, new ideas. It is completely incompatible<sup>5</sup> (Interviewee 3, code: budget allocation).*

As third most mentioned challenge, the lack of vision was emphasised by the sample with five quotes from four different participants. Lac of vision means that employees

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<sup>5</sup> Translated from German, for original quote see Appendix K Interview Translations: original quotes

are not sure about the direction of the company and therefore feel insecure in submitting ideas because they do not know if this applies to the companies' vision:

*“Let's say [...] [the market] used to be a lot more stable than it is now. Because there is a real lack of vision in big programs and internationally in what people are doing next.” (Interviewee 9, code: lack of vision).*

Next, the factor inflexible processes mainly concentrates on rigid and impenetrable processes defined for innovation within the company. If an employee has an idea, it is common within the company that this person also develops the idea. But sometimes they do not want to develop it further because of time pressure or workload or any other reason but would still like to submit it because it may be a valuable idea. In addition, there are too many innovation processes within the company impenetrable for employees:

*“I think this is arriving at the destination. So that positive and good. I think right now we are in the definition phase of the processes so basically what we have and this is the difficulty for an innovation manager basically what we have is a lot of Innovation opportunity a lot of Innovation process” (Interviewee 13, code: inflexible processes).*

Another challenge in the company concerning innovation was named risk aversion. This means that the company fears taking over risks especially financially and resource based. The use of resources like machines or expert knowledge for an idea which possibly will not survive is cost intense. The risk that resources are blocked where it could have been used for more beneficial idea or project is a challenge for innovation:

*The fear of taking over risks [is a big problem], using own means and resources. They hope to get investors taking over those risks.<sup>6</sup> (Interviewee 11, code: risk aversion)*

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<sup>6</sup> Translated from German, for original quote see Appendix K Interview Translations: original quotes

For employees, also the coordination of innovation processes is an issue. This includes on the one hand the own developed processes of employees. Especially encouraged and convinced employees submit the same idea in several initiatives over and over again. In addition to that, they go own ways pitching ideas directly to the top management. That is why several ideas exist over years and are over an over pitched to different points of contact. On the other hand people are unsecure if a submitted idea is exchanged between different innovation initiatives because this could lead to the right initiative for a specific idea where it is best supported and funded:

*“And at my level sometimes I lack the understanding of how all these [innovation processes] are coordinated. Or if they are somehow coordinated” (Interviewee 13, code: coordination of processes).*

Next, the factor no flexible structure emphasizes that the organizational structure of the firm is under employees widely seen as construed for long term projects rather than innovative projects resulting in an inflexible structure:

*“I think it is because we traditionally kind of have the big long term project we don't have to steer the market in a quick way. It's more a long term lobbying and thing like that. And it is very conservative and risk averse. And if you take the new business approaches like [...] [company x] they are doing, it scare a lot of people and they don't know how to deal with that” (Interviewee 9, code: no flexible structure).*

The factor no reactiveness emphasizes the hazard that the company is too slow to react on market trends and therefore does not match innovative ideas with market trends:

*“Second [internal innovation goal] should be to react on trends like [...] [company x] several years ago because they invented in a completely other direction” (Interviewee 6, code: no reactiveness). .*

The last factor tackles the age structure. This means that especially innovation experts but also well experienced engineers have relatively high age in this company which causes generation conflicts in the evaluation of ideas and the use of networks in order to develop ideas:

*“They are more experts and seniors and have a very different network what the younger more innovative people might have. And therefore misjudge or don’t understand potential new ideas” (Interviewee 9, code: age structure).*

Overall, the eliminated challenge factors during template analysis were: no access to resources, no freedom to innovate, costs, no feedback, and workload.

Considering the group comparison, particularly experts commented on challenges in innovation in the company (24 total quotes) emphasising especially demotivation and inflexible processes with total eight quotes. The contributors commented on each of the remaining challenges especially on lack of vision and demotivation with five quotes each. Noticeably, the group of initiators withhold with comments on challenges in innovation with only eight quotes in total but emphasising the inflexible processes.

*“[...] we are not allowed to look for any new partner which would be of interest for us and we have to take care because if we want to work with a partner from [...] [a country] we have to be aware of the national policy. It’s a strong limitation for innovation” (Interviewee 4, code: inflexible processes).*



Table 6 shows a summary of all challenges per group.

| <b>Challenges</b>                           | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|---------------------------------------------|------------------|---------------|--------------------|
| <i>Inflexible Processes</i>                 | x                | x             | x                  |
| <i>Budget Allocation</i>                    | x                |               | x                  |
| <i>Demotivation</i>                         |                  | x             | x                  |
| <i>Lack of Vision</i>                       |                  | x             | x                  |
| <i>Risk Aversion</i>                        |                  | x             | x                  |
| <i>No Access to Resources</i>               |                  |               |                    |
| <i>No Freedom to innovate</i>               |                  |               |                    |
| <i>Coordination of Processes</i>            | x                | x             | x                  |
| <i>No flexible organizational structure</i> |                  |               |                    |
| <i>Costs</i>                                |                  |               |                    |
| <i>No Reactiveness</i>                      | x                | x             | x                  |
| <i>Age Structure</i>                        |                  | x             | x                  |
| <i>No Feedback</i>                          |                  |               |                    |
| <i>Workload</i>                             |                  |               |                    |

**Table 6 Group of Challenges in Innovation**

### *Discussion*

Summarizing, the following company specific challenges were identified in this study: inflexible processes, budget allocation, and demotivation, lack of vision, risk adversity, coordination of processes, no flexible organizational structure, no reactivity, and the age structure.

Overall, the sample emphasized especially the challenges demotivation, budget allocation and the lack of vision. An explanation for this could be the effort and the goal of the company to innovate trying to set up several different innovation initiatives which seem to be rather uncoordinated and inflexible in nature. In corporate entrepreneurship literature, researchers suggest a “structuring [of] the organization in ways that accommodate and reinforce the business ventures embraced as part of the firms’ strategic context” (Kuratko, 2010:142-143). Furthermore, employees are not sure about the strategic direction of the company, which results in a lack of vision and the employees’ uncertainty about what to innovate and sense behind innovation. However, in the case employees are encouraged to innovate and submit an innovative idea because they believe in it, they

seem to get demotivated by processes and budget allocation as it seem to be rather hard to convince the management from a very early stage idea that need be developed and researched. Therefore, especially in the space sector and for technological innovation, a relatively high amount of money is needed for research and development. For smaller technological ideas this may mean no budget allocation and no chance for experimentation. In their intrapreneurship assessment instrument, Kuratko, Montagno and Hornsby (1990) stated the support of smaller and experimental projects as a factor of management support for intrapreneurship (1990:56). However, for potentially bigger project, also a higher budget is required which may causes a higher risk. In literature, the “encouragement for taking risks” (Kuratko, Montagno and Hornsby, 1990:56) as a factor for management support is stated. During analysis, the company seemed to be risk averse in innovation but trying to collaborate with other companies to share risks. This seems to be a reasonable approach as solution for reducing risk but also taking the challenge. However, the perceived challenge of arbitrary budget allocation and risk aversion in top management causes the demotivation of people.

### **4.3 Application of corporate Effectuation**

#### *Results*

*“Until some month ago, I did not know, that this effectuation has a name and defined principles. But with friends I already applied this scheme completely” (Interviewee 6).*

The main purpose in this section is to detect and analyse existing effectual thinking within the company in order to have a basic understanding of the current effectual situation and a basis for later discussion on framework conditions for the application of Effectuation in this company.

The initial template of the application of Effectuation in a corporate context was based on the literature and the five core principles of Effectuation: bird in hand, affordable loss, lemonade, crazy quilt, and pilot in the plane whereas the factor pilot in the plane constitutes that a decision maker tries to control the future rather than predict it in uncertain environments. In this section, codes could not be added but only eliminated as the codes are based on the five core principles of Effectuation. In the case that quotes were made fitting the effectual philosophy, those were allocated

to one of the five principles where it was most applicable. After the first five interviews, every factor was stated more than once. In the next two interview groups, participants mentioned all of the principles especially bird in hand and crazy quilt. In the final template, no codes were eliminated.

As already stated, the codes bird in hand and crazy quilt were the most frequent identified principles of Effectuation within the company. Bird in hand was overall quoted from 12 interviewees with a total quote of 18. Some participants talked about innovative projects they were working on using and acting with resources available:

*“The idea was to use our skills and knowledge in Astronaut training and develop a system that could be used in Astronaut training” (Interviewee 10, code: bird in hand).*

Others participants were not taking part in an innovative project but were thinking effectual in the way of the use of existing resources:

*“So where you have resources organized normally per areas or program areas or technical areas but organized by people that have similar capabilities or similar orientation. And when you try to innovate you look at your team and you say: ok and now what can this team do” (Interviewee 13, code: bird in hand).*

The crazy quilt principle was also quoted 18 times by 12 different interviewees. Here, most of the interviewees referred to real engineering projects where cooperation and additional resources and knowledge is inevitable for the project to succeed. One of the participants commented on this more negatively intoning and as a necessity rather than something desirable:

*“Yes sometimes. When I am working with Subcontractors and we have to manufacture new machines it's very important to work together and to be sure to succeed. We have an interest to succeed because we have opportunities to gain money with it. Interestingly, we have a need and work together and not in struggle” (Interviewee 12, code: crazy quilt).*

However, many participants were open minded towards partnerships and knowledge sharing and were not only thinking but also acting effectual in the way of crazy quilt:

*“And we worked together with this company and learned very much. And it was the best result in my whole career because for me it was the biggest scope” (Interviewee 15, code: crazy quilt).*

The lemonade principle was mentioned with 11 quotes in the whole interview phase. Here most of the interviewees emphasised their thinking but not their acting like the lemonade principle. Unexpectedly, most of the participants were thinking of the benefits of contingencies rather than seeing them as hindrances. However, one participant used contingencies in a specific project in order to enhance the idea. The result was ground breaking for the company:

*From market experiences which we gained from customer interaction, inherent in the whole activity and mutual discussions, a new modified way arose. This ultimately led to the business we have started. A small modification and a ground breaker for big business today [...]”<sup>7</sup> (Interviewee 3, code: lemonade).*

The last two principles affordable loss and pilot in the plane were both quoted nine times each from six (affordable loss) and seven (pilot in the plane) different interviewees. The reason for the relatively low number of quotes for affordable loss is on the one hand that participants struggled with the understanding of this principle and that the company is focuses on return on of investment as it is an economically company. For that reason the number of appearing affordable loss cases is in fact relatively high. Interviewee 4 from a specific high innovative and high technology based project indicates the affordable loss principle in a corporate context in action:

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<sup>7</sup> Translated from German, for original quote see Appendix K Interview Translations: original quotes

*“I have no limitations. I was given a very simple objective: to get this product properly funded and to address whatever the market is as long as of course in the end we make profit. One limit was given concerning the risks: one is the product itself, second that the market itself is an emerging market (Interviewee 4, code: affordable loss).*

As this project of course faces several risks, the project manager and the company decided to only spend what the company is able to lose and therefore tried to give one of the risks to a committed stakeholder because they were not able to lose the investments of both. This indicated also the principle of crazy quilt as this not only means additional resources but also risk sharing.

*“With these project, as soon as you have a risk sharing partner you are not only sharing the risk off course but opportunities and mutual interests and strategy, long and short term. Therefore we are doing co-creation” (Interviewee 4, code: crazy quilt).*

The pilot in the plane principle was mainly driven by thinking rather than acting. However, the mind set of controlling the future rather than predicting it is shown in the next quote:

*The future is in your hands. You can control it but you really have to know it, want it and boost it. Only you know the business, your personality, your strength and weaknesses and which weaknesses to overcome. Only you know your network with which you can reach your goals<sup>8</sup> (Interviewee 3, code: pilot in the plane).*

Lastly, the results are analyzed according to their specific group.

41 quotes were given by participants belonging to the group contributor which is the highest number of quotes in application of Effectuation within one group, followed by experts with 32 quotes and initiators with 26 quotes. Overall, this was expected as contributors are really acting within innovation initiatives and idea generation and

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<sup>8</sup> Translated from German, for original quote see Appendix K Interview Translations: original quotes

therefore either think or act effectual in all dimensions of Effectuation emphasizing crazy quilt and bird in hand.

However, experts of innovation are less thinking that they are the pilot in the plane but are mainly using existing resources and corporations or think that this is the best way to generate ideas and opportunities.

Initiator is the group with only three applied effectual dimensions: bird in hand, affordable loss crazy quilt. During the interviewees, it was obvious that most of the initiators do not feel controlling the future. Furthermore, from seven initiators only two quotes were made concerning the use of contingencies and its seen benefits.

*“Use surprises, if a chance comes up use it and go to that direction. Be brave enough to walk outside pre-defined goals. Adapt goals to new goals”*  
(Interviewee 6, code: lemonade).

