# APPLYING SIX SIGMA PRINCIPLES TO BUSINESS STRATEGY IMPLEMENTATION

# APPLYING SIX SIGMA PRINCIPLES TO BUSINESS STRATEGY IMPLEMENTATION

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## ABSTRACT

Purpose

The study examines the question, if the business process excellence methodology Six Sigma can be applied to enhance business strategy implementations.

Design and methodology

Through a literature review on strategy implementation, on Six Sigma as well as on the combination of both, a survey amongst managers and decision makers engaged in strategy implementations and a semi-structured focus group interview with experts in both fields yield the necessary literature background and the empirical data for this research.

Findings

Six Sigma can be directly applied in the strategy implementation process to enhance the handling of strategy implementation success factors. Six Sigma can indirectly be a means for a better achievement of strategic goals and for better strategy implementations respectively as organizations, which use Six Sigma as a process management and improvement methodology or moreover as a management philosophy, are able to implement new strategies more successfully, efficiently and faster.

Implications and research limitations

The findings of this study can help companies to improve on their strategy implementation efforts as the results offer a new approach through the application of Six Sigma. In order to extend the validity of this research the research population can be extended in terms of quantity, geographical aspects as well as industry sectors.

Keywords

Strategy implementation, Six Sigma, Strategy implementation success rates, Strategy implementation success factors, Application of Six Sigma to strategy implementation



Approved: 

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# CHAPTER 1

# INTRODUCTION

Chapter 1 provides an overview of the research project. After the discussion of the background, the research problem and the reasons for this research project are highlighted. Furthermore the objectives of the research project and the research questions are being described. General assumptions, benefits as well as limitations of the research conclude this chapter.

## 1.1 Background

IBB Management Consulting (IBB) is a company with two major consulting focuses and core competencies respectively. One is the area of strategy consulting, including both strategy development/formulation and strategy implementation. The second one is providing business process excellence through the application of the Six Sigma methodology.

IBB as well as its clients are constantly monitoring the impact and success of strategy development/formulation and implementation projects. The CEOs of IBB, Stefan and Robert Dannenmaier (2008) confirm that the results of these evaluations are showing that companies especially have problems establishing new business strategies within their organizations.

IBB has therefore decided to look deeper into the subject in order to learn more about the problems related to strategy implementation. As Six Sigma offers business process implementation concepts and tools that shall guarantee a successful and sustainable implementation (Dannenmaier & Dannenmaier, 2008), IBB has also decided to examine if Six Sigma theory and concepts like the process improvement

methodology DMAIC (Define-Measure-Analyze-Improve-Control) and the change management tools from CAP (Change Acceleration Process) / TOP (Transformation Optimizing Process), can help to enhance the strategy implementation process.

## 1.2 Statement of Problem

As mentioned above, IBB evaluations of strategy implementations have shown that companies have difficulties with the introduction of newly developed strategies to their organizations (Dannenmaier & Dannenmaier, personal interview, February 29,August 18, 2008).

As a management consulting company, IBB is facing the issue that clients are not only demanding guidance during strategy development/formulation and implementation, they also hold IBB more and more responsible for strategy implementation success (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008).

If, in the future, IBB is not able to provide strategy consulting services that lead to the desired outcomes, IBB is likely to face two problems (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008). Firstly IBB will not be able to earn the contingent fees for successful implementations. Secondly existing and future clients will tend to put IBB's competitors in charge of guiding them through the strategy formulation and implementation process, which would lead to a loss in IBB's market share as well as to losses in revenue.

## 1.3 Intention and Reason for Study

IBB has decided to start a research project that shall deliver necessary findings for successful future consulting in the field of strategy implementation.

IBB has a genuine interest in the examination of relevant literature combined with an empirical research on strategy implementation amongst its clients. The research is intended to yield comprehensive knowledge on success rates, problem areas and success factors as well as the applicability of Six Sigma principles in the field of strategy implementation.

Based on the results of this research project, IBB wants to further develop and improve its consulting approach for a sustainable strategy implementation, in order to secure client satisfaction, revenue base and market share.

Therefore the empirical research among IBB's clients shall also indicate to them that IBB is willing to improve its services based on the experiences of its customers. At the same time it shall increase awareness for the importance of proper and thorough strategy implementation amongst managers and decision-makers of clients of IBB.

## 1.4 Research Objectives

This study pursues seven main research objectives. To itemize these:

1. To determine strategy implementation success rates.
2. To evaluate problem areas and examine the importance of different success factors for business strategy implementation as perceived by managers and decision-makers of clients of IBB.
3. To assess their actual experiences with strategy implementations in terms of the realization of the different success factors.
4. To highlight possible gaps between managers' perceptions of the importance of success factors on the one hand and their actual experiences on the other hand.

5. To assess the experience of managers and decision-makers of clients of IBB with existing strategy implementation concepts and tools.

6. To examine, if Six Sigma Principles can be applied in the strategy implementation process and therefore are suitable to more successfully implement business strategies, by contributing to the reduction of possible gaps.

7. To ascertain, if Six Sigma as a process management tool can be a means for a better achievement of strategic (Implementation) goals.

Based on these objectives the below following research questions will be examined.

## 1.5 Major Research Problem and Sub-Questions

The major research problem, for which this study aims to find an answer to, is if the Six Sigma methodology can support and therefore improve the strategy implementation process.

In order to answer this question, it will primarily be necessary to evaluate if strategy implementations are unsuccessful. Thus the first step will be to find out about success rates of strategy implementations. If success rates are low according to the literature and the managers and decision-makers of clients of IBB, it will be crucial to find out about the problem areas in order to understand implementation difficulties. That is why the next question to answer will be what problem areas exist and moreover what success factors are critical to proper strategy implementations. Answering this question shall help to find about the existing gaps between the perceived important success factors and their actual realization during strategy implementations. This will lead to the question, what strategy implementation concepts and tools exist and moreover if managers and decision makers of IBB's

clients have experience in applying existing implementation concepts and tools. Finally the questions will be posed, if the Six Sigma methodology can deliver adequate tools for the strategy implementation process, hence help to reduce or minimize gaps between perceived important success factors and their actual realization and therefore contribute to more successful strategy implementations, and if Six Sigma can generally be a means for a better achievement of strategic (Implementation) goals.

The main research problem and the necessary sub-questions are formulated as below:

Major Research Problem:

- Can Six Sigma principles contribute to more successful business strategy implementations?

Sub-Questions:

SQ1) What are the success rates of strategy implementations?

SQ2) Which problem areas exist, how often do they occur and which success factors do managers and decision-makers of clients of IBB assess as important for strategy implementation?

SQ3) What is their actual perception of strategy implementations in terms of the realization of the different success factors?

SQ4) What are the gaps between managers' assessment on the importance of success factors on the one hand and their actual perceptions on the other hand?

SQ5) What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB?

SQ6) Can Six Sigma principles be applied in the strategy implementation process and therefore help to reduce the gaps between managers' perceptions of the importance of success factors and their actual experiences?

SQ7) Can Six Sigma as a process management concept support the achievement of strategic (Implementation) goals?

## 1.6 Assumptions of Research

In terms of validity and reliability the research is based on the following assumptions:

1. The research design yields the necessary and appropriate data in order to answer the stated research questions.
2. The research is researchable regarding the availability of managers and decision-makers of clients of IBB and their willingness to participate in this study.
3. Implementation of the once developed strategy(ies) is perceived and handled differently among managers and decision-makers of clients of IBB.
4. Measurable gaps exist between the developed strategies and the outcome of their implementation.
5. Respondents are answering comprehensively and honestly.
6. There is appropriate access to relevant literature.

## 1.7 Scope of Research

The findings of this study will be used by IBB in order to develop a comprehensive knowledge of the existing literature on strategy implementation, especially in combination with Six Sigma principles. At the same time the research will provide IBB with a better understanding of the perceptions and experiences of managers and decision-makers of its clients in the field of strategy implementation.

In order to deliver these results, the literature review, besides a general overview of research methodologies, focuses on strategy implementation, Six Sigma and the integration of the both. The scope of the empirical part of this research is targeted to experts in strategy implementation and Six Sigma as well as relevant managers and decision-makers of IBB's clients, from where the appropriate sample for questioning will be drawn. These clients are from the financial services industry, the food & beverages sector, from life science & health care institutions as well as other sectors.

## 1.8 Benefits of Research

This research will provide IBB with useful information on existing literature on strategy implementation as well as valuable insight into its clients' perceptions and experiences with strategy implementation.

These findings will help IBB to develop a clearer picture of the needs and requirements of its clients in order to successfully deploy a business strategy. They will also yield evidence, if Six Sigma methodologies like DMAIC can provide tools for a more structured and standardized strategy implementation in order to make the progress of the implementation transparent and the realization quantifiable. The research will also try to answer the question, if the CAP / TOP change management methodology can offer concepts that lead to a swift and targeted transformation of the organization towards its new strategy as well as to the necessary acceptance amongst its members.

Furthermore this study will provide the "general" reader with an overview of existing literature on strategy implementation as well as practical insight into perceptions and experiences of managers and decision-makers from a very specific

segment of companies. It will also give an interested reader an overview of the main aspects of the Six Sigma methodologies DMAIC and CAP / TOP.

## 1.9 Limitations of Research

This research project is subject to the following limitations:

- The available time and budget for conducting this research is limited.
- The research is focused on a sample taken from the clients of IBB Management Consulting and from experts on Six Sigma and strategy implementation from IBB.
- Therefore the research design of this study is only valid for this specific project and the generalizability of the findings of this study is also limited.
- Specific literature and practical experience with the topic of integrating Six Sigma principles with strategy implementation is scarce.

The limitations of this research project conclude the introductory chapter. The following table gives a brief overview of the upcoming chapters of this study:

Table 1.1: Chapter Overview

| Chapter | Content |
|---|---|
| 2 | Literature review on:<br>- Strategy Implementation<br>- Six Sigma Methodologies (DMAIC, CAP/TOP) and Strategy Implementation |
| 3 | Research methodology:<br>- Literature review on relevant research methodologies<br>- Description of the actual methods used in this study |
| 4 | Presentation of empirical evidence |
| 5 | Analysis and comparison of the evidence with the relevant literature as outlined in chapter two |
| 6 | Implications of the findings from chapters four and five as well as referencing to research questions from chapter one |

# CHAPTER 2

# LITERATURE REVIEW

Chapter two provides an insight into appropriate literature on the main topics of this study. After an introductory section, the first part of this literature review will concentrate on concepts on strategy implementation; the second part will deal with the Six Sigma methodologies DMAIC and CAP/TOP with their possible impact on strategy implementation. An overview of the major literature outcomes will conclude chapter two.

## 2.1 Strategy Implementation – Introduction

Strategies are either deliberately developed or just emerge within the organization through mutual consent amongst the decision makers on general objectives, based on which they determine business actions over time (Eschenbach, Eschenbach, & Kunesch, 2003, pp. 10-11).

Reputable authors have developed methods to develop such business strategies. Aloys Gaelweiler, Peter F. Drucker, Gary Hamel, Coimbatore Prahalad, Robert S. Kaplan, David P. Norton, Fredmund Malik, Michael Porter, Henry Mintzberg or Cuno Puempin are only some of the economists, who delivered relevant concepts and tools (Eschenbach et al., 2003). More and more businesses have the need to apply these methodologies of an institutionalized process to generate their strategies on a periodical basis (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008).

A problem does not so much seem to exist in the development or formulation of strategies (Dannenmaier & Dannenmaier, personal interview, February 29, August 18,

2008). Companies have the awareness of the importance of proper strategy development and they can refer to lots of appropriate methodologies, such as Gaelweiler's concept on strategic and operative corporate management (Eschenbach et at., 2003, pp. 93-103), Hamel's and Prahalad's model on future-oriented strategy development (Eschenbach et al., 2003, pp. 115-129), Porter's Five Forces and generic strategy types (Eschenbach et al., 2003, pp. 213-229) or Puempin's Strategic Success Positions or SEPs (Eschenbach et al., pp. 249-259). The challenge therefore seems to lie in the effective implementation of the once developed strategies after their successful formulation.

Stefan and Robert Dannenmaier state that many companies, even though they had dedicated considerable resources to the development of their business strategies, are not satisfied with the transformation of the developed strategic framework and guidelines into business reality. Companies are concerned about the fact that a great percentage of the strategies are never implemented, although they were considered crucial for business success during the development stage. This leads to a lack of strategic focus and triggers different kinds of negative effects on a company's operation and after all on its performance (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008).

Without proper implementation of strategies, management tends to lose track toward defined business goals, which causes uncertainty about necessary operative measures and can lead to day-to-day management decisions caused by the lack of general directions. Different departments, units and teams are not heading in the same direction. They pursue their own, short term goals with no regard of overall long-term company objectives. Company goals and strategies are not broken down to individual

performance targets. This leads to a lack of employee identification with desired strategies. Individual measures that would be necessary in order to pursue company strategies, cannot be identified. The overall outcome is dissipation of company resources and a dissatisfying business performance (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008).

The following literature review will consider the terminology, existing concepts of strategy implementation and possible implementation tools, success rates, problem areas as well as success factors.

## 2.2 Strategy Implementation – Discussion

### 2.2.1 Terminology

The term "Strategy" is derived from the two ancient Greek words *stratos* (army) and *agos* (leader) which form *strategos* (military commander or general). It refers to the general's plan for arraying and maneuvering his forces with the goal to defeat an enemy army (Luecke, 2005, p. xi).

The term "Implementation" is derived from the Latin word *implere* (fill, fulfill) or *implementum* (fulfillment, accomplishment, realization) and refers to the act of accomplishing some aim or executing some order (The American Heritage Dictionary of the English Language, 2003).

"Business Strategy" can be defined as an organization's concept or plan to develop and reach its long-term goal to gain and sustain a competitive advantage (Pümpin & Amann, 2005; Luecke, 2005) while controlling and using its human, technological and financial resources (Luecke, 2005). Business strategies stake off the framework for concrete actions and necessary behavior to reach these objectives (Pümpin & Amann, 2005).

Since the term business strategy was first introduced in economics by the Harvard Business School in the 1950s it has been differentiated into strategy development or formulation and implementation. Strategy development or formulation comprises the definition of strategic goals and the preparation of the implementation. The implementation per se aims to bring the strategy to life by introducing and establishing it within the organization and to deliver the desired effects to the market (Eschenbach et al., 2003, p. 9).

Strategy implementation comprises all measures, activities and processes which are dedicated to integrate a newly developed strategy into an existing system, organization or entity (Raps, 2004, p. 71; Huber, 1985, p. 21). This definition of strategy implementation will be used throughout this study.

Strategy implementation is separated from the term strategy formulation/ development. In contrast to the above definition of strategy implementation, strategy formulation/development is a different process and management function, where the strategic goal is defined, a strategic analysis of the external environment as well as of the organization is performed, and where the strategies are formulated that are intended to lead the organization towards the strategic goal (Raps, 2004, pp. 21-22). The separation of these two terms was introduced by the Harvard Business School and is called the formulation-implementation-dichotomy (Cespedes & Piercy, 2004, as cited in Raps, 2004, p. 24). At the same time it is pointed out that the separation of the two is necessary especially for didactical and analytical reasons (Raps, 2004, p. 24). Further, Raps (2004, p. 25) indicates that this separation leads to the problem that more weight is put on the formulation process and the implementation part is often just treated as an appendix. On the other hand, Raps (ibid) states that in practice,

formulation and implementation cannot be separated. Moreover both aspects are closely related and dependent from each other (Raps, 2004, p. 24). Pümpin (1996, p. 719) points out that parallel to strategy formulation, implementation activities are already performed, which themselves have an influence on the formulation process. Nevertheless this study will focus on the implementation aspects and not on the formulation aspects.

Strategy implementation encompasses two major aspects, which are on the one hand all operative measures in order to implement the new strategies, on the other hand all activities that are necessary to create acceptance for the new strategy amongst the affected managers and employees (Raps, 2004, p. 71; Kolks, 1990, p. 79).

The next section will describe existing tools and concepts on strategy implementation.

### 2.2.2 Strategy Implementation Success Rates

In order to answer the first sub-question (SQ1) to the research problem – What are the success rates of strategy implementations? – the literature on success rates of strategy implementations will now be examined.

A successful strategy implementation is determined by two factors (Raps, 2004, p. 71; Kolks, 1990, p. 94). The first is an implementation plan, where all defined necessary operative measures have actually been realized. The second is the achievement of the intended goals, as defined in the proposed strategy. Only when both requirements are fulfilled, it can be taken as a successful strategy implementation (Raps, 2004, p. 71). Emphasis has to be put on the term “intended” outcome of a strategy implementation, which marks the basis of comparison for determining, whether an implementation was successful or not (Kiechel, 1984, p. 8).

Implementation is successful only when the full intended outcome – realization of planned operative measures and attainment of intended goals – has been achieved (Raps, 2004, p. 71; Kiechel, 1984, p. 8).

Different figures on success rates can be found in the literature. Raps (2004), Kiechel (1984) and Gurowitz (2008) state that less than 10% of intended strategies are implemented. Kaplan and Norton (2001, p. 2) speak of success rates between 10% and 30%. Allio found out that 57% of firms are unable to execute their strategic initiatives. O'Coorbui (2008, p. 1) and Sterling (2003, p. 27) state that up to 70% of strategies fail to get fully implemented. Mintzberg (1994, as cited in Atkinson, 2006, p. 1441) asserts that more than half of the strategies are never actually implemented.

From the above numbers it could be assumed that there is not enough focus on proper strategy implementation or that there is not enough focus on the actual implementation criteria. At least the notion that up to 90% of strategy implementations fail should draw some attention from strategy formulation towards strategy implementation.

In order to understand implementation difficulties, problem areas of strategy implementation will be discussed in the next section, before the attention is turned to the success factors.

### 2.2.3 Problem Areas

The literature evaluation of problem areas of strategy implementations contributes to answer the second research sub-question (SQ2) – Which problem areas exist and which success factors do managers and decision-makers of clients of IBB perceive as important for strategy implementation? – by highlighting implementation

difficulties first. On the basis of this evaluation a closer look on success factors will then be taken.

Different authors have pointed out different kinds of problems when it comes to strategy implementation. The following table will summarize problems that are negatively influencing strategy implementations. The factors are allotted to categories, which are based on the different contents of implementation problems.

Table 2.1: Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
|---|
| 1. Strategy<br>- Unapproved strategy (Mankins & Steele, 2005, p. 67)<br>- Effective competitor response to strategy (Sterling, 2003, p. 29)<br>- Timeliness (Sterling, 2003, p 31)<br>- Distinctiveness (Sterling, 2003, p. 31)<br>- Lack of focus (Sterling, 2003, p. 31)<br>- Poorly conceived strategies and business models (Sterling, 2003, p. 31)<br>- Unclear strategic intentions with conflicting priorities (Beer & Eisenstat, 2000, p. 37) |
| 2. Planning & Execution<br>- Major problems surfaced during implementation that had not been identified beforehand (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| - Coordination of implementation activities was not effective enough (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Key implementation tasks and activities were not defined in enough detail (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Weak coordination across functions and businesses (Beer & Eisenstat, 2000, p. 37)<br>- Actions required to execute not clearly defined (Mankins & Steele, 2005, p. 67)<br>- Lack of translation of strategic ideas into actions (Allio, 2005, p. 13)<br>- Initiative fatigue – nothing really gets done (Freedman, 2003, p. 27) |
| 3. Organizational Design & Processes<br>- Organizational structural changes made were not effective (Alexander, 1985, p. 97)<br>- New strategy is not reflected in the structural design (Reed & Buckley, 1988, p. 68)<br>- The organization is not capable of adapting its structure fast enough in order to fit the new strategy (Reed & Buckley, 1988, p. 68)<br>- Organizational silos (Mankins & Steele, 2005, p. 67) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| 4. Resources<br>- Implementation took more time than originally allocated (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Competing activities and crisis distracted attention from implementing this decision (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Financial resources made available were not sufficient (Alexander, 1985, p. 97)<br>- Ignoring the day-to-day business imperatives (Corboy & O'Corrbui, 1999, p. 29)<br>- Inadequate or unavailable resources (Mankins & Steele, 2005, p. 67)<br>- Need to get back to the real job from strategy implementation (Allio, 2005, p. 13)<br>- Application of insufficient resources (Sterling, 2003, p. 30) |
| 5. Responsibilities<br>- Changes in responsibilities of key employees were not clearly defined (Alexander, 1985, p. 95; Al-Ghamdi, 1998, p. 325)<br>- Unclear individual responsibilities in the change process (Corboy & O'Corrbui, 1999, p. 29)<br>- Unclear accountabilities for execution (Mankins & Steele, 2005, p. 67) |

(Continued)

Table 2.1 (Continued): Categories with allotted problems of strategy implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| - Inadequate consequences or rewards for failure or success (Mankins & Steele, 2005, p. 67)<br>- Lack of clearly defined responsibilities (Allio, 2005, p. 13)<br>- Strategic dilution – things are moving without a clear driver (Freedman, 2003, p. 26) |
| 6. Capabilities<br>- Capabilities of employees involved were not sufficient (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Training and instruction given to lower level employees were not adequate (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Ineffective senior management team (Beer & Eisenstat, 2000, p. 37)<br>- Inadequate down-the-line leaderships skills development (Beer & Eisenstat, 2000, p. 37)<br>- Lack of understanding of how a strategy should be implemented (Corboy & O'Corrbui, 1999, p. 29)<br>- Inadequate skills and capabilities (Mankins & Steele, 2005, p. 68) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| 7. Monitoring<br>- Uncontrolled factors in the external environment had an adverse impact on implementation (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Information systems used to monitor implementation were not adequate (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Identification and monitoring of coordinated targets for the various levels in the organization (Reed & Buckley, 1988, p. 68)<br>- Difficulties and obstacles not acknowledged, recognized and acted upon (Corboy & O'Corrbui, 1999, p. 29)<br>- Inadequate management controls, particularly budgeting systems (Atkinson, 2006, p. 1446)<br>- Inadequate performance monitoring (Mankins & Steele, 2005, p. 68)<br>- Loss of track (Allio, 2005, p. 13)<br>- Difficulties to easily monitor the implementation (Allio, 2005, p. 13)<br>- Loss of relevance of the new strategy in the day-to day business (Allio, 2005, p. 13)<br>- Unanticipated market changes are not monitored (Sterling, 2003, pp. 27-29)<br>- Strategic drift – not focusing on the destination (Freedman, 2003, p. 26)<br>- Failure to understand progress – meaning not knowing where the company is on the journey (Freedman, 2003, p. 27) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| 8. Communication<br>- Problems requiring top management involvement were not communicated early enough (Al-Ghamdi, 1998, p. 325)<br>- Poor vertical communication (Beer & Eisenstat, 2000, p. 37)<br>- Poor communication in general (Atkinson, 2006, p. 1445)<br>- Poorly communicated strategy (Mankins & Steele, 2005, p. 67)<br>- Lack of communication (Sterling, 2003, p. 30)<br>- Strategic isolation – things are happening without communication (Freedman, 2003, p. 27) |
| 9. Understanding<br>- Overall goals were not sufficiently well understood by employees (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Understanding of the intended strategy (Sterling, 2003, p. 30) |
| 10. Acceptance<br>- Customers and staff not fully appreciating the strategy (Corboy & O'Corrbui, 1999, p. 29)<br>- Diminished feelings of ownership and commitment (Atkinson, 2006, p. 1445)<br>- Failures of buy-in (Sterling, 2003, p. 30) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| - Rewards and incentives utilized to get employee conformance to program were not sufficient (Alexander, 1985, p. 97)<br>- Lack of rewards for sticking with the new strategy (Allio, 2005, p. 13)<br>- Not celebrating success – failure to recognize and reward progress (Freedman, 2003, p. 27)<br>- Impatience – demand for change is unrealistic (Freedman, 2003, p. 27) |
| 11. Leadership & Support<br>- Leadership and direction provided by departmental managers were not adequate enough (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Key formulators of the strategic decision did not play an active role in implementation (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Advocates and supporters of the strategic decision left the organization during implementation (Alexander, 1985, p. 92; Al-Ghamdi, 1998, p. 325)<br>- Support and backing by top management in this SBU and at the corporate level were not sufficient (Alexander, 1985, p. 97)<br>- Management style is not appropriate for the strategy being implemented (Reed & Buckley, 1988, p. 68)<br>- Poor senior leadership (Mankins & Steele, 2005, p. 68) |

(Continued)

Table 2.1 (Continued): Categories with Allotted Problems of Strategy Implementation

| Categories with Allotted Problems of Strategy Implementation |
| --- |
| - Uncommitted leadership (Mankins & Steele, 2005, p. 68)<br>- Strategic inertia – the problem of not getting started due to a lack of priority amongst executives (Freedman, 2003, p. 26)<br>- Lack of stakeholder commitment – not everyone is on board (Freedman, 2003, p. 26)<br>- Top-down laissez-faire senior management style (Beer & Eisenstat, 2000, p, 37) |
| 12. Culture<br>- Organizational culture blocking the execution (Mankins & Steele, 2005, p. 67)<br>- Organizational culture is not in line with new strategy (Beaudan, 2001, p. 68)<br>- Employees face a dilemma between sticking with existing culture or executing the new strategy, which demands actions that run counter existing culture (Thompson et al., 2007, p. 428) |

Figure 2.1 gives an overview of the 12 categories derived from the consolidation of the strategy implementation problems in table 2.1. It will also link the above described problem areas with possible success factors for each of the 12 categories, which are described section 2.2.4.

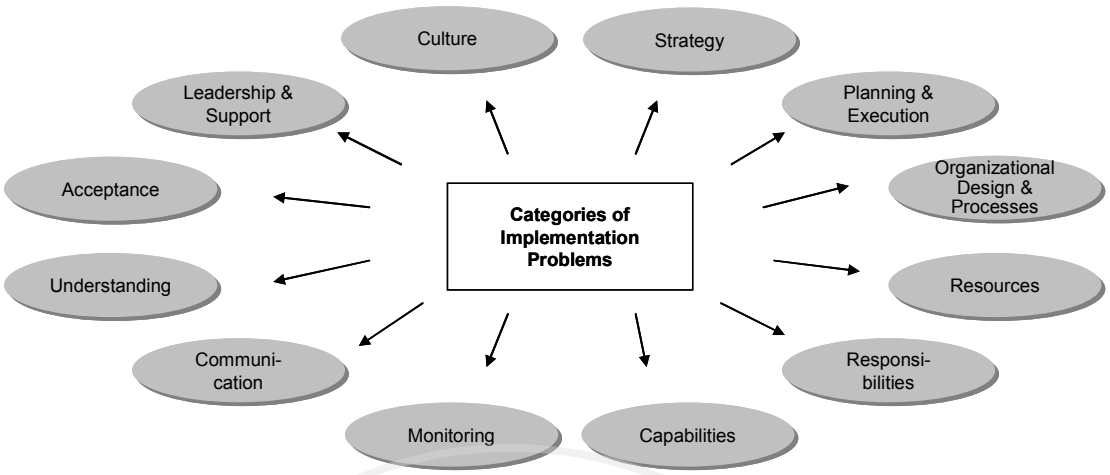


Figure 2.1: Categories of Implementation Problems

Two specific studies have evaluated the occurrence of selected implementation problems. Looking at the results may help to draw a clearer picture of those implementation problems which have a greater impact on implementation failure.

Alexander (1985, pp. 91-97) has led his study on strategy implementation among 93 companies in the US. 80% of these companies were at that time ranked within the Fortune 500 list of America's leading enterprises. Members of strategic business units within the 93 companies had to estimate, if the problems occurred either "never", "rarely", "sometimes", "frequently" or "always", when it came to strategy implementation. The number of "rarely" to "always" mentions where then counted and implementation problems ranked by the number total mentions. Al-Ghamdi (1998, pp. 322-327) performed the same study amongst 24 enterprises in the UK.

The table below shows a ranking of the 17 most often mentioned implementation problems in Alexander's study as well as the ranked 10 most frequently mentioned problems from Al-Ghamdi's evaluation:

Table 2.2: Problems of Strategy Implementations after Alexander (1985) and Al-Ghamdi (1998)

| Problems of Strategy Implementation | Ranking according to Alexander (1985, pp. 91-97) | Ranking according to Al-Ghamdi (1998, pp. 322-327) |
|---|---|---|
| 1. Implementation took more time than originally allocated | 1 | 2 |
| 2. Major problems surfaced during implementation that had not been identified beforehand | 2 | 4 |
| 3. Coordination of implementation activities was not effective enough | 3 | 3 |
| 4. Competing activities and crisis distracted attention from implementing this decision | 4 | 1 |

(Continued)

Table 2.2 (Continued): Problems of Strategy Implementations after Alexander (1985) and Al-Ghamdi (1998)

| Problems of Strategy Implementation | Ranking according to Alexander (1985, pp. 91-97) | Ranking according to Al-Ghamdi (1998, pp. 322-327) |
|---|---|---|
| 5. Capabilities of employees involved were not sufficient | 5 | 8 |
| 6. Training and instruction given to lower level employees were not adequate | 6 | - |
| 7. Uncontrolled factors in the external environment had an adverse impact on implementation | 7 | 10 |
| 8. Leadership and direction provided by departmental managers were not adequate enough | 8 | 7 |
| 9. Key implementation tasks and activities were not defined in enough detail | 9 | 5 |

(Continuted)

Table 2.2 (Continued): Problems of Strategy Implementations after Alexander (1985) and Al-Ghamdi (1998)

| Problems of Strategy Implementation | Ranking according to Alexander (1985, pp. 91-97) | Ranking according to Al-Ghamdi (1998, pp. 322-327) |
|---|---|---|
| 10. Information systems used to monitor implementation were not adequate | 10 | 6 |
| 11. Problems requiring top management involvement were not communicated early enough | - | 9 |
| 12. Key formulators of the strategic decision did not play an active role in implementation | 11 | - |
| 13. Changes in responsibilities of key employees were not clearly defined | 12 | - |
| 14. Organizational structural changes made were not effective | 13 | - |
| 15. Advocates and supporters of the strategic decision left the organization during implementation | 14 | - |

(Continued)

Table 2.2 (Continued): Problems of Strategy Implementations after Alexander (1985) and Al-Ghamdi (1998)

| Problems of Strategy Implementation | Ranking according to Alexander (1985, pp. 91-97) | Ranking according to Al-Ghamdi (1998, pp. 322-327) |
|---|---|---|
| 16. Financial resources made available were not sufficient | 15 | - |
| 17. Support and backing by top management in this SBU and at the corporate level were not sufficient | 16 | - |
| 18. Rewards and incentives utilized to get employee conformance to program were not sufficient | 17 | - |

Source: Alexander, L. D. (1985). Successfully implementing strategic decisions., *Long Range Planning*, *18*(3), 91-97.

Al-Ghamdi, S. M. (1998). Obstacles to successful implementation of strategic decisions: The British experience. *European Business Review*, *98*(6), 322-327.

Table 2.2 shows that the ten most mentioned implementation problems from both studies fall into the categories (taken from figure 2.1) “Planning and Execution”, “Resources”, “Capabilities”, “Monitoring” and “Leadership and Support”. This, at least as a result from these two studies, might be a hint, where to lay special attention to avoid implementation problems.

In this section it has been described, what possible implementation problems might show up, which categories of problem areas might be formed and what problems frequently occur. The next section illustrates the success factors of strategy implementation, based on the categories depicted in figure 2.1.

### 2.2.4 Success Factors

In this section success factors for each of the defined problem categories (from figure 2.1) are identified. This shall, on the one hand, help to find out about what success factors generally exist and secondly provide the background to answer the second part of the second research sub-question (SQ2): Which success factors do managers and decision-makers of clients of IBB perceive as important for strategy implementation?

The detailed description of the different success factors of each category is followed by a graphical summary in figure 2.2.

Quality of the Strategy: Probably the most crucial point of a successful strategy implementation is the strategy itself that is intended to be implemented (Dannenmaier & Dannenmaier, 2008) It is stated that without a properly developed strategy even the best implementation will not deliver the desired results (Dannenmaier & Dannenmaier, 2008). A properly defined strategy is based on a thorough analysis of the competitive environment which is combined with the

analysis of internal capabilities and mainly encompasses the development of core competencies as differentiators that lead to competitive advantages in the market (Porter, 2000, as cited in Eschenbach et al., 2003, p. 214 ff). As already described in section 1.2, there are many different concepts that deal with techniques and models that foster a proper strategy formulation, which are not subject of this study. Nevertheless it has to be pointed out that the development of the right strategies is essential for a successful implementation (Sterling, 2003, p. 32).

Implementation Planning: One crucial part of strategy implementation is a comprehensive implementation plan, with clearly defined actions, responsibilities and timeframes, which makes it possible to track implementation progress (Alexander, 1985, p. 97). It is important to break down the basic logic of how a broader logic is to be implemented into shorter-term actions (Allio, 2005, p. 15). The plan should also identify likely implementation problems including possible contingency responses (Alexander, 1985, p. 97, see also paragraphs on resources and monitoring in this section). One aspect is setting clear priorities in the implementation plan. This means that a few key steps and decisions have to be set and executed at the right time in the right way to meet planned implementation performance. These implementation priorities have to be translated into action items, responsibilities and timelines for each business unit and have to be provided with key performance indicators. Such priorities make it clear for every business unit on what to focus and help management to more precisely track performance (Mankins & Steele, 2005, pp. 70-71).

A clear understanding of what has to be done and easy tracking of implementation tasks can be achieved by using a common implementation format with a consistent set of templates and exhibits. This also enhances the adaptability of

the implementation plan, as unit plans can be compared side-by-side (Allio, 2005, p. 18).

When it comes to realistic planning and goal setting for a newly designed strategy, Mankins and Steele (2005) emphasize the importance of discussing assumptions and not forecasts. Forecasts often are the result of a political bargaining process where unit management argues for lower near-term profit projections top management presses for more long-term stretch. Mankins and Steele argue that for a goal-oriented planning it is necessary to clarify the assumptions on growth-potential and market trends first and then prepare the forecast figures based on the results of the discussion. It is therefore necessary to agree on a framework that includes the size and growth potential of each market, in which the organization participates (Mankins & Steele, 2005, p. 70). They also state that this "common language" creates a common understanding amongst top management, business units and the finance department concerning a much more practical planning and goal setting. This approach also helps to ensure that budgets and profits can be planned according to strategy and its action plans (Sterling, 2003, p. 33), which also will allow to track implementation performance (see also the paragraphs on resources and monitoring). Allio (2005, p. 18) additionally asks for balancing short-term and long-term goals in the implementation plan to cover the whole time-span of the implementation and to counter common tendencies that focus on short-term targets.

The allocation of the necessary resources is an important part of the planning process (Mankins & Steele, 2005, pp. 69-70) and will be discussed separately in one of the following paragraphs.

Planning alone is nothing without proper execution (Beaudan, 2001). Apart from the necessary premises for execution like enough resources, clear responsibilities, comprehensive communication as well as understanding and acceptance among employees, it is crucial to follow through with the strategy execution. It is therefore necessary to meet regularly, in well-structured, punctuated team sessions, where progress of implementation action items is discussed and necessary adaptations are made. This applies to both the team responsible for the whole program as well as to the teams in the specific units (Allio, 2005, p. 19; see also the paragraph on monitoring)

Adaptation of Organizational Design & Processes: Sterling (2003, p. 32) and Freedman (2003, p. 30) recommend adapting the organizational design to the needs of the strategy, meaning that structure has to follow the new strategy. The organization has to make sure that all necessary organizational functions are being created in order to be able to fulfill the operational needs of the new strategy (Sterling, 2003, p. 32). Structure deploys accountability within the organization and is a prerequisite that the company can achieve its strategic goals and objectives (Raps, 2004, p. 51).

Sterling (2003) opts for a basic assessment of organizational capabilities and for an immediate alignment of detected capability gaps according to the new strategic requirements. Possible criteria to assess structural design with the new strategy can be: compatibility of structure with the desired competitive advantages; consistency with the company's future core processes; alignment with the future product and market segments the company wants to serve; support of central functions; grade of devolution of decision making authority to those positions that are closest to the expertise needed for the decision (Freedman, 2003, p. 30). Thompson et al. (2007,

pp.373, 384) promote a five step approach to adapt an organization's design. The first question to answer is whether an organization will perform its different value chain activities, which have been identified according to the new strategy, internally or externally. The second step is to build main blocks in the organizational structure according to internally performed strategy-critical activities. This also comprises the decision on a certain type of organizational structure, like functional departments, process departments, divisional or geographical units, or individual businesses and profit centers. The third decision to make is to decide upon the degree of centralized and decentralized decision-making, depending on the degree of control top management has to apply in order to make the new strategy work. The fourth step is to secure cross-unit coordination through establishing effective and efficient cross-functional processes. Such processes assure fewer barriers between different vertical ranks, functions, disciplines and geographic locations. Such processes are also considered crucial to develop the core competencies that lead to the creation of competitive advantages, which make new strategies successful and sustainable. Implementing a process-oriented organization means guiding the organization away from organizational silos, where each department focuses and optimizes itself without a proper link to the up- and downstream functions in the value-stream. This can be achieved through the introduction of a matrix organization, where functional departments are linked by cross-functional processes (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008). The other option would be to establish process departments, where key processes are performed in one unit each (Thompson et al., 2007, p. 382). The last step is to provide necessary collaboration with customers, suppliers and strategic allies.

The adaptation of the organizational design therefore always has to include two main aspects, namely structure and cross-functional processes (Thompson et al., 2007, pp. 363, 374).

Allocation of Resources: Mankins and Steele (2005) suggest that resources deployment has to be discussed as early as possible in the whole implementation planning process, and these resources, have to be included in the company's budget from the beginning (Allio, 2005, p. 19). In order to obtain a realistic picture of necessary resources, it is considered important that budgeting and resource allocation follows the newly designed strategy and not existing financial plans (Freedman, 2003, p. 30). Resource allocation contains two aspects. The fist one is the level of necessary resources, the second one is the timing of the allocation. In order to assure the necessary amount and the right timing Mankins and Steele (2005, p. 70) argue that every business unit has to answer three questions precisely: What actions have to be taken in order to implement the new strategy within the unit? How long will it take? What kind of resources (financial and personal) will be needed and when during the implementation stage? After obtaining the answers for these questions from every unit, organizations can build up their resource allocation for the whole strategy initiative (Mankins & Steele, 2005, p. 70). Alexander (1985) emphasizes the importance of allocating more resources than normally planned, in order to be able to handle unexpected problems and the unknown.

It is the duty of top management to provide every unit with the necessary funds. This can also mean that it becomes necessary to shift resources according to the new necessities (Thompson et al., 2007, pp. 289, 390). Sterling (2003) also points out the importance of allocating the right amount of financial, personal and time

resources. He suggests to even include the financial evaluation of a new strategy during the strategy formulation, by developing a base case financial model and layering the impact of the newly developed strategy on top of that base case. This shall help to forecast, which impact in terms of resources the new strategy will have, and makes it possible to develop the strategy according to factual resource capabilities.

Another important resource aspect is the alignment of information resources with the strategy (Sterling, 2003; Al-Ghamdi, 1998). They point out that the organization must have the necessary, updated information technology to be able to execute the new strategy.

Allotment of Responsibilities: Alexander (1985) points out that it has to be clear from the very beginning of the implementation process who is responsible for which task. This includes the implementation process itself as well as the new organizational design, with its new structures and processes (Alexander, 1985, p. 96; Raps, 2004, p. 51).

One strategy manager is responsible for the implementation as a whole with the task to guide the overall process. He is not the sole implementer, but relies on designated "stewards", who have the responsibility to coordinate the implementation tasks in their respective organizational units. They themselves use employees of these specific units in order to fulfill the necessary actions (Allio, 2005, p. 17). Such a clear plan of responsibilities helps to avoid power struggles between units and within hierarchies and is crucial for a smooth implementation (Raps, 2004, p. 51)

Employees' Capabilities: Mankins and Steele (2005, p. 72) state that "no strategy implementation can be better than the people who have to make it work."

Apart from the creation of the necessary structures and processes it is thus crucial to have capable employees (Sterling, 2003; Beaudan, 2001). An organization must either develop its employees by giving them the necessary capabilities to successfully implement the new strategy or to hire the right personnel (Mankins & Steele, 2005, p. 72). Thompson et al. (2007, pp. 364-365) even state that putting together a staff with the right mix of experiences, skills and abilities to get things done should be one of the first strategy implementing steps, because knowledgeable and engaged employees are an essential part of successful strategy execution. The challenge seems to be twofold. First it is crucial to hire the best and brightest people and second it is necessary to retain them by developing them. Recruiting incorporates thorough screening and evaluating applicants, selecting those with the most suitable skill sets, energy, initiative, judgment, aptitudes for learning and adaptability to the company's strategy needs. Retaining - including developing - these employees comprises continuous training programs, challenging and skill-stretching assignments, job-rotation, incentives to challenge existing ways of doing things, idea-creating environments, as well as promotions, salary increases, bonuses or fringe benefits (Thompson, Strickland, & Gamble, 2007, pp. 366-367). These measures to retain employees could also be useful to boost their acceptance of the new strategy (see also the paragraph on acceptance).

Implementation Monitoring: Another key for a successful strategy implementation is to continuously monitor implementation performance (Mankins & Steele, 2005; Freedman, 2003). Sterling (2003, p. 33) states that effective implementation requires continual monitoring of progress in implementing the plan and of the financial returns generated by the strategy. That is why it is necessary to

develop a control system that is able to provide the necessary information (Raps, 2004, p. 53). Successful companies use real-time performance tracking to non-stop monitor their resource deployment as well as results against plan, in order to constantly be aware of implementation progress and necessary adaptations or corrections (Mankins & Steele, 2005, p. 71). Sterling (2003) also demands that such monitoring has to be accompanied by accountability and prompt change when change is needed, if the necessary quality and benefits are not being delivered.

There is a need to establish co-ordinated strategic and management control mechanisms (Allio, 2005, p. 19), which should incorporate both financial and non-financial performance indicators (Atkinson, 2006, p. 1447). Therefore both quantitative and qualitative measurements should be taken (Allio, 2005, p. 17). Al-Ghamdi (1998) also demands an effective control system over cost and quality involved in the process.

Thompson et al. (2007) also note the importance of gathering accurate and timely information about daily operations. Therefore they suggest adapting the information system in a way so that it delivers five kinds of data: customer data, operations data, employee data, supplier/partner/collaborative ally data and financial performance data. Employee data monitoring especially involves monitoring, if empowered employees are acting within the specified limits. Giving employees enough room for action is one important way to boost their acceptance of the new strategy, but empowerment loses its power, when there is no adequate control (Thompson et al., 2007, pp. 402-403).

Sterling (2003, p. 33) points out the Balanced Scorecard by Kaplan and Norton as the most important strategy performance measurement tool. Similar to

Sterling, Atkinson (2006) and Raps (2004) state that the Balanced Scorecard can provide a vital link between strategy and action, and therefore assist organizations to achieve effective strategic implementation (see also section 2.2.5).

Apart from this "internal" monitoring of implementation progress, observation of the "external" environment seems to be crucial. Sterling (2003) emphasizes two such external factors, which are the necessity to be ready for unanticipated market changes during the implementation as well as for effective competitor response to a company's new strategy. In order to be able to react to market changes, Sterling (2003) and Alexander (1985) propose to identify the market conditions that have the biggest impact on the strategy, to recognize what the company does not know in terms of possible changes, to prepare contingencies for different scenarios as well as to just being prepared to change a once developed strategy. To be able to foresee, what the competition's reactions to the new strategy might be, Sterling recommends building a solid competitive intelligence capability including the collection of knowledge on competitor's market positions, their relative competitive advantages and disadvantages, their historical behavior towards competitive strategy and the general position of their respective management teams.

Communication: The first step to understanding and acceptance of a newly designed strategy is effective communication to all people involved in the implementation, which basically comprises all managers and employees of an organization (Sterling, 2003; Al-Ghamdi, 1998). Freedman (2003) highlights the necessity to properly communicate to the stakeholders of the strategy implementation first, meaning those people who have a genuine interest in the new strategy or who are mostly affected by the new strategy. Sterling (2003, pp. 30-31) further emphasizes

that comprehensive communication of the strategic plans is especially important when reaching out beyond the group directly involved in the development (see also the paragraph on acceptance).

Communication is considered a major instrument to manage change (Raps, 2004, p. 51). Raps emphasizes the importance of communicating before, during and after the organizational change is to take place, to communicate to all levels. According to Raps it is therefore necessary to develop an integrated communications plan that has to address the following issues: Who are the participants and addressees of the communication process? What needs to be communicated? When will the communication need to be placed? What media is adequate for communicating? How and when are the communication results measured? What time and effort are required to ensure the above actions?

It is important to allocate resources to secure continuing and persistent communication in order to relate recent events, actions and business results back to strategy (Sterling 2003, p. 33). Sterling also highlights that it is extremely important to be candid and tell the staff, what is working and what is not working and what the company is doing to fix it.

Understanding of Strategy: According to Mankins and Steele (2005, p. 69) strategy is in most companies a highly abstract concept, which is something that cannot be easily communicated and translated into action. The more abstract the strategy is formulated the more difficult it gets for lower levels within the organization to put in place executable plans (Mankins & Steele, 2005, p. 69). Mankins and Steele (2005) as well as Allio (2005) therefore point out the importance of a strategy that is being kept simple and as concrete as possible. This means to

clearly highlight in simple words what the strategy is and what it is not (Mankins & Steele, 2005, p. 69). Allio (2005) promotes the idea to stick to not more than one page and use understandable language that contains action verbs in order to highlight the importance that implementing a new strategy is all about doing. Communication of the new strategy should be two-way, which gives affected employees the possibility to get answers to possible questions. Communication should also include the explanation, why changes are made and why there is a new strategy in the first place. Both facets foster proper understanding of the new strategy (Alexander, 1985, p. 96; Raps, 2004, p. 51).The explanation of the intended meaning has to be followed by the check, what employees think the strategy means in order to make sure that employee interpretation is in line with the intended meaning of the new strategy (Beaudan, 2001, p. 66).

These are basic requirements for the first crucial step of spreading a newly developed strategy within an organization, namely understanding amongst employees (Mankins & Steele, 2005, p. 69).

Acceptance of Strategy: Every strategic initiative needs the acceptance of a critical mass of employees in order to be successful (Dannenmaier & Dannenmaier, 2008). Acceptance means that people believe that the strategy is the best possible one for the business and that they are willing to make the strategy work, regardless of the effort needed for implementation (Beaudan, 2001, p. 66). Implementing strategic change requires the confidence and cooperation of the organization's managerial and operative people. In order to gain acceptance among employees it is necessary to actively manage the change. Change management is crucial to avoid or reduce potential barriers, which might lead to a lack of acceptance and consequently to a

breakdown of strategy implementation (Raps, 2004, p. 51; Dannenmaier & Dannenmaier, 2008).

After a thorough communication of the new strategy and after safeguarding the understanding of everyone involved, acceptance is key to consistent participation and execution (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008). Sterling (2003) and Alexander (1985) argue that the surest way to ensure someone understands and especially accepts a strategy is to involve him or her in the creation. Such an involvement creates the ownership needed for the implementation and motivates especially the important middle-managers to properly transport the strategy into their respective units. One way to secure the buy-in of those who are not part of the creation, but responsible for the implementation is to reward them according to their success (Mankins & Steele, 2005, p. 72). Thompson, et al. (2007, p. 404) even state that a properly designed reward structure is a very powerful tool for mobilizing organizational commitment to strategy execution, and such rewards have to be both monetary and nonmonetary. Financial incentives include base pay increases, performance bonuses, profit-sharing plans, stock awards or retirement plans (Thompson et al., 2007). Equally important seem nonmonetary rewards. Thompson et al. (2007, pp. 404-405) mention special recognition at company gatherings or in the newsletter, stimulating assignments, opportunities to transfer to attractive locations or rapid promotion. But the most important factor is to consequently tie such rewards to the employees' contribution to strategy execution and the achievement of their performance targets, because then employees will notice how serious the company is about the new strategy (Thompson et al., 2007, p. 408).

Other ways to boost acceptance, as promoted by Sterling (2003, pp. 33-34), are symbolic actions in the context of the new strategy like ceremonies, physical settings, effective use of language, stories that are told and retold, etc. These symbolic actions underscore how serious management and the organization as a whole is about the new strategy.

Leadership & Support: For successful strategy implementation a company needs to fill key managerial slots with "smart people who are clear thinkers, good at figuring out what needs to be done and skilled in making it happen and delivering good results" (Thompson et al., 2007, p. 364). Such capable management teams can successfully lead the organization through the change process to implement the new strategy and they are true believers in such change, which arises when it comes to their full support of the implementation efforts (Thompson et al., 2007; Raps, 2004). Leading the strategy execution process is considered a top-down responsibility which encompasses staying on top of what is happening, monitoring progress, clearing out issues, putting constructive pressure on the organization, displaying ethical integrity, leading social responsibility initiatives as well as pushing corrective actions to improve strategy execution (Thompson et al., 2007, p. 439).

Adjustment of Organizational Culture: Thompson et al. (2007, p. 415) define corporate culture as "the character of a company's work climate and personality – as shaped by its core values, beliefs, business principles and policies, traditions, ingrained behaviors, work practices, and styles of operating." Culture determines the extent of cooperation, dedication and strategic thinking in an organization (Raps, 2004, p. 50). It is considered one of the success factors for strategy implementations

because it influences the organization's actions, approaches to conducting business and the way of executing strategies (Thompson et al., 2007, p. 415).

It is the task of top management to foster a corporate culture that paves the way for the effective implementation of new strategies (Thompson et al., 2007, p. 416; Raps, 2004, p. 50). A company's culture can promote strategy execution, when its values are strategy-supportive and its practices and behavioral norms add to the company's strategy execution efforts (Thompson et al., 2007, p. 426). A company's culture should encourage strategic thinking and dialogue, which helps to develop a strategically more aware workforce which is also more open to necessary strategic changes (Beaudan, 2007, p. 68). Therefore senior management has to evaluate if there is the necessary fit between culture and strategy, and has to take action if this is not the case (Thompson et al., 2007, pp. 427-428). If strategy and culture are not in line, management, according to Thompson et al. (2007, p. 429) has to take the following action steps: identify facets of organizational culture, that are conducive to strategy execution and those who are not; specify what new actions, behaviors and practices are needed in a new culture; talk openly about the necessary changes; follow with visible and forceful actions to ingrain the new culture.

Figure 2.2 summarizes key aspects of the above described success factors of each category:

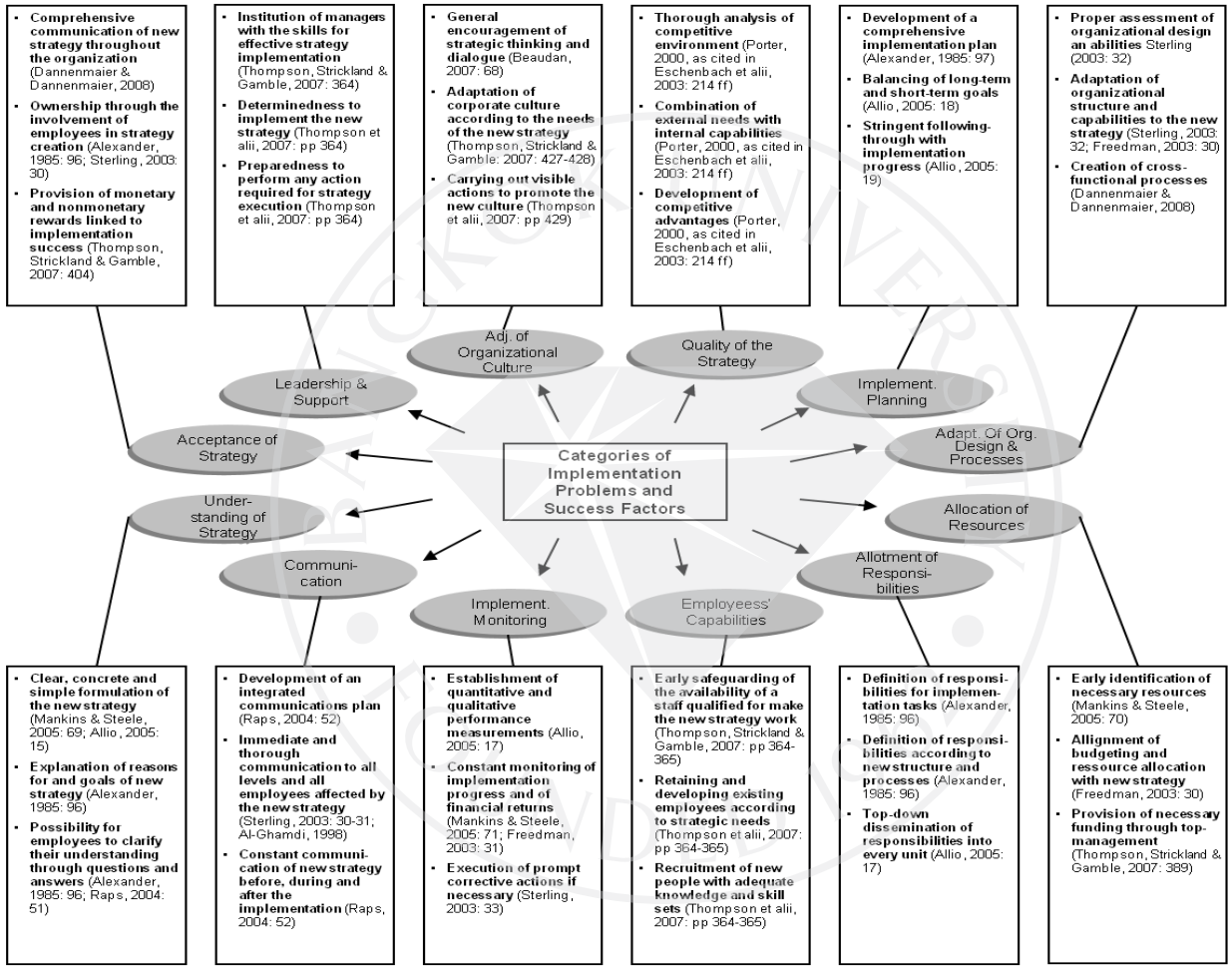


Figure 2.2: Categories of Implementation Problems and Corresponding Success Factors

The following section will cover concepts for a comprehensive strategy implementation as well as tools to monitor implementation progress and success. The description of every concept or tool will be followed by a reference as to which implementation categories (see figure 2.2, p. 44) are represented in each of them. The implementation category is not always explicitly named but has to be derived from the described contents. This shall help linking the concepts and tools to implementation problems and success factors, respectively.

### 2.2.5 Concepts and Tools

Apart from publications on problem areas and success factors for strategy implementation (see sections 2.2.3, pp. 15-29 and 2.2.4, pp. 29-45), different authors have developed systemic approaches to strategy implementation and tools to monitor it respectively. Among these authors are Kolks, Huber, Pearce and Robinson, Noble, Raps, Hronec, McNair, Lynch and Cross, Adams and Roberts or Kaplan and Norton. The following section will describe the concepts and tools developed by these authors. This will help to answer the first part of research sub-question five (SQ5): What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB?

The following paragraph will describe the “Action Model” developed by Kolks (1990, pp. 109-113, pp, 258-261, if not indicated otherwise). In his model he describes all necessary actions for an implementation and brings them in a logical, sequential order (Raps, 2004, p. 53). The first part of the implementation is called implementation planning and encompasses an analysis of the formulated strategy and the internal implementation environment, from the company point of view. On this basis implementation goals have to be formulated. Implementation goals are

differentiated into system goals and action goals. System goals have to answer the question, what has to be achieved by the implementation. Action goals comprise the framework for the execution itself, like cost, deadlines or administrative guidelines. During planning it has to be considered that in the first stage of the implementation emphasis has to lie on the achievement of acceptance towards the new strategy. Acceptance at first comprises knowledge of the new strategy, then understanding, followed by obtaining the necessary capability and the necessary determination amongst employees. Once acceptance has been achieved more attention has to be directed towards the virtual actions to implement the new strategy. The second part after implementation planning is the realization of the implementation. It is divided into a communication phase, followed by a transformation phase, where project teams are selected and the strategy is being operationalized throughout all parts of the organization. The third phase of the transformation is the real life application of the new strategy accompanied by training and instruction. The third part of Kolks' "Action Model" is implementation control, where the as-is status of the implementation is compared to should-be goals and necessary corrective actions are taken. Kolks, in his "Action Model", considers implementation aspects related to "Planning and Execution", "Resources", "Responsibilities", "Acceptance", "Communication", "Capabilities" and "Monitoring".

The second comprehensive concept on strategy implementation introduced in this study is the "Implementation Process" by Huber (1985). Huber builds his concept on two components namely adaptation to and execution of the new strategy. The necessary adaptation for the implementation comprises organizational culture, organizational structure, employees' capabilities as well as leadership systems,

including leadership guidelines and tools. The adaptation of these areas represents the qualitative part of the implementation. For a proper execution five steps have to be gone through. The first is to create the preconditions for an effective and efficient implementation through proper implementation planning. The second one is the transformation of the new strategy into concrete actions supported by the allocation of sufficient resources. The third one is the virtual realization of the planned measures. During the fourth step continuous monitoring of the implementation progress as well as possible changes of external conditions is performed. The final step includes the necessary changes and adaptations to the strategy itself as well as the implementation process. According to Huber the qualitative part of the "Implementation Process" is the crucial part for a successful implementation, because only after a complete adaptation of the organization the execution of the implementation can be successful. The adaptation is considered a precondition for the operationalization of the new strategy. In his "Implementation Process" Huber touches implementation issues related to "Culture", "Organizational Design and Processes", "Capabilities", "Leadership and Support", "Resources", Planning and Execution", "Monitoring" as well as adaptation of "Strategy".