Summarizing, mostly project managers submitting and developing innovative ideas, were identified to not only think but also act effectual. In the sample, there were three innovative ideas which were developed and implemented effectually. Two of the ideas are today big projects with several employees working on it. None of them has break even yet. Regarding especially people involved in the innovation process, some of them only think but not act in several effectual dimensions especially bird in hand and crazy quilt. Within the expert group, the barrier between thinking and acting effectual also seems to be high as some of them were thinking effectual but not acting stating different identified challenges in innovation as reasons.

The below shown Table 7 summarizes the application of Effectuation within the three group.

| <i>Application of Effectuation</i> | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|------------------------------------|------------------|---------------|--------------------|
| <i>Bird in Hand</i>                | x                | x             | x                  |
| <i>Affordable Loss</i>             | x                | x             | x                  |
| <i>Lemonade</i>                    |                  | x             | x                  |
| <i>Crazy Quilt</i>                 | x                | x             | x                  |
| <i>Pilot in the Plane</i>          |                  |               | x                  |

**Table 7 Group comparison for Application of Effectuation**

During the interview phase, it became obvious that especially in the analyzed company there is a big difference between thinking and really acting effectual meaning that many of the interviewed persons think effectual but either don't know how to act effectual or are hindered by several organizational circumstances like processes, organizational structures, rules or personal hindrances like time pressure and project workload.

First, also some participants neither think nor act effectual as they may be focused on planning the future:

*“However, I think we are concentrating more on what we can lose than what we should invest. So it's the opposite consideration. So in the past it was more that [...] [the engineers] have been alone with bringing the idea on the next level cause yes it's right they got money they got hours but they were always supposed to get economically information” (Interviewee 7).*

Second, most of the people thought effectual but did not act effectual primarily because of company and cultural barriers:

*“So I try to share and capitalize knowledge and try to make people taking risks and develop their ideas. There are many barriers inside the companies so I try to make people work on a plateau style. [...]. But it would take time” (Interviewee 14).*

*“The organizational structure is not built for that. You cannot take people away from their service and department and take them to a plateau and make them to work on something specific. That won't work very well (Interviewee 14).*

The third group consists of those persons thinking and acting effectual meaning that they are not only thinking in a dynamical, resource based and partnership approach but also act like this in their professional lives:

*“[...] we said what we have right now, what is missing. So we had an extensive network to the outside and the money that we spent was mostly spent outside of the company to get the solid scientific foundation for it or to develop new technical equipment that is not available in house for example” (Interviewee 5).*

Lastly, the fourth group acting but not thinking effectual is not appearing in this sample.

### *Discussion*

The factors bird-in hand and crazy quilt were the most quoted factors in this study whereas there seems to be a difference between effectual thinking and acting of participants. Overall, participants quoted positively about the application of effectual principles. Three participants said that they are or were actually trying to implement a project under these principles but never knew that their kind of thinking and acting approach has a name called Effectuation. On the one hand, this means, that not only employees are thinking effectual but that also the company supports effectual thinking in some projects. On the other hand, many participants were already thinking effectual but did not know how to actually transform it in real actions because of the challenges in strategic entrepreneurship and innovation stated above.

The factor lemonade was not only thought but also implemented as participants tried to find support and suggestions on their idea within their internal and external network. However, the least quoted factors affordable loss and pilot in the plane differentiate from each other as the affordable loss principle was both little thought and acted whereas the pilot in the plane principle was thought but not acted. The first finding not thinking of what the company can afford to lose, may be caused in the corporate context as employees do not own the budget they need for their own projects. Caused by not thinking in affordable loss manners, this results in also not acting according to this factor. The finding of thinking in pilot of the plane manners but not acting in it is supported by quantitative analysis as 9 out of 15 participants indicated in their answers that they prefer non-prediction over prediction (only 5 out of 15 prefer prediction over non-prediction). This implied that employees in the company have the mind-set to control the future and would like to shape it but are not able to act in controlling sense because of cultural and structural constraints.



Considering the group comparison, the interview revealed that experts were not applying the pilot in the plane principle which possibly can be caused in their expert and supporter role. In this sample, experts are more supporting and advising innovation but not really acting. The pilot in the plane principle however means that people think and act like they can control and shape the future. On the other hand, the group comparison in quantitative analysis revealed that 5 out of 9 experts think effectual. Experts possibly put some more emphasis on controlling the future in answering the questionnaire than in really quoting controlling thinking and acting. Contributors and initiators on the other hand focused more on the visionary approach with 4 of 7 initiators (I) and 6 of 9 contributors (C). This possibly originates in the passion for space inherent in the sample and the current trend on new technologies, new markets and new applications of existing products. This result is not caused by a precise company vision but an industry vision.

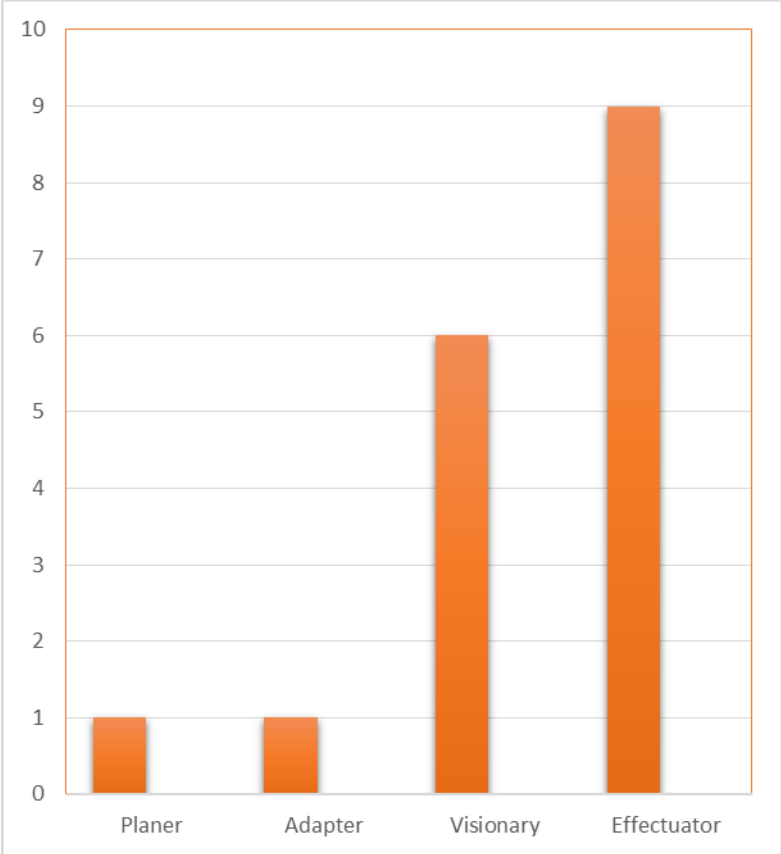
Overall, it can be said that the company much more thinks effectual than acting like it. Beside affordable loss which is neither thought nor lived, and the lemonade and pilot in the plane principle which are only thought but not implemented, it can be said that the bird in hand and crazy quilt principles are implemented in some innovative projects in the company.

#### **4.4 The Extent of using Corporate Effectuation**

In this section, the quantitative data collected from the PAVE test will be analysed in a simplified way as this data aims at simply supporting the results from qualitative analysis. This support is reached by analysing mainly the distribution of answers in terms of planning (P), adapting (A), vision (V), and effectuating (E): PAVE. First, the overall distribution of the four strategies is analysed. Afterwards, groups of strategies (see chapter 3.1.3) are formed and distributions are shown in order to find results in the dimension of prediction and control. Lastly, results are shown according to groups.

Overall, 15 participants weighted 12 questions from 1 to 10 (the higher weight the more applicable the answer) with four different answer opportunities each representing one of the four strategies of decision making under uncertainty. With

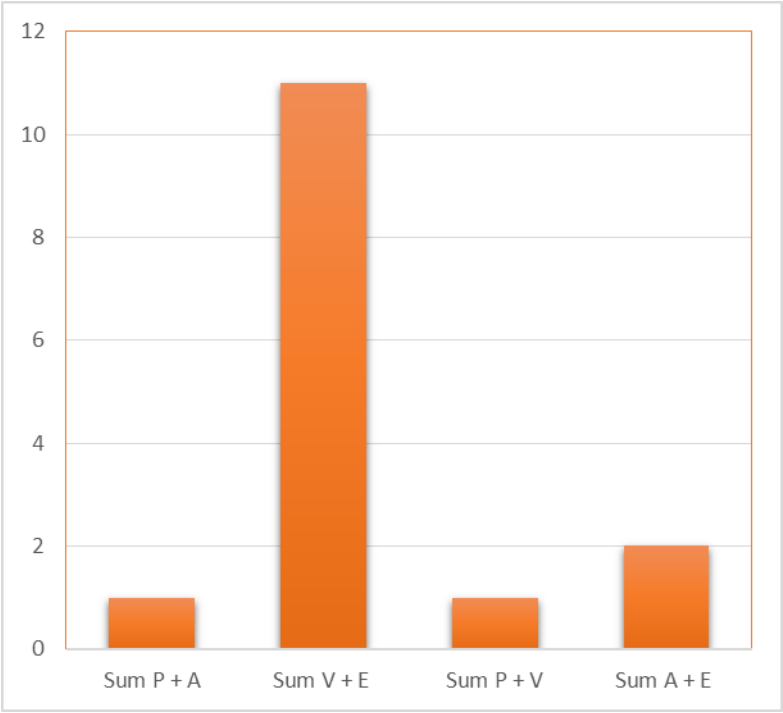
538 points from overall 1800 points allocated points, 9 out of 15 participants were allocated to the effectual logic saying that the participants are using their own resources and networks in order to create and develop ideas. 6 out of 15 participants (507 points) gave their answers according to the vision approach indicating the creation of ideas based on a clear vision of the future and actively shaping the future. One participants (403 points) gave his answers according to the adaptive approach meaning the active adaption to changing environmental circumstances. The least points (52 points) were allocated to the planning approach (applicable for one person who had the same amount of points for adaptive as for visionary approach) more trying to predict the future rather than to control it and analysing markets and positioning in the respective market. Graph 1 shows the corresponding distribution:



**Graph 1 Distribution of Preferred Strategy according to number of participants**

Adding those results in the PAVE groups in to order to evaluate the answers along the dimensions of control and prediction, the following results are stated: the group of V and E represents in total 11 of 15 participants, representing the group with the most answers in sum. Thus, the group V + E depicts a high focus on control. Next,

the group A + E represents 2 persons focusing on a low focus on prediction. One person matches with the high focus on predication group P + V. Lastly and with a low number of participants (one person), the group with low emphasis on control is P + A. Graph 2 illustrates this relation:



**Graph 2 Distribution of PAVE groups according to number of participants**

Comparing the groups with each other the following results are drawn:  
 9 out of 15 participants prefer non-prediction over prediction under uncertainty. Prediction is preferred over non-prediction by 5 participants and for each one person predication is as important as non-prediction or put a high emphasis on control (Table 8). One person matched with two groups preferring prediction and positioning.

| <i>Comparison of groups</i> | <b>Description</b>                                 | <b>Result</b>  |
|-----------------------------|----------------------------------------------------|----------------|
| $(P+V) > (A+E)$             | more prediction preference than non-prediction     | 5 participants |
| $(P+V) < (A+E)$             | more non-prediction preference than prediction     | 9 participants |
| $(P+V) = (A+E)$             | equal preference for prediction and non-prediction | 1 participant  |
| $(P+A) > (V+E)$             | higher emphasis on control                         | 1 participant  |

**Table 8 Comparison of PAVE groups**

Regarding the results for the three groups initiator, expert, and contributor, 5 out of 9 experts indicated effectual logic thinking followed by visionary (3 out of 9) and adaptive thinking (one out of 9). No expert preferred the planning approach. The experts were the only group mostly answering the questions with effectual related points. Both, initiators and contributors focused on visionary thinking with 4 out of 7 initiators and 6 out of 9 contributors. This is very surprising as especially the contributors were expected to answer most of the questions with the effectual answer. However, 4 out of 9 contributors did focus on effectual thinking as well as 5 out of 9 experts. The results from group comparison of the PAVE test are shown in Table 9.

| <i>Strategy</i> | <b>I</b>              | <b>E</b>              | <b>C</b>              |
|-----------------|-----------------------|-----------------------|-----------------------|
| <i>P</i>        | 1 participant         | No participant        | 1 participant         |
| <i>A</i>        | 1 participant         | 1 participant         | No participant        |
| <i>V</i>        | <b>4 participants</b> | 3 participants        | <b>6 participants</b> |
| <i>E</i>        | 2 participants        | <b>5 participants</b> | 4 participants        |

**Table 9 Effectuation distribution according to group comparison**

Summarizing, the results of the quantitative analysis can be seen as results of the mind set of participants and how they deal with an uncertain environment. Those results are valuable for the later discussion on the application of Effectuation in the corporate context and conditions of applying corporate Effectuation.

### 4.5 Conditions of Implementing Corporate Effectuation

*“Share and keep control” (Interviewee 6).*

First, challenges of innovation within the company were identified to have a basic understanding of those issue being possibly the reason for difficulties in applying Effectuation in this corporate context. In addition, the status quo of the effectual mind-set in the company was examined to find out if people think and act effectual. The analysed challenges and the status quo of the application of Effectuation in the company serve as discussion basis for company specific conditions in order to apply Effectuation in the corporate context which are analysed in this chapter.

The chapter is divided according to main influencing factors organizational factors, human capital factors, and new developed innovation factor. In these sub-chapters, the remaining condition factors are analysed.

#### **4.5.1 Organizational Factors**

##### *Organizational Culture Results*

The initial template in the organizational culture consisted of four different factors developed from recent research on corporate Effectuation. Those were: failure treatment, project evaluation, experimentation, and top management support. After the first five interviews none of those factors were eliminated as were stated at least once during the first interview phase. Three factors were additionally emphasized by the sample and minimum quoted once: freedom to innovate, solidarity to the company, and risk acceptance. These three factors were added to the first revised template. After the following five interviews, project evaluation and risk acceptance were eliminated again as those factors were not mentioned anymore. Again, no factor was stated additionally to the existing once. During the last five interviews, solidarity to the company was eliminated as there were only two quotes from the same person stating that solidarity is very important in order to only invest what you can afford to lose. Contradictory, one person from the last five interviews commented on solidarity as well stating that the company has committed employees anyways as this is inherent and common in the space industry anyways.

*“There is a very positive trend to push people to innovate. And I think this is good. I think everyone feels it. I feel it also myself” (Interviewee 13, reverse code: solidarity to the company).*

The final template resulted in four factors for organizational culture: failure treatment, experimentation and top management support which were already stated in the initial template, and the freedom to innovate, added during the interviews.

Overall, 44 quotes were made concerning the organizational culture whereas the importance of top management support was highly emphasised by 10 participants stating 22 quotes. Thus half of all quotes made for organizational culture were those for top management support meaning the support of the head of department for idea

generation and the allowance to participate in an innovation initiative. Next, top management support means also the support from innovation initiatives in developing the idea, access to budget and the idea push towards the top management. Lastly, top management supports also indicates the open mind set of the top management for crazy and/ or new ideas towards a new businesses. The last point is linked to the hierarchical structure as both are often named in combination meaning that top management support also means that even if the top management is many hierarchical levels away from the level of the idea generator, the distance should be reduced and should not result in idea refusal because of no open mind set.

*“And very important for Innovation is you need to have channels to address the top management directly. Why? To make sure that ideas are not stopped. Or good ideas are not stopped. That good ideas have the chance to be heard at the top management. Because often good ideas are linked with high investment and only top management can decide on high investments and not the middle management. Because it has more limited resources” (Interviewee 13, code: top management support).*

Next, failure treatment was quoted 14 times also putting an emphasis on this conditional factor for applying Effectuation in a corporate context. Failure treatment encompasses the overall attitude towards failure keeping in mind that failure is nothing bad but useful for learning and experiences and how not to do it:

*“When you fail in the US system it doesn’t matter, they stand up, try again, and fail again. In Europe if you fail once you are dead forever. Because you never get the reputation of being an expert. Because you failed” (Interviewee 5, code: failure treatment).*

The third factor - experimentation - was quoted 12 times from seven different participants. This factor also emphasizes an open minded organizational culture where employees know that they are allowed to experiment with several ideas without disadvantages for the personal career.

*“Because we are an aerospace company so as [...] [company] we need to have a high quality culture but on some areas of Innovation you need to try and fail” (Interviewee 13, code: experimentation).*

The fourth and last factor, freedom to innovate is the only factor added to the literature based factors. This factor was stated six times from five different interviewees. Freedom to innovate means on the one hand an open minded culture with no internal barriers blocking idea generation and idea push towards business generation and access to resources. On the other hand, freedom to innovate in this company also means shared mind set towards a strategically direction but not being blocked the inflexible directions.

*“[...] give [...] [the employees] more freedom. Companies with which we benchmark like [...] [company x] give every employee five thousand dollars a year to promote an idea” (Interviewee 6, code: freedom to innovate).*

The eliminated factors for organizational culture were: project evaluation, solidarity to the company, and risk acceptance due to either to less quotes on those factors or due to contradictory arguments (solidarity to the company).

Considering the groups, experts commented most on cultural aspects considering all of the four factors with 38 quotes total but emphasizing top management support and failure treatment. Initiators were quoting similar with 31 quotes in total, an emphasis on top management support and failure treatment. However, they neglected freedom to innovate with only limited number of quotes. The group contributors did not contribute to organizational factors that much only commenting 22 times neglecting the freedom to innovate and failure treatment. The group contributors emphasized the importance of experimentation and top management support. Those results are summarized in Table 10 Group comparison analysis for Organizational Culture.

| <i>Organizational Culture</i>    | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|----------------------------------|------------------|---------------|--------------------|
| <i>Failure Treatment</i>         | x                | x             |                    |
| <i>Project Evaluation</i>        |                  |               |                    |
| <i>Experimentation</i>           | x                | x             | x                  |
| <i>Top Management Support</i>    | x                | x             | x                  |
| <i>Freedom to innovate</i>       |                  | x             |                    |
| <i>Solidarity to the company</i> |                  |               |                    |
| <i>Risk Acceptance</i>           |                  |               |                    |

**Table 10 Group comparison analysis for Organizational Culture**

### *Organizational Culture Discussion*

The remaining factors from template analysis for organizational culture were: failure treatment, experimentation, top management support, and freedom to innovate.

Especially top management support was the most quotes condition for applying Effectuation within the organization. This results can be proved by literature on corporate entrepreneurship also stating the importance of top management support for successful entrepreneurial behaviour, and its positive impact on entrepreneurial action and subordinates' satisfaction with the manager (Pearce et al., 1997:148; Kuratko et al., 1990). In this study, the factor of top management support was identified as the most quoted and most important one mentioned by all participants. This is caused by the hierarchical structure of the company which also will be discussed below. Employees and managers depend on the decisions of their superior meaning that even if the operational management supports the idea this does not necessarily mean that the upper or top management will support the idea too. The current organizational culture is shaped by French and German cultural influences. Where the German culture indicates a relatively low power distance, the French culture is characterized by a high power distance. This means the French do more accept the unequally distributed power and the hierarchical structure within the company than the German (Hofstede, 1984:83-85). However, this fact influences the top management support. In the sample only two participants were French, 13 were German. However, as this is a multi-national company, French and German cultural influences extend over the whole company independent from the site. The cultural background of the top manager(s) may influence their support towards effectual thinking and acting of employees.



Related to top management support, failure treatment was the second most quoted condition stated. Summarizing, for corporate effectual thinking and acting in this company a change in failure treatment might be necessary as employees fear to fail and in consequence lose their jobs and experiment concealed where possible (Hornsby, 2002:258). But if experimentation and the acceptance of failure would be supported the company could possibly gain valuable knowledge (means) from employees as well as motivation for idea generation. Thus, experimentation and failure treatment are related as experimentation means trial and fail and if fail is not accepted, experimentation is not accepted. But experimentation in a limited way is the key to reduce risks before fully supporting an idea (Markides, 1997:11).

Lastly, the factor freedom to innovate is also closely related to experimentation and top management support because the freedom to innovate means on the one hand time to innovate and the acceptance of idea generation and experimenting.

Surprisingly, in group comparison only two factors were confirmed by contributors: experimentation and top management support. This confirmation is reasonable because of the above stated reasons but failure treatment and freedom to innovate were not mentioned sufficiently even though this group actively participated in innovation initiatives but did not identify those conditions. The reason here could on the one hand be the strong focus on top management support and experimentation as those were the most important conditions for the application of Effectuation neglecting the failure treatment and freedom to innovate. On the other hand, contributors in the sample were innovative and entrepreneurial by personal nature as all of them submitted several ideas to initiatives and three of the contributors had the freedom to innovate either because of the freedom within their department or because of the strategic importance of the innovative project they were working on. Also initiators did not sufficiently mention all of the four remaining conditions of organizational culture neglecting the freedom to innovate. This could be caused by the position of the initiators and their organizational task to enhance and develop innovative ideas within their initiatives. Initiators might not be aware that employees would need a certain kind of freedom to innovate in order to be able to think and act effectual.

### *Organizational Structure Results*

This section aims at finding the conditions regarding the organizational structure. The initial template consisted of three factors raised from literature: number of hierarchical levels, organic management style and flexibility. The first five interviews revealed an additional factor called separate organizational structure. This means a separate structure for innovation as well as for specific idea (strategic entrepreneurship). In the next 10 interviews there was neither a factors eliminated nor added to this code family finally resulting in four factors for organizational structure.

Overall, 44 comments on the organizational structure were given regarding the four factors. The factor flexibility in the structure was stated 21 times, so almost half of all quotes which indicates the importance of that factor in order to apply Effectuation. This factor especially included flexible processes within the company as well as a certain degree of self-organization:

*“I have no idea if [...] [forbidding own processes and rules] could work because of our centralized thinking. It should be self-organized, organic, not French let’s say” (Interviewee 6, code: flexibility).*

Next, the separate organizational structure factor was stated 16 times from eight different interviewees including the desire of several participant to on the one hand have a separate structure for innovation in general and for several internal ideas leading to ventures in specific.

*“At the time we implemented the project I spoke about we had a smaller company, but already a [...] [city] entity with decision making guys. But in that smaller organization it was easier. So the less people involved the easier it is” (Interviewee 15, code: separate organizational structure).*

Next, the number of hierarchies was stated with eight quotes from six different study participants. Here, participants focused on the reduction, minimization and

overcoming of hierarchical levels in order to generate a structure enabling effectual thinking.

*“Hierarchical free communication and the Innovation process should be classified” (Interviewee 6, code: number of hierarchical levels).*

*“Personally, you have to tap on individuals [...] who bring forward the process, not straight forward looking on an organigram (Interviewee 15, code: number of hierarchical levels).*

Lastly, the organic management style was stated only five times but all from different interviewees. Here, the focus lies on a flexible management style were managers adapt their style to different circumstances.

*“[...] because [...] [blocking the idea] is simply due to the fact that there are differences how business is run in a French company and a German company. So on the French side they used to get orders from the top and in this case everything is preset you don’t need a company strategy” (Interviewee 5, code: organic management style).*

The group comparison revealed that the experts contributed the most for organizational structure stating all of the four factors and emphasizing especially flexibility and a separate organizational structure. However, contributors could not comment that deeply on conditions for the organizational structure only stating 17 quotes with a low emphasis on flexible structures and a separate organizational structure.

Initiators on the other hand, commented 36 times with a deep emphasis on again flexible structures and a separate organizational structure. Table 11 shows the summary of this group comparison.

| <b>Organizational Structure</b>          | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|------------------------------------------|------------------|---------------|--------------------|
| <i>Number of hierarchical levels</i>     | x                | x             |                    |
| <i>Organic Management style</i>          |                  | x             |                    |
| <i>Flexibility</i>                       | x                | x             | x                  |
| <i>Separate organizational structure</i> | x                | x             | x                  |

**Table 11 Group comparison for Organizational Structure**

### *Organizational Structure Discussion*

Concluding the organizational structure, the remaining factors were: number of hierarchical structure, organic management style, flexibility and a separate organizational structure. Flexibility focuses on flexible structures and self-organization. This study revealed that specifically for this company a decentralized form for Innovation and strategic entrepreneurship would enhance Effectuation in innovation initiatives. “Decentralization provides autonomy to individuals and allows the firm to effectively pursue a larger number of opportunities” (Ireland and Webb, 2007:55). This does not imply that a decentralized structure also enhances effectual thinking of employees in project departments it selves. Furthermore, the need for an organic management style was identified. In literature, this is called entrepreneurial leadership (Ireland et al., 2003). Entrepreneurial leaders are able to “influence others to manage resources strategically” (Ireland et al., 2003: 971).

Lastly, the number of hierarchical levels in the organizational structure was stated as needed to be as small as possible. This is possibly caused by the wish of the employees for a separate structure due to demotivation and many hierarchical levels of this company but is not seen as a reliable condition for implementing corporate Effectuation because hierarchies and management is actually the challenge of corporate Entrepreneurship. With a very low number of hierarchical levels, this would mean a smaller company or even a venture because the more employees an organization has the more detailed is the hierarchical structure.

Considering the group comparison it was again surprising that contributors only focused on flexibility and the separate organizational structure. Flexibility is caused by the complex and invisible innovation structure of this company. The number of hierarchical levels does not seem to be a condition for contributors for corporate Effectuation in this company. This could be caused by the fact that many passionate contributors go different ways in promoting their ideas than predefined ways. However, experts identified all of the mentioned conditions because they well know innovations and were able to give a lot of input to the organizational structure factor.