Pearce and Robinson (1988, pp. 323-356, pp. 357-403) promote an implementation concept based on three interdependent steps. The first step is the operationalization of the strategy, which includes the identification of measurable implementation targets, the deduction of strategies for each business unit as well as the development of precise guidelines for the middle management. Clear and measurable annual targets with concrete deliverables have to be broken down from the defined long-term strategy targets. Functional strategies help to disseminate the

overall business strategy into every business unit and facilitate the definition of action plans. Guidelines for the middle management shall promote the realization of the new strategy by defining standards for implementation measures and decision-making. The second implementation step is the transformation of the strategy into daily business, which makes it necessary to adapt structure, culture and leadership principles of the organization to the new strategy. The third step is constant monitoring of the implementation and is divided into two components. Strategic controlling shall make sure that implementation efforts stay on track towards the strategic goals. Operative controlling aims to secure compliance of action plans and resources with the implementation plan. Pearce and Robinson's implementation concept covers implementation aspects of "Planning and Execution", "Responsibilities", "Organizational Design and Processes", "Culture" and "Leadership and Support".

Noble (1999, pp. 19-23) developed a model containing four stages of implementation. In the pre-implementation stage a cross-functional team has to be put together, which members already had been included in the strategy formulation process. This secures a mutual understanding of the new strategy as well as the inclusion of all necessary divisions of the organization. Stage two – called organizing the effort – contains the organization of resources including the formation of the implementation teams, the detection and elimination of possible conflicts within the teams, the institution of capable team leaders as well as the development of an implementation plan. Stage three is the ongoing management of the implementation process. This especially comprises the handling of arising implementation difficulties as well as the maximization of added value to the company, which means safeguarding the value for the company as a whole and not for single departments or

units. The last stage is called the maximization of cross-functional performance, which particularly incorporates the use of managers' informal networks all across the company. Noble (1999, p. 23) states that this enhances resource allocation, decision-making and therefore the overall implementation process. Noble developed an implementation model which takes into account implementation elements of "Planning and Execution", "Acceptance", "Understanding", "Resources" and "Organizational Design and Processes".

Raps (2004, pp. 74-77) starts his strategy implementation concept with a description of a hierarchy of the strategy implementation goals. Above all stands the global goal of the successful execution of the strategy implementation, which has to be in line with company vision and goals. Thereafter he puts systemic goals, which clarify what specific deliverables have to be achieved by the implementation. Raps separates systemic goals into so called "goals for enforcement" and "goals for realization". Goals for enforcement encompass the achievement of acceptance amongst managers and employees, which can be realized through the stages knowledge, comprehension, capability and acceptance. All four stages have to be fulfilled to secure employees' support for the new strategy and the implementation effort. Goals for realization incorporate the development of a stepwise implementation plan for every department and unit after the formulation of partial strategies for each division within the organization, which have to be derived from the new overall strategy. The last goals in the hierarchy are goals for the effective and efficient implementation itself. Raps (2004) divides them into monetary goals, which make sure not to exceed costs, technical goals, which guarantee compliance with

deadlines, as well as social goals, which deal with the appropriate management style for the implementation.


Figure 2.3: Hierarchy of Goals after Raps (2004)

Source: Raps, A. (2004). *Erfolgsfaktoren der Strategieimplementierung* [Succes factors of strategy implementation]. Wiesbaden : Deutscher Universitätsverlag.

Based on this goal definition Raps (2004, pp. 77-80) has developed a strategy implementation concept that consist of elements that are independent of the management process and of such that are closely related to the management process. He defines the management process as the process that is essential to implement the new strategy. Elements of this implementation management process are planning,

directives and implementation control. Elements of the concept, which are independent of the implementation management process, are organization, culture, human resource management and controlling. “Independent” is defined as not directly connected to the implementation itself but crucial for creating the environment for a successful implementation. “Planning” comprises the concretion of the new strategy into medium-term measures, the deduction of operative goals and resource requirements for every department, the definition of annual budgets for each department as well as quarterly, monthly and weekly plans. “Directives” are understood as the definition, execution and enforcement of concrete actions. “Control” (Raps, 2004, pp. 80-96) on the one hand comprises operative control, thus securing the execution of the defined actions according to plan, on the other hand strategic control as the permanent check, if the developed strategy is still the right one and valid according to the external and internal environment. In Raps’ implementation concept the element “organization” (Raps, 2004, p. 121) has to yield the adequate structural environment for the particular strategy to implement. According to Raps (2004, p. 152) the organizational “culture” plays an important role, as it functions as an amplifier for the acceptance of the new strategy and the engagement during the implementation process. Therefore employees’ values and convictions have to be in line or brought in line with the culture that comes along with the new strategy. “Human resource management” (Raps, 2004, p. 186) has to make sure early and active employee participation during action planning, as well as the availability of the adequate (both quantitative and qualitative) human resources that are necessary for the implementation. The last element of Raps’ strategy implementation concept is “controlling”, which fulfills the central task of coordinating implementation activities

in terms of time and content. In his comprehensive implementation concept, Raps considers all of the twelve general implementation categories.

In the following paragraphs existing tools will be covered.

Speaking of tools and instruments for strategy implementation basically means speaking of performance measurement systems. Performance measurement systems help to monitor company performance by looking at different kinds of criteria, which differ depending on the tool applied (Raps, 2004, p. 226). Performance measurement systems are for example the Quantum-Performance-Concept (Hronec, 1993, 1996), the Performance Pyramid (McNair, Lynch & Cross, 1990) or the $EP^2M$-Approach (Adams & Roberts, 1993). The Balanced Scorecard is one of the most commonly used tools to track strategy implementation (Atkinson, 2006, p. 1448). It is assumed that more than 60% of the Fortune 1000 companies use the Balanced Scorecard to monitor strategy implementation progress and company performance (Atkinson, 2006, p. 1448). All four above mentioned tools will be described in the next paragraphs, with a focus on the Balanced Scorecard methodology.

The Quantum-Performance-Concept comprises a matrix with three performance measures, namely cost, quality and time, as well as three performance levels (or generators) of an organization which are the structural organization, processes and employees (Hronec, 1996, p. 12; Hronec, 1993, p. 24). The Quantum-Performance-Measurement-Matrix combines these six elements into nine fields, each of which related to a combination of one performance measure and one performance generator (Hronec, 1993, pp. 24-25). Especially two relationships are of special interest. The relation of cost and quality, which is crucial in terms of value added to the customer and the relation of quality and time, also called the service-relation

(Hronec 1996, pp. 21-22). Each combination of a performance measure and a performance generator has to be rated, to be put in context with the strategy that is intended to be implemented and to be adapted to the needs of the new strategy (Hronec 1996, pp. 21-22). Of the twelve general implementation categories, Hronec has incorporated the aspects of "Monitoring", "Resources", "Organizational Design and Processes" and "Capabilities" into his Quantum-Performance-Concept.

The Performance Pyramid helps to disseminate performance goals, drawn from a newly developed strategy, top down into every business unit, for every main business process and every department and work center of an organization (McNair, Lynch and Cross, 1990, pp. 28-29). The application of the pyramid shall also help to distribute strategic information as quickly as possible, to develop financial and non-financial key performance indicators, as well as to communicate performance figures throughout the company. The first implementation step includes the definition of both financial as well as market-oriented performance goals and a clear description of the necessary actions for every business unit. The second step yields performance measures for the main business processes, especially customer satisfaction, flexibility and productivity. The third step delivers performance measurements in the field of quality, availability of goods and services, cycle time and scrap for every department and work center. With the help of this top-down pyramid it becomes possible to develop a staged introduction of market requirements and financial goals into the whole organization (McNair et al., 1990, pp. 29-35). In terms of the twelve implementation categories the Performance Pyramid covers "Monitoring", "Planning and Execution", "Communication", "Organizational Design and Processes" as well as "Resources".

The EP$^2$M-Approach – Effective Progress and Performance Measurement – focuses on the development of a performance measurement system splitted into four areas in order to monitor the activities of a business. Effectivity and efficiency are two internal areas for which key performance measures have to be developed. Additional performance measures have to be installed for two external areas namely markets and customers. The designed measures are on the one hand intended to function as top-down measures to disseminate the new strategy into every part of the business, and on the other hand to promote bottom-up motivation for every employee by linking their specific function to overall business performance (Adams & Roberts, 1993, pp. 504-507). This approach especially incorporates the issues "Monitoring", "Organizational Design and Processes", "Communication" and "Acceptance" from the twelve implementation categories.

The Balanced Scorecard (BSC) focuses its view on four dimensions of a business, which are the financial perspective, the customer perspective, the internal process perspective and the innovation and learning perspective (Kaplan & Norton, 1997, p. 7). The consideration of these four dimensions shall help to close the gap between strategic and operative management (Raps, 2004, p. 231). The process to build the BSC is always based on vision and a (new) business strategy that sometimes happens to be specified or modified during the application of the BSC (Eschenbach et al., 2003, p. 156). 20 to 25 performance measures or indicators have to be developed in order to link the new strategy to the four dimensions mentioned above (Kaplan & Norton, 1997, p. 7).

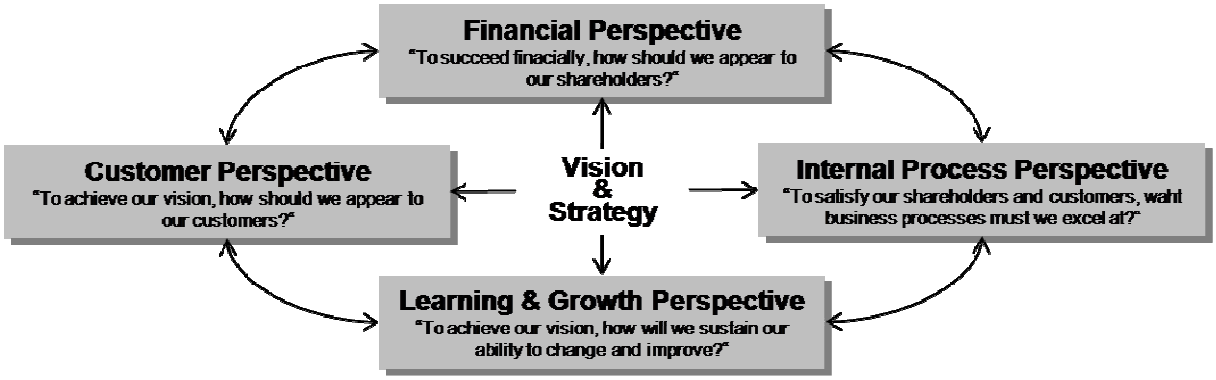


Figure 2.4: The 4 Perspectives of the BSC after Kaplan and Norton (1997)

Source: Kaplan, R. S. & Norton, D.P. (1997). *The balanced scorecard: Translating strategy into action*. Boston : Harvard Business School Press.

The financial perspective of the BSC gives an important insight into the rentability of a business (Raps, 2004, p. 233). The BSC closely relates strategic management to operative outcomes, because the long-term goal of every business is to deliver financial returns to investors and thus every new strategy will be judged, if it delivered such returns or not (Kaplan & Norton, 1997, p. 60). The quality of a strategy can ultimately only be assessed through its impact on the financial result (Eschenbach et al., 2003, p. 156). The BSC employs key measures like profitability, return on investment, residual income, economic value added, sales growth or cash flow to measure if the implementation of a new strategy has led to an improvement of the financial result of an organization. Performance measures of the other three perspectives of the BSC have to be connected to the chosen financial measures through traceable cause-and-effect-chains (Kaplan & Norton, 1997, p. 60). The

customer perspective is becoming more and more important as sellers' markets are increasingly replaced by buyers' markets, where businesses have to adapt to customer needs and expectations (Raps, 2004, p. 234). At first it is necessary to exactly define market- and customer-segments and to do market research to identify customer needs in terms of price, quality, functionality and service. Secondly performance measures like market position, market share, customer share, customer satisfaction, customer rentability or acquisition have to be introduced. The third step encompasses the implementation of a second set of performance indicators like product functionality, quality, price, image or reputation (Kaplan & Norton, 1997, pp. 63-66). The internal process perspective identifies those internal processes, which are key for the achievement of goals of the financial and customer perspective (Kaplan & Norton, 1997, p. 89). The main business processes are clustered into innovation processes, operational processes and service processes. Key performance measures are product development, research, process times, process quality or process costs (Kaplan & Norton, 1997, pp. 93-96). The learning and growth perspective measures the ability of an organization to develop its internal skills and capabilities and is intended to create the preconditions for the other three perspectives. Possible performance measures are employee satisfaction, continuing employee education, quality of information systems or empowerment (Kaplan & Norton, 1997, pp. 121-122). According to Raps (2004, pp. 236-237) the BSC is an appropriate management system to create consistent goals for strategy implementation, to communicate the new strategy as well as to integrate strategic initiatives into long-term budgeting and business-planning. The BSC touches the implementation aspects "Monitoring", "Planning and Execution", "Resources", "Organizational Design and Processes", "Capabilities" and "Communication".

The following section will conclude the strategy implementation part of the literature review chapter by jointly considering the learnings from the sections problem areas/success factors and concepts/tools.

### 2.2.6 Strategy Implementation – Conclusion

From the above paragraphs on problem areas and success factors for strategy implementation it could be concluded that existing implementation problems as well as stated success factors might be allocated to twelve general categories, which are "Strategy", "Planning and Execution", "Organizational Design and Processes", "Resources", "Responsibilities", "Capabilities", "Monitoring", "Communication", "Understanding", "Acceptance", "Leadership and Support" as well as "Culture". Two specific studies from Alexander (1985) and Al-Ghamdi (1998) have shown that the ten most mentioned implementation problems fall into the categories "Planning and Execution", "Resources", "Capabilities", "Monitoring" and "Leadership and Support", which might be a first clue where to lay closer attention in order to improve strategy implementations.

The paragraphs on concepts and tools for strategy implementation describe approaches of different authors for a better strategy implementation. Even though not every author is explicitly covering all of the twelve implementation categories, it could be said that all twelve implementation aspects are incorporated into one or more of the concepts and tools. This might lead to the conclusion that all important aspects of strategy implementation are part of already existing concepts and tools, which could be used by organizations to improve their strategy implementation capabilities. Through the empirical part of this study it will have to be found out, if such existing tools and concepts are already being applied, in order to answer the second part of the

fifth research sub-question (SQ5): What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB?

The next section will describe Six Sigma methodologies and their possible application to strategy implementation.

## 2.3 Six Sigma Methodologies and Strategy Implementation

### 2.3.1 Introduction

Before Six Sigma and its application in strategy implementation are being closely examined, a general introduction of Six Sigma and its methodologies will be given, including its history, its basic concept and possible application fields in strategy implementation.

The Six Sigma methodology was first developed and successfully applied in the mid-1980s by Motorola (Bertels, 2003, p. 2). Through a former CEO of AlliedSignals, a company later known as Honeywell, Six Sigma was brought to General Electric (GE) where it had a strong positive impact on GE' s operating figures and especially its profits from the very beginning of its application. Through GE's continuing success other companies, like ABB, Black & Decker, Bombardier, Dupont, Dow Chemical, FedEx, Kodak, Sony or Toshiba, were becoming more and more interested and decided to incorporate the methodology into their businesses (Pande, Neumann, & Cavanagh, 2000, pp. 8-9).

Pande et al. (2000, p. xi) define Six Sigma as a "comprehensive and flexible system for achieving, sustaining and maximizing business success, which is uniquely driven by close understanding of customer needs, disciplined use of facts, data, and statistical analysis, and diligent attention to managing, improving, and reinventing

business processes". Robert Dannenmaier (2008) describes Six Sigma as a process management and improvement methodology, which is consequently based on customer needs, data and facts, statistical analysis as well as constant monitoring of the implemented process improvements. The final vision of Six Sigma is to completely satisfy customer needs profitably (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008).

The term Six Sigma itself refers to a statistically derived process performance target of operating with only 3.4 defects per one million opportunities or process runs. From the methodology point of view this is supposed to be the general performance goal for every process, but only few processes can claim to have achieved it (Pande et al., 2000, p. x). At the same time there are processes for which the above performance goal would by far not be good enough, like processes in the airline industry. That is why some processes are even aiming for a level of seven or eight sigma (Dannenmaier & Dannenmaier, personal interview February 29, August 18, 2008).

Six Sigma is thus defined as a process management and improvement methodology. But what could be possible applications of Six Sigma in strategy implementation? After Dannenmaier & Dannenmaier (2008) two specific applications seem to be possible.

On the one hand strategy implementation itself is considered a process, where process management and improvement tools from the Six Sigma methodology could be applied to support the realization of the success factors for a sound strategy implementation. On the other hand Six Sigma is also considered a process management philosophy or concept, therefore a means to manage an organization by managing its processes. Everything that an organization does can be expressed as a

process and its process steps and Six Sigma can be the tool to manage the organizational process landscape. The notion is that an organization, who is managing its processes by using Six Sigma and who is therefore especially aware of constant process monitoring, improvements and changes is able to effectively and efficiently implement newly designed strategies into its operations (Dannenmaier & Dannenmaier, personal interview February 29, August 19, 2008).

Six Sigma therefore might offer two possibilities for enhanced strategy implementation. The first one is to improve the strategy implementation process itself by applying Six Sigma methodologies. The second one is to use Six Sigma as a permanent process management approach, which prepares the way for the necessary adaptations due to new strategies.

Before these two potential applications are examined, an overview of the Six Sigma methodologies DMAIC and CAP / TOP will now be given.

2.3.2 Overview of the Six Sigma Methodologies DMAIC and CAP / TOP

Originally Six Sigma solely contained the process management and improvement technique DMAIC (Define-Measure-Analyze-Improve-Control). When GE dedicated itself to Six Sigma and DMAIC, it did not take GE long to realize that it was also necessary to develop a suitable change management methodology to support the changes that the application of DMAIC brought, which was called CAP (Change Acceleration Process). Over the last ten to fifteen years it therefore has become standard to add CAP to the education syllabus of upcoming full-time Six Sigma experts, so called Black Belts or Master Black Belts. That is the reason why Six Sigma becomes more and more synonymous for both the DMAIC and the CAP

methodology (Dannenmaier & Dannenmaier, personal interview February 29, August 19, 2008).

CAP is sometimes also called TOP (Transformation Optimizing Process). CAP and TOP are two different denominations for the same methodology. The reason for the different labeling stems from the fact that the whole methodology was firstly developed and named CAP by GE, for which it of course holds the copyright (Dannenmaier & Dannenmaier, 2008). Although IBB Management Consulting is licensed to apply and train the CAP methodology, it is not allowed to use it under the term CAP. Therefore IBB developed the acronym TOP (Dannenmaier & Dannenmaier, personal interview February 29, August 19, 2008). The term TOP will be used from here on throughout the study to denote the Six Sigma change management approach.

DMAIC and TOP will be described in the next two sections.

#### 2.3.2.1 DMAIC

DMAIC is a methodology that consists of five phases of process improvement (Pande et al., 2002, pp. 14-15). These phases are called “Define”, “Measure”, “Analyze”, “Improve” and “Control” and have to be applied to the improvement project in this specific order (Pande et al., 2002, p. 15; Birkmayer, Dannenmaier, Matlasek, Pirker-Krassnig, & Weibert, 2008, p. 6). Every phase can be divided into three steps. The phases are separated by so called toll gates, where project progress has to be reported to a steering committee after each phase (Birkmayer et al., 2008, p. 6). The following figure gives an overview of the five phases and fifteen steps:

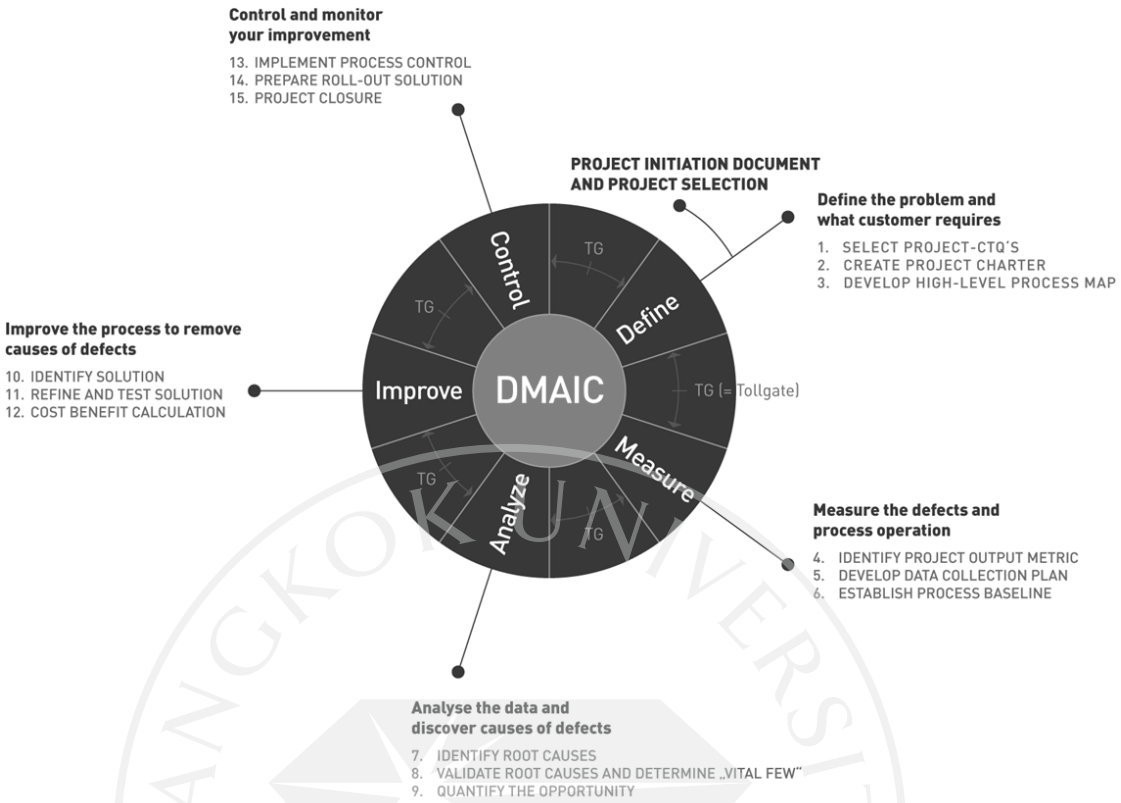


Figure 2.5: The DMAIC-cycle after Birkmayer, Dannenmaier, Matlasek, Pirker-Krassnig, & Weibert. (2008)

Source: Birkmayer, S., Dannenmaier, R., Matlasek, S., Pirker-Krassnig, T. & Weibert, W. (2008). *Lean six sigma toolkit*. Vienna: Institute for Six Sigma.

In the Define-Phase the problem and customer requirements are being defined (Pande et al., 2002, p. 14). It can be divided into three steps which are “Select the customer requirements that are critical to the process quality (CTQs)”, “Create the project charter or contract”, and “Develop the high-level process-map” (Birkmayer et al., 2008, p. 6).

The Measure-Phase aims to measure the defects (not fulfilled customer requirements) the process is producing and the process capability (Pande et al., 2002, p. 14). The three steps of this phase are “Identify the project output metrics, which are the key performance indicators of the process within the project”, “Develop the data collection plan”, and “Establish the process baseline, which indicates the current process performance level” (Birkmayer et al., 2008, p. 6).

In the Analyze-Phase the collected data is being analyzed and root causes for the process problems are being identified (Pande et al., 2002, p. 14). The first step of this phase is “Identify root causes”, the second is “Validate root causes and determine the vital few, which are the few with a real impact on the process problems”, and the third step is “Quantify the opportunity of a possible positive project impact” (Birkmayer et al., 2008, p. 6).

In the Improve-Phase the process is being improved and causes of defects are being removed (Pande et al., 2002, p. 14). The three steps of this phase are “Identify the solution”, “Refine and test the solution”, and “Calculate the costs and benefits of the project” (Birkmayer et al., 2008, p. 6).

The last phase is called Control and aims to monitor and control the new process so that defects do not recur (Pande et al., 2002, p. 14). Step one of this phase is “Implement process control”, step two “Prepare and roll out the solution”, and step three “Close the project” (Birkmayer et al., 2008, p. 6).

In order to be able to evaluate the applicability of DMAIC methodologies to strategy implementation in section 2.3.3, the following table will briefly describe the tools and concepts of each phase:

Table 2.3: DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Define | VOC (Voice of Customer) | To define who is the customer and what does he want from the process (Pande et al., 2002, pp. 82-83) |
| | VOC-Translation Matrix | To translate customer comments into measurable process requirements (Pande et al., 2002, pp. 87-89) |
| | Kano-Analysis | To prioritize customer process requirements into dissatisfiers, satisfiers and delighters (Pande et al., 2002, pp. 89-91) |
| | Project Charter | To integrate project name, business case, problem statement, goal statement, project scope, project leader, project team and milestones into one clearly arranged page (Pande et al., 2002, pp. 74-83) |
| | SIPOC (Supplier, Input, Process, Output, Customer) | To pin down the process under observation, by defining its 5-7 main process steps, each with its supplier, input, output and customer (Pande et al., 2002, pp. 113-117) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Measure | QFD - Quality Function Deployment | To define and prioritize metrics to measure customer process requirements (Pande et al., 2002, pp. 120-121) |
| | CTQ (Critical to Quality) – Tree | To define metric, target value, specification limits and defect definition for every chosen customer process requirement (Birkmayer et al., 2008, p. 12) |
| | Data Collection Plan | To plan the data collection by defining what data to collect and how to segment this data, by determining the operational definition and check sheets for the measurement, by identifying the sample and by analyzing the correctness of the measurement system (Birkmayer et al., 2008, p. 36) |
| | Segmentation Factors | To determine which data to collect and to split the data to be collected into smaller groups or categories (Birkmayer et al., 2008, pp. 37-39) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Measure | Operational Definition | To develop a clear, understandable description of what is to be observed and measured so that different people interpret the data and instructions consistently (Birkmayer et al., 2008, p. 37) |
| | Data Collection Sheets | To design clear, concise forms in order to reduce the risk of errors during the actual data collection (Birkmayer et al., 2008, p. 37, pp. 40-41) |
| | Sampling Strategy | To gather a subset of the total data available, because it is often too difficult and expensive to measure the whole population and to obtain a representative sample (Pande et al., 2002, pp. 142-144) |
| | MSA – Measurement System Analysis | To reduce variation of the measurement system in order to obtain reliable process data (Birkmayer et al., 2008, pp. 46-53) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Measure | DPMO – Defects per Million Opportunities | To calculate the probability of defects per one million process runs in order to be able to calculate the process performance through the Process Sigma Value (Pande et al., 2002, pp. 177-179) |
| | Process Sigma | To obtain a Sigma value that indicates the actual process performance or capability (Pande et al., 2002, pp. 177-179) |
| Analyze | Data Visualization | To increase understanding of the data by displaying the data in e.g. Pareto- or run-charts, histograms, box- or frequency-plots (Pande et al., 2002, pp. 236-249) |
| | Segmentation & Stratification | To compare differences between groups or categories of data in order to find clues for root causes for process problems (Birkmayer et al., 2008, pp. 84-85) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Analyze | Process Mapping | To increase understanding for problems in the process-flow by mapping the sub-processes in flow charts, alternate path maps or cross-functional deployment charts (Pande et al., 2002, pp. 261-264) |
| | Process Analysis – Nature of Work | To find out about value-added, non-value-added and value enabling process steps (Birkmayer et al., 2008, p. 88) |
| | Process Analysis – Flow of Work | To analyze the process in terms of time-related process problems (Birkmayer et al., 2008, p. 88) |
| | Value-Time-Matrix | To link the value analysis with the time analysis of the process and to identify process steps that add cost and time without adding value for the customer (Pande et al., 2002, pp. 265-266) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Analyze | Cause-and-Effect Analysis | To identify the cause of a problem by applying the experience and expertise of a group in a structured brainstorming (Pande et al., 2002, pp. 250-251) |
| | The Five Whys | To drill deeper into the process in order to as close as possible to root-causes of a problem (Birkmayer et al., 2008, p. 94) |
| | Control/Impact Matrix | To identify which of the segmentation factors have an impact on the process (problem) and which of them are in control of the project team (Birkmayer et al., 2008, pp. 96-97) |
| | Correlation/Regression Analysis | To test if segmentation factors have a statistically significant impact on a customer process requirement (Pande et al., 2002, pp. 274-276) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Analyze | Hypothesis Testing | To test if differences in data groups or segments are statistically significant (Pande et al., 2002, pp. 270-274) |
| | Quantify the Opportunity | To estimates the potential benefit of the project in order to provide the financial rationale for continuing the project (Birkmayer et al., 2008, pp. 104-105) |
| Improve | Idea Generation | To identify possible solutions by applying creativity techniques like brainstorming, brainwriting, anti-solution or analogy (Birkmayer et al., 2008, pp. 138-139) |
| | Brainstorming/Brainwriting | To find possible solutions to the process problem through the collection and clustering of ideas (Birkmayer et al., 2008, p. 138) |
| | Anti-solution | To find possible solutions to the process problem by brainstorming the opposite of the objective (Birkmayer et al., 2008, p. 139) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Improve | Analogy | To find possible solutions to the process problem by brainstorming around a related or analogous issue and translating the ideas to the real situation (Birkmayer et al., 2008, p. 138) |
| | NGT - Nominal Group Technique | To screen and prioritize solutions by a weighted ranking method that allows a group to generate and prioritize a large number of issues within a structure that gives everyone an equal voice (Birkmayer et al., 2008, pp. 140-141). |
| | Criteria Based Matrix | To choose the most appropriate solution through the definition of key success criteria, weighing the importance of each criterion and evaluation of the solutions against every criterion (Pande et al., 2002, pp. 315-317) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Improve | Impact/Effort Matrix | To make an informed decision about which solution to implement by determining for each potential solution how strong the impact will be and how much effort will be needed (Pande et al., 2002, pp. 314-315) |
| | DOE – Design of Experiments | To explore the cause and effect relationship between numerous process variables and the customer process requirements and to find out about the most suitable combination of the variables for the desired solution (Birkmayer et al., 2008, pp. 142-144) |
| | Error Proofing | To optimize the should-be process/solution in a way that the occurrence of errors becomes less likely or impossible (Birkmayer et al., 2008, p. 147) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Improve | FMEA – Failure Modes and Effects Analysis | To anticipate problems in the should-be process/solution to be able to take actions to counteract them and to reduce or eliminate risks (Pande et al., 2002, pp. 326-328) |
| | Pilot | To test a proposed solution on a small scale in order to better understand its effects and to learn about how to make a full scale implementation more effective (Pande et al., 2002, pp. 319-322) |
| | Cost/Benefit Analysis | To quantify the benefits and cost of pursuing the chosen solution and to determine if the project has clear financial payback (Birkmayer et al., 2008, pp. 152-154) |
| Control | Process Management Chart | To include the should-be process map, the planned monitoring activities and the response plan in one chart in order to maintain a smoothly operating process (Pande et al., 2002, pp. 362-363) |

(Continued)

Table 2.3 (Continued): DMAIC Concepts and Tools

| Phase | Tool / Concept | Use |
|---|---|---|
| Control | Should-be Process Map | To visualize the process steps of the new process and who is performing them when (Pande et al., 2002, p. 362) |
| | Monitoring Plan | To determine what kind of data has to be collected at which point in the process, how, how frequently, when and how the data will be recorded (Birkmayer et al., 2008, p. 227) |
| | Control Chart | To monitor if a process is operating within statistical control, by checking if the process is running within the control limits or shows abnormal patterns (Pande et al., 2002, pp. 346-349) |
| | Response Plan | To specify who has to take what measures, when the process or parts of the process are out of control (Pande et al., 2002, pp, 362-363) |
| | Process Dashboard | To monitor the most important indicators of quality, cost and effectiveness associated with the new process (Pande et al., 2002, p. 364) |

The following section contains a description of the TOP methodology.

#### 2.3.2.2 TOP

TOP is a change management methodology that helps to support the implementation of the technical solution, generated by a DMAIC project, through the development of a cultural and organizational implementation strategy. It follows the idea that it is necessary to create acceptance for the solution among the members of the organization (Dannenmaier, 2007, p. 12).

The TOP model consists of six elements or key actions, which have to be taken care of during the implementation process. These six elements are “Leading the change”, “Creating a shared need”, “Shaping a common vision”, “Mobilizing stakeholders”, “Reflecting for sustainability” and “Adapting systems and structures” (Dannenmaier, 2007, pp. 13-16). Dannenmaier summarizes these six elements in his temple of change:

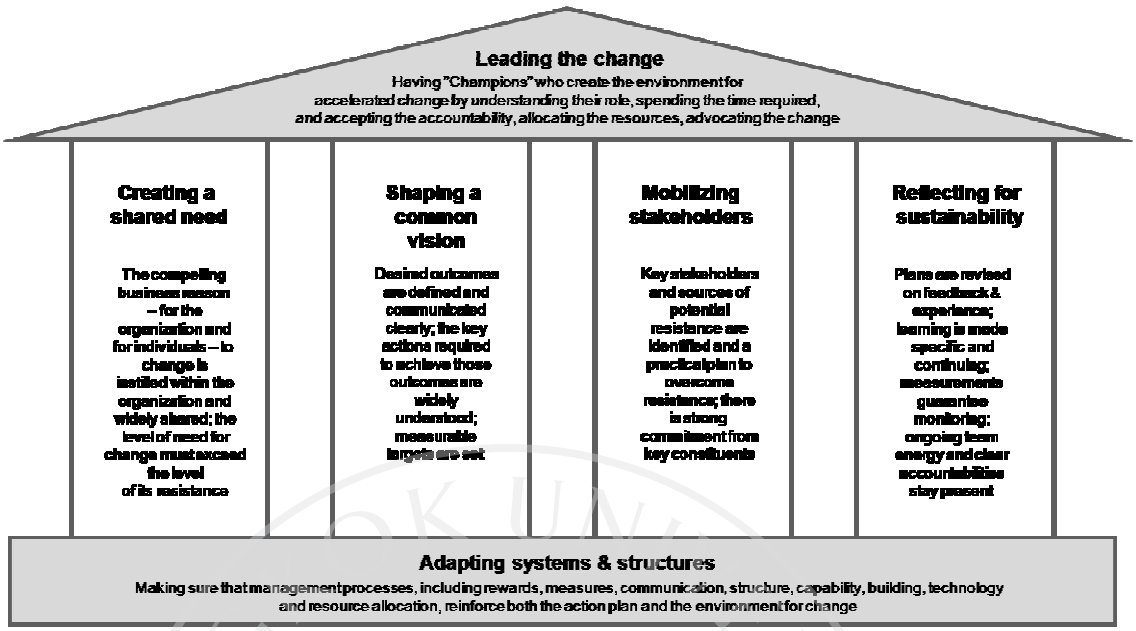


Figure 2.6: The Temple of Change after Dannenmaier (2007)

Source: Dannenmaier, R. (2007). *TOP-transformation optimizing process* (Version 4). Vienna: Institute of Six Sigma.

Before the temple of change is being "entered" an introductory stage makes sure that the project starts fast and effectively, that objectives are clearly defined and that expectations are communicated and discussed within the team (Dannenmaier, 2007, p. 23).

"Leading the change" comprises the engagement of leaders who provide resources, remove obstacles, and take accountability for success by answering the question how leaders can frequently demonstrate their commitment to the initiative (Dannenmaier, 2007, p. 13).

"Creating a shared need" involves the establishment of a compelling case for change and tries to answer the question, what is the rationale for why the initiative is important and why now (Dannenmaier, 2007, p. 13).

"Shaping a common vision" deals with the setting and communication of a clear vision, key actions and performance metrics, and aims to answer the question what are the critical messages and key mediums for communicating the initiative's purpose and progress (Dannenmaier, 2007, p. 13).

"Mobilizing stakeholders" consist of involving and informing all relevant stakeholders to obtain ownership and support, and answers the question what must be done to minimize resistance and build commitment to the initiative amongst key persons (Dannenmaier, 2007, p. 13).

"Reflecting for sustainability" comprises the application of lessons learned and the establishment of ongoing accountability and motivation for change, while answering the question what adjustments must be made to ensure that the vision is achieved and sustainability is guaranteed (Dannenmaier, 2007, p. 13).

"Adapting systems and structures" involves the realignment of all aspects of the organization to sustain the change, through finding answers to the question what structures, processes, practices, and rewards must be altered in order to ensure the change is accepted and lasts (Dannenmaier, 2007, p. 13).

In order to be able to evaluate the applicability of the TOP methodologies to strategy implementation, the following table will briefly describe the concepts and tools of each TOP element:

Table 2.4: TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Intro | In/Out of Frame | To visualize, if topics are within or outside the project frame (GE Capital Services, 1998, p. 8.6) |
| | 15-Word Flipchart | To develop a 15-word statement project definition in order to clarify the project content (GE Capital Services, 1998, p. 8.7) |
| | TOP Profile | To help the team to assess current habits and approaches relative to how well the organization focuses on each of the six TOP elements (GE Capital Services, 1998, p. 7.6) |
| | GRPI (Goals, Roles, Processes, Interpersonal Relationships) | To assess and plan important aspects of teamwork in the early stage of the change project (Dannenmaier, 2007, p. 24) |
| Leading the Change | Calendar Test | To stimulate awareness for time spent on change issues/management (GE Capital Services, 1998, p. 15.5) |

(Continued)

Table 2.4 (Continued): TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Leading the Change | TOP Personal Audit | To self-assess one's current capacity to exhibit specific competencies in each of the six TOP elements (GE Capital Services, 1998, pp. 15.6-15.9) |
| Creating a Shared Need | Threat/ Opportunity Matrix | To frame the need for change as a combination of threats and opportunities over the short- and long-term (GE Capital Services, 1998, p. 9.6) |
| | Three D's Matrix | To build a strategy for communicating the need for change through demand, data and demonstration (GE Capital Services, 1998, p. 9.7) |
| | Business Need / Vulnerability Assessment | To create a "case for change" by answering the questions what impact it had, if the organization would/would not change in terms of its culture, strategy and goals (Dannenmaier, 2007, pp. 59-63) |
| | Need Alignment Test | To get a team consensus on the need for change (GE Capital Services, 1998, p. 9.11) |

(Continued)

Table 2.4 (Continued): TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Shaping a Common Vision | Backwards Imaging | To create a picture of the future state that is expressed in behavioral terms to be able to uncover both support and resistance to this state (GE Capital Services, 1998, p. 12.5) |
| | More of / Less of | To spell out the vision of the future state in behavioral terms by listing what is expected to see more of and less of in order to reach the future state (GE Capital Services, 1998, p. 12.6) |
| | Bull's Eye Chart | To state a vision in actionable terms by formulating the necessary mindset and behavior to reach the vision (GE Capital Services, 1998, p. 12.6) |
| | Elevator Speech | To be able to clearly and simply state the need for change and describe the future state in 90 seconds for rallying the support and commitment of key constituents (GE Capital Services, 1998, p. 12.8) |

(Continued)

Table 2.4 (Continued): TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Mobilizing Stakeholders | Key Constituents Map | To identify and label key constituent groups who will be impacted by the change initiative to be able to estimate their relative interest/involvement in the change effort (GE Capital Services, 1998, p. 10.4) |
| | Attitude Charting | To develops a graphic representation of the attitudes toward the change initiative (GE Capital Services, 1998, p. 10.4) |
| | Stakeholder Analysis | To develop a detailed sense of who the key stakeholders are, how they currently feel about the change initiative and the level of support they need to exhibit for the change initiative to have a good chance for success (GE Capital Services, 1998, p. 10.6) |
| | TPC-Analysis (Technical, Political, Cultural) | To identify, label and understand sources of resistance as either technical, political or cultural (GE Capital Services, 1998, p. 10.7) |

(Continued)

Table 2.4 (Continued): TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Mobilizing Stakeholders | Influencing Strategy | To build an effective strategy for influencing the stakeholders to strengthen, or at a minimum, maintain their level of support (GE Capital Services, 1998, p. 10.8) |
| Reflecting for Sustainability | Force Field Analysis | To identify the processes, systems, and people that will support or impede the team's efforts in successfully implementing their improvements (Dannenmaier, 2007, pp. 90-93) |
| | 30, 60, 90 Day Review | To review the change initiative on a periodical basis through questioning the change strategy, the change management, the lessons learned and the action planning (Dannenmaier, 2007, p. 94) |
| | Measurement Audit | To assess current metrics and to identify improvement opportunities underlying the needs of the current change initiative (Dannenmaier, 2007, pp. 95-100) |

(Continued)

Table 2.4 (Continued): TOP Concepts and Tools

| Element | Tool / Concept | Use |
|---|---|---|
| Reflecting for Sustainability | Energy Wheel | To review the energy level the team/organization displays regarding key change aspects of the initiative (GE Capital Services, 1998, pp. 14.4-14.5) |
| | RASIC (Responsible, Approve, Supports, Informed, Consulted) | To analyze, design or re-design responsibilities and authorities for specific tasks, decisions or process steps during the initiative (Dannenmaier, 2007, pp. 105-110) |
| | Communication Strategy / Plan | To identify the audience for and the content of the messages that needs to be communicated, to determine the objective of the communication, to consider the best channel for communicating and to plan the necessary actions (Dannenmaier, 2007, pp. 118-126) |

(Continued)

Table 2.4 (Continued): TOP concepts and tools

| Element | Tool / Concept | Use |
|---|---|---|
| Adapting Systems and Structures | Project Impact on Systems & Structures | To determine the impact the initiative has on staffing, development, measures, rewards, communications and structure to be able to identify key systems and structures that must be addressed to assure long-lasting project success (GE Capital Services, 1998, pp. 13.4-13.6) |
| | Control / Influence Cycle | To clarify on which aspects of the systems and structure analysis the team has control, influence or no control, and to define an action strategy for those aspects the team has "only" influence or no control over (GE Capital Services, 1998, p. 13.7) |

In section 2.3.3 the application of DMAIC and TOP for strategy implementation will be examined.

### 2.3.3 Applying Six Sigma Methodologies to the Strategy Implementation Process

This section seeks to find an answer to the first part of research sub-question six (SQ6) - Can Six Sigma Principles be applied in the strategy implementation process? – by scanning existing and accessible literature.

Up to the time of the research for this study literature regarding the application of Six Sigma methodologies and tools to the process of strategy implementation seems to be very scarce if not just non-existing. The research has especially been geared towards the utilization of specific tools to this process. But within the accessible sources no indication for such an application could have been found, apart from one exemption, which is the concept of the "Six Sigma Business Scorecard" by Gupta (2007).

Gupta has developed the Six Sigma Business Scorecard (SSBS) to firstly identify measurements that relate process measures to a company's profitability and to secondly accelerate the improvement in business performance (Gupta, 2007, p. 120). Its overall goal is to support business strategy execution by delivering measurements that reflect the actual performance of a company at any time. Such figures can then be compared to the stated strategy, which helps to identify possible gaps and to establish necessary actions in order keep the company on strategy track. Hence the SSBS can be defined as a strategy implementation monitoring system (Gupta, 2007, pp. 163-164).

But what Six Sigma methodology is applied in the SSBS (apart from the name)? The SSBS uses the DPMO-method and the Sigma Level-concept in order to calculate a corporate Sigma value, which reflects possible opportunities that exist for improving profitability and growth (Gupta, 2007, pp. 90-93).

The SSBS tries to fill the gap between profitability measurements like sales or profit, as reflected for example in the Balanced Scorecard, and measurements of operational effectiveness like defect rate or throughput time, as reflected in Six Sigma measurements at the process level. The notion is to create performance indicators starting with strategic goals and objectives that can be linked to operative processes (Gupta, 2007, pp. 48, 55-58). Through this link process capability can be aggregated to overall performance and strategy execution and give a prompt snapshot of the business' status. The SSBS necessarily combines strategic and execution aspects of the business (Gupta, 2007, p. 58, 61).

The SSBS consists of seven elements which are "Leadership and Profitability", "Management and Improvement", "Employees and Innovation", "Purchasing and Supplier Management", "Operational Execution", "Sales and Distribution" and "Service and Growth" (Gupta, 2007, pp. 72-74). The measurements have to be developed individually in every organization and have to be related to operational processes within the seven elements according to the strategies which are intended to be implemented. The defined measurements have to challenge the existing system, have to identify opportunities for improvement and profitability, and finally have to lead to proper strategy execution (Gupta, 2007, pp. 88-89).

The measurements of every single process can be combined to calculate an overall process defects per million opportunities value (Process DPMO), which then can be transformed in to a Sigma level process performance figure using a standardized Sigma conversion table (Gupta, 2007, p. 128; Pande et al., 2002, pp. 177-180). This helps the process owner to get a picture of the overall process performance (Gupta, 2007):

$$\text{Process DPMO} = \frac{\text{Number of defects/errors produced in a process x 1,000,000}}{\text{Number of produced units x Defect/error opportunities}}$$

A departmental DPMO value and Sigma level can then be calculated in order to give the department heads or executives a picture of the overall departmental process performance (Gupta, 2007, 128):

$$\text{Departmental DPM} = \frac{\text{Number of defects/errors produced in a department x 1,000,000}}{\text{Number of produced units x Defect/error opportunities}}$$

The ten most critical measurements from the SSBS can then be combined into a Business Performance Index, which is intended to give an overall process performance picture to the board of directors and executives (Gupta, 2007, p. 89, 126). First the seven elements of the SSBS are ranked according to their importance for the business strategy execution by assigning numbers, which have to add up to 100. Second the company's performance against plans is assessed for every SSBS element, by expressing the actual performance level in percent from the plan. Importance ranking and percentage are then multiplied for each measurement and added to the Business Performance Index (BPIn), also denoted as a percentage figure. Then the corporate defects per unit (Corporate DPU) is calculated by using the formula (Gupta, 2007, p. 90):

$$\text{Corporate DPU} = -\text{In}\ \frac{\text{BPIn}}{100}$$

This value is used to calculate the corporate DPMO by using the below formula, where the number of executives reporting to the CEO or COO represent the opportunities to make mistakes in decision making (Gupta, 2007, p. 90):

$$\text{Corporate DPMO} = \frac{\text{Corporate DPU x 1,000,000}}{\text{Number of executives reporting to CEO/COO}}$$

Then the corporate Sigma value can be determined by using the standardized Sigma conversion table, where each DPMO value has a respective Sigma value (Gupta, 2007, p. 91). This method enables executives not only to assess corporate process performance but also strategy execution performance (Gupta, 2007, p. 58).

The evaluation of the literature in order to answer the question (SQ6), if Six Sigma methodologies can be applied in the strategy implementation process, yields two outcomes. At first the SSBS of Gupta is the only documented application of Six Sigma methodologies to strategy implementation in the literature that was accessible for this study. This secondly means that in order to answer the above stated question more into depth, it will be necessary to specifically evaluate it in the empirical part of this study.

The next section will screen the literature for another possible application of Six Sigma to strategy implementation.

2.3.4 Six Sigma as a Process Management Concept that Supports the Achievement of Strategic Goals

This section will try to find an answer to research sub-question seven (SQ7) - Can Six Sigma as a general process management concept support the achievement of strategic (implementation) goals? In this case the idea is that Six Sigma does not function as a tool box to improve the implementation process, but paves the way for successful strategy implementation as a constantly applied process management concept (Dannenmaier & Dannenmaier, personal interview, February 29, 2008).

Bertels (2003, p. 21-22) states that organizational work is done by people embedded in processes and therefore processes are the vehicles by which employees carry out their work. The manager's role is to plan, organize, direct and control processes - in short managers have to manage organizational processes. Processes are what an organization does and every developed strategy has to finally become what the organization does. Hence processes are the instruments by which organizations execute their strategies. Six Sigma is focused around defining processes, measuring, analyzing, improving and controlling them, which means that Six Sigma is not only a tool box, but also a process management concept. Six Sigma also helps to create organizational alignment through the use of a common language, it supports organizational learning as well as continuous improvement. The better an organization manages its processes through Six Sigma, the better strategies are being executed.

Thompson et al. (2007, pp. 399-400) are also underlining that Six Sigma makes major strides in improving the proficiency with which an organization is executing its strategy, when it is applied to every activity in a company's value chain. Six Sigma needs to be seen as a part of the effort to execute strategy proficiently. Strategy points to those value chain activities that matter and what performance targets make the most sense on the way to a profitable organization. Six Sigma has to be applied in order to make the strategy happen within the processes of the value chain.

Pande et al. (2000, p. 13) emphasize that organizations that are using Six Sigma as a company-wide comprehensive process management and improvement methodology have permanent control over its processes. In other words the

organization that has Six Sigma in place as its process management methodology is able to better execute necessary strategic change.

Gupta (2007, p. 163) states that four aspects have to be realized in order to execute a strategy successfully by realizing its full potential, which are appropriate measurements, profit improvement, business growth and sustenance. He believes that Six Sigma process management is the instrument of choice to improve profit margins through process improvements and the accompanying reduction of costs (Gupta, 2007, p. 163, 165, 189).

The above collected statements and findings indicate that Six Sigma, as a process management concept, can play a strong role to improve and foster business strategy implementation.

2.3.5 Six Sigma Methodologies and Strategy Implementation – Conclusion

Apart from Gupta's SSBS, applications of Six Sigma concepts and tools to the strategy implementation process seem to be very rare, at least in accessible literature for this study. At the same time it can be highlighted that Six Sigma is recognized as a process management methodology which can strongly support the implementation of newly designed strategies in business operations.

## 2.4 Literature Review – Conclusion

The literature review in the fields of strategy implementation and of Six Sigma in the context of strategy implementation has delivered the following results:

- Strategy implementation success rates are estimated between 10 and 50% (see section 2.2.2, pp. 14-15)

- Existing implementation problems as well as success factors might be allocated to twelve general categories or areas of special interest (see sections 2.2.3, pp. 15-29 & 2.2.4, pp. 29-45)

- Various authors have incorporated these twelve implementation aspects into concepts and tools for a better strategy implementation (see section 2.2.5, pp. 45-57)

- Only one direct application of Six Sigma concepts and tools to the strategy implementation process could be identified in the literature, which was the Six Sigma Business Scorecard (see section 2.3.3, pp. 85-88)

- Six Sigma, as a process management methodology, can strongly support the implementation of new strategies (see section 2.3.4, pp. 88-90)

In the empirical part of this study, findings from the literature review will have to be verified and additional aspects of the research questions will have to be evaluated.

In the next chapter, literature on relevant research methodologies will be explored and actual methods used in this study will be described.

# CHAPTER 3

# RESEARCH METHODOLOGY

This chapter explains the research methodology that will be used in this study. First, a literature review explains the relevant research process and methods. Then the research questions are stated again in order to prepare the link between the methodology reviewed in the literature and the practical application of this methodology. After that the specific research methodology for this study will be developed.

## 3.1 Research Methodology – Introduction

A research project can be described as a research process from formulating the research topic, over critically reviewing the literature, defining the research design, to selecting samples, collecting and analyzing data as well as creating the report (Saunders, Lewis, & Thornhill, 2007, p. XIV). According to this research process the main concepts and approaches from each of the research process stages relevant for this study will be described in section 3.2, before developing the statement of actual research methods used in section 3.4, likewise according to the research process. The following figure gives an overview of the main stages of the research process as proposed by Saunders et al. (2007, p. XIV):

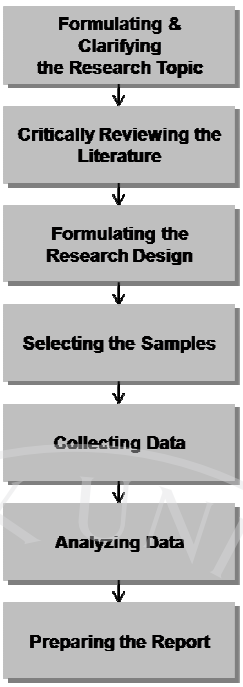


Figure 3.1: Research Process after Saunders et al. (2007)

Source: Saunders, M., Lewis, P. & Thornhill, A. (2007). *Research Methods for Business Students* (4th ed.). Essex: Pearson Education.

## 3.2 Research Methodology – Discussion

All seven steps of the research process (contained in Figure 3.1 above) are covered in this section. In order to help clarify the use of this process greater emphasis is given to the steps formulating the research design, selecting the samples, collecting data, analyzing data and preparing the report, as these steps are crucial for the empirical part of this study.

Formulating and Clarifying the Research Topic: At the beginning of a research project stands the generation of a research idea, for which own strengths and interests,

past projects, thesis or dissertation titles, replications of existing studies, literature, discussions or participation at actual research projects are possible sources (Saunders et al., 2007, pp. 22-26; Bortz & Döring, 1995, pp. 35-39).

Subsequently these ideas have to be refined, which means that the topic has to be evaluated in terms of its feasibility and if it delivering new insights into the chosen topic (Saunders et al., 2007, pp. 27-29; Bortz & Döring, 1995, pp. 39-40).

The next step comprises the formulation of a general focus research question, the definition of the specific research objectives and finally the development of the detailed research sub-questions, which shall lead to the necessary research depth (Saunders et al., 2007, pp. 30-33).

Critically Reviewing the Literature: The purpose of the literature review is to provide the foundation on which the research is build by developing a good understanding of relevant previous research and the trends that have emerged (Saunders et al., 2007, p. 57; Bortz & Döring, 1995, p. 46).

There are three general literature sources available for evaluation, which are primary, secondary and tertiary sources. Primary literature sources are the first occurrences of a piece of work, like reports, government publications, planning documents, letters, memos or minutes (Saunders et al., 2007, pp. 64-65). Secondary sources are books and journals, which are aimed at a wider audience (Saunders et al., 2007, p. 65). Tertiary resources, also called search tools, are designed to help to locate primary and secondary literature, and include indexes, abstracts or bibliographies (Saunders et al., 2007, p. 65).

A crucial point is to properly document the used resources in order to make the research of others traceable and to avoid plagiarism (Saunders et al., 2007, p. 58; Bortz & Döring, 1995, pp. 47-48).

Formulating the Research Design: In the next stage of the research process it is crucial to define the research design for the underlying study (Saunders et al., 2007, p. 10).

The purpose of research could either be exploratory, descriptive or explanatory (Saunders et al., 2007, pp. 133-134). Exploratory studies try to find out "what is happening" meaning to understand a problem and to assess a topic in a new light (Robson, 2002, p. 59; Bortz & Döring, 1995, pp. 49-51), typically using methods like literature search, interviews or focus groups (Saunders et al., 2007, p. 133). Descriptive research is to portray an accurate profile of a person, event or situation (Robson, 2002, p. 59). Explanatory research is focused on studying a situation or problem in order to explain the relationships between variables and the problem (Saunders, et al., 2007, p. 134).

The next step is to define the research strategy that will be employed. Three important research strategies are experiment, survey and case study (Saunders et al., 2007, p. 135).

Experiments follow the purpose to study causal links, whether a change in an independent variable leads to a change in a dependent variable, and therefore aims to find out main influence factors to a research problem (Saunders et al., 2007, p. 136; Bortz & Döring, 1995, pp. 53-54). A survey typically tries to find answers to research questions by addressing a population in a very economical way, where the data collection is standardized, easy to understand and therefore easily comparable.

Typical data collection techniques of the survey strategy are questionnaires and structured interviews (Saunders et al., 2007, pp. 138-139). A case study is a research strategy which involves an empirical investigation of a particular contemporary phenomenon within its real life context (Robson, 2002, p. 59).

Another important aspect of the research design is the credibility of the research findings. The research has to be designed and conducted in a way that findings will be reliable and valid (Saunders et al., 2007, pp. 149-151; Bortz & Döring, 1995, pp. 52-53). Although the research design has to aim for the highest credibility possible, inconsistencies can never totally be ruled out. The researcher has to reduce the possibility for inconsistencies as much as possible (Saunders et al., 2007, p. 149).

Reliability refers to the extent to which the data collection and analysis will yield consistent findings, meaning that the results will be repeatable or reproducible by others (Collis & Hussey, 2009, p. 64). Limitations in reliability can occur through subject or participant error or bias, as well as through observer error or bias (Saunders et al., 2007, p. 149).

To avoid or minimize possible participant error the completion of a questionnaire could be set at emotionally and workload-wise "neutral" times, where the participant is neither in a "high", looking forward to the weekend, nor in a "low" with the working week ahead, or where the participant is given a time-window, where the completion is up to her own discretion (Saunders et al., 2007, p. 149). Furthermore questionnaires can be tested for equal understanding amongst participants or unequal understanding of questions can be equalized through facilitated discussions during

focus group interviews (Saunders et al., 2007, p. 149; Collis & Hussey, 2009, pp. 155-156).

Participant bias can be avoided through a guarantee of anonymity to the respondents (Saunders et al., 2007, p. 149).

Observer error can be minimized through a high degree of standardization of the questions posed to the participants, in order to make it possible that different observers get equal or similar results (Collis & Hussey, 2009, p. 64). In focus groups observer errors are reduced through clarifications made by the participants, when the facilitator records the findings openly (Bryman & Bell, 2007, pp. 512-513).

Observer bias lies within the researcher and can be minimized through a high degree of self-discipline of the researcher concerning her objectivity while recording data and observations (Bryman & Bell, 2007, pp. 163-164).