## 4.5.2 Human Capital Factors

### *Effectual Factors Results*

This section aims at exploring effectual human capital factors for an application of corporate Effectuation in the company. It is distinctive to the family code application of Effectuation as there the aim was to explain existing effectual structures whereas in this section the aim is to explain conditional effectual factors in order to apply Effectuation.

The initial template consisted of five factors: means-driven, controllability, risk assumption, use of contingencies, and cooperation. During the whole interview process none of those factors were eliminated and no factors were added to this code family as on the one hand all factors were mentioned regularly and on the other hand no additional factors were applicable here because the context is the effectual logic with its basic assumptions.

Overall, 45 comments were made in this code family primarily focusing on cooperation with 64% of all stated comments in this section (29 quotes) from nine different interviewees:

*“Bring people from the outside who are willing to share their experience. People are really interested then and start building ideas when they exchange ideas” (Interviewee 1, code: cooperation).*

Next, the factor controllability also has a relatively high number of quotes with 10 quotes from nine different participants. This factor includes the controllability of idea generation and development as well as the controllability of the market:

*“And we have just to follow the market and not to plan” (Interviewee 12, code: controllability).*

The last three factors risk assumption, means-driven and use of contingencies have almost the same low number of quotes (5, 4, and 3 quotes) which will be investigated

in the discussion section. Below the corresponding quotes demonstrating every factor separately:

*“[...] expect the risks involved and except that it is a different way of working” (Interviewee 14, code: risk assumption).*

*“But also if it can use out existing knowledge and assets and money and in a way we can make money” (Interviewee 9, code: means-driven).*

*“Because you get to know other opinions and recognize that you have to change the idea and if environment changes you have to be agile (Interviewee 14, code: use of contingencies).*

Concluding, in the template analysis of other factors, two factors were eliminated: high level of education and position in top management as only one person quoting ones for those factors were made for the eliminated ones.

Concerning the group comparison, it conspicuous that none of the groups put emphasis on the factor means-driven. However, this factor remained in the final template, as overall three participants strongly commented on this factor. Further discussions on this factor follow in chapter 5. The experts stated 25 comments on effectual factors focusing mainly on cooperation. The main focus on cooperation was in all groups very strong. Comparing the number of comments on cooperation within the groups with the number of all other factors in this code family, it is apparent that the other factors only play a minor role in applying corporate Effectuation.

| <i>Effectual Factors</i>    | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|-----------------------------|------------------|---------------|--------------------|
| <i>Means-driven</i>         |                  |               |                    |
| <i>Controllability</i>      | x                | x             | x                  |
| <i>Risk Assumption</i>      | x                | x             |                    |
| <i>Use of Contingencies</i> |                  |               |                    |
| <i>Cooperation</i>          | x                | x             | x                  |

**Table 12 Group comparison for Effectual Factors**

### *Effectual Factors Discussion*

The section of effectual factors aims at finding the perceived value for effectual thinking in the company and the best adaption of effectual principles as maybe not all of them should have to be implemented in this case.

All of the five dimensions of Effectuation were mentioned to be important for the company to be implemented. Especially controllability and cooperation were seen as the most important factors for the company. Cooperation was seen as very valuable for the company because knowledge, resources and risks can be shared. Furthermore the controllability was stated as the next desire for this company in order to apply Effectuation because participants may see the company as predictive only adapting to the market but not taking the risk and create an own market. Contrary, Arend et al. (2015) argue that competition and other industry forces are not considered within the effectual logical and that this might be difficult for the company as they act within a competitive environment and that rivalry is specified insufficiently (2015:639). This fact should also be considered in this company as space is an industry with strong competition. Moroz and Hindle (2012) argue entrepreneurial processes can only be purposive if a certain amount of planning is integrated (2012:806) meaning that the effectual approach should not be seen as holistic and perfect approach matching to every company but as something valuable for adaption and consideration. Therefore, the planning approach won't be eliminated but postponed to later stages of strategic entrepreneurship.

Considering the mentioned risk assumption, this factor correlates with the factor failure treatment and top management support from organizational factors and is also a reasonable condition for implementing Effectuation as risk-taking also creates a corporate entrepreneurial environment (Kuratko et al., 1990: 51).

The means-driven factor was not mentioned by any group sufficiently. Arend et al. (2015) argues that assumption of means-driven restricts employees to only existing resources but not prior to stakeholder commitment (2015:641). The here found study result support the findings of Arend et al. (2015) because also in this company only taking existing resources was insufficiently mentioned.

### *Other Factors Results*

This section aims at allocating all human capital factors beside the effectual factors which are seen by the sample as necessary condition for the application of corporate Effectuation.

The initial template consisted of five factors. High level of education, position in top management, pro-activeness, individual attitude, and capabilities. After the first five interviews, high level of education and position in top management were eliminated as no participant commented on those factors. However, the factor reward was added to the code family as no other factor could display the reward factor. After the last five interviews, two factors were renamed: pro-activeness/ motivation and individual attitude by open mind-set as this better displayed the content of the factor. The final template consisted of four factors: pro-activeness/ motivation, capabilities, rewards, and open mind-set.

Overall, 25 quotes were made in this code family focusing on the open mind-set which was added after the first five interviews and continuously gained recognition throughout the interview phase. The open mind-set comments primarily focused on the individual attitude towards idea generation and participation in innovation initiatives. Some participants stated that there need to be an open mind-set like the ones from the Americans, not a European one (Interviewee 5, code: open mind-set).

*“But first it needs people with open mind-set and who are able to have the distance to internal processes” (Interviewee 6, code: open mind-set).*

Next, pro-activeness/ motivation reached 19 comment from nine different persons which also indicates a focus here. Pro-activeness mainly means the motivation of people and can be distinguished from the factor open mind-set by an intrinsic motivation whereas the open-mind set also includes the extrinsic motivation towards idea generation.



*“We need to be more reactive, more proactive both. We need to react when the market changes/ environment changes and we need to also proactively try to influence the environment on the one hand and try to anticipate the reaction” (Interviewee 13, code: pro-activeness/ motivation).*

Lastly, the factors capabilities and reward are composed here, as they only have a limited number of answers (eight and three comments). Capabilities were stated from five different participants and the factor reward from three.

*“I took the decision to only hire people that have competency in their field” (Interviewee 4, code: capabilities).*

Finally, three factors were first added to the template and then eliminated again due to quantitatively less quotes. Those factors were: visibility, personal flexibility, and easy access to innovation support.

The group comparison for the other factors, reveals that the factor reward is not ticked, as it has per group less than 10 of the total comments. However, there were comments on the reward systems from especially initiators and experts but surprisingly not from contributors as those could have been assumed to put the reward system as one focus factor for framework conditions. This will be controverted in the discussion section. All group put the main focus on the factor open mind-set with 25 comments in total. Table 13 summarizes the group comparison.

| <i>Other Factors</i>                         | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|----------------------------------------------|------------------|---------------|--------------------|
| <i>High Level of Education</i>               |                  |               |                    |
| <i>Position in Top Management</i>            |                  |               |                    |
| <i>Pro-activeness/ Motivation</i>            | x                | x             | x                  |
| <i>Individual Attitude<br/>Open mind-set</i> | x                | x             | x                  |
| <i>Capabilities</i>                          | x                | x             |                    |
| <i>Reward</i>                                |                  |               |                    |

**Table 13 Group comparison for Other Factors**

### *Other Factors Discussion*

In this section the remaining factors pro-activeness/ motivation, open mind set and capabilities are discussed. Mainly the individual attitude towards idea generation (open mind set) was mentioned under other factors saying that employees should be open minded towards crazy ideas and experimentation in order to enforce innovation and strategic entrepreneurship. Ireland et al. (2003) described this as entrepreneurial mind set. An entrepreneurial mind set means the ability to capture the benefits of uncertainty (McGrath and MacMillan, 2000; Ireland et al., 2003). Therefore, this finding is supported by literature.

Furthermore, reward was not mentioned specifically by any group contrary to the current literature. Hornsby et al. (2002) for example argue that an effective reward system “can also enhance middle managers’ willingness to assume the risks associated with entrepreneurial activity” (2002:259). This was only barely proved in this study.

In the group initiator and expert, capabilities were stressed caused by their experience in innovation saying that employees submitting an idea should be capable to first develop the idea further and second be able to introduce the idea to the network.

### **4.5.3 Innovation Factors**

#### *Results*

The last chapter under conditions aims at exploring the completely new emerged factors during the interview which did not fit to any other factor or family code.

Thus, this code family did not exist in the initial template but was emerging directly after the first five interviews with the following codes: Visibility, time availability, personal flexibility, communication, rules and routines, active involvement of employees, access to resources, and an easy access to innovation support. After the next five interviews three factors were eliminated again as those were not stated anymore and had maximum one quote. After the last five interviews, no code was eliminated or added but one was renamed by access to resources/ expert knowledge as this name described better the content of the factor. The final five remaining factors for the family code innovation factors were: time availability, communication, rules and routine, active involvement of employees, and access to resources/ expert knowledge.

Overall, 43 comments were made on innovation factors. 15 of them applied to access to resources, the most emphasized factor in this family. Access to resources means the access to a wide range of resources, mainly expert knowledge, budget, and internal cooperation.

*“[...] [An] obstacle is the expert community inside the company. To my understanding these experts are not properly used. The understanding of this community is not understood by themselves. To become an expert you need to have a lot of work experience” (Interviewee 5, code: access to resources).*

Time availability was the second frequently stated factor with 12 comments from eight different interviewees. In the case participants commented on this factor they put great emphasis on it because of workload and time pressure within the own project and at worst in the innovation project as well. Those issues disable idea generation, experimentation and cooperation.

*“[...] too many people are hindered in their daily work because they have to go to this Innovation meeting and hand in this proposal” (Interviewee 6, code: time availability).*

Rules and Routine as well as the factor active involvement of people are displayed with seven quotes each whereas rules and routines were mentioned by four persons and active involvement by six people. Rules and Routines mean the desire of some participants to have a common understanding of innovation and innovation initiatives with common rules and routines known in the whole company. This should add value by engaging the people to innovate and not be stopped by complex innovation processes.

*“Sustainable, easy, here we are. So the thing is it is not clear who has which responsibilities, who is doing what. And who can assist you with something special. There are always people who talk. There is definitely no difference in people who meet. But what is the outcome at the end of the day. And if there is outcome, who of those people who have met has the power to put it through” (Interviewee 7, code: rules and routines).*

Lastly, the factor communication remains with four overall quotes from four different people. This factor means enabling active communication channels between employees and an active communication inside and outside the company about innovation and idea generation.

*“Communication is important. People need to be aware of what is happening and we need to create an open market. What is possible and how can we do it? Management need to get out of the comfort zone because sometimes they are shocked [...]” (Interviewee 1, code: communication).*

For group comparison purpose, Table 14 is shown below. For innovation factors, experts mainly contributed to this section focusing on access to resources and time availability. Next, contributors also focused on access to resources as well the initiator group whereas they could only less contribute to communication and active involvement of employees.

| <b><i>Innovation Factors</i></b>         | <b>Initiator</b> | <b>Expert</b> | <b>Contributor</b> |
|------------------------------------------|------------------|---------------|--------------------|
| <i>Visibility</i>                        |                  |               |                    |
| <i>Time Availability</i>                 | x                | x             | x                  |
| <i>Personal Flexibility</i>              |                  |               |                    |
| <i>Communication</i>                     |                  | x             |                    |
| <i>Rules and Routines</i>                | x                | x             | x                  |
| <i>Active Involvement of employees</i>   |                  | x             | x                  |
| <i>Access to Resources</i>               | x                | x             | x                  |
| <i>Easy Access to innovation support</i> |                  |               |                    |

**Table 14 Group comparison for Innovation Factors**

## *Discussion*

Lastly, innovation factors were introduced and analysed. Most of the employees mentioned the necessity to have access to resources and expert knowledge. Especially contributors focused on that because from experience they were missing sufficient knowledge about for example business modelling, financing and market analysis. For the application of Effectuation, this is a limitation as not only available resources are regarded but also those of not or not yet committed stakeholders by having access to expert knowledge, machines and tools for experimentation and off course financial resources. Also Kuratko et al. (1990) stated the importance of resource availability arguing that the access to resources is needed to foster entrepreneurial activity (1990:55). Next, time availability was identified as condition for implementing corporate Effectuation which can be supported by Hornsby et al. (1999) stating that time availability and resource access can be summarized in one factor fostering entrepreneurial activities (1990:55). Next, organizational rules and routines are predefining the strategical direction of the company and give innovation and idea generation a framework with a limited number of rules and routines for example meetings on status of the project or workshops where contributors can learn about how to raise a business. This is supported by organizational boundaries giving a way to accommodate and reinforce innovation (Kuratko, 2010:142).

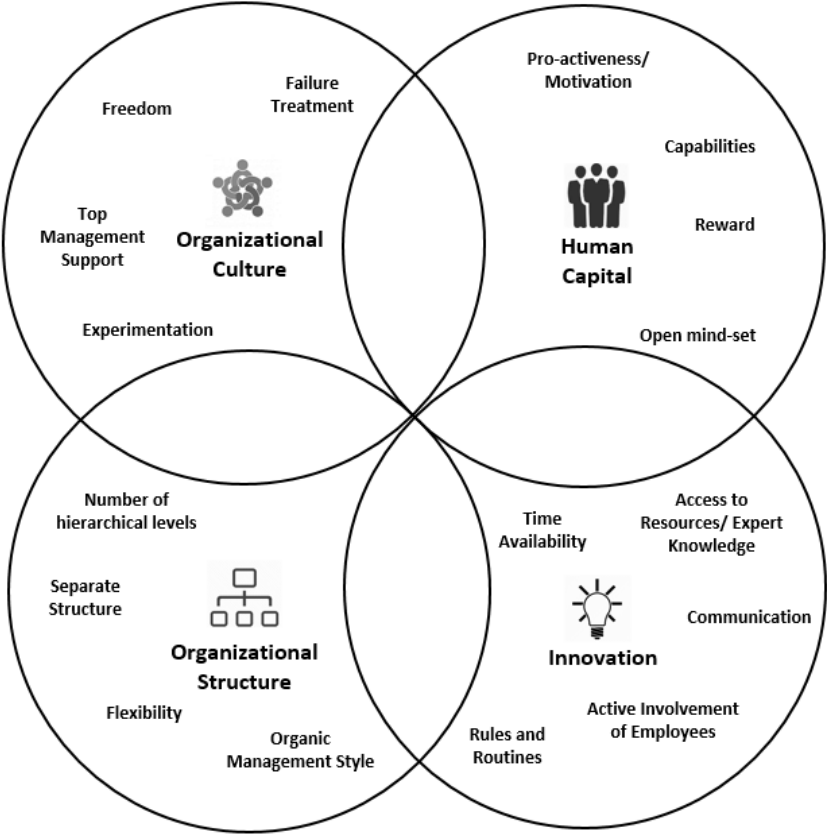
Also the raised factor involvement of employees and communication in a combined matter is supported by literature arguing that if the expected outcome, goals, mission and priorities are communicated entrepreneurial behaviour is enforced (Hornsby et al. 2002:257).

Summarizing, conditions depend on the focused company, its environment and the inherent degree of uncertainty but especially internal factors like the organizational structure and cultural which need to incorporate certain entrepreneurial aspects in order to gain competitive advantage and new market creation through Effectuation.

# 5 Conclusion

To conclude, this study aimed at finding organizational and human factor conditions in order to apply Effectuation in a corporate context. This was an explanatory study qualitative research approach using qualitative interviews as primary data and quantitative data to find evidence of support.

The research questions tackled the question what are the conditions for the application of Effectuation in a large corporation. The below shown figure answers this questions summarizing the identified conditions which will be concluded below.



**Figure 12 Conditions on applying Corporate Effectuation**

Facing high uncertainty in new markets in the space industry and ongoing competition in technological progress and competitive advantage, corporations should make use of some of the effectual principles in order to enhance their entrepreneurial activities and therefore their performance and competitive advantage. Effectuation describes an entrepreneurial process in a dynamic way using pre-

existing resources trying to generate an idea out of it. With stakeholder commitment additional resources are added to the cycle which can help developing the idea changing goals. With this dynamic, new markets possibly can be created (Sarasvathy, 2001). Findings support especially controllability and cooperation as being valuable for the space industry driven by uncertainty and high risks caused by new emerging space market and high costs in technological research and developments.

Summarizing challenges identified, the company faces challenges regarding the organizational culture (lack of vision, risk aversion, age structure, budget allocation) and regarding the organizational structure (no flexible structures and processes and a weak coordination of processes), as well as human factors (reactiveness, demotivation).

However, employees in the company already think and in some cases also act effectual in the way of using existing resources with the limitation that not only own existing resources were used but also expert knowledge without pre stakeholder commitment. Also cooperation is taking place in the thoughts and actions of employees as the input and feedback of especially colleagues seem to be very important. Employees also think that contingencies are something valuable for idea development but they are not acting towards the lemonade principle due to organizational restrictions (culture, structure). Only investing what one can afford to lose is also only thought but not in actions as it might be difficult for employees to perceive company resources like their own resources investing only what they can afford to lose. However, employees only feel limited control of the future which might be caused by deep hierarchical structures, a missing top management support and a lack of vision provided by the company especially top management.

The following table summarizes the included and eliminated factors:

| Main Factor              | Factor                                | Literature                                                                       | Eliminated | Included |
|--------------------------|---------------------------------------|----------------------------------------------------------------------------------|------------|----------|
| Organizational Culture   |                                       | Hornsby et al., 1999                                                             |            |          |
|                          | Failure Treatment                     | Ireland and Webb, 2007                                                           |            | x        |
|                          | Project Evaluation                    | Ireland and Webb, 2007                                                           | x          |          |
|                          | Experimentation                       | Ireland and Webb, 2007; Sarasvathy, 2001a; Johansson and McKelvie, 2012          |            | x        |
|                          | Top Management Support                | Kuratko et al., 1990; Hornsby et al., 2002; daCosta and Brettel, 2012            |            | x        |
|                          | Freedom                               | template analysis developed                                                      |            | x        |
| Organizational Structure |                                       | Kuratko et al. 1990                                                              |            |          |
|                          | Number of Hierarchical Levels         | Johansson and McKelvie, 2012                                                     |            | x        |
|                          | Organic Management Style              | Ireland and Webb, 2007                                                           |            | x        |
|                          | Flexibility                           | Ireland and Webb, 2007, Johansson and McKelvie, 2012                             |            | x        |
|                          | Separate Structure                    | template analysis developed                                                      |            | x        |
| Effectual Factors        |                                       |                                                                                  |            |          |
|                          | Means-driven                          | Sarasvathy, 2001a                                                                |            | x        |
|                          | Controllability                       | Sarasvathy, 2001a; Arend, 2015                                                   |            | x        |
|                          | Risk Assumption                       | Ireland and Webb, 2007; Sarasvathy, 2001a; Moroz and Hindle, 2011; Kuratko, 1990 |            | x        |
|                          | Use of contingencies                  | Sarasvathy, 2001a                                                                |            | x        |
|                          | Cooperation                           | Ireland and Webb, 2007; Sarasvathy, 2001a                                        |            | x        |
| Other Factors            |                                       |                                                                                  |            |          |
|                          | High level of Education               | Johansson and McKelvie, 2012                                                     | x          |          |
|                          | Position in Top Management            | Johansson and McKelvie, 2012                                                     | x          |          |
|                          | Proactiveness                         | daCosta and Brettel, 2012                                                        |            | x        |
|                          | Individual Attitude                   | daCosta and Brettel, 2012                                                        | x          |          |
|                          | Capabilities                          | daCosta and Brettel, 2012                                                        |            | x        |
|                          | Reward                                | template analysis developed, proved by Kuratko, 1990                             |            | x        |
|                          | Open Mind-set                         | template analysis developed                                                      |            | x        |
| Innovation Factors       |                                       |                                                                                  |            |          |
|                          | Time Availability                     | template analysis developed, proved by Hornsby et al., 1999                      |            | x        |
|                          | Communication                         | template analysis developed, proved by Hornsby et al., 2002                      |            | x        |
|                          | Rules and Routines                    | template analysis developed, proved by Hornsby et al., 2002, Kuratko, 2010       |            | x        |
|                          | Active Involvement of employees       | template analysis developed, Pearce et al., 1997                                 |            | x        |
|                          | Access to Resources/ Expert knowledge | template analysis developed, Kuratko, 1990                                       |            | x        |

**Table 15 Summary of eliminated and included factors of template analysis**

The following chapter concludes managerial implications on the identified conditions of the application of corporate Effectuation.



## 5.1 Managerial and Theoretical Implications

### *Managerial Implications*

The following section shows a summary of the most important conditions identified in this study enabling the company and managers of the company to start enhancing effectual thinking and promoting effectual acting.

#### *#1 Corporate Effectuation requires an entrepreneurial culture!*

The existing company culture is a mix of French power distance and European failure treatment many intrinsic motivated employees working passionate in the space industry. However, the organizational culture need a more entrepreneurial approach to enhance innovation with Effectuation. This should focus especially on top management support encouraging people to develop ideas, experiment with ideas, and collaborate with internal and external stakeholders and finally submitting and developing ideas under the official umbrella of the company. Furthermore, managers at all levels should enhance the employees perception of freedom to innovate implementing for example several hours per week for innovation like 3M is doing or giving every employee a certain amount of budget per year to develop innovative ideas. The individual budget can then be combined with the ones of others finding committed stakeholder and investors. Caused by the free distribution of the individual allocated budget per year, employees feel responsible for it and may try to only invest what they can afford to lose. Furthermore, this approach could possibly raise innovation by it means and enhance promising ideas of other colleagues. A failed investment however should not be punished but seen as something valuable because of experience and learning. Failure treatment to a certain extent could also be supported by allocating a certain amount of money to employees for innovation, if this money is depreciated mainly anyways and if employees only have to justify in which idea they invested but not if that investment was valuable. A kind of internal market of idea investments would emerge out of this approach enhancing innovation ideas and competitive advantage.

*#2 Employee Effectuation is enhanced by a flexible organizational structure!*

Next, Effectuation is enhanced by a flexible organizational structure meaning that the company could possibly implement a separate organizational structure for innovation with low hierarchical levels, fast decision making and a clear vision on the strategical direction of the company and its investments. For the early stage of idea generation a separate structure would not work but access to the separate structure could be provided enabling employees to collaborate with others, experiment with their idea and find expert knowledge which supports employees in business generation.

*#3 Employee Effectuation is promoted by motivation and an open mind set!*

The third managerial implication is that managers should promote Effectuation by motivating people in the engineering and project department to innovate and be open minded towards crazy ideas and the development of them. Not only the employees, but also the management itself should be open minded towards crazy ideas and support them with a good communication of strategic goals, the freedom to innovate and the encouragement to fail. This could also enhance entrepreneurial and effectual thinking.

*#4 Time, available resources and a continuous communication enable employees to act effectual!*

Fourth, for not only thinking effectual but also acting effectual, managers should enable employees to have the time to innovate beside their normal workload with some hours free of normal work but time for collaboration and idea generation. In addition, a continuous communication top-down is important to inform employees about current activities and strategic goals. The communication in this company is already implemented via the intranet informing people about current news about the company. However, those news are very frequent and may should be divided in several topic groups, one for innovation. Also a kind of internal market could be implemented via the intranet where ideas can be exchanged, commented, supported or joined. This would possibly solve the problem of many employees not having the access to the real experts in the company who could give feedback or support the idea. A division in innovation related topics on this shared news and market intranet page would be beneficial here as well to simply the search for experts.

Summarizing, those recommendations are not a generalized approach for all companies even not for all space companies as those differentiate significantly in number of employees, revenue, and budget available for resources. However, the recommendations made for this space company are beneficial for top managers, middle and operational managers as well as employees and the whole company enforcing competitive advantage, innovation and entrepreneurial behaviour, and the organizational culture as this is crippled anyways because of restructure activities in the past two years.

### *Theoretical implications*

The theoretical contribution of this study encompasses the research on Effectuation, corporate Effectuation and entrepreneurial processes in general researching on the application of entrepreneurial behaviour especially Effectuation in a specific corporate context and finding evidence for entrepreneurial thinking and acting. In addition, this study investigated in entrepreneurial processes and Effectuation enhancing innovation which was barely researched before. Furthermore, several conditions for applying Effectuation were identified supported by and enforcing current literature on corporate Entrepreneurship and Effectuation literature. Lastly, this study examined conditions in specific groups named initiator, expert and contributor, dividing target groups of Effectuation in innovation being able to analyse the results depending on those groups.

For literature, the answers support the stated conditions of entrepreneurial behaviour in a corporate context.

## **5.2 Limitations and Future Research**

### *Limitations*

This study also encompasses some limitations: first, the study focuses on only one company in the space sector. This is valuable as company specific on the one hand but results cannot be generalized by the whole space industry as especially new space companies emerging in the US are differently organized (lower hierarchical structure fast decision making, existence of a vision), funded (privately funded against institutional funded in Europe), and located (different culture).

Second, Kuratko (2010) suggests to differentiate between three management levels in order to analyse organizational antecedents of corporate entrepreneurship. In this

study, only top management support is regarded encompassing also middle and operational management. This possibly causes a bias in the organizational culture factor top management support and need to be differentiated.

Third, the sample focused on innovation initiatives and projects in innovation but disregarded any other department primarily not working with innovation departments but innovate on their own developing new technologies and new processes within the department. These departments are not considered in this study.

#### *Future Research*

For future research it would be very interesting to test the findings of this study in quantitative analysis with a large sample first within this company and second over the space industry in order to prove evidence of those conditions. Furthermore, on the basis of the found conditions, the application in other technology based industries could be tested and proved. Results revealed the cultural influence on the application of Effectuation stating that top management support may depend on the respective cultural background. This would be an attractive field of research to what extent the organizational culture has an influence on the application of corporate Effectuation involving French and German cultural influences on top management support, failure treatment, experimentation, and the freedom to innovate.