Validity is concerned with whether the findings are really about what they appear to be or better if the research findings accurately reflect the phenomena under study (Collis & Hussey, 2009, pp. 64-65; Saunders et al., 2007, pp. 150-151; Bortz & Döring 1995, pp. 52-53). It is necessary that the study demonstrates what the researcher thinks it does and validity is therefore the test, if the measurement seems to be able to measure the phenomenon under study (Collis & Hussey, 2009, pp. 64-65). There are different ways to test validity. Content validity refers to the extent to which the measurement device provides adequate coverage of the investigative questions, which is evaluated through discussion with others, whether the questions are "essential", "useful but not necessary" or "not necessary" (Saunders et al., 2007, p. 366). Construct validity deals with phenomena, which are not directly observable, like motivation or satisfaction (Collis & Hussey, 2009, p. 65). Measurement of such

existing constructs against existing data is considered to be complex (Saunders et al., 2007, p. 367). Predictive validity is concerned with the ability of measures to make accurate predictions (Bryman & Bell, 2007, p. 165) and is tested by comparing questionnaire data with the data specified in the criterion by correlation (Saunders et al., 2007, p. 367). The most common way and at the same time the minimum requirement to assess the validity of a research is face validity, where it is ensured that the measures used by the researcher actually measure what they are supposed to measure (Collis & Hussey, 2009, p. 65). Face validity is tested through asking experts in the field under study to determine whether or not on the face of it the measure seems to reflect the concept concerned (Bryman & Bell, 2007, p. 165). Another aspect of validity is the translation aspect. If research questions need to be translated into other languages, it is necessary that the questions have to have the same meaning in every language used. Readers, familiar with both languages need to check whether equivalent questions have the same meaning in both versions of the questionnaire (Saunders et al., 2007, p. 377).

The research design also has to try to make sure that research findings drawn from a population are generalisable and therefore can be applied to other people, organizations, research settings or times (Bortz & Döring, 1995, pp. 52-53).

Selecting the Samples: A sample is a sub-set of a population, where the population is the full set of all cases. Using a sample enables to reduce the amount of data needed to collect by considering only data from a subgroup rather than all possible cases or elements (Bryman & Bell, 2007, p. 180). Data gathered from a sample is intended to help to draw conclusions to the attributes of the whole population. Sampling is necessary whenever it is impracticable to survey the entire

population or when the research budget and time is limited (Saunders et al., 2007, pp. 204, 206).

Sampling techniques are divided into two types, which are probability sampling and non-probability sampling (Saunders et al., 2007, p. 207; Bortz & Döring, 1995, p. 376). With probability sampling the chance, of any case being selected from the population is equal (Bortz & Döring, 1995, p. 376). This technique enables to answer research questions, which require estimating statistically the characteristics of the population (Saunders et al., 2007, p. 207). For non-probability sampling the probability of each case being selected from the population is not known and it is not possible to generalize from the sample about the population on statistical grounds (Bortz & Döring, 1995, p. 376).

Probability (or representative) sampling requires the definition of a complete list of all the cases in the population (sampling frame), the calculation of a suitable sample size and the selection of the most appropriate sampling technique (Collis & Hussey, 2009, p. 209).

The sample size depends on the confidence – the certainty that the data from the sample represents the characteristics from the whole population – needed in the data collected and the margin of error that can be tolerated in terms of accuracy of the estimates made from the sample (Saunders et al., 2007, p. 210).

For (eMail-)surveys the necessary minimum response rate in order to reliably predict the outcome for the whole population is stated between 25 and 35%. Survey analyst Hamilton (2009) has examined about 200 surveys and found out that among those surveys with statistical significance the response rate was at least 26%.

Bruce, et al. (2009) stated that the minimum response rate of 25 to 35% is described as the new norm for survey response rates.

If the above minimum sample sizes are not reached through the necessary response rate, the statistical generalizability of the findings taken from the sample to the whole population is shortened (Collis & Hussey, 2009, pp. 210-211).

The most common probability sampling techniques are simple random sampling, where the sample is selected at random from the sampling frame by using random number tables or computer software, systematic random sampling, which involves the selection of the sample at regular intervals from the sampling frame, and stratified random sampling, which is similar to random sampling but where the population is first divided into two or more relevant strata based on attributes (Bryman & Bell, 2007, pp. 185-191).

Non-probability sampling is mostly applied, when time and resources are short or the total population/sampling frame cannot be identified and therefore a representative sample cannot be drawn, which allows generalizing in a statistical sense to a population (Saunders et al., 2007, p. 226; Collis & Hussey, 2009, p. 213). In this case sample size becomes ambiguous and it rather depends on the research questions and objectives, what is needed to be found out, what is sample is useful, what will have credibility and what can be done within available resources (Saunders et al., 2007, pp. 226-227).

Non-probability sampling techniques are quota sampling, which involves dividing the population into specific groups and calculating a quota for each group from which data has to be collected and can normally be referred to the whole population, judgmental sampling, where the researcher selects the cases according to

his judgement, snowball sampling, where one cases helps to find the next case, and convenience sampling, which encompasses selecting the cases which are easiest to obtain (Saunders et al., 2007, pp. 226-234; Collis & Hussey, 2009, pp. 212-213; Bryman & Bell, 2007, pp. 197-202).

In judgmental sampling the researcher selects the participants of the sample according to his perception on the strengths of their experience of the phenomenon under study (Collis & Hussey, 2009, p. 213). Apart from resource constraints, judgmental sampling is a valid alternative to statistically representative probability sampling, when there is a need to select information-rich cases or sample participants (Saunders et al., 2007, pp. 231-232).

Convenience sampling is considered appropriate, when the chance to obtain data is too good an opportunity to miss, which means that relevant members of the population are at hand and convenient to be investigated, or when the findings drawn from such a sample are used as a preliminary analysis or as a pilot for the "real" investigation (Bryman & Bell, 2007, pp. 197-198).

Collecting Data: There are two general data collection techniques available, which are quantitative and qualitative (Saunders et al., 2007, p. 145; Bortz & Döring 1995, pp. 127, 271). Quantitative is used for any data collection technique that generates numerical data. Qualitative is used for data collection techniques that produce non-numeric data like words, pictures or video clips (Saunders et al., 2007, p. 145). The kind of data collection technique applied to a study also determines the analysis procedure (Bortz & Döring 1995, pp. 127, 271), which is described later on. In terms of data collection sources two categories can be distinguished which are primary and secondary data (Collis & Hussey, 2009, p. 23; Saunders et al., 2007,

p. 246). Primary data is data that is collected specifically for the purpose of the present study from an original source (Collis & Hussey, 2009, p. 23). Three kinds of primary data sources can be identified namely observation, interviews and focus groups, as well as questionnaires (Saunders et al., 2007, p. XIV). Secondary data is data that has already been collected for some other research purpose, but is reanalyzed for the present study (Collis & Hussey, 2009, p. 23).

Observation is a method that is used to answer research questions that are concerned with what people do, by watching them do it (Bryman & Bell, 2007, p. 281). Participant observation is a method in which the researcher participates in the lives and activities of those whom they are studying and is qualitative. Structured observation is quantitative and more concerned with the frequency of people's actions (Bortz & Döring, 1995, p. 241). Main threats to reliability and validity are subject and time error or observer effects (Saunders et al., 2007, p. 302).

Interviews are defined as purposeful discussions between two or more people (Saunders et al., 2007, p. 310; Bortz & Döring, 1995, p. 216). Structured interviews use questionnaires with a standardized set of questions and pre-coded answers and therefore are subject to quantitative analysis (Collis & Hussey, 2009, p. 195). Semi-structured interviews are non-standardized, where the interviewer has a list of themes and questions to be covered, although these may vary from interview to interview (Saunders et al., 2007, p. 312). Unstructured interviews are informal and are used to explore on depth a general area (Collis & Hussey, 2009, p. 144). Semi-structured and unstructured interviews are analyzed qualitatively and collected data seeks to find answers to the "why" (Saunders et al., 2007, p. 313). Semi-structured and unstructured interviews can be conducted on a one-to-one or on a one-to-many basis

(Bortz & Döring, 1995, pp. 221-222). One-to-many interviews are called group interviews or, when the topic is very specific and interaction between participants is especially fostered, focus groups (Saunders et al., 2007, 337; Bortz & Döring, 1995, pp. 221-222). The lack of standardization in semi-structured and unstructured interviews may lead to reduced reliability through interviewer, interviewee or response bias (Saunders et al., 2007, p. 337).

A special kind of interview is the expert opinion interview, in which data is collected through an inquiry of experts in a specific field, where other data collection methods fall short due to the fact that expertise can exclusively be found amongst these experts. Depending on the amount of experts to be questioned, interview outcomes have to be treated carefully due to possible lack of objective traceability. Furthermore the expert opinion interview is especially suitable to support outcomes of collected qualitative data (Treasury Board of Canada, 2010).

A focus group is an interview with a group of several participants on a tightly defined topic, where interaction within the group is fostered to deliver new knowledge to certain aspects of this topic (Collis & Hussey, 2009, p. 155; Bryman & Bell, 2007, p. 511; Saunders et al., 2007, p. 339). The participants are selected because they have certain characteristics in common that relate to the topic or because they have special expertise on the topic (Bryman & Bell, 2007, p. 511; Saunders et al., 2007, p. 339). Focus groups are lead by a facilitator, who has to stimulate discussion and interaction between the participants and to keep the group within the boundaries of the specific topic without leading the group towards certain opinions (Bryman & Bell, 2007, p. 511; Saunders et al., 2007, p. 340).

A questionnaire is a data collection technique in which each person is asked to respond to the same structured questions in a predetermined order (Bryman & Bell, 2007, p. 281; Saunders et al., 2007, p. 355). It provides an efficient way of collecting responses from a large sample prior to quantitative analysis, due to the fact that the researcher does not have to personally see each participant (Saunders et al., 2007, p. 355; Bortz & Döring, 1995, p. 231). Questionnaires are best used for descriptive or explanatory research, where attitudes, opinions, practices or relationships between variables are being studied (Saunders et al., 2007, p. 356). Types of questionnaires are on the one hand self-administered questionnaires in the form of internet, intranet, mail or delivered and collected by hand questionnaires which are all completed by respondents (Bryman & Bell, 2007, pp. 240-245), and on the other hand interviewer-administered questionnaires in the form of personal or telephone interviews which are recorded by the interviewer on the basis of each respondent's answers. The choice of questionnaire depends on characteristics of the respondents, importance of reaching a particular person, size of sample required, available time, available budget, or types or number of questions needed to ask (Saunders et al., 2007, pp. 356-358).

Questionnaires contain either open questions, which allow respondents to give answers in their own way, or closed questions, which provide a number of answers from which the respondent has to choose (Bortz & Döring, 1995, pp. 232-233). There are six types of closed questions: list, category, ranking, rating, quantity and grid. List questions offer the respondent a list of possible answers, from which he can choose, and are helpful when it is needed to make sure that the respondent has considered all answers. Category questions are designed so that each respondent's answer can fit only one category, and they are useful if data about behavior or attributes has to be

collected (Saunders et al., 2007, pp. 368-370). Ranking questions ask the respondent to place things in rank order and help to find out about the relative importance of aspects to the respondent (Saunders et al., 2007, p. 372). Rating questions are used to collect opinion data and are most frequently using the Likert-scale, where respondents are asked how they agree or disagree with a statement. The answer to a quantity question is a number, which gives the amount of a characteristic. A grid enables the researcher to record the responses to two or more questions at the same time (Saunders et al., 2007, pp. 372-375). If data will be analyzed by computer it is helpful to code the answers prior to entry, where a number is assigned to every answer in order to simplify data entry (Bryman & Bell, 2007, p. 249; Saunders et al., 2007, p. 377). For quantity questions actual numbers can be used, whereas for quality questions a coding scheme has to be designed (Saunders et al., 2007, p. 377). The questionnaire is usually accompanied by a covering letter, which explains the purpose of the survey (Collis & Hussey, 2009, pp. 192-193). At the top of the questionnaire it has to be explained clearly why it is necessary that the respondent completes the survey and that all information will be treated confidentially. At the end of the questionnaire it is crucial to describe, what the respondent has to do with the completed form (Saunders et al., 2007, pp. 383-386).

Secondary data include both quantitative and qualitative data and they are used in descriptive and exploratory research (Saunders et al., 2007, p. 248). Advantages of the use of secondary data are for example that fewer resources may be needed, that data can be obtained much quicker, or that their quality can be better (Bryman & Bell, 2007, pp. 328-334). Disadvantages are for instance that secondary data may be collected for a purpose other than the present research, that access may

be difficult or costly, or that the researcher has no control over data quality (Bryman & Bell, 2007, pp. 334-336). Before the use of secondary data for a study it is necessary to check the validity of the measurements, the coverage of the exact population and the reliability of the data especially in terms of measurement bias (Saunders et al., 2007, pp. 263-268).

Analyzing Data: There are different ways to analyze data according to the two data collection techniques quantitative and qualitative (Bortz & Döring, 1995). Quantitative analysis techniques such as graphs, charts and statistics help to process quantitative raw data and to turn them into relevant information (Saunders et al., 2007, p. 406; Bortz & Döring, 1995, p. 127). Qualitative analysis techniques help to understand the meaning of qualitative data by allowing the researcher to develop theory and concepts (Saunders et al., 2007, p. 470; Bortz & Döring, 1995, p. 271).

Quantitative data can be divided into two groups, which are categorical data and quantifiable data. Categorical data refers to data values that cannot be measured numerically but can be classified into sets, called descriptive data, or placed in rank order, also called ranked data. Quantifiable data can be measured numerically as quantities and are divided into continuous data, whose values can theoretically take any value (like distance, weight, time, etc.), and discrete data, whose values are measured precisely in whole numbers (Saunders et al., 2007, p. 409).

At first quantitative data analysis explores data using tables, diagrams and charts in order to make the data visible and comprehensible, for instance by showing highest and lowest values, trends, proportions or distributions (Saunders et al., 2007, pp. 420-421). Tables and diagrams used are bar charts, pie charts, histograms, line graphs or box plots (Saunders et al., 2007, pp. 423-428). A bar chart shows the

frequency or percentage frequency for each category, where the height of each bar indicates the frequency of occurrence. It is useful to compare highest and lowest values, especially when bars are ordered from highest to lowest values (Collis & Hussey, 2009, p. 236). A component bar chart is best used to compare percentage proportions of each type of response between different categories (Saunders et al., 2007, p. 432). A pie chart displays the percentage frequency for each category as a segment of a circular diagram and is applied to show how much of the total pie is represented by the area of each segment. A histogram is a bar chart where each bar represents the frequency of occurrence without gaps between the bars, which indicates the continuous nature of the displayed data. Continuous data is categorized and each bar represents the occurrence of each category, where the whole graph approximately represents the shape of the distribution (Collis & Hussey, 2009, p. 236). A line graph depicts data values for each time period and joins these data values with a line. It is helpful, whenever it is necessary to show a trend over time (Saunders et al., 2007, p. 426). A box plot shows the distribution of values including information on the middle value or median, the distribution of the middle 50 percent of the values, highest and lowest value as well outliers (Saunders et al., 2007, p. 428).

Subsequent analysis explores data using statistics to describe data and to examine relationships (Saunders et al., 2007, p. 421). Analysis involves statistics such as the mean, median or mode to describe central tendencies, the range and standard deviation to describe dispersion, hypothesis testing to find significant differences between variables, and correlation and regression to assess the strength of a relationship between variables (Saunders et al., 2007, pp. 433-455; Bortz & Döring, 1995, pp. 459-463, 473; Collis & Hussey, 2009, pp. 240-289; Bryman & Bell, 2007,

pp. 347-371). Measures of central tendency encapsulate in one figure a value that is typical for a distribution of values of one variable and which is comparable to the same type of value of other variables. The mean represents the arithmetic average and is calculated by dividing the sum of observations by the number of observations (Bryman & Bell, 2007, p. 359). The median is the mid-value of a data set derived by arraying all values from the smallest to the highest value and then finding the middle point. Compared to the mean it is not affected by outliers. The mode is the most frequently occurring value of a data set (Collis & Hussey, 2009, pp. 240-241). Measures of dispersion show the amount of variation in the data set of a variable and are another important way to compare data sets. Range is the difference between the maximum and the minimum value in a distribution (Bryman & Bell, 2007, p. 359). Standard deviation is the average difference of every data point to the mean (Collis & Hussey, 2009, p. 245). Hypothesis testing involves trying to find an answer to the question, if variables are statistically significantly different or if the differences between the variables are just random effects (Saunders et al., 2007, pp. 440-441). Differences in the variables are statistically significant, when the p-value (or probability) is < 0,05, which means that there is only a 5 % chance that differences are falsely acknowledged (Bryman & Bell, 2007, pp. 368-369). There are two different types of hypothesis tests, which are non-parametric and parametric tests. Parametric tests are used with quantifiable data and non-parametric tests are used with categorical data (Saunders et al., 2007, p. 441). Parametric tests include the test of equal means, like the T-test or ANOVA, and the test of equal variances (standard deviations), like the F-test or Bartlett's-test (Saunders et al., 2007, pp. 441-449). If quantifiable data is not normally distributed the Moods-Median-test or the Mann-Whitney test can be

applied (Collis & Hussey, 2009, pp. 260-261). The most common non-parametric test (therefore categorical data) is the Chi-square tests, which uses a contingency table by comparing observed values from the table and expected values if the distributions of the variables were entirely independent (Saunders et al., 2007, p. 444). The test calculates the difference between the actual and expected values and this differences can again be considered significant, when the p-value is < 0,05 (Bryman & Bell, 2007, p. 369). Correlation and regression analysis assess the strength of the relationship between variables (Saunders et al., 2007, p. 450). Correlation is a measure of the direction and strength of association between two variables denoted by the coefficient "r", which can be within the range of -1 (strong negative) to +1 (strong positive) (Bryman & Bell, 2007, p. 369). Regression is a measure of how much an independent variable can influence a dependent variable or how much the independent variable can predict the dependent one (Saunders et al., 2007, p. 451). It is denoted by "$r^2$", which can take any value between 0, meaning that 0% of the variation of the dependent variable can be explained by the independent variable, and 1, meaning that 100% of the variation of the dependent variable can be explained by the independent variable (Saunders et al., 2007, p. 453).

Another concept for quantitative analysis is the SERVQUAL-methodology (Parasuraman et al. 1988, p. 12). SERVQUAL is a tool to highlight gaps in performance between expected performance levels and actually perceived performance levels in order to find out about possible starting-points for improvement. Participants have to assess their expectations on/the importance of different aspects of the performance and the actual performance on a Likert scale (Landrum et al., 2009, p. 18), where a cluster (3 to 7) of pre-coded attitudes is

investigated (Bryman & Bell, 2007, p. 161). To quantify the gaps, the arithmetic means of all answers per aspect are calculated and then the means of the expected performance per aspect are subtracted from the actually perceived performance. Gaps between expectation and perception scores become obvious and possible actions can be derived (Landrum et al., 2009, pp. 19, 28-31).

In order to analyze qualitative data, there are on the one hand methods that quantify qualitative data and on the other hand non-quantifying methods. Quantifying qualitative data is especially of interest under a positivist research paradigm, while non-quantifying methods support research under an interpretive paradigm (Collis & Hussey, 2009, p. 163). Positivism is a paradigm that rests on the assumption that social reality is objective and not influenced by the act of investigating it (Collis & Hussey, 2009, p. 56). The research involves a deductive process, where social phenomena are measured to provide explanatory theories (Collis & Hussey, 2009, p. 56). Using the deductive approach also involves the use of existing theory as the basis for analysis. Deductively-based analytical procedures for example are pattern matching, where a pattern of outcomes is predicted based on theoretical propositions, and explanation building, where an explanation is built while collecting data and analyzing them (Saunders et al., 2007, pp. 487, 489-492). Interpretivism is based on the assumption that social reality is subjective and therefore affected by the investigation. The research involves an inductive process to provide an interpretive understanding of social phenomena. Interpretive methods seek to describe and translate the meaning of phenomena rather than measuring those (Collis & Hussey, 2009, p. 57). Using the inductive approach involves building up new theory grounded in the findings of the research's interpretation of the phenomena. Inductively-based

analytical procedures are for example data display, where data is organized and assembled into diagrammatic or visual displays (Saunders et al., 2007, pp. 487, 493-496), analytic induction, where the researcher is collecting data until no cases that are inconsistent with a hypothetical explanation of a phenomenon are found (Bryman & Bell, 2007, p. 583), and grounded theory, where the development of theory out of data is iterative with data collection and data coding (Collis & Hussey, 2009, pp. 179-182).

Quantifying methods for analysis of qualitative data are either informal methods, which count the frequency of occurrence of the phenomena under study, or content analysis, which systematically convert qualitative data into numerical data through defining coding units and a coding frame, which allow the analysis of each coding unit. Non-quantifying methods for analysis of qualitative data are reducing, restructuring and detextualizing the data in order to fully comprehend the data, to synthesize different findings and to develop new theories (Collis & Hussey, 2009, pp. 164-168). This process involves the development of categories, allocating units of the collected data to appropriate categories and recognizing relationships within and between categories in order to produce appropriate conclusions (Saunders et al., 2007, pp. 479-484).

Preparing the Report: The last step of the research process encompasses the preparation of the report (Saunders et al., 2007, p. XIV). The report typically consists of the abstract, an introduction, the literature review, the methodology, the results, the conclusions, the references and the appendices (Robson, 2002, p. 69). In order to make the report understandable and traceable it is recommended that a clear storyline has to be developed from the research question, to the evidence and the answer to the research question (Saunders et al., 2007, p. 533). It is furthermore crucial that the

report is structured, includes tables and graphics, and that chapters are previewed and summarized (Saunders et al., 2007, pp. 534-535).

## 3.3 Research Questions

According to section 1.5 (p. 6) the research questions of this study are:

Major Research Problem**:**

- Can Six Sigma principles contribute to more successful business strategy implementations?

Sub-Questions:

SQ1) What are the success rates of strategy implementations?

SQ2) Which problem areas exist, how often do they occur and which success factors do managers and decision-makers of clients of IBB assess as important for strategy implementation?

SQ3) What is their actual perception of strategy implementations in terms of the realization of the different success factors?

SQ4) What are the gaps between managers' assessment on the importance of success factors on the one hand and their actual perceptions on the other hand?

SQ5) What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB?

SQ6) Can Six Sigma principles be applied in the strategy implementation process and therefore help to reduce the gaps between managers' perceptions of the importance of success factors and their actual experiences?

SQ7) Can Six Sigma as a process management concept support the achievement of strategic (implementation) goals?

In order to answer the major research problem seven sub-questions have to be answered in this study. In chapter 2 the literature was scanned to answer the questions from the existing research point of view. The empirical part of this study aims to find the answers to these questions from a real-life perspective of the sample population. The following section will describe the methodical framework and the research design used.

## 3.4 Statement of Research Methods Used

Formulating the Research Design: The purpose of this research is exploratory, descriptive as well as explanatory. It is exploratory, because it tries to assess a topic in a new light by seeking answers, for example, to the questions if Six Sigma can contribute to more successful strategy implementations or if Six Sigma can be applied to the strategy implementation process. It also has descriptive aspects, because it tries to give a picture of specific situations (Robson, 2002, p. 59) through answering questions like, what the success rates of strategy implementations are or what the actual experience with strategy implementations is alike. It is also explanatory by trying to find out about the relationships between certain variables (Saunders et al., 2007, p. 134) – the success factors – and the effective success of strategy implementations.

The study focuses on the survey research strategy, by using a questionnaire and a structured focus group interview (see “Collecting Data” below), because it tries to find answers to research questions like for example what, how much or how many by addressing the population (see “Selecting the samples” below) in a very economical way, where the data collection is standardized, easy to understand and therefore easily comparable (Saunders et al., 2007, p. 138).

In order to increase the reliability and validity of this study the following measures are taken.

To minimize possible participant errors the questionnaire is sent by eMail and participants have a time-frame of two weeks, during which they can complete and return the questionnaire, which should make it possible for them to choose a time where the completion is most suitable for them. Furthermore the questionnaire (two in English and two in German) was tested by four members of the sample population (see "Selecting the samples" below) to ensure their understanding of the questionnaire as well as to ensure equal understanding between the test persons (Saunders et al., 2007, p. 149). During the structured focus group interview participant errors are narrowed through the fact that equal understanding of the questions are achieved through facilitated discussions that yield a clarified meaning of the question posed among participants (Saunders et al., 2007, p. 149; Collis & Hussey, 2009, pp. 155-156).

Participant bias is avoided by sending the questionnaire by eMail exclusively to each participant and through a guarantee of anonymity to the respondents towards their peers and superiors (Saunders et al., 2007, p. 149). During the focus group interview the participants are not anonymous and therefore bias cannot be completely ruled out. But at the same time the group consists of experts of IBB, where open discussions and exchange of opinions is part of the daily business. This should help to minimize possible bias.

Observer error is minimized through a high degree of standardization of the questionnaire posed to the participants, which should help to get similar results, if the research was carried out by other observers (Collis & Hussey, 2009, p. 64). During

the focus group session observer error is tried to be narrowed down by the participants themselves, when the facilitator is openly summarizing the results and participants have the chance to clarify possible ambiguities (Bryman & Bell, 2007, pp. 512-513).

Observer bias cannot be totally eliminated as the researcher has own ideas and opinions. But the researcher of this study tries to lay special attention on objectivity while recording data and through observations (Bryman & Bell, 2007, pp. 163-164).

Validity of the questionnaire was tested in three ways. Face validity was tested through asking six experts from IBB in the fields of strategy implementation and Six Sigma, who confirmed that the questions from the questionnaire as well as the design of the focus group seem appropriate to answer the research questions (see section 3.3, pp. 112-113) posed in this study (Bryman & Bell, 2007, p. 165). Secondly content validity was tested. The same six IBB experts were asked if the questions from the questionnaire are “essential”, “useful but not necessary” or “not necessary” (Saunders et al., 2007, p. 366). All six experts found all questions from the questionnaire “essential” in terms of necessary elements to answer the research sub-questions as well as the major research problem. In order to ensure that the questions from the questionnaire have the same meaning in English and German an IBB expert, who grew a bilingually with English and German, checked the correctness of the translation from English into German (Saunders et al., 2007, p. 377).

Due to the fact that the two samples (see next paragraph) are limited to managers and decision makers of clients of IBB and to experts on Six Sigma and strategy implementation from IBB, results of this research are most likely not generalisable to other people, organizations or research settings (Bortz & Döring, 1995, pp. 52-53).

Selecting the Samples: In order to be able to answer the research questions of this study, two different populations are addressed, which are on the one hand managers and decision makers of clients of IBB and on the other hand experts in both the fields of strategy implementation and Six Sigma.

The main research population consists of managers and decision makers of clients of IBB. IBB momentarily has 141 active client accounts, which include both clients with ongoing projects as well as prospects. There are between one and three contact persons per client that can be directly addressed for this study, which total 163 addressees. From past experiences with surveys, where response rates were between 25 and 50 per cent, it cannot be expected that all clients are going to respond to the actual study (Dannenmaier & Dannenmaier, personal interview, February 29, August 18, 2008,). Therefore the whole population of 163 persons is addressed and therefore sampling, in the sense of selecting a subset of the population, is not necessary (Saunders et al., 2007, p. 206). Nevertheless, in order to obtain statistically significant results that can be generalized to the whole population, it is essential to reach around 49 persons from the population, which equals a response rate of around 30% (Bruce et al., 2009).

The second research population consists of experts in both the fields of strategy implementation as well as of Six Sigma and is addressed to answer the question – Can Six Sigma principles be applied in the strategy implementation process? Due to the fact that for this study time and resources are short in order to define the total population/sampling frame of experts in strategy implementation and Six Sigma, a representative probability sample, which allows generalization in a statistical sense to a population, cannot be drawn (Saunders et al., 2007, p. 226; Collis

& Hussey, 2009, p. 213). The sampling technique is therefore a non-probability sampling, because not every expert in the two research areas has the chance to be part of the sample (Saunders et al., 2007, p. 207). The two applied non-probability sampling techniques are judgmental and convenience sampling.

In judgmental sampling it lies within the researcher's assessment to decide upon the composition of the sample, when there are especially information-rich sample participants (Collis & Hussey, 2009, p. 213; Saunders et al., 2007, pp. 231-232). Strategy implementation and Six Sigma are core competencies of IBB and there are two available consultants with special expertise in both fields. A third external expert with the same expertise is included in the sample. These three experts are representing the sample population, which is intended to deliver the findings in order to answer the above stated research question.