# APPENDICES

## Appendix A: Interview Guideline (page 1/2)

### Expert-Interviews:

#### *Opening:*

Hello and welcome to the Innovation Thesis Interview today. This interview will approximately take 1 hour.

In my thesis, I am studying the application of Effectuation in the Innovation Process of this company on the basis of the research of Saras Sarasvathy in 2001. Effectuation describes the process of problem solving and decision making of expert entrepreneurs under uncertainty. The expert entrepreneur decides on the basis of existing resources and tries to partner with stakeholders in order to develop and implement the business idea. Expert entrepreneurs do not decide upon a determined return but on a predetermined border of what he or she is willing to lose. The expert entrepreneur also decides flexibly and uses unforeseen events (contingencies) to adapt the idea profitably.

The goal of the Interview is to find out under which conditions the Innovation process of this company

DS could foster Innovation created on the basis of Effectuation.

The Interview is structured in 3 parts: the identification of problems with the Innovation process in the firm, the degree of effectuation in the existing Innovation process and conditions for implementing Effectuation in order to generate Innovations.

At the end of the interview you will have the opportunity to state additional facts or personal explorations on the topic.

The information you give are treated confidential and anonymously.

#### A) Background

1. Please describe shortly your function and your task!
2. How is your task related to Innovation?

#### B) Problem Statements

1. To what extent is the Space industry driven by uncertainty? What should Innovations should aim at?
2. What do you think are the problems in doing Innovations and how can we solve that?
3. Do you have suggestions on how to improve the Innovation process?

#### C) Effectuation in general

(Showing the effectual logic and effectuation principles, see appendix)

1. Have you heard of the effectual logic before?
2. In general, do you think we apply Effectuation (**bird-in-hand, crazy quilt, affordable loss, lemonade, pilot in the plane**) in order to generate Innovations? Do you think that it is possible to create opportunities in this large international company? Why?

## Appendix A: Interview Guideline (page 2/2)

### **D) Application of Effectuation (Effectual Cycle)**

(Showing the effectual cycle, see appendix)

1. **Do you think this process can be implemented? How? Why?**
2. How important is it for the company to influence market conditions or create markets?

### **E) Conditions for implementing Effectuation in the Innovation process of the firm**

1. Under which conditions can Innovation with Effectuation be effective in this company? Why?

2. What are important factors to implement Effectuation in the Innovation process?

**Top Management support**

**Flexible processes**

**Separate organizational structure**

**Access to resources**

**Capabilities, tools**

**Development of peoples' skills**

**Attitude**

**Knowledge**

**Recognition**

**Reward**

**Failure treatment**

3. What are the *organizational conditions* to enable Innovation with Effectuation in this company?

**Budget allocation**

**Partner acquisition**

**Use of existing resources**

**Flexibility of goals**

4. What are the *personal conditions* to enable Innovation with Effectuation in this company?

**Budget allocation**

**Partner acquisition**

**Use of existing resources**

**Flexibility of goals**

5. How do you think, should the **management structure and behaviour** change to enable opportunity creation?

**Exit:**

Thank you very much for your time and your answers.

Do you have any facts or personal explorations you would like to mention regarding the innovation process?

In the next couple of days I will send you the minutes of the interview via email



### Agreement on Data Protection for scientific Interviews

- The participation in the interview is voluntary. It is for the following purpose:

#### Master Thesis of Luise Kautschur

- Responsible for the scientific analysis is:

*Interviewer:* Luise Kautschur

*Project leader (if needed):* \_\_\_\_\_

- The persons responsible take care that all collected data are treated confidential and only for the agreed purpose.
- The interviewee declares his/ her consent of the record of the interview and of the scientific analysis of the interview. After the record and on request single paragraphs can be deleted.

#### For ensuring data protection the parties agree upon the following:

The material is used based on the following data protection regulations:

##### Record:

1. The record is stored safely by the interviewer and project leader and only used for analysis purpose.
2. After analysis, latest after ten years, the record is deleted.
3. Only the interviewer and the project leader have access to the recorded data.

##### Analysis:

1. For analysis purpose a written protocol (transcript) of the record is generated. Name and Place of the interviewee are – if necessary - obliterated in the protocol.
  2. The name and position in the company of the interviewee will not be published. The interviewee will remain anonymous.
- The copyright of the interview has the interviewer and the project leader.
  - The interviewee can reject the declaration of consent within 14 days.

Bremen, \_\_\_\_\_ Interviewer: \_\_\_\_\_ Interviewee: \_\_\_\_\_

:

### Vereinbarung zum Datenschutz für wissenschaftliche Interviews

- Die Teilnahme am Interview ist freiwillig. Es dient folgendem Zweck:

#### Masterarbeit von Luise Kautschur

- Für die Durchführung und wissenschaftliche Auswertung des Interviews sind verantwortlich:

Interviewer: Luise Kautschur

ProjektleiterIn (ggf.): \_\_\_\_\_

- Die Verantwortlichen tragen dafür Sorge, dass alle erhobenen Daten streng vertraulich behandelt und ausschließlich zum vereinbarten Zweck verwendet werden.
- Die/der Befragte erklärt sein Einverständnis mit der Bandaufnahme (Ton oder Video) und der wissenschaftlichen Auswertung des Interviews. Nach Ende der Bandaufnahme können auf ihren/seinen Wunsch einzelne Abschnitte des Gesprächs gelöscht werden.

#### Zur Sicherung des Datenschutzes gelten folgende Vereinbarungen:

Das Material wird entsprechend folgender Datenschutzvereinbarungen behandelt:

##### **Bandaufnahme:**

1. Die Bandaufnahme wird von der/dem InterviewerIn bzw. der/dem ProjektleiterIn verschlossen aufbewahrt und nach Abschluss der Untersuchung, spätestens jedoch nach zehn Jahren gelöscht.
2. Zugang zur Bandaufnahme haben die/der InterviewerIn und ProjektleiterIn für die Auswertung.

##### **Auswertung:**

1. Zu Auswertungszwecken wird von der Bandaufnahme ein schriftliches Protokoll (Transkript) angefertigt. Namen und Ortsangaben der/des Befragten werden im Protokoll – soweit erforderlich – unkenntlich gemacht.
  2. In Veröffentlichungen muss sichergestellt werden, dass eine Identifikation der/des Befragten nicht möglich ist.
- Die Verwertungsrechte (Copyright) des Interviews liegen bei der/dem InterviewerIn bzw. der/dem ProjektleiterIn.
  - Die/der Befragte kann ihre/seine Einverständniserklärung innerhalb von 14 Tagen ganz oder teilweise widerrufen.

Bremen, den \_\_\_\_\_ InterviewerIn: \_\_\_\_\_ Befragte/r: \_\_\_\_\_



### PAVE-Test

The PAVE- Test provides you with information about your preferred PAVE Strategy in the problem solving and decision making process.

Please distribute 10 points in 4 possible answers (a higher score means a higher accordance to your person. You can also distribute 10 points to one answer.

| Frage / Antworten (pro Frage 10 Pkt auf 4 Antworten verteilen)                                | Score |
|-----------------------------------------------------------------------------------------------|-------|
| <b>1) What do you advise your children when they take their career choice?</b>                |       |
| Start with something that has great demand today.                                             |       |
| Learn something reasonable, which is also useful in 15 years.                                 |       |
| Do what you are interested in and mind opportunities on your way.                             |       |
| Believe in your dreams and make fulfill them.                                                 |       |
| <b>2) Tomorrow night you expect guests who you would like to serve. How do you proceed?</b>   |       |
| I go in the kitchen and look what I have got. Maybe the guests can bring something as well... |       |
| I think about a meal and buy and cook based on a recipe.                                      |       |
| Something may come to my mind until tomorrow. Then I improvise.                               |       |
| A good opportunity for a new creation – I'll already order the ingredients...                 |       |
| <b>3) You already booked a weekend trip to Paris. That's how this trip will be great:</b>     |       |
| A great meal with the view on Sacre Coeur – and I organise tickets for a dancing show.        |       |
| I decide spontaneously – depending on the wheather, feeling, and mood.                        |       |
| I study the travel guide and set up a program.                                                |       |
| Maybe my study colleague who is living in Paris, has an idea. I call her/ him.                |       |

Appendix D: Questionnaire PAVE test (page 2/4)

| 4) A colleague of your team has an interesting but vague suggestion for an improvement. How do you handle that?                 | Score |
|---------------------------------------------------------------------------------------------------------------------------------|-------|
| I ask her for more data in order to be able to evaluate the feasibility and return of the suggestion.                           |       |
| I agree upon a limited timeframe to find partners, progress and to set up a feedback meeting for the next weeks.                |       |
| I ask for a detailed description and differences. If I am convinced I am fully committed to the idea.                           |       |
| Sounds good – let’s try it. If it does not work we change it back.                                                              |       |
| 5) You would like to win your boss over to a project idea. What do you do?                                                      |       |
| I lurk on the next best opportunity to pitch the idea.                                                                          |       |
| I set up a meeting with her/ him and I am of lasting conviction.                                                                |       |
| I rap it on the table in an open conversation. Maybe my boss would like to add some points and contribute.                      |       |
| I want to present a solid idea. I develop an extensive concept before I speak to him.                                           |       |
| 6) You would like to write a scientific book and already have an idea. How do you begin?                                        |       |
| I speak to colleagues, friends, potential readers and publishers. I start writing as soon as I got a contract with a publisher. |       |
| I seize the moment and start writing because I don’t want others to discover the niche.                                         |       |
| I investigate in trends, define target customers, value and develop a concept.                                                  |       |
| I write the book and pull strings to sell it to the publisher I want.                                                           |       |
|                                                                                                                                 |       |

Appendix D: Questionnaire PAVE test (page 3/4)

| 7) Your team needs support. How do you recruit people?                                                                                                                         | Score |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| I get an idea of the new team member and look for persons who fit best.                                                                                                        |       |
| I speak to colleagues, employees, friends and family to get recommendations.                                                                                                   |       |
| Human Resources is responsible for that. I choose the best fitting candidate in an interview.                                                                                  |       |
| I set up a job profile on the basis of challenges our team will face in the next couple of years. The search for candidates will do HR.                                        |       |
| 8) Think about one of the biggest unsolved issues in your métier. What is needed for a good solution?                                                                          |       |
| A comprehensive analysis by experts and the development of a clean, long-term concept.                                                                                         |       |
| Unite all stakeholders. Discuss given issues in a small group and start to implement first improvements in a small scale immediately and stop discussing the "right" solution. |       |
| A clear future-vision and the leadership-skills to make that vision a reality.                                                                                                 |       |
| Seize rapid, modern and comprehensive arrangements.                                                                                                                            |       |
| 9) How do you realize, that you have a good functioning work-relationship to somebody?                                                                                         |       |
| I decide by gut feeling and present necessity.                                                                                                                                 |       |
| I'll know that after a detailed talk.                                                                                                                                          |       |
| I collect as much information as possible and judge afterwards.                                                                                                                |       |
| I'll find out by testing the cooperation in small steps.                                                                                                                       |       |
| 10) What is most important to you when deciding about a delicate investment?                                                                                                   |       |
| I need to have a good gut instinct.                                                                                                                                            |       |
| I pledge a long-term earning or use.                                                                                                                                           |       |
| The investment offers instant and immediate advantages.                                                                                                                        |       |
| I can fairly limit the risk.                                                                                                                                                   |       |

Appendix E: Questionnaire PAVE test (page 4/4)

| 11) A trip to Scotland in May can be beautiful – but sometimes it’s rainy all week. What would you do most likely? | Score |
|--------------------------------------------------------------------------------------------------------------------|-------|
| I trade for good cancellation-conditions and cancel short-term if there’s bad weather forecast.                    |       |
| I book last-minute – if it’s rainy in Scotland I’ll fly somewhere else.                                            |       |
| It’s all about preparation and equipment. I’m happy about sunshine. Rain has different upsides.                    |       |
| You got to take a risk sometimes – I believe in good weather.                                                      |       |
| 12) What would be the best precondition for you to become self-employed?                                           |       |
| I can realize my private and professional experience in a new context.                                             |       |
| I have a good idea for a – according to my analysis – promising market.                                            |       |
| I discover an opportunity, that I can 100% identify with..                                                         |       |
| I’ll find a new market niche that I can serve rapidly.                                                             |       |

## Appendix F: Initial Template

| <b>Initial Template</b> |                                              |                               |
|-------------------------|----------------------------------------------|-------------------------------|
| <b>1</b>                | <b>Challenges in Innovation</b>              |                               |
|                         | 1                                            | Inflexible Processes          |
|                         | 2                                            | Budget Allocation             |
|                         | 3                                            | Demotivation                  |
| <b>2</b>                | <b>Application of Effectuation</b>           |                               |
|                         | 1                                            | Bird in Hand                  |
|                         | 2                                            | Affordable Loss               |
|                         | 3                                            | Lemonade                      |
|                         | 4                                            | Crazy Quilt                   |
|                         | 5                                            | Pilot in the Plane            |
| <b>3</b>                | <b>Conditions for Corporate Effectuation</b> |                               |
|                         | 1                                            | <i>Organizational Factors</i> |
|                         | 1                                            | Organizational Culture        |
|                         | 1                                            | Failure Treatment             |
|                         | 2                                            | Project Evaluation            |
|                         | 3                                            | Experimentation               |
|                         | 4                                            | Top Management Support        |
|                         | 2                                            | Organizational Structure      |
|                         | 1                                            | Number of Hierarchical Levels |
|                         | 2                                            | Organic Management Style      |
|                         | 3                                            | Flexibility                   |
|                         | 2                                            | <i>Human Capital Factors</i>  |
|                         | 1                                            | Effectual Factors             |
|                         | 1                                            | Means-driven                  |
|                         | 2                                            | Controllability               |
|                         | 3                                            | Risk Assumption               |
|                         | 4                                            | Use of contingencies          |
|                         | 5                                            | Cooperation                   |
|                         | 2                                            | Other Factors                 |
|                         | 1                                            | High level of Education       |
|                         | 2                                            | Position in Top Management    |
|                         | 3                                            | Proactiveness                 |
|                         | 4                                            | Individual Attitude           |
|                         | 5                                            | Capabilities                  |

## Appendix G: 1<sup>st</sup> Revised Template

| <b>First Revised Template</b> |                                              |                                      |
|-------------------------------|----------------------------------------------|--------------------------------------|
| <b>1</b>                      | <b>Challenges in Innovation</b>              |                                      |
|                               | 1                                            | Inflexible Processes                 |
|                               | 2                                            | Budget Allocation                    |
|                               | 3                                            | Demotivation                         |
|                               | 4                                            | Lack of Vision                       |
|                               | 5                                            | Risk Aversity                        |
|                               | 6                                            | No Access to Resources               |
|                               | 7                                            | No Freedom to innovate               |
|                               | 8                                            | Coordination of Processes            |
|                               | 9                                            | No flexible organizational structure |
|                               | 10                                           | Costs                                |
| <b>2</b>                      | <b>Application of Effectuation</b>           |                                      |
|                               | 1                                            | Bird in Hand                         |
|                               | 2                                            | Affordable Loss                      |
|                               | 3                                            | Lemonade                             |
|                               | 4                                            | Crazy Quilt                          |
|                               | 5                                            | Pilot in the Plane                   |
| <b>3</b>                      | <b>Conditions for Corporate Effectuation</b> |                                      |
|                               | 1                                            | <i>Organizational Factors</i>        |
|                               | 1                                            | Organizational Culture               |
|                               | 1                                            | Failure Treatment                    |
|                               | 2                                            | Project Evaluation                   |
|                               | 3                                            | Experimentation                      |
|                               | 4                                            | Top Management Support               |
|                               | 5                                            | Freedom                              |
|                               | 6                                            | Solidarity to Company                |
|                               | 7                                            | Risk Acceptance                      |
|                               | 2                                            | Organizational Structure             |
|                               | 1                                            | Number of Hierarchical Levels        |
|                               | 2                                            | Organic Management Style             |
|                               | 3                                            | Flexibility                          |
|                               | 4                                            | Separate Structure                   |
|                               | 2                                            | <i>Human Capital Factors</i>         |
|                               | 1                                            | Effectual Factors                    |
|                               | 1                                            | Means-driven                         |
|                               | 2                                            | Controllability                      |
|                               | 3                                            | Risk Assumption                      |
|                               | 4                                            | Use of contingencies                 |
|                               | 5                                            | Cooperation                          |
|                               | 2                                            | Other Factors                        |
|                               | 1                                            | High level of Education              |
|                               | 2                                            | Position in Top Management           |
|                               | 3                                            | Proactiveness                        |
|                               | 4                                            | Individual Attitude                  |
|                               | 5                                            | Capabilities                         |
|                               | 3                                            | <i>Innovation Factors</i>            |
|                               | 1                                            | Visibility                           |
|                               | 2                                            | Time Availability                    |
|                               | 3                                            | Personal Flexibility                 |
|                               | 4                                            | Communcation                         |
|                               | 5                                            | Rules and Routines                   |
|                               | 6                                            | Active Involvement of employees      |
|                               | 7                                            | Access to Resources                  |
|                               | 8                                            | Easy Access to innovation support    |

## Appendix H: 2<sup>nd</sup> Revised Template

| Second Revised Template |                                              |  |
|-------------------------|----------------------------------------------|--|
| <b>1</b>                | <b>Challenges in Innovation</b>              |  |
| 1                       | Inflexible Processes                         |  |
| 2                       | Budget Allocation                            |  |
| 3                       | Demotivation                                 |  |
| 4                       | Lack of Vision                               |  |
| 5                       | Risk Aversity                                |  |
| 6                       | No Access to Resources                       |  |
| 7                       | No Freedom to innovate                       |  |
| 8                       | Coordination of Processes                    |  |
| 9                       | No flexible organizational structure         |  |
| 10                      | Costs                                        |  |
| 11                      | No Reactiveness                              |  |
| 12                      | Age Structure                                |  |
| 13                      | No Feedback                                  |  |
| 14                      | Workload                                     |  |
| <b>2</b>                | <b>Application of Effectuation</b>           |  |
| 1                       | Bird in Hand                                 |  |
| 2                       | Affordable Loss                              |  |
| 3                       | Lemonade                                     |  |
| 4                       | Crazy Quilt                                  |  |
| 5                       | Pilot in the Plane                           |  |
| <b>3</b>                | <b>Conditions for Corporate Effectuation</b> |  |
| 1                       | <i>Organizational Factors</i>                |  |
| 1                       | Organizational Culture                       |  |
| 1                       | Failure Treatment                            |  |
| 2                       | Project Evaluation                           |  |
| 3                       | Experimentation                              |  |
| 4                       | Top Management Support                       |  |
| 5                       | Freedom                                      |  |
| 6                       | Solidarity to Company                        |  |
| 7                       | Risk Acceptance                              |  |
| 2                       | Organizational Structure                     |  |
| 1                       | Number of Hierarchical Levels                |  |
| 2                       | Organic Management Style                     |  |
| 3                       | Flexibility                                  |  |
| 4                       | Separate Structure                           |  |
| 2                       | <i>Human Capital Factors</i>                 |  |
| 1                       | Effectual Factors                            |  |
| 1                       | Means-driven                                 |  |
| 2                       | Controllability                              |  |
| 3                       | Risk Assumption                              |  |
| 4                       | Use of contingencies                         |  |
| 5                       | Cooperation                                  |  |
| 2                       | Other Factors                                |  |
| 1                       | High level of Education                      |  |
| 2                       | Position in Top Management                   |  |
| 3                       | Proactiveness                                |  |
| 4                       | Individual Attitude                          |  |
| 5                       | Capabilities                                 |  |
| 6                       | Reward                                       |  |
| 3                       | <i>Innovation Factors</i>                    |  |
| 1                       | Visibility                                   |  |
| 2                       | Time Availability                            |  |
| 3                       | Personal Flexibility                         |  |
| 4                       | Communication                                |  |
| 5                       | Rules and Routines                           |  |
| 6                       | Active Involvement of employees              |  |
| 7                       | Access to Resources                          |  |
| 8                       | Easy Access to innovation support            |  |

## Appendix I: 3<sup>rd</sup> Revised Template

| Third Revised Template |                                              |  |
|------------------------|----------------------------------------------|--|
| <b>1</b>               | <b>Challenges in Innovation</b>              |  |
| 1                      | Inflexible Processes                         |  |
| 2                      | Budget Allocation                            |  |
| 3                      | Demotivation                                 |  |
| 4                      | Lack of Vision                               |  |
| 5                      | Risk Aversity                                |  |
| 6                      | No Access to Resources                       |  |
| 7                      | No Freedom to innovate                       |  |
| 8                      | Coordination of Processes                    |  |
| 9                      | No flexible organizational structure         |  |
| 10                     | Costs                                        |  |
| 11                     | No Reactiveness                              |  |
| 12                     | Age Structure                                |  |
| 13                     | No Feedback                                  |  |
| 14                     | Workload                                     |  |
| <b>2</b>               | <b>Application of Effectuation</b>           |  |
| 1                      | Bird in Hand                                 |  |
| 2                      | Affordable Loss                              |  |
| 3                      | Lemonade                                     |  |
| 4                      | Crazy Quilt                                  |  |
| 5                      | Pilot in the Plane                           |  |
| <b>3</b>               | <b>Conditions for Corporate Effectuation</b> |  |
| 1                      | <i>Organizational Factors</i>                |  |
| 1                      | Organizational Culture                       |  |
| 1                      | Failure Treatment                            |  |
| 2                      | <b>Project Evaluation</b>                    |  |
| 3                      | Experimentation                              |  |
| 4                      | Top Management Support                       |  |
| 5                      | Freedom                                      |  |
| 6                      | <del>Solidarity to Company</del>             |  |
| 7                      | <del>Risk Acceptance</del>                   |  |
| 2                      | Organizational Structure                     |  |
| 1                      | Number of Hierarchical Levels                |  |
| 2                      | Organic Management Style                     |  |
| 3                      | Flexibility                                  |  |
| 4                      | Separate Structure                           |  |
| 2                      | <i>Human Capital Factors</i>                 |  |
| 1                      | Effectual Factors                            |  |
| 1                      | Means-driven                                 |  |
| 2                      | Controllability                              |  |
| 3                      | Risk Assumption                              |  |
| 4                      | Use of contingencies                         |  |
| 5                      | Cooperation                                  |  |
| 2                      | Other Factors                                |  |
| 1                      | <del>High level of Education</del>           |  |
| 2                      | <del>Position in Top Management</del>        |  |
| 3                      | Proactiveness/ Motivation                    |  |
| 4                      | <del>Individual Attitude</del> Open-minded   |  |
| 5                      | Capabilities                                 |  |
| 6                      | Reward                                       |  |
| 3                      | <i>Innovation Factors</i>                    |  |
| 1                      | <del>Visibility</del>                        |  |
| 2                      | Time Availability                            |  |
| 3                      | <del>Personal Flexibility</del>              |  |
| 4                      | Communcation                                 |  |
| 5                      | Rules and Routines                           |  |
| 6                      | Active Involvement of employees              |  |
| 7                      | Access to Resources/ Expert knowledge        |  |
| 8                      | <del>Easy Access to innovation support</del> |  |



## Appendix J Final Template

| <b>Final Template</b> |                                              |                                         |
|-----------------------|----------------------------------------------|-----------------------------------------|
| <b>1</b>              | <b>Challenges in Innovation</b>              |                                         |
|                       | 1                                            | Inflexible Processes                    |
|                       | 2                                            | Budget Allocation                       |
|                       | 3                                            | Demotivation                            |
|                       | 4                                            | Lack of Vision                          |
|                       | 5                                            | Risk Aversity                           |
|                       | 6                                            | Coordination of Processes               |
|                       | 7                                            | No flexible organizational structure    |
|                       | 8                                            | No Reactiveness                         |
|                       | 9                                            | Age Structure                           |
| <b>2</b>              | <b>Application of Effectuation</b>           |                                         |
|                       | 1                                            | Bird in Hand                            |
|                       | 2                                            | Affordable Loss                         |
|                       | 3                                            | Lemonade                                |
|                       | 4                                            | Crazy Quilt                             |
|                       | 5                                            | Pilot in the Plane                      |
| <b>3</b>              | <b>Conditions for Corporate Effectuation</b> |                                         |
|                       | 1                                            | <i>Organizational Factors</i>           |
|                       |                                              | 1 Organizational Culture                |
|                       |                                              | 1 Failure Treatment                     |
|                       |                                              | 2 Experimentation                       |
|                       |                                              | 3 Top Management Support                |
|                       |                                              | 4 Freedom                               |
|                       | 2                                            | Organizational Structure                |
|                       |                                              | 1 Number of Hierarchical Levels         |
|                       |                                              | 2 Organic Management Style              |
|                       |                                              | 3 Flexibility                           |
|                       |                                              | 4 Separate Structure                    |
|                       | 2                                            | <i>Human Capital Factors</i>            |
|                       |                                              | 1 Effectual Factors                     |
|                       |                                              | 1 Means-driven                          |
|                       |                                              | 2 Controllability                       |
|                       |                                              | 3 Risk Assumption                       |
|                       |                                              | 4 Use of contingencies                  |
|                       |                                              | 5 Cooperation                           |
|                       |                                              | 2 Other Factors                         |
|                       |                                              | 1 Proactiveness/ Motivation             |
|                       |                                              | 2 Capabilities                          |
|                       |                                              | 3 Reward                                |
|                       |                                              | 4 Open mind set                         |
|                       | 3                                            | <i>Innovation Factors</i>               |
|                       |                                              | 1 Time Availability                     |
|                       |                                              | 2 Communication                         |
|                       |                                              | 3 Rules and Routines                    |
|                       |                                              | 4 Active Involvement of employees       |
|                       |                                              | 5 Access to Resources/ Expert knowledge |

## **Appendix K Interview Translations: original quotes**

### **Footnote 5**

„Die Firma hat aber schon ein Jahr vorher wissen wollen, welche Projekte wir letztendlich einreichen könnten, damit die Budgets festgelegt werden können. Die Festlegung der Budget geschieht in einem Zyklus, in einem Zeitrahmen, der mit vernünftigen Innovationen und kurzfristigem Entwickeln von Strategien, Technologien, neuen Ideen, vollkommen inkompatibel ist“ (Interviewee 3, code: budget allocation)

### **Footnote 6**

„Wiederum Angst vor Risikoübernahme, eigene Mittel zu übernehmen und hoffen, dass man Investoren bekommt, bevor man weitere Wege geht“ (Interviewee 11: code: risk aversion).