Convenience sampling is appropriate, when the chance to obtain data is too good an opportunity to miss, which means that relevant members of the population are at hand and convenient to be investigated (Bryman & Bell, 2007, pp. 197-198). The three above mentioned experts are considered relevant members of the population. The two IBB experts have more than ten years of expertise in strategy consulting as well as in Six Sigma projects, and are easily available for this study. The third expert was a senior manager in one of the world's largest conglomerates and has been involved in strategic decisions and implementations for more than 8 years. Furthermore he was the head of the Six Sigma-process excellence department for three years. He is based in Vienna and showed personal interest in the study. Therefore he was also available for the focus group interview. Furthermore time and resource constraints do not allow to search and include other external experts.

Generalizability of the findings from this part of the empirical study is therefore limited.

Collecting Data: As described in the section above "Formulating the Research Design", this study focuses on the survey research strategy, by using a questionnaire and a structured focus group interview, because it tries to find answers to research questions like for example what, how much or how many by addressing the research populations (see above "Selecting the samples") in a very economical way, where the data collection is standardized, easy to understand and therefore easily comparable (Saunders et al., 2007, p. 138).

A questionnaire is used in order to be able to reach the population of this study, which consists of 163 people, in a most economical way, due to the fact that the members of the sample of this study (managers and decision-makers of IBB's clients) are geographically wide spread and personal interaction between researcher and respondent would be too expensive and time resource consuming (Collis & Hussey, 2009, p. 192). Using a questionnaire therefore helps to reach the target sample more efficiently (Saunders et al., 2007, p. 138). The questionnaire is self-administered by the respondents. It will be distributed through internet (returned via e-mail or fax) or delivered and collected personally, whenever personal distribution is possible, meaning that no additional costs are occurred for example when IBB consultants meet with their clients for regular project activities.

The questions contained in the questionnaire (see appendices 1 and 2) are designed to find answers to the research questions by questioning experiences, attitudes, opinions and practices as well as by checking on relationships between variables (Saunders et al., 2007, p. 356). The questionnaire contains mainly closed

questions, which provide a number of answers from which the respondent has to choose (Bortz & Döring, 1995, pp. 232-233), in order to make comparison between respondents' answers more easy. Technically the questionnaire includes list, category and rating questions. List questions are used to make sure that the respondent considers all answers. Category questions are posed to make sure that each respondent can only choose one specific answer (Saunders et al., 2007, pp.369-370). Ranking questions ask the respondent to place things in rank order and help to find out about the relative importance of aspects to the respondent. Rating questions are used in this study to collect opinion data how the respondents agree or disagree with a statement. Some questions are integrated in a grid, which makes it easier to record the responses to two or more questions at the same time (Saunders et al., 2007, pp. 372-375). Answers are coded prior to entry in order to make computer analysis more efficient (Bryman & Bell, 2007, p. 249). The questionnaire is accompanied by a covering letter, which explains the purpose of the survey and at the end of the questionnaire it is described, what the respondent has to do with the completed form (Saunders et al., 2007, pp. 383-386). For those addressees, who are not capable of English, the questionnaire is translated into German.

The research sub-question – Can Six Sigma principles be applied in the strategy implementation process? – cannot be answered by managers and decision makers of IBB's clients because practical experience to this topic does not seem to exist (Dannenmaier & Dannenmaier, 2008). Therefore expert opinions are collected (Treasury Board of Canada, 2010) through the questioning of three experts in strategy implementation and Six Sigma during a semi-structured interview/focus group, where discussions among the participants are intended to lead to the answer of this particular

question (Saunders et al., 2007, p. 312). The semi-structured interview/focus group sessions addresses the research question – Can Six Sigma principles be applied in the strategy implementation process? The participants are asked to assess the applicability of every Six Sigma and TOP tool (see tables 2.3 and 2.4, pp. 64-74 and 78-84) to the strategy implementation process, by deciding if the tool is capable of enhancing strategy implementation success factors (see figure 2.2, p. 45). At the same time the incorporation of these expert opinions helps to support outcomes gathered through quantitative analysis (Treasury Board of Canada, 2010). The

Analyzing Data and Preparing the Report: The study uses quantitative as well as qualitative data. The answers to most of the research questions will generate numerical data, which means that data collection and analysis technique is quantitative. The question (SQ6) – Can Six Sigma principles be applied in the strategy implementation process? – is tried to be answered qualitatively by generating non-numeric data like words (Saunders et al., 2007, p. 145), because literature (see section 2.3.4, pp. 88-90) and practical experience to this topic does not seem to exist (Dannenmaier & Dannenmaier, 2008) and therefore cannot be measured. The following section gives an outlook how the collected data will be analyzed and presented.

Data from question one (Q1 – see appendices 1 and 2) is presented as a pie-chart, where the five answer possibilities are displayed according to the frequency/percentages of their occurrence. It is applied to show how much of the total pie is represented by the area of each segment, which gives a better visualization how successful strategy implementations are (Collis & Hussey, 2009, p. 236).

Results from questions two and three (Q2 and Q3 – see appendices 1 and 2) are first displayed in a component bar chart in order to compare the percentage proportions of each type of response between the different categories (Saunders et al., 2007, p. 432). This means that for each category the percentages of every answer component (Q2: from not important to very important; Q3: from not fulfilled to very well fulfilled) is shown. Then hypothesis tests are performed for question two and three in order to check if possible differences between the answers to each category are statistically significantly different or just random effects. If the differences are statistically significantly different, then it is justified to treat the different categories differently in terms of conclusions and possible actions (Saunders et al., 2007, pp. 440-441). Statistically significant differences can be assumed, when the p-value (or probability) is < 0,05 (Bryman & Bell, 2007, pp. 368-369). As the data collected in questions two and three is categorical, a non-parametric hypothesis test is performed (Saunders et al., 2007, p. 441). This test has to be the Chi-square test, which uses a contingency table by comparing observed values from the table and expected values (calculated statistically) and their differences (Saunders et al., 2007, p. 444). Following the SERVQUAL approach, gaps between the importance of categories (Q2) and the actually perceived performance in every category (Q3) are identified (Landrum et al., 2009, p. 18). Arithmetic means of all answers per category (Likert scale from 1 to 4 – Saunders et al., 2007, p. 372) are calculated and then the means of the importance per category (Q2) are subtracted from the actually perceived performance (Q3) (Parasuraman et al. 1988, p. 19). The results are shown in a table and differences are plotted on a bar-chart from maximum to minimum gap, as bar-

charts are especially useful to compare highest and lowest values (Collis & Hussey, 2009, p. 236).

To analyze question four (Q4 – see appendices 1 and 2) answers are first displayed in a component bar chart in order to compare the percentage proportions of each answer component from every concept and tool (Saunders et al., 2007, p. 432). This means that for each category the percentages of every answer component are shown. In order to compare how frequent the different tools are being applied, the averages for every tool are calculated for every answer (Bryman & Bell, 2007, p. 359). Generally the data collected with question five is categorical, where averages cannot be calculated meaningfully (Saunders et al., 2007, p. 432). But through coding from 1 (Never) to 4 (Often/Always) possible answers are becoming quantifiable and the calculation of the mean makes sense (Saunders et al., 2007, p. 409). The higher the mean the more often the tool is applied in average. The means are plotted on a bar-chart from maximum to minimum, in order to see which concepts and tools are used more frequently (Collis & Hussey, 2009, p. 236).

Question five (Q5 – see appendices 1 and 2) is analyzed in the same way as question four. Answers are first displayed in a component bar chart in order to compare the percentage proportions of each answer component from every category (Saunders et al., 2007, p. 432). Then averages of every answer are calculated and plotted on a bar-chart from maximum to minimum, in order to see for which success factors more conceptual and tool support is necessary (Collis & Hussey, 2009, p. 236). The higher the mean the higher the necessity for tool support in the respective category.

Data from question six (Q6) is presented as a pie-chart, where the four answer possibilities are displayed according to the frequency/percentages of their occurrence.

It is applied to show how much of the total pie is represented by the area of each segment, which gives a better visualization of the truth of the statement on strategy implementation (Collis & Hussey, 2009, p. 236).

The research sub-question (SQ6) – Can Six Sigma principles be applied in the strategy implementation process? – is explored in a semi-structured interview/focus group session (see above "Collecting Data"), where the participating experts are asked to assess the applicability of every Six Sigma and TOP tool (see tables 2.3 and 2.4, pp. 64-74 and 78-84) to the strategy implementation process, by deciding if the tool is capable of enhancing strategy implementation success factors (see figure 2.2, p. 44). The so obtained data is qualitative data (Saunders et al., 2007, p. 145). The analysis follows the inductive approach to build a theory that is grounded in the data collected, where no existing theory on the application of Six Sigma and TOP can be used as the basis for analysis (Saunders et al., 2007, p. 487). Using the inductive approach therefore involves building up new theory on the relationship between strategy implementation and Six Sigma, grounded in the findings of the structured interview/focus group session of this study (Saunders et al., 2007, p. 487). The analytical procedure applied is data display, where data is organized and assembled into diagrammatic displays (Saunders et al., 2007, pp. 493-496). Results of the interview are therefore presented on a table, where Six Sigma and TOP tools are assigned to one or more of the twelve strategy implementation success factor categories according to their assessed suitability for enhancing them. This allocation relates tools and success factors in order to set the base for appropriate conclusions to answer this research sub-question (Saunders et al., 2007, pp. 479-484). Based on this

methodical background the virtual setting of the semi-structured focus group interview is described as follows:

- Location: IBB office in Vienna
- Participants: Two IBB strategy implementation and Six Sigma experts, one such external expert of an IBB's customer, thesis author as facilitator
- Supporting material: Print-outs with all relevant DMAIC and TOP tools (see tables 2.3 and 2.4, pp. 64-74 and 78-84) as well as print-outs with a blank table (see section 4.2, pp. 127-130) showing the twelve different success factors and room to fill in fitting DMAIC and TOP tools
- Process: Every single DMAIC and TOP tool is assessed in terms of its applicability to each of the twelve success factors in an open discussion led by the facilitator, the facilitator orally summarizes the results of the discussion (see example in appendix 3), gathers a joint agreement of all experts and adds the tool to every suitable success factor in writing
- Documentation: The written results of the focus-group interview are transferred into a data-file in Microsoft Word

Furthermore the outcome of this qualitative analysis is used in order to compare and underline the results of the quantitative analysis (Treasury Board of Canada, 2010).

## 3.5 Research Methodology – Conclusion

The empirical part of this study applies two research methods. The first one is a questionnaire, which is intended to deliver answers to most of the research questions of this study by addressing managers and decision makers of clients of IBB. The data from this questionnaire is analyzed quantitatively.

The second research methodology employed is a structured interview, which shall yield findings to the research question (SQ6) - Can Six Sigma principles be applied in the strategy implementation process? The target population for answering this question is composed of experts in both the fields of strategy implementation as well as Six Sigma. The outcomes from these interviews are analyzed qualitatively and are also intended to support the quantitative analysis.

In chapter 4 the empirical evidence will be presented according to the outline given in section 3.4.

# CHAPTER 4

# DATA PRESENTATION

In the following chapter the data from the empirical research outcome is presented. This primary data is the basis for the research findings that will be derived in order to answer the research questions. An analysis will be presented in chapter 5. Conclusions and implications will then follow in chapter 6.

## 4.1 Data Presentation – Introduction

In the empirical part of this research two different research methods are applied. Firstly a questionnaire, which is analyzed quantitatively; and secondly a semi-structured interview which is analyzed qualitatively.

The questionnaire was sent to 163 strategy implementation experts at client companies of IBB. 56 of which filed a fully answered questionnaire. The response rate therefore is 34,35%, which is a higher percentage than the necessary 30% demanded for a statistically valid survey (Bruce et al., 2009).

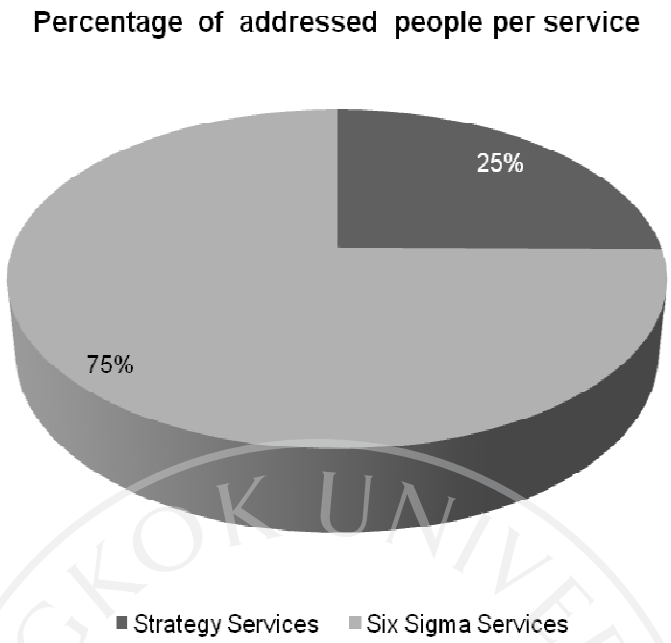


Figure 4.1: Percentage of Addressed People per Service

Table 4.1: Percentage of Addressed People per Service

| | Number of Addressed People | Percentage |
|---|---|---|
| Strategy Services | 41 | 25% |
| Six Sigma Services | 122 | 75% |

75% of the addressed experts work for clients for whom IBB is delivering Six Sigma services. 25% are obtaining strategy consulting services.

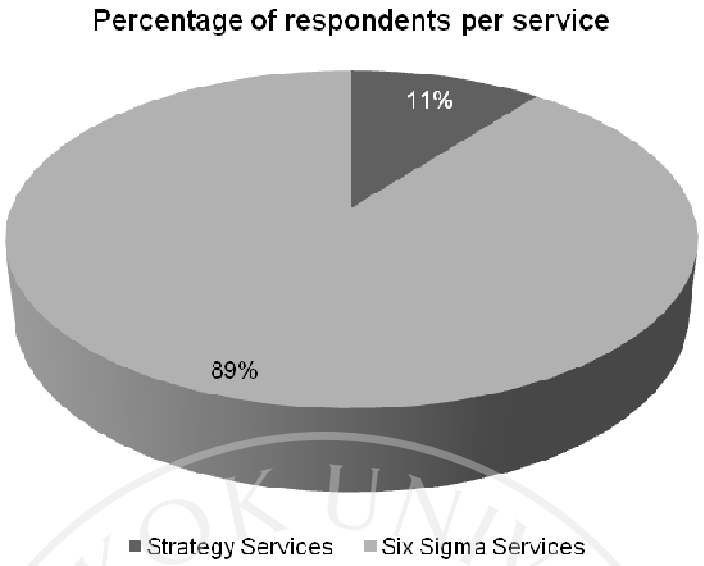


Figure 4.2: Percentage of Respondents per Service

Table 4.2: Percentage of Respondents per Service

| | Number of Respondents | Percentage |
|---|---|---|
| Strategy Services | 6 | 11% |
| Six Sigma Services | 50 | 89% |

Almost 90% of the respondents stem from IBB Six Sigma clients.

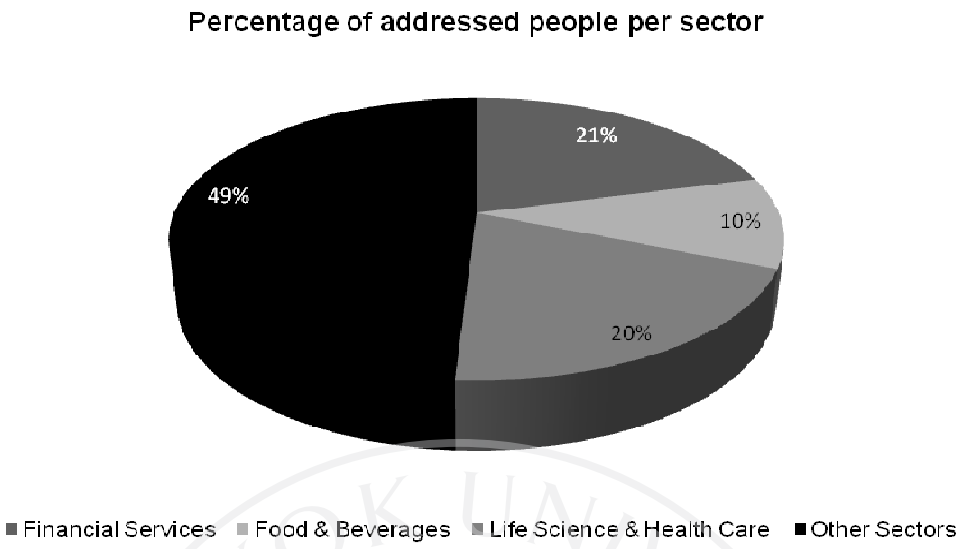


Figure 4.3: Percentage of Addressed People per Sector

Table 4.3: Percentage of Addressed People per Sector

| | Number of Addressed People | Percentage |
|---|---|---|
| Financial Services | 34 | 21% |
| Food & Beverages | 17 | 10% |
| Life Science & Health Care | 32 | 20% |
| Other Sectors | 80 | 49% |

Around 20% of the addressed strategy implementation experts are each related to the financial and life science and health care sector, 10% to the food and beverages sector and around 50% to other sectors like retail, automotive or metal industry.

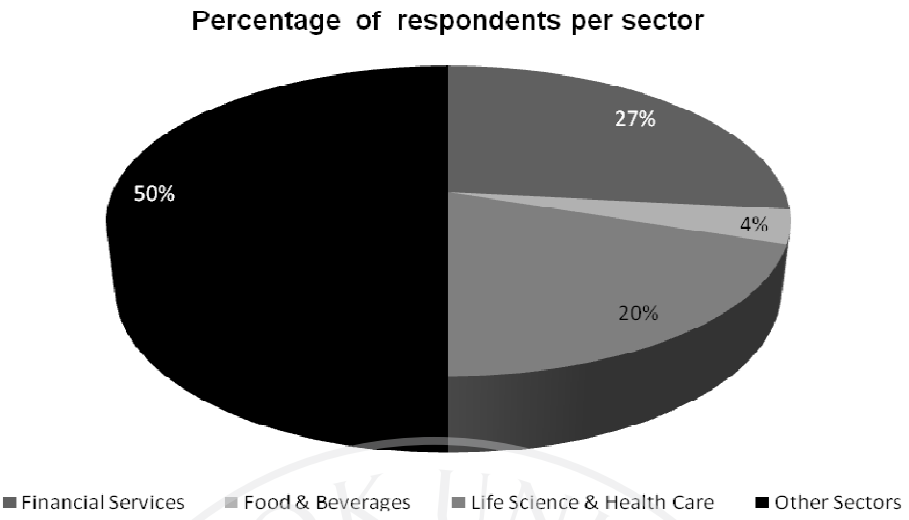


Figure 4.4: Percentage of Respondents per Sector

Table 4.4: Percentage of Respondents per Sector

| | Number of Respondents | Percentage |
|---|---|---|
| Financial Services | 15 | 27% |
| Food & Beverages | 2 | 4% |
| Life Science & Health Care | 11 | 20% |
| Other Sectors | 28 | 50% |

The distribution of the respondents per sector almost equals the distribution of the addressees apart from the difference that only 4% of the questionnaires were returned by experts from the food and beverages sector.

For the structured interview three experts in strategy implementation and Six Sigma were jointly questioned.

The following section is focusing on the description of the so gathered research data. The interpretation of the outcome will follow in chapter 5. The data is presented according to the research questions to be answered.

4.2 Data Presentation

Sub-question 1: What are the success rates of strategy implementations? The following data was gathered through question 1 in the questionnaire (see appendices 1and 2):

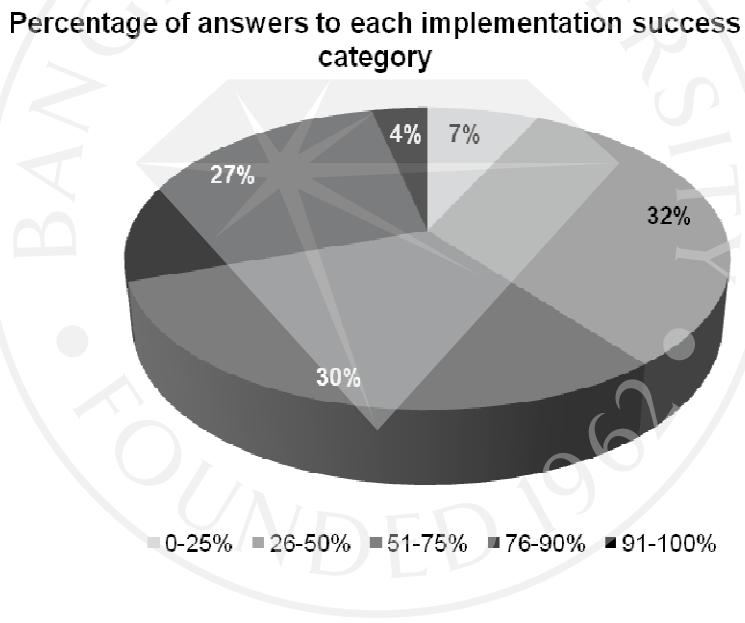


Figure 4.5: Percentage of Answers to Each Implementation Success Category

Table 4.5: Percentage of Answers to Each Implementation Success Category

| %-categories | Number of Answers | Percentage of Answers |
|---|---|---|
| 0-25% | 4 | 7% |
| 26-50% | 18 | 32% |
| 51-75% | 17 | 30% |
| 76-90% | 15 | 27% |
| 91-100% | 2 | 4% |

For 7% of the participants strategy implementations were only in 0-25% of the cases successful. 32% opted for a success rate between 26%-50%, 30% between 51-75%, 27% between 76-90% and 4% for a rate between 91-100%.

Sub-question 2: Which problem areas exist, how often do they occur and which success factors do managers and decision-makers of clients of IBB assess as important for strategy implementation? The following data related to the importance of strategy implementation success factors was gathered through question 2 of the questionnaire (see appendices 1 and 2):

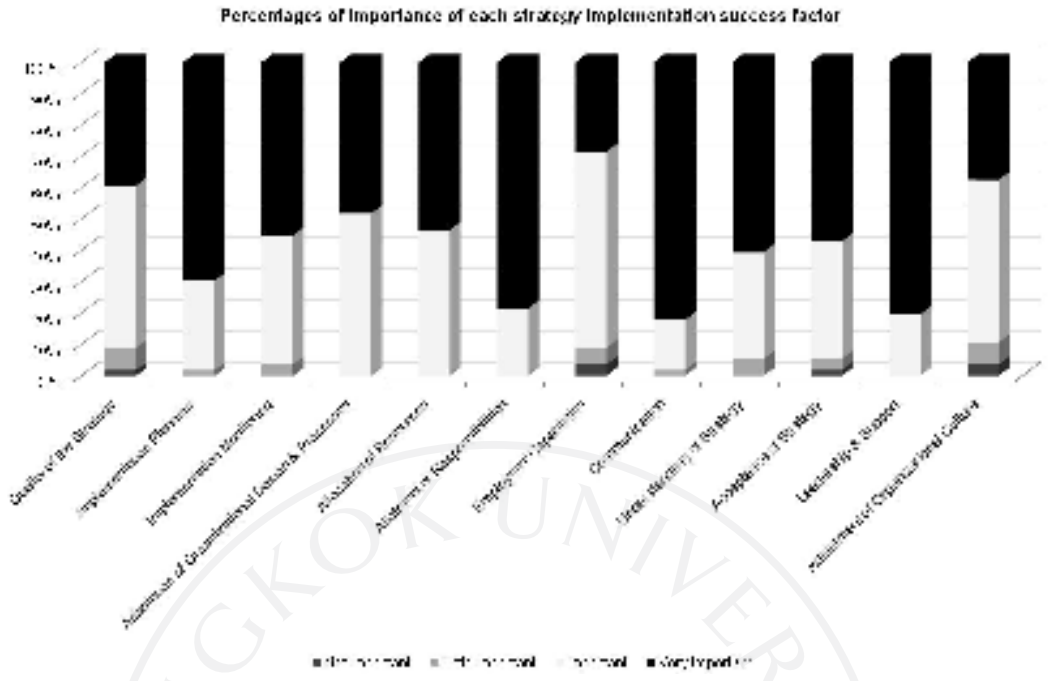


Figure 4.6: Percentages of Importance of Each Strategy Implementation Success Factor

Table 4.6.a: Percentages of Importance of Each Strategy Implementation Success Factor

| Categories | Quality of the Strategy | Implemen-tation Planning | Implemen-tation Monitoring | Adaptation of Organizatio-nal Design & Processes | Allocation of Resources | Allotment of Responsi-bilities | Employees' Capabilities | Communi-cation | Understan-ding of Strategy | Acceptance of Strategy | Leadership & Support | Adjustment of Organizatio-nal Culture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Not important | 2% | 0% | 0% | 0% | 0% | 0% | 4% | 0% | 0% | 2% | 0% | 4% |
| Little important | 7% | 2% | 4% | 0% | 0% | 0% | 5% | 2% | 5% | 4% | 0% | 7% |
| important | 52% | 29% | 41% | 52% | 46% | 21% | 63% | 16% | 34% | 38% | 20% | 52% |
| Very important | 39% | 70% | 55% | 48% | 54% | 79% | 29% | 82% | 61% | 57% | 80% | 38% |

Table 4.6.b: Chi-Square of Importance of Each Strategy Implementation Success Factor

**Chi-Square Q2**

| | Quality of the Strategy | Implementation Planning | Implementation Monitoring | Adaptation of Organizational Design | Allocation of Resources |
|---|---|---|---|---|---|
| 1 | 29 | 16 | 23 | 29 | 26 |
| | 20,45 | 22,05 | 21,65 | 22,45 | 22,45 |
| | 3,577 | 1,660 | 0,084 | 1,910 | 0,561 |
| 2 | 22 | 39 | 31 | 27 | 30 |
| | 30,55 | 32,95 | 32,35 | 33,55 | 33,55 |
| | 2,394 | 1,111 | 0,056 | 1,278 | 0,375 |
| Total | 51 | 55 | 54 | 56 | 56 |

| | Allotment of Responsibilities | Employees Capabilities | Communication | Understandiing of Strategy |
|---|---|---|---|---|
| 1 | 12 | 35 | 9 | 19 |
| | 22,45 | 20,45 | 22,05 | 21,25 |
| | 4,866 | 10,357 | 7,724 | 0,238 |
| 2 | 44 | 16 | 46 | 34 |
| | 33,55 | 30,55 | 32,95 | 31,75 |
| | 3,256 | 6,932 | 5,170 | 0,159 |
| Total | 56 | 51 | 55 | 53 |

| | Acceptance of Strategy | Leadership & Support | Adjustment of Organizational Cu | Total |
|---|---|---|---|---|
| 1 | 21 | 11 | 29 | 259 |
| | 21,25 | 22,45 | 20,05 | |
| | 0,003 | 5,841 | 3,999 | |
| 2 | 32 | 45 | 21 | 387 |
| | 31,75 | 33,55 | 29,95 | |
| | 0,002 | 3,909 | 2,676 | |
| Total | 53 | 56 | 50 | 646 |

Chi-Qd = 68,141; DF = 11; p-Value = 0,000

Each of the defined strategy implementation success factors is perceived as either “very important” or “important” by more than 80% of the participants.

Furthermore the success factors “Implementation Planning”, “Implementation Monitoring”, “Allotment of Responsibilities”, “Communication”, “Understanding of Strategy”, “Acceptance of Strategy” and “Leadership and Support” are considered “very important” in more than 55% of the answers. The performed Chi-square hypothesis test yields a result of p = 0,000, which is lower than 0,05, and which means that differences in the answers to each success factor are therefore also statistically different.

Sub-question 3: What is their actual perception of strategy implementations in terms of the realization of the different success factors? The following data related to the realization of strategy implementation success factors was gathered through question 3 of the questionnaire (see appendices 1 and 2):

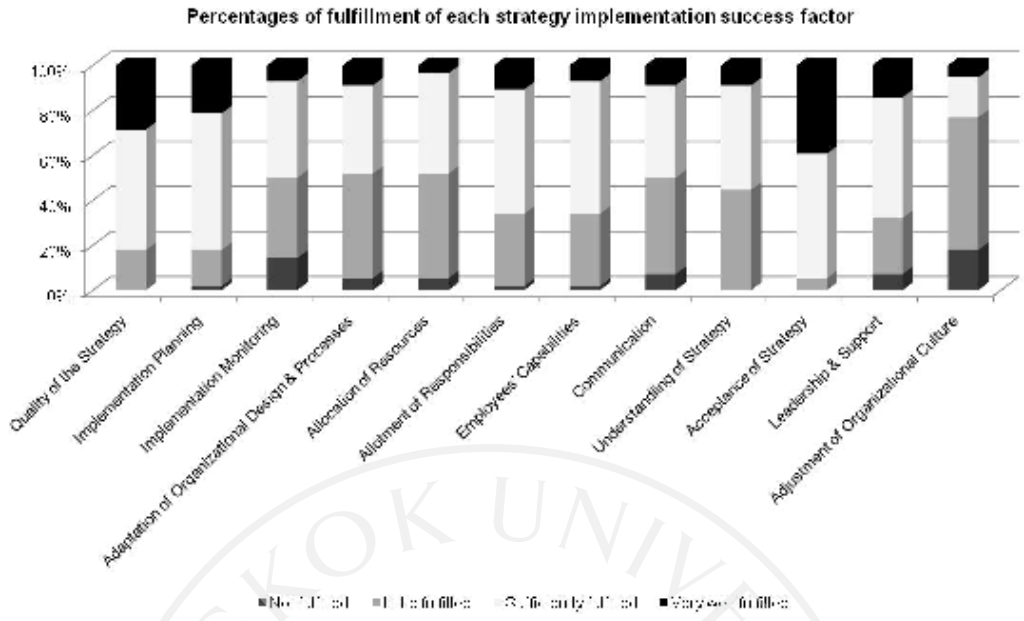


Figure 4.7: Percentages of Fulfillment of Each Strategy Implementation Success Factor

Table 4.7.a: Percentages of Fulfillment of Each Strategy Implementation Success Factor

| Categories | Quality of the Strategy | Implemen-tation Planning | Implemen-tation Monitoring | Adaptation of Organizatio-nal Design & Processes | Allocation of Resources | Allotment of Responsi-bilities | Employees' Capabilities | Communi-cation | Understan-ding of Strategy | Acceptance of Strategy | Leadership & Support | Adjustment of Organizatio-nal Culture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Not fulfilled | 0% | 2% | 14% | 5% | 5% | 2% | 2% | 7% | 0% | 0% | 7% | 18% |
| Little fulfilled | 18% | 16% | 36% | 46% | 46% | 32% | 32% | 43% | 45% | 5% | 25% | 59% |
| Sufficiently fulfilled | 54% | 61% | 43% | 39% | 45% | 55% | 59% | 41% | 46% | 55% | 54% | 18% |
| Very well fulfilled | 29% | 21% | 7% | 9% | 4% | 11% | 7% | 9% | 9% | 39% | 14% | 5% |

Table 4.7.b: Chi-Square of Fulfillment of Each Strategy Implementation Success Factor

**Chi-Square Q3**

| | Quality of the Strategy | Implementation Planning | Implementation Monitoring | Adaptation of Organizational Design | Allocation of Resources |
|---|---|---|---|---|---|
| 1 | 10 | 9 | 20 | 26 | 26 |
| | 19,87 | 19,51 | 17,03 | 18,80 | 18,80 |
| | 4,901 | 5,664 | 0,518 | 2,754 | 2,754 |
| 2 | 30 | 34 | 24 | 22 | 25 |
| | 28,04 | 27,54 | 24,04 | 26,54 | 26,54 |
| | 0,136 | 1,514 | 0,000 | 0,777 | 0,090 |
| 3 | 16 | 12 | 4 | 5 | 2 |
| | 8,09 | 7,94 | 6,93 | 7,65 | 7,65 |
| | 7,740 | 2,072 | 1,240 | 0,921 | 4,177 |
| Total | 56 | 55 | 48 | 53 | 53 |

| | Allotment of Responsibilities | Employees Capabilities | Communication | Understandiing of Strategy |
|---|---|---|---|---|
| 1 | 18 | 18 | 24 | 25 |
| | 19,51 | 19,51 | 18,45 | 19,87 |
| | 0,117 | 0,117 | 1,670 | 1,326 |
| 2 | 31 | 33 | 23 | 26 |
| | 27,54 | 27,54 | 26,04 | 28,04 |
| | 0,434 | 1,081 | 0,355 | 0,149 |
| 3 | 6 | 4 | 5 | 5 |
| | 7,94 | 7,94 | 7,51 | 8,09 |
| | 0,476 | 1,958 | 0,839 | 1,179 |
| Total | 55 | 55 | 52 | 56 |

| | Acceptance of Strategy | Leadership & Support | Adjustment of Organizational Cu | Total |
|---|---|---|---|---|
| 1 | 3 | 14 | 33 | 226 |
| | 19,87 | 18,45 | 16,32 | |
| | 14,321 | 1,073 | 17,047 | |
| 2 | 31 | 30 | 10 | 319 |
| | 28,04 | 26,04 | 23,04 | |
| | 0,312 | 0,602 | 7,377 | |
| 3 | 22 | 8 | 3 | 92 |
| | 8,09 | 7,51 | 6,64 | |
| | 23,930 | 0,032 | 1,998 | |
| Total | 56 | 52 | 46 | 637 |

Chi-Qd = 111,651; DF = 22; p-Value = 0,000

"Quality of the Strategy", "Implementation Planning", "Allotment of Responsibilities", "Employees' Capabilities", "Acceptance of Strategy" and "Leadership and Support" are considered "very well fulfilled" or "sufficiently fulfilled" in at least 65% of all answers. "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Allocation of Resources", "Communication" and "Adjustment of Organizational Culture" are perceived as "not fulfilled" or "little fulfilled" by more than 50% of all participants. The performed Chi-square hypothesis test yields a result of p = 0,000, which is lower than 0,05, and which means that differences in the answers to each success factor are therefore also statistically different.

Sub-Question 4: What are the gaps between managers' assessment on the importance of success factors on the one hand and their actual perceptions on the other hand? Gaps between the importance of each category (Q2) and the actually perceived performance in every category (Q3) are displayed in the following graph:

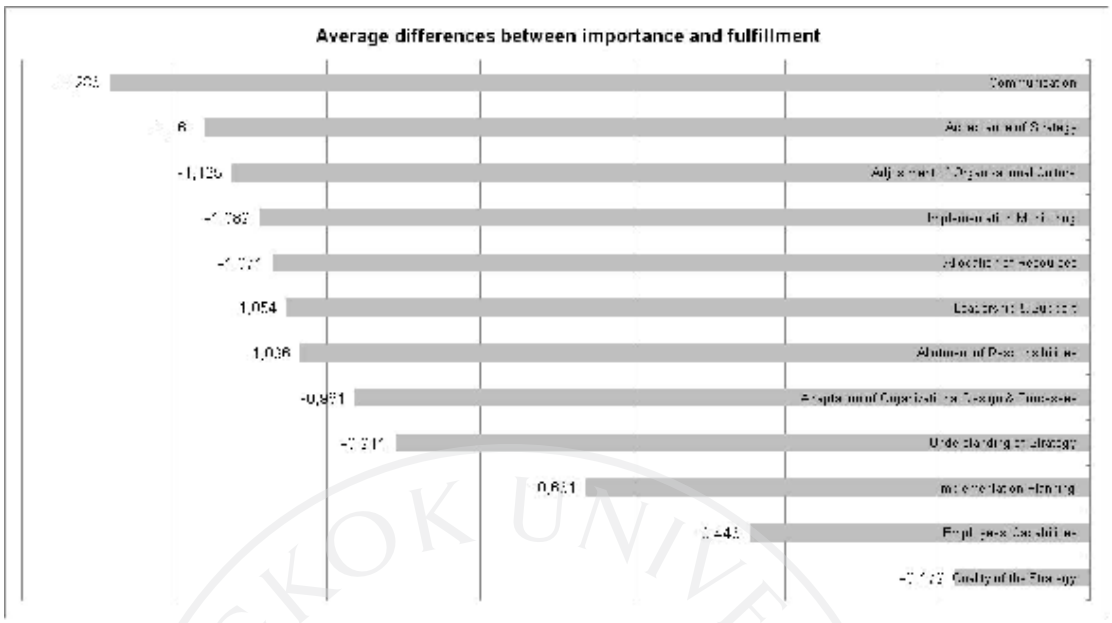


Figure 4.8: Average Differences between Importance and Fulfillment

Table 4.8: Average Differences between Importance and Fulfillment

| Categories | Quality of the Strategy | Implemen-tation Planning | Implemen-tation Monitoring | Adaptation of Organizatio-nal Design & Processes | Allocation of Resources | Allotment of Responsi-bilities | Employees' Capabilities | Communi-cation | Understan-ding of Strategy | Acceptance of Strategy | Leadership & Support | Adjustment of Organizational Culture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean differences | -0,179 | -0,661 | -1,089 | -0,964 | -1,071 | -1,036 | -0,446 | -1,286 | -0,911 | -1,161 | -1,054 | -1,125 |
| Arithmetic mean Q3 | 3,107 | 3,018 | 2,429 | 2,518 | 2,464 | 2,750 | 2,714 | 2,518 | 2,643 | 2,339 | 2,750 | 2,107 |
| Arithmetic mean Q2 | 3,286 | 3,679 | 3,518 | 3,482 | 3,536 | 3,786 | 3,161 | 3,804 | 3,554 | 3,500 | 3,804 | 3,232 |

At the success factors “Communication”, “Acceptance of Strategy”, “Adjustment of Organizational Culture”, “Implementation Monitoring”, “Allocation of Resources”, “Leadership and Support” as well as “Allotment of Responsibilities” differences between the arithmetic means of importance and fulfillment are bigger than 1. The biggest gap lies within “Communication” and the lowest within “Quality of the Strategy”.

Sub-Question 5: What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB? Existing concepts and tools are contained in section 2.2.5, pp. 45-57. Data was gathered related to the frequency of applications of the existing concepts and tools, and related to the need for more concept and tool support, through questions 4 and 5 of the questionnaire (see appendices 1 and 2):

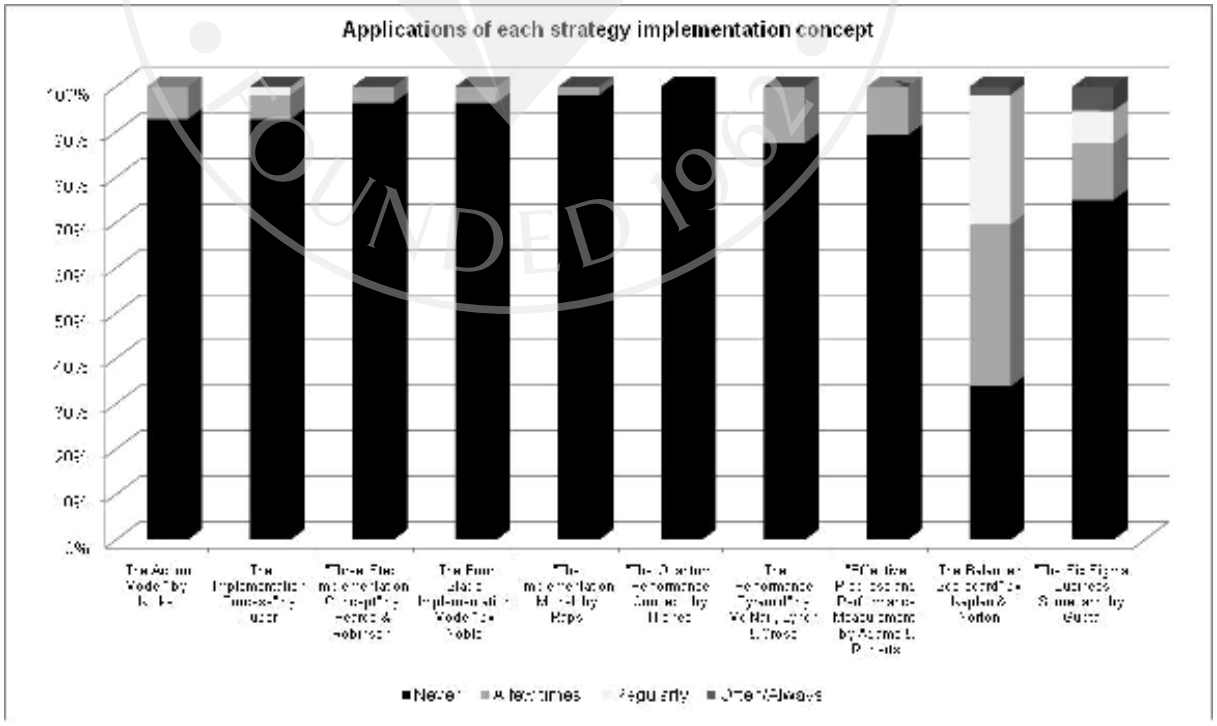


Figure 4.9: Application of Each Strategy Implementation Concept

Table 4.9: Application of Each Strategy Implementation Concept

| Categories | "The Action Model" by Kolks | "The Implementation Process" by Huber | "Three Step Implementation Concept" by Pearce & Robinson | "The Four Stage Implementation Model" by Noble | "The Implementation Model" by Raps | "The Quantum Performance Concept" by Hronec | "The Performance Pyramid" by Mc Nair, Lynch & Cross | "Effective Progress and Performance Measurement" by Adams & Roberts | "The Balanced Scorecard" by Kaplan & Norton | "The Six Sigma Business Scorecard" by Gupta |
|---|---|---|---|---|---|---|---|---|---|---|
| Never | 93% | 93% | 96% | 96% | 98% | 100% | 88% | 89% | 34% | 75% |
| A few times | 7% | 5% | 4% | 4% | 2% | 0% | 13% | 11% | 36% | 13% |
| Regularly | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% | 29% | 7% |
| Often/Always | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 5% |

All concepts, apart from “The Balanced Scorecard” by Kaplan and Norton and “The Six Sigma Business Scorecard” by Gupta, were practically “never” or only “a few times” applied as strategy implementation support. Only 2% of the participants applied “The Implementation Process” by Huber “regularly”. “The Six Sigma Business Scorecard” by Gupta was used “regularly” by 7% of the participants and “often/always” by 5%. “The Balanced Scorecard” by Kaplan and Norton was applied “a few times” by 36%, “regularly” by 29% of the participants and “often/always” by 2%.

Figure 4.10: Average Application of Each Concept

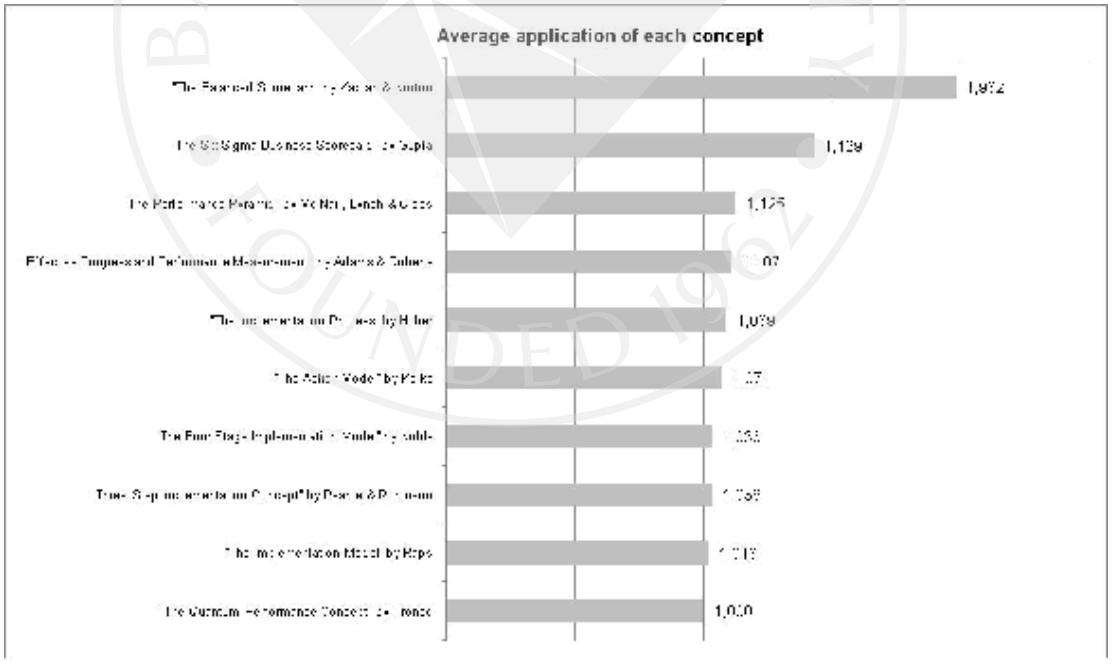

Table 4.10: Average Application of Each Concept

| Categories | "The Quantum Performance Concept" by Hronec | "The Implementation Model" by Raps | "Three Step Implementation Concept" by Pearce & Robinson | "The Four Stage Implementation Model" by Noble | "The Action Model" by Kolks | "The Implementation Process" by Huber | "Effective Progress and Performance Measurement" by Adams & Roberts | "The Performance Pyramid" by Mc Nair, Lynch & Cross | "The Six Sigma Business Scorecard" by Gupta | "The Balanced Scorecard" by Kaplan & Norton |
|---|---|---|---|---|---|---|---|---|---|---|
| Arithmetic mean | 1,000 | 1,018 | 1,036 | 1,036 | 1,071 | 1,089 | 1,107 | 1,125 | 1,429 | 1,982 |

On average “The Balanced Scorecard” by Kaplan and Norton and “The Six Sigma Business Scorecard” by Gupta were applied most frequently and significantly more often than all other concepts in question.

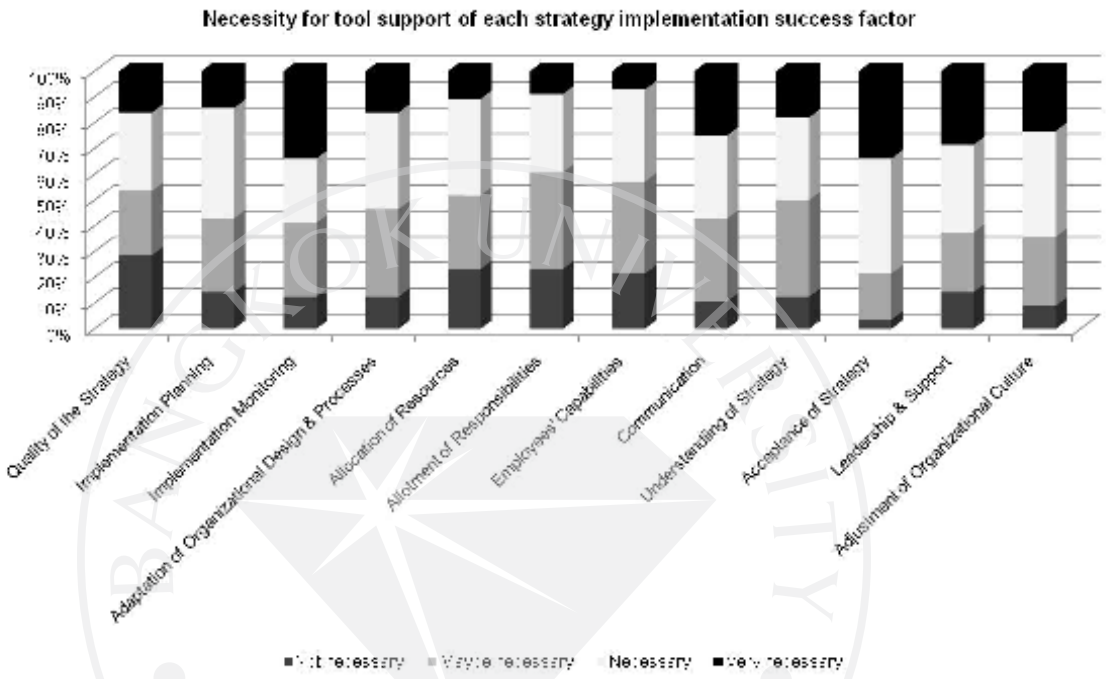


Figure 4.11: Necessity for Tool Support of Each Strategy Implementation Success Factor

Table 4.11: Necessity for Tool Support of Each Strategy Implementation Success Factor

| Categories | Quality of the Strategy | Implemen-tation Planning | Implemen-tation Monitoring | Adaptation of Organizatio-nal Design & Processes | Allocation of Resources | Allotment of Responsi-bilities | Employees' Capabilities | Communi-cation | Understan-ding of Strategy | Acceptance of Strategy | Leadership & Support | Adjustment of Organizatio-nal Culture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Not necessary | 29% | 14% | 13% | 13% | 23% | 23% | 21% | 11% | 13% | 4% | 14% | 9% |
| Maybe necessary | 25% | 29% | 29% | 34% | 29% | 38% | 36% | 32% | 38% | 18% | 23% | 27% |
| Necessary | 30% | 43% | 25% | 38% | 38% | 30% | 36% | 32% | 32% | 45% | 34% | 41% |
| Very necessary | 16% | 14% | 34% | 16% | 11% | 9% | 7% | 25% | 18% | 34% | 29% | 23% |

More than 50% of the participants found that in the fields of “Implementation Planning”, “Implementation Monitoring”, “Adaptation of Organizational Design and Processes”, “Communication”, “Understanding of Strategy”, “Acceptance of Strategy”, “Leadership and Support” and “Adjustment of Organizational Culture” more tool support is either “very necessary” or “necessary”.

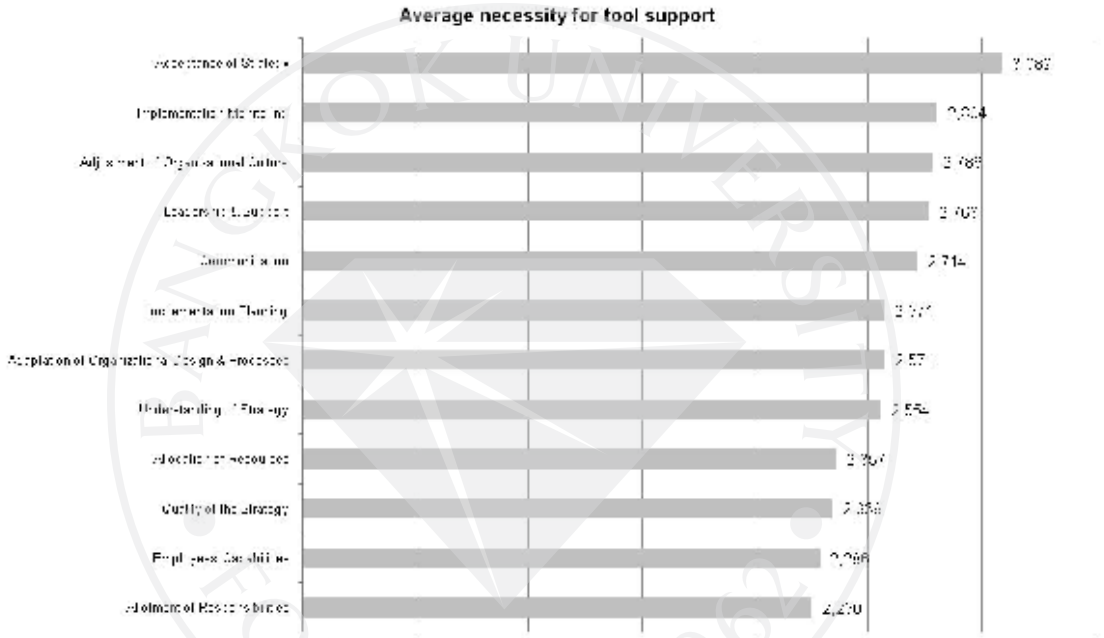


Figure 4.12: Average Necessity for Tool Support

Table 4.12: Average Necessity for Tool Support

| Categories | Allotment of Responsi-bilities | Employees' Capabilities | Quality of the Strategy | Allocation of Resources | Understan-ding of Strategy | Adaptation of Organizatio-nal Design & Processes | Implemen-tation Planning | Communi-cation | Leadership & Support | Adjustment of Organizatio-nal Culture | Implemen-tation Monitoring | Acceptance of Strategy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arithmetic mean | 2,250 | 2,286 | 2,339 | 2,357 | 2,554 | 2,571 | 2,571 | 2,714 | 2,768 | 2,786 | 2,804 | 3,089 |

On average the participants most frequently demanded tool support for "Acceptance of Strategy", "Implementation Monitoring", "Adjustment of Organizational Culture", "Leadership and Support" and "Communication".

Sub-Question 6: Can Six Sigma principles be applied in the strategy implementation process and therefore help to reduce the gaps between managers' perceptions of the importance of success factors and their actual experiences? DMAIC and TOP tools (see tables 2.3 and 2.4, pp. 64-74 and 78-84) were assessed in terms of their capability to enhance strategy implementation success factors, through the semi-structured expert opinion interview/focus group (see a sample discourse on the tool "SIPOC" in appendix 3, with the vital parts shaded) by assigning each tool to the respective success factors in the following table:

Table 4.13: Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| Quality of the Strategy | | |
| | VOC (Voice of Customer) | To define who is the customer and what does he want from the process (Pande et al., 2002, pp. 82-83) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | VOC-Translation Matrix | To translate customer comments into measurable process requirements (Pande et al., 2002, pp. 87-89) |
| | Kano-Analysis | To prioritize customer process requirements into dissatisfiers, satisfiers and delighters (Pande et al., 2002, pp. 89-91) |
| | Cause-and-Effect Analysis | To identify the cause of a problem by applying the experience and expertise of a group in a structured brainstorming (Pande et al., 2002, pp. 250-251) |
| | The Five Whys | To drill deeper into the process in order to as close as possible to root-causes of a problem (Birkmayer et al., 2008, p. 94) |
| | Idea Generation | To identify possible solutions by applying creativity techniques like brainstorming, brainwriting, anti-solution or analogy (Birkmayer et al., 2008, pp. 138-139) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Brainstorming/ Brainwriting | To find possible solutions to the process problem through the collection and clustering of ideas (Birkmayer et al., 2008, p. 138) |
| | Anti-solution | To find possible solutions to the process problem by brainstorming the opposite of the objective (Birkmayer et al., 2008, p. 139) |
| | Analogy | To find possible solutions to the process problem by brainstorming around a related or analogous issue and translating the ideas to the real situation (Birkmayer et al., 2008, p. 138) |
| | NGT - Nominal Group Technique | To screen and prioritize solutions by a weighted ranking method that allows a group to generate and prioritize a large number of issues within a structure that gives everyone an equal voice (Birkmayer et al., 2008, pp. 140-141). |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Criteria Based Matrix | To choose the most appropriate solution through the definition of key success criteria, weighing the importance of each criterion and evaluation of the solutions against every criterion (Pande et al., 2002, pp. 315-317) |
| | Impact/Effort Matrix | To make an informed decision about which solution to implement by determining for each potential solution how strong the impact will be and how much effort will be needed (Pande et al., 2002, pp. 314-315) |
| | In/Out of Frame | To visualize, if topics are within or outside the project frame (GE Capital Services, 1998, p. 8.6) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| Implementation Planning | | |
| | Project Charter | To integrate project name, business case, problem statement, goal statement, project scope, project leader, project team and milestones into one clearly arranged page (Pande et al., 2002, pp. 74-83) |
| | GRPI (Goals, Roles, Processes, Interpersonal Relationships) | To assess and plan important aspects of teamwork in the early stage of the change project (Dannenmaier, 2007, p. 24) |
| | Force Field Analysis | To identify the processes, systems, and people that will support or impede the team's efforts in successfully implementing their improvements (Dannenmaier, 2007, pp. 90-93) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Project Impact on Systems & Structures | To determine the impact the initiative has on staffing, development, measures, rewards, communications and structure to be able to identify key systems and structures that must be addressed to assure long-lasting project success (GE Capital Services, 1998, pp. 13.4-13.6) |
| | Control / Influence Cycle | To clarify on which aspects of the systems and structure analysis the team has control, influence or no control, and to define an action strategy for those aspects the team has "only" influence or no control over (GE Capital Services, 1998, p. 13.7) |
| Implementation Monitoring | | |
| | QFD - Quality Function Deployment | To define and prioritize metrics to measure customer process requirements (Pande et al., 2002, pp. 120-121) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | CTQ (Critical to Quality) – Tree | To define metric, target value, specification limits and defect definition for every chosen customer process requirement (Birkmayer et al., 2008, p. 12) |
| | Data Collection Plan | To plan the data collection by defining what data to collect and how to segment this data, by determining the operational definition and check sheets for the measurement, by identifying the sample and by analyzing the correctness of the measurement system (Birkmayer et al., 2008, p. 36) |
| | Segmentation Factors | To determine which data to collect and to split the data to be collected into smaller groups or categories (Birkmayer et al., 2008, pp. 37-39) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Operational Definition | To develop a clear, understandable description of what is to be observed and measured so that different people interpret the data and instructions consistently (Birkmayer et al., 2008, p. 37) |
| | Data Collection Sheets | To design clear, concise forms in order to reduce the risk of errors during the actual data collection (Birkmayer et al., 2008, p. 37, pp. 40-41) |
| | Sampling Strategy | To gather a subset of the total data available, because it is often too difficult and expensive to measure the whole population and to obtain a representative sample (Pande et al., 2002, pp. 142-144) |
| | MSA – Measurement System Analysis | To reduce variation of the measurement system in order to obtain reliable process data (Birkmayer et al., 2008, pp. 46-53) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | DPMO – Defects per Million Opportunities | To calculate the probability of defects per one million process runs in order to be able to calculate the process performance through the Process Sigma Value (Pande et al., 2002, pp. 177-179) |
| | Process Sigma | To obtain a Sigma value that indicates the actual process performance or capability (Pande et al., 2002, pp. 177-179) |
| | Data Visualization | To increase understanding of the data by displaying the data in e.g. Pareto- or run-charts, histograms, box- or frequency-plots (Pande et al., 2002, pp. 236-249) |
| | Segmentation & Stratification | To compare differences between groups or categories of data in order to find clues for root causes for process problems (Birkmayer et al., 2008, pp. 84-85) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Process Management Chart | To include the should-be process map, the planned monitoring activities and the response plan in one chart in order to maintain a smoothly operating process (Pande et al., 2002, pp. 362-363) |
| | Monitoring Plan | To determine what kind of data has to be collected at which point in the process, how, how frequently, when and how the data will be recorded (Birkmayer et al., 2008, p. 227) |
| | Control Chart | To monitor if a process is operating within statistical control, by checking if the process is running within the control limits or shows abnormal patterns (Pande et al., 2002, pp. 346-349) |
| | Response Plan | To specify who has to take what measures, when the process or parts of the process are out of control (Pande et al., 2002, pp. 362-363) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Process Dashboard | To monitor the most important indicators of quality, cost and effectiveness associated with the new process (Pande et al., 2002, p. 364) |
| | 30, 60, 90 Day Review | To review the change initiative on a periodical basis through questioning the change strategy, the change management, the lessons learned and the action planning (Dannenmaier, 2007, p. 94) |
| | Measurement Audit | To assess current metrics and to identify improvement opportunities underlying the needs of the current change initiative (Dannenmaier, 2007, pp. 95-100) |
| | Energy Wheel | To review the energy level the team/organization displays regarding key change aspects of the initiative (GE Capital Services, 1998, pp. 14.4-14.5) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| Adaptation of Organizational Design & Processes | | |
| | SIPOC (Supplier, Input, Process, Output, Customer) | To pin down the process under observation, by defining its 5-7 main process steps, each with its supplier, input, output and customer (Pande et al., 2002, pp. 113-117). See also appendix 3. |
| | Process Mapping | To increase understanding for problems in the process-flow by mapping the sub-processes in flow charts, alternate path maps or cross-functional deployment charts (Pande et al., 2002, pp. 261-264) |
| | Process Analysis – Nature of Work | To find out about value-added, non-value-added and value enabling process steps (Birkmayer et al., 2008, p. 88) |
| | Process Analysis – Flow of Work | To analyze the process in terms of time-related process problems (Birkmayer et al., 2008, p. 88) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Value-Time-Matrix | To link the value analysis with the time analysis of the process and to identify process steps that add cost and time without adding value for the customer (Pande et al., 2002, pp. 265-266) |
| | Cause-and-Effect Analysis | To identify the cause of a problem by applying the experience and expertise of a group in a structured brainstorming (Pande et al., 2002, pp. 250-251) |
| | The Five Whys | To drill deeper into the process in order to as close as possible to root-causes of a problem (Birkmayer et al., 2008, p. 94) |
| | Control/Impact Matrix | To identify which of the segmentation factors have an impact on the process (problem) and which of them are in control of the project team (Birkmayer et al., 2008, pp. 96-97) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Correlation/Regression Analysis | To test if segmentation factors have a statistically significant impact on a customer process requirement (Pande et al., 2002, pp. 274-276) |
| | Hypothesis Testing | To test if differences in data groups or segments are statistically significant (Pande et al., 2002, pp. 270-274) |
| | DOE – Design of Experiments | To explore the cause and effect relationship between numerous process variables and the customer process requirements and to find out about the most suitable combination of the variables for the desired solution (Birkmayer et al., 2008, pp. 142-144) |
| | Error Proofing | To optimize the should-be process/solution in a way that the occurrence of errors becomes less likely or impossible (Birkmayer et al., 2008, p. 147) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | FMEA – Failure Modes and Effects Analysis | To anticipate problems in the should-be process/solution to be able to take actions to counteract them and to reduce or eliminate risks (Pande et al., 2002, pp. 326-328) |
| | Pilot | To test a proposed solution on a small scale in order to better understand its effects and to learn about how to make a full scale implementation more effective (Pande et al., 2002, pp. 319-322) |
| | Process Management Chart | To include the should-be process map, the planned monitoring activities and the response plan in one chart in order to maintain a smoothly operating process (Pande et al., 2002, pp. 362-363) |
| | Should-be Process Map | To visualize the process steps of the new process and who is performing them when (Pande et al., 2002, p. 362) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Monitoring Plan | To determine what kind of data has to be collected at which point in the process, how, how frequently, when and how the data will be recorded (Birkmayer et al., 2008, p. 227) |
| | Control Chart | To monitor if a process is operating within statistical control, by checking if the process is running within the control limits or shows abnormal patterns (Pande et al., 2002, pp. 346-349) |
| | Response Plan | To specify who has to take what measures, when the process or parts of the process are out of control (Pande et al., 2002, pp. 362-363) |
| | Process Dashboard | To monitor the most important indicators of quality, cost and effectiveness associated with the new process (Pande et al., 2002, p. 364) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| Allocation of Resources | | |
| Allotment of Responsibilities | | |
| | RASIC (Responsible, Approve, Supports, Informed, Consulted) | To analyze, design or re-design responsibilities and authorities for specific tasks, decisions or process steps during the initiative (Dannenmaier, 2007, pp. 105-110) |
| Employees' Capabilities | | |
| Communication | | |
| | Elevator Speech | To be able to clearly and simply state the need for change and describe the future state in 90 seconds for rallying the support and commitment of key constituents (GE Capital Services, 1998, p. 12.8) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Communication Strategy / Plan | To identify the audience for and the content of the messages that needs to be communicated, to determine the objective of the communication, to consider the best channel for communicating and to plan the necessary actions (Dannenmaier, 2007, pp. 118-126) |
| Understanding of Strategy | | |
| | SIPOC (Supplier, Input, Process, Output, Customer) | To pin down the process under observation, by defining its 5-7 main process steps, each with its supplier, input, output and customer (Pande et al., 2002, pp. 113-117). See also appendix 3. |
| | Should-be Process Map | To visualize the process steps of the new process and who is performing them when (Pande et al., 2002, p. 362) |
| | 15-Word Flipchart | To develop a 15-word statement project definition in order to clarify the project content (GE Capital Services, 1998, p. 8.7) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Elevator Speech | To be able to clearly and simply state the need for change and describe the future state in 90 seconds for rallying the support and commitment of key constituents (GE Capital Services, 1998, p. 12.8) |
| Acceptance of Strategy | | |
| | Threat/ Opportunity Matrix | To frame the need for change as a combination of threats and opportunities over the short- and long-term (GE Capital Services, 1998, p.9.6) |
| | Three D's Matrix | To build a strategy for communicating the need for change through demand, data and demonstration (GE Capital Services, 1998, p. 9.7) |
| | Business Need / Vulnerability Assessment | To create a "case for change" by answering the questions what impact it had, if the organization would/would not change in terms of its culture, strategy and goals (Dannenmaier, 2007, pp. 59-63) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Need alignment test | To get a team consensus on the need for change (GE Capital Services, 1998, p. 9.11) |
| | Backwards Imaging | To create a picture of the future state that is expressed in behavioral terms to be able to uncover both support and resistance to this state (GE Capital Services, 1998, p. 12.5) |
| | More of / Less of | To spell out the vision of the future state in behavioral terms by listing what is expected to see more of and less of in order to reach the future state (GE Capital Services, 1998, p. 12.6) |
| | Bull's Eye Chart | To state a vision in actionable terms by formulating the necessary mindset and behavior to reach the vision (GE Capital Services, 1998, p. 12.6) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Key Constituents Map | To identify and label key constituent groups who will be impacted by the change initiative to be able to estimate their relative interest/involvement in the change effort (GE Capital Services, 1998, p. 10.4) |
| | Attitude Charting | To develops a graphic representation of the attitudes toward the change initiative (GE Capital Services, 1998, p. 10.4) |
| | Stakeholder Analysis | To develop a detailed sense of who the key stakeholders are, how they currently feel about the change initiative and the level of support they need to exhibit for the change initiative to have a good chance for success (GE Capital Services, 1998, p. 10.6) |
| | TPC-Analysis (Technical, Political, Cultural) | To identify, label and understand sources of resistance as either technical, political or cultural (GE Capital Services, 1998, p. 10.7) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| | Influencing strategy | To build an effective strategy for influencing the stakeholders to strengthen, or at a minimum, maintain their level of support (GE Capital Services, 1998, p. 10.8) |
| | Force Field Analysis | To identify the processes, systems, and people that will support or impede the team's efforts in successfully implementing their improvements (Dannenmaier, 2007, pp. 90-93) |
| Leadership & Support | | |
| | Calendar Test | To stimulate awareness for time spent on change issues/management (GE Capital Services, 1998, p. 15.5) |
| | TOP Personal Audit | To self-assess one's current capacity to exhibit specific competencies in each of the six TOP elements (GE Capital Services, 1998, pp. 15.6-15.9) |

(Continued)

Table 4.13 (Continued): Allocation of DMAIC and TOP Concepts and Tools to Strategy Implementation Success Factors

| Success Factor | DMAIC & TOP Tools | Use |
|---|---|---|
| Adjustment of Organizational Culture | | |
| | TOP Profile | To help the team to assess current habits and approaches relative to how well the organization focuses on each of the six TOP elements leading the change, creating a shared need, shaping a common vision, mobilizing stakeholders, reflecting for sustainability, adapting systems and structures (GE Capital Services, 1998, p. 7.6) |

According to the Six Sigma and strategy implementation experts questioned in the focus group session, Six Sigma provides concept and tool support for the success factors “Quality of the Strategy”, “Implementation Planning”, “Implementation Monitoring”, “Adaptation of Organizational Design and Processes”, “Acceptance of Strategy”, “Allotment of Responsibilities”, “Communication”, “Understanding of Strategy”, “Leadership and Support” and “Adjustment of Organizational Culture”. Six Sigma delivers support especially for the success factors

"Quality of the Strategy", "Implementation Planning", "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Acceptance of Strategy", as for each of these factors there are a great number of tools available for disposition to use in the best fit situation. For the success factors "Allocation of Resources" and "Employees' Capabilities" no concept and tool support is available through Six Sigma.

Sub-question 7: Can Six Sigma as a process management concept support the achievement of strategic (implementation) goals? Question 6 of the questionnaire addressed the general aspect, if organizations with process mindset are more likely implementing new strategies successfully, than organizations with a departmental orientation (see appendices 1 and 2):

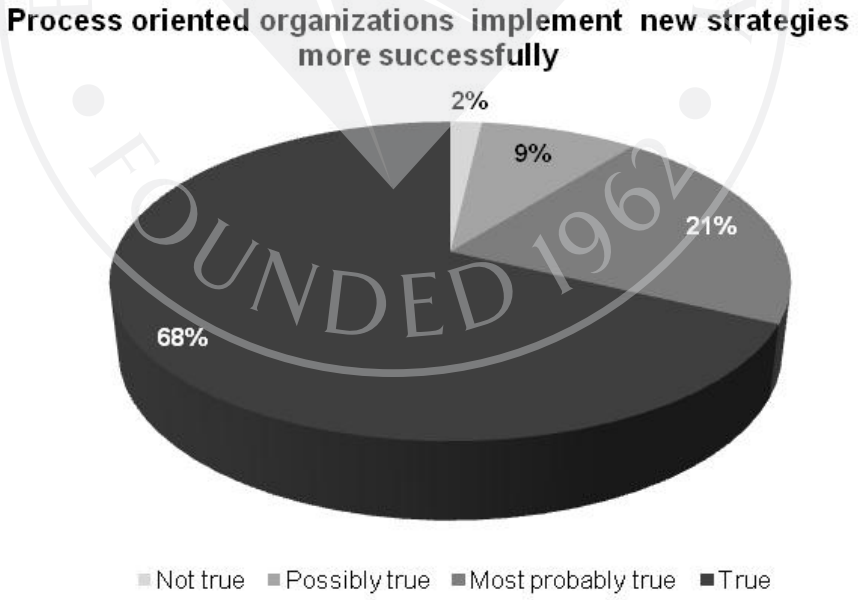


Figure 4.13: Process Oriented Organizations Implement New Strategies More Successfully

Table 4.14: Process Oriented Organizations Implement New Strategies More Successfully

| Categories | Number of answers | Percentage of answers |
|---|---|---|
| Not true | 1 | 2% |
| Possibly true | 5 | 9% |
| Most probably true | 12 | 21% |
| True | 38 | 68% |

Almost 90% of the participants found that the statement is either “true” or “most probably true”.

4.3 Data Presentation – Conclusion

Empirical data for this study was collected through a questionnaire and a semi-structured/focus group interview. The so gathered raw data was presented in chapter 4 by thematically linking the results of the data collection to the respective research sub-questions.

In the following chapter 5 the collected data is analyzed and interpreted in terms of what outcomes from chapter 4 where expected related to the literature findings and what new, unexpected outcomes are found.

# CHAPTER 5

# ANALYSIS OF THE STUDY

In the following chapter the results gathered from the empirical research, which are presented in chapter 4, are analyzed and interpreted.

## 5.1 Analysis of the Study – Introduction

The basis for this study forms a literature review and an empirical evaluation consisting of data which is collected through a questionnaire and a semi-structured interview.

In the following section the results of the empirical research are interpreted based on the findings from the literature review. In this way the research outcome is investigated in terms of what results are expected and what new or unexpected results the data yields. Results and interpretations are directly linked to the respective research sub-questions.

## 5.2 Analysis of the Study – Discussion

Sub-question 1 (questionnaire question1): What are the success rates of strategy implementations? The empirical data from question 1 of the questionnaire (see appendices 1 and 2) yields a results where around 27% of the participants state that strategy implementations were successful between 76-90% and 4% between 91-100% (see section 4.2, p. 131). It can be concluded that only 31% percent of the participants observed successful implementations, at least at a rate higher than 75%. This goes along with the findings from the literature, where successful implementations are estimated between 10 and 40% of the observed cases (see section 2.2.2, pp. 14-15).

Findings sub-question 1: Both empirical data and literature sources confirm that strategy implementation success rates are low at an approximate rate of around 25 to 30%.

Sub-question 2 (questionnaire question 2): Which problem areas exist, how often do they occur and which success factors do managers and decision-makers of clients of IBB assess as important for strategy implementation? The survey has confirmed the importance of all twelve strategy implementation problem areas/success factors (see section 4.2, pp. 131-175), which were derived from the literature (see section 2.2.3, pp. 15-29), as each of the defined strategy implementation success factors is perceived as either "very important" or "important" by more than 80% of the survey participants. In the literature five factors are considered especially problematic, which are "Implementation Planning", "Allocation of Resources", "Employees' Capabilities", "Implementation Monitoring" and "Leadership and Support" (see section 2.2.3, pp. 15-29). Answers from the questionnaire have shown that "Implementation Planning", "Implementation Monitoring", "Allotment of Responsibilities", "Communication", "Understanding of Strategy", "Acceptance of Strategy" and "Leadership and Support" are considered "very important" (see section 4.2, pp. 131-175).

Findings sub-question 2: All twelve strategy implementation success factors are considered important in both the literature as well as in the survey. Both sources equally consider "Implementation Planning", "Implementation Monitoring" and "Leadership and Support" as especially notable for implementation success. In addition, "Allocation of Resources", "Employees' Capabilities", "Allotment of

Responsibilities" and "Communication" are assessed similarly important either in the literature or in the survey.

Sub-Question 3 (questionnaire question 3): What is their actual perception of strategy implementations in terms of the realization of the different success factors? Survey results show that "Quality of the Strategy", "Implementation Planning", "Allotment of Responsibilities", "Employees' Capabilities", "Acceptance of Strategy" and "Leadership and Support" are "very well" or at least "sufficiently fulfilled" in the majority of the strategy implementation cases, and that "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Allocation of Resources", "Communication" and "Adjustment of Organizational Culture" are "not" or "little fulfilled" in the majority of the cases (see section 4.2, pp. 131-175). Findings from the literature show that most problematic and therefore least fulfilled factors are "Implementation Planning", "Allocation of Resources", "Employees' Capabilities", "Implementation Monitoring" and "Leadership and Support" (see section 2.2.3, pp. 15-29).

Findings sub-question 3: Comparing the top five problem areas from the survey and the literature it can be seen that the two factors "Implementation Monitoring" and "Allocation of Resources" are in both sources considered as "not" or "not sufficiently fulfilled". The factors "Adaptation of Organizational Design and Processes", "Communication", "Adjustment of Organizational Culture", "Implementation Planning", "Employees' Capabilities" and "Leadership and Support" are not satisfactorily fulfilled either in the survey or in the literature.

Sub-Question 4 (questionnaire questions 2 and 3): What are the gaps between managers' assessment on the importance of success factors on the one hand and their actual perceptions on the other hand? In order to answer sub-question 4 the survey results for importance and fulfillment are combined by taking average differences in order to find out about the biggest gaps. This analysis shows the biggest gaps at "Implementation Planning", "Implementation Monitoring", "Allotment of Responsibilities", "Communication", "Understanding of Strategy", "Acceptance of Strategy" and "Leadership and Support" (see section 4.2, pp. 131-175). Comparing this gap analysis with the five most problematical strategy implementation factors from the literature (see section 2.2.3, pp. 15-29), it can be observed that three out of the top five factors from the literature are also among the top 6 factors, with biggest gaps between importance and fulfillment. These three factors are "Implementation Monitoring", "Allocation of Resources" and "Leadership and Support". The gap analysis for the other two from the top five problem factors drawn from the literature "Implementation Planning" and "Employees Capabilities" does only show insignificant gaps between importance and fulfillment. On the other hand the top three factors from the gap analysis "Communication", "Acceptance of Strategy" and "Adjustment of Organizational Culture" are not reflected in the most problematic factors in the literature.

Findings sub-question 4: The synopsis of the gap analysis between importance and fulfillment on the one hand and the analysis of the most problematic factors from the literature shows accordance for three strategy implementation factors namely "Implementation Monitoring", "Allocation of Resources" and "Leadership and Support".

Sub-Question 5 (questionnaire questions 4 and 5): What strategy implementation concepts and tools exist and are already being applied by managers and decision-makers of clients of IBB? Existing concepts and tools contained in the literature are described in section 2.2.5, pp. 45-57 and 2.3.3, pp. 85-88. These concepts and tools yield support for all twelve strategy implementation success factors and therefore were evaluated in terms of their frequency of application during strategy implementation. The results of this evaluation show that only "The Balanced Scorecard" by Kaplan and Norton and "The Six Sigma Business Scorecard" by Gupta were applied frequently. Both tools are especially helpful as performance management tools for "Implementation Monitoring" (see sections 2.2.5, pp. 45-57 and 2.3.3, pp. 85-88). The use of all other concepts and tools was insignificant. Additionally more than 50% of the participants stated that more tool support is either "necessary" or "very necessary" in the fields of "Implementation Planning", "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Communication", "Understanding of Strategy", "Acceptance of Strategy", "Leadership and Support" and "Adjustment of Organizational Culture".

Findings sub-question 5: Survey results show that "The Balanced Scorecard" and "The Six Sigma Business Scorecard" are the only concepts/tools from the literature that are frequently used to support strategy implementation. At the same time more concept and tool support is demanded especially for "Implementation Planning", "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Communication", "Understanding of Strategy", "Acceptance of Strategy", "Leadership and Support" and "Adjustment of Organizational Culture". It

follows that theoretical/methodical support is available as well as desired but at the same time these literature sources are not exploited.

Sub-Question 6 (questionnaire question 4): Can Six Sigma principles be applied in the strategy implementation process and therefore help to reduce the gaps between managers' perceptions of the importance of success factors and their actual experiences? Results of the semi-structured expert opinion interviews show that Six Sigma provides tool support for ten out of the twelve success factors, namely "Quality of the Strategy", "Implementation Planning", "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Acceptance of Strategy", "Allotment of Responsibilities", "Communication", "Understanding of Strategy", "Leadership and Support" and "Adjustment of Organizational Culture". Six Sigma shows special strength through the tool support for the factors "Quality of the Strategy", "Implementation Planning", "Implementation Monitoring", "Adaptation of Organizational Design and Processes", "Acceptance of Strategy" (see section 4.2, pp. 131-175). In the literature review the "Six Sigma Business Scorecard" was the only identified Six Sigma concept/tool that can support business strategy implementation and is designed to support "Implementation Monitoring" (see section 2.3.3, pp. 85-88). The gap analysis showed the biggest gaps at "Implementation Planning", "Implementation Monitoring", "Allotment of Responsibilities", "Communication", "Understanding of Strategy", "Acceptance of Strategy" and "Leadership and Support" (see section 4.2, pp. 131-175). Six Sigma provides support for all these factors, where differences between importance and fulfillment are biggest.

Findings sub-question 6: Six Sigma offers tool support for ten out of twelve strategy implementation success factors. The "Six Sigma Business Scorecard" is

designed to be used for “Implementation Monitoring” and is the only tool from the literature that directly links Six Sigma and business strategy implementation. Biggest gaps between importance and fulfillment were identified for the factors “Implementation Planning”, “Implementation Monitoring”, “Allotment of Responsibilities”, “Communication”, “Understanding of Strategy”, “Acceptance of Strategy” and “Leadership and Support”. Six Sigma is able to support and reduce the gaps through the tool delivery for all these factors with special strength at the factors “Implementation Planning”, “Implementation Monitoring” and “Acceptance of Strategy”. The results of the expert opinion interview are also backing up the quantitative analysis in the sense that they confirm the ability of Six Sigma tools to enhance success factors, which have been considered important and not satisfactorily fulfilled by the participants.

Sub-question 7 (questionnaire question 6): Can Six Sigma as a process management concept support the achievement of strategic (implementation) goals? Around 90% of the participants found that the statement “Process oriented organizations implement new strategies more successfully” is either “true” or “most probably true”. From the literature it can be learned that businesses, which are applying Six Sigma as a company-wide comprehensive process management and improvement methodology, show such strong process orientation (see section 2.3.4, pp. 88-90). Moreover literature sources emphasize that organizations with a Six Sigma process mindset are more effective and faster in executing new strategies (see section 2.3.4, p. 88).

Findings sub-question 7: Both literature and survey yield identical findings for this sub-question. Process oriented businesses are implementing new strategies more

successfully, effectively and faster. Companies which apply Six Sigma as a company-wide process management and improvement methodology are considered to be such process oriented businesses.

## 5.3 Analysis of the Study – Conclusion

The comparison of the findings from the survey and the results of the literature review show a great deal of congruence.

Strategy implementation success rates are similarly evaluated, all problem areas/success factors are equally important in both sources, the results of the fulfillment of the problem areas/success factors are very much overlapping, gap analysis from the survey and most problematic factors from the literature show accordance for three crucial factors, and both sources equally concede that process oriented organization are more likely successful in strategy implementations. Strategy implementation concept and tool support is available in the literature but are only rarely applied in practice. From expert opinions it can be drawn that Six Sigma can substantially enhance “important” and “not satisfactorily fulfilled” success factors.

In the following and last chapter findings of this study are summarized in order to answer the major research problem, possible implications and recommendations are discussed, and lessons learned from the study are specified.

# CHAPTER 6

# IMPLICATIONS AND RECOMMENDATIONS

This last chapter contains the implications and recommendations formed on the basis of the results of this study.

## 6.1 Implications and Recommendations – Introduction

The summary of the findings from chapter 5 leads to the answering of the major research problem. On this foundation implications and recommendations are developed. Limitations and lessons learned conclude chapter 6.

## 6.2 Implications and Recommendations – Discussion

### 6.2.1 Research Findings and Major Research Problem

In order to answer the major research problem – Can Six Sigma principles contribute to more successful business strategy implementations? –, which forms the origin of this study, the research findings from section 5.2 (pp. 176-183) are summarized. To support this summary the results of the semi-structured interview and the survey regarding the problem areas/success factors are visualized in the following table.

Table 6.1: Problem Areas/Success Factors in Relation to Results from Semi-structured Interview and Survey

| Problem areas/ success factors | Six Sigma tool support available according to semi-structured interview | Most important factors according to survey | Least fulfilled factors according to survey | Most problematic/important as well as least fulfilled factors according to literature | Factors, where more tool support is demanded by participants of survey | Factors with biggest gaps between importance and fulfillment according to survey |
|---|---|---|---|---|---|---|
| Quality of the Strategy | X | | | | | |
| Implementation Planning | X | X | | X | X | X |
| Implementation Monitoring | X | X | X | X | X | X |
| Adaptation of Organizational Design & Processes | X | | X | | X | |
| Allocation of Resources | | | X | X | | |
| Allotment of Responsibilities | X | X | | | | X |
| Employees' Capabilities | | | | X | | |
| Communication | X | X | X | | X | X |
| Understanding of Strategy | X | X | | | X | X |
| Acceptance of Strategy | X | X | | | X | X |
| Leadership & Support | X | X | | X | X | X |
| Adjustment of Organizational Culture | X | | X | | X | |

The research findings, based on the answering of the research sub-questions in section 5.2 (pp. 176-183), are summarized in the following 10 statements:

1. Strategy implementation success rates are low at an approximate rate of around 25 to 30%.

2. 12 strategy implementation problem areas/success factors exist (see table 6.1, first column) and all are considered important in both the literature as well as in the survey.

3. Six Sigma provides tools for 10 of these 12 factors (see table 6.1, second column).

4. Six Sigma offers tool support (see table 6.1, second column) for all strategy implementation success factors considered as most important in the survey (see table 6.1, third column).

5. Six Sigma provides tool assistance (see table 6.1, second column) for 4 of the 5 strategy implementation success factors considered as least fulfilled in the survey (see table 6.1, fourth column).

6. Six Sigma delivers enhancements tools (see table 6.1, second column) for 3 of the 5 strategy implementation success factors considered as most problematic/ important as well as least fulfilled according to the literature (see table 6.1, fifth column).

7. Six Sigma allocates tools (see table 6.1, second column) to all 8 factors where more tool support is demanded by the participants of the survey (see table 6.1, sixth column).

8. Six Sigma supplies improvement tools (see table 6.1, second column) for all 7 strategy implementation success factors, which, according to the survey, show the biggest gaps between importance and fulfillment (see table 6.1, seventh column).

9. Generally, not only Six Sigma, concept and tool support is available for all twelve strategy implementation success factors, but only two performance management tools (suited for “Implementation Monitoring”), namely “The Balanced

Scorecard" by Kaplan and Norton and "The Six Sigma Business Scorecard" by Gupta, were frequently applied according to the survey participants.

10. Companies which apply Six Sigma as a company-wide process management and improvement methodology are implementing new strategies more successfully, efficiently and faster.

Major research problem: Can Six Sigma principles contribute to more successful business strategy implementations? Based on the above summary of the findings of this research it is concluded that Six Sigma can contribute to more successful business strategy implementations in two ways.

First Six Sigma can be directly applied in the strategy implementation process to enhance the handling of strategy implementation success factors, as Six Sigma provides tools for the most important as well as the least fulfilled of these factors. It furthermore offers tools for those factors, where more tool support is demanded as well as for those, where the gaps between importance and fulfillment are biggest.

Second Six Sigma can indirectly be a means for a better achievement of strategic goals and for better strategy implementations respectively. This advantage refers to organizations, which use Six Sigma as a process management and improvement methodology or moreover as a management philosophy, because such organizations are able to implement new strategies more successfully, efficiently and faster.

### 6.2.2 Implications and Recommendations

The following section describes what the above research findings imply both for IBB and its clients and what recommendations can be drawn.

The intention and reason why IBB initiated this research project was that the company wants to further develop and improve its consulting approach for a sustainable strategy implementation, in order to secure client satisfaction, revenue base and market share (see sections 1.1, 1.2, 1.3, 1.4 pp. 1-3). The basic idea was to further improve its strategy implementation consulting expertise especially by enriching it with principles from its second core competence Six Sigma (see sections 1.1, 1.2, 1.3, 1.4 pp. 1-3).

The study confirms that IBB's clients are facing considerable problems during strategy implementation and that these problems can be attributed to twelve specific success factors. With this knowledge IBB should always proactively address and incorporate these factors during strategy implementation projects in order to minimize the risk for unsuccessful implementations. Alone the fact of addressing these topics can help to increase awareness for possible obstacles or to avoid them from the beginning.

The study also shows that substantial strategy implementation concept and tool support is available for all twelve success factors both from the non-Six Sigma and Six Sigma world, but at the same time customers apply only very few tools during the actual implementation process. During strategy implementations IBB therefore should always apply or strongly recommend the application of these concepts and tools. In doing so special attention should be laid on those factors, which are considered either most problematic/important or least fulfilled, for which more tool support is demanded by customers, and where gaps between importance and fulfillment