### **Footnote 7**

„Also aus der Markterfahrung, die wir gesammelt haben, aus den Kundengesprächen, aus der ganzen Aktivität heraus und der gegenseitigen Diskussion ist jetzt ein modifizierter Weg geworden, der letztendlich für das Geschäft, was begonnen wurde, eine geringe Modifikation bedeutet aber Wegbereiter für ein größeres Geschäft nämlich [...] [Projekt] war“ (Interviewee 2, code: lemonade).

### **Footnote 8**

„Du musst es wissen, du musst es wollen, du musst es treiben. Nur du kennst dich und dein Geschäft, deine Persönlichkeit im übertragenen Sinne am besten und weißt wo deine Stärken und Schwächen sind und ergo welche Schwächen du besiegen musst und wo deine Partner sind, damit du das erreicht“ (Interviewee 3, code: pilot in the plane).

## REFERENCES

- Ansoff, I. (1965). *Corporate Strategy*, McGraw-Hill, New York, NY.
- Arend, R. J., Sarooghi, H., & Burkemper, A. (2015). Effectuation as ineffectual? Applying the 3E theory-assessment framework to a proposed new theory of entrepreneurship. *Academy of Management Review*, 40(4), 630-651.
- Baden-Fuller, C. (1995). Strategic Innovation, Corporate Entrepreneurship and Matching Outside-in to Inside-out Approaches to Strategy Research<sup>1</sup>. *British Journal of Management*, 6(s1), S3-S16.
- Barich, H., & Kotler, P. (1991). A framework for marketing image management. *Sloan management review*, 32(2), 94-104.
- Barringer, B. R., & Bluedorn, A. C. (1999). The relationship between corporate entrepreneurship and strategic management. *Strategic Management Journal*, 20(5), 421-444.
- Bessant, J. (2003). Challenges in innovation management. *International handbook on innovation*, Elsevier Science Ltd, 761-774.
- Blekman, T. (2011). *Corporate Effectuation: What Managers Should Learn from Entrepreneurs!* Academic Service.
- Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: Entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing*, 27(2), 167-184.
- Brews, P. J., & Hunt, M. R. (1999). Learning to plan and planning to learn: Resolving the planning school/learning school debate. *Strategic Management Journal*, 20(10), 889-913.
- Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done?. *Qualitative research*, 6(1), 97-113.

Bygrave, B. (2004). The entrepreneurial process. In: W. Bygrave & A.E. Zacharkis (Eds.). *The portable MBA in entrepreneurship*. 1-28. Hoboken: John Wiley & Sons.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of business venturing*, 26(3), 375-390.

Cooper, D. R. & Schindler, P. S. (2006). *Business research methods*, 9<sup>th</sup> ed. New York.

Covin, J. G., & Miles, M. P. (1999). Corporate entrepreneurship and the pursuit of competitive advantage. *Entrepreneurship: Theory and practice*, 23(3), 47-47.

Covin, J. G., & Miles, M. P. (2007). Strategic use of corporate venturing. *Entrepreneurship Theory and Practice*, 31(2), 183-207.

Creswell, J. W., & Clark, V. L. P. (2007). *Designing and conducting mixed methods research*.

da Costa, A. F., & Brettel, M. (2011). EMPLOYEE EFFECTUATION-WHAT MAKES CORPORATE EMPLOYEES ACT LIKE ENTREPRENEURS?. *Frontiers of Entrepreneurship Research*, 31(17), 2.

Dess, G. G., Lumpkin, G. T., & McKee, J. E. (1999). Linking corporate entrepreneurship to strategy, structure, and process: Suggested research directions. *Entrepreneurship: Theory and Practice*, 23(3), 85-85.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), 25-32.

Faschingbauer, M. (2010). *Effectuation: Wie erfolgreiche Unternehmer denken, entscheiden und handeln*. Schäffer-Poeschel Verlag für Wirtschaft Steuern Recht.

Faschingbauer, M. (2016). PAVE\_Test. *Effectuation Forschung & Praxis*. <http://www.effectuation.at/project/pave-test/>. Access: 7<sup>th</sup> of June 2016.

Gall, M. D., Gall, J. P. & Borg, W. R., (2006). *Educational research: An introduction* (8th edition). Longman Publishing.

Grichnik, D., Brettel, M., Koropp, C., & Mauer, R. (2010). *Entrepreneurship: unternehmerisches Denken, Entscheiden und Handeln in innovativen und technologieorientierten Unternehmungen*. Stuttgart: Schäffer-Poeschel.

Guth, W. D., & Ginsberg, A. (1990). Guest editors' introduction: Corporate entrepreneurship. *Strategic management journal*, 11(5), 5-15.

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific journal of management*, 1(2), 81-99.

Hornsby, J. S., Kuratko, D. F., & Montagno, R. V. (1999). Perception of internal factors for corporate entrepreneurship: A comparison of Canadian and US managers. *Entrepreneurship: Theory and Practice*, 24(2), 9-24.

Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: assessing a measurement scale. *Journal of business Venturing*, 17(3), 253-273.

Howell, E. (2015). SpaceX's Elon Musk to Reveal Mars Colonization Ideas This Year. <http://www.space.com/28215-elon-musk-spacex-mars-colony-idea.html#sthash.OFLP2yWs.dpuf>. Access: 1<sup>st</sup> of May 2016.

Ireland, R. D., Hitt, M. A., & Sirmon, D. G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. *Journal of management*, 29(6), 963-989.

Ireland, R. D., Kuratko, D. F., & Covin, J. G. 2003. Antecedents, elements, and consequences of corporate entrepreneurship strategy. In D. H. Nagao (Ed.), *Proceedings of the Sixty-third Annual Meeting of the Academy of Management (CD)*, ISSN 1543–8643.

Ireland, R. D., & Webb, J. W. (2007). Strategic entrepreneurship: Creating competitive advantage through streams of innovation. *Business Horizons*, 50(1), 49-59.

Johnson, P., & Clark, M. (2006). Editors' introduction: Mapping the terrain: An overview of business and management research methodologies. In: P. Johnson & M. Clark (eds) *Business and Management Research Methodologies*, Sage, xxxv-iv.

Johansson, A., & McKelvie, A. (2012). Unpacking the antecedents of effectuation and causation in a corporate context. *Frontiers of Entrepreneurship Research*, 32(17), 1-15.

King, N. (2012). Doing template analysis. In: G. Symon and C. Cassell (eds) *The Practice of Qualitative organizational research: Core methods and current challenges*, Sage, 426-450.

Kraaijenbrink, J. (2008). The nature of the entrepreneurial process: causation, effectuation, and pragmatism.

Kuratko, D. F., Montagno, R. V., & Hornsby, J. S. (1990). Developing an intrapreneurial assessment instrument for an effective corporate entrepreneurial environment. *Strategic management journal*, 11(5), 49-58.

Kuratko, D. F. (2010). Corporate entrepreneurship: An introduction and research review. In: *Handbook of entrepreneurship research*, 129-163. Springer New York.

Lewins, A., & Silver, C. (2009). Choosing a CAQDAS package. Working Paper. <http://eprints.ncrm.ac.uk/791/1/2009ChoosingaCAQDASPackage.pdf>, Access: 7<sup>th</sup> of May 2016.

Lumpkin, G. T. and G. G. Dess (1996). 'Clarifying the entrepreneurial orientation construct and linking it to performance', *Academy of Management Review*, 21, 135-172.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization science*, 2(1), 71-87.

Markides, C. (1997). Strategic innovation. *Sloan Management Review*, 38(3), 9-23.

McGrath, R. M., & MacMillan, I. C. 2000. *The entrepreneurial mindset*. Boston: Harvard Business School Press.

Molina-Azorín, J. F. (2010). The use and added value of mixed methods in management research. *Journal of Mixed Methods Research*, 5(1), 7-24.

Moroz, P. W., & Hindle, K. (2011). Entrepreneurship as a process: Toward harmonizing multiple perspectives. *Entrepreneurship Theory and Practice*, 36(4), 781-818.

Morris, M. H., & Kuratko, D. F. (2008). *Corporate entrepreneurship: Entrepreneurial development within organizations*. 2<sup>nd</sup> edition. South-Western Pub.

Miller, D. (1983). 'The correlates of entrepreneurship in three types of firms', *Management Science*, 29, 770-791.

Mintzberg, H., & Waters, J. A. (1985). Of strategies, deliberate and emergent. *Strategic management journal*, 6(3), 257-272.

Pearce, J. A., Kramer, T. R., & Robbins, D. K. (1997). Effects of managers' entrepreneurial behavior on subordinates. *Journal of Business Venturing*, 12(2), 147-160.

Read, S., Song, M., & Smit, W. (2009). A meta-analytic review of effectuation and venture performance. *Journal of Business Venturing*, 24(6), 573-587.

Roberts, E. B., & Berry, C. A. (1984). Entering new businesses: selecting strategies for success. *Sloan Management Review*, 26(3), 3-17.

Sackmann, S. A. (1991). Uncovering culture in organizations. *The Journal of applied behavioral science*, 27(3), 295-317.

Sarasvathy, S. D. (2001a). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of management Review*, 26(2), 243-263.

Sarasvathy, S. D. (2001b). What makes entrepreneurs entrepreneurial?

Sarasvathy, S. D. (2009). *Effectuation: Elements of entrepreneurial expertise*. Edward Elgar Publishing.

Sarasvathy, S. D., & Dew, N. (2005). New market creation through transformation. *Journal of Evolutionary Economics*, 15(5), 533-565.

Sarasvathy, S. D., Dew, N., Read, S., & Wiltbank, R. (2008). Designing organizations that design environments: Lessons from entrepreneurial expertise. *Organization Studies*, 29(3), 331-350.

Saunders, M. N. (2012). *Research methods for business students*, 6<sup>th</sup> ed. Pearson Education India.

Schein, E. H. (2004). *Organizational culture and leadership*. 3rd edition. Jossey Bass.

Sharma, P., & Chrisman, S. J. J. (2007). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship\*. In: *Entrepreneurship*, 83-103. Springer Berlin Heidelberg.

Simon, H. A. (1997). *Administrative Behavior: A study of decision-making processes in administrative organization*. 4<sup>th</sup> edition. The Free Press.

Slevin, D. P., & Covin, J. G. (1990). Juggling entrepreneurial style and organizational structure. *MIT Sloan Management Review*, 31(2), 43.

Tidd, J. & Bessant, J. (2009). *Managing innovation* (Vol. 4). John Wiley & Sons, Ltd.

Unsworth, K. (2001). Unpacking creativity. *Academy of management review*, 26(2), 289-297.

Unsworth, K. L. (2003). Engagement in employee innovation: A grounded theory investigation. Available on: [http://eprints.qut.edu.au/3033/1/Engagement\\_AoM.pdf](http://eprints.qut.edu.au/3033/1/Engagement_AoM.pdf).



VHB online (2016). Complete list of the journals in VHB-JOURQUAL3 in alphabetical order. <http://vhbonline.org/service/jourqual/vhb-jourqual-3/gesamtliste/>. Last Access: 7<sup>th</sup> of June 2016.

Vogt, W. P., & Johnson, R. B. (2011). *Dictionary of Statistics & Methodology: A Nontechnical Guide for the Social Sciences: A Nontechnical Guide for the Social Sciences*. Sage.

Vozikis, G. S., Bruton, G. D., Prasad, D., & Merikas, A. A. (1999). Linking corporate entrepreneurship to financial theory through additional value creation. *Entrepreneurship: Theory and Practice*, 24(2), 33-33.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic management journal*, 27(10), 981-998.

Yin, R. K. (2009). *Case study research: Design and methods*. 4<sup>th</sup> edition. Sage publications.

Zahra, S. A., & Covin, J. G. (1995). Contextual influences on the corporate entrepreneurship-performance relationship: A longitudinal analysis. *Journal of business venturing*, 10(1), 43-58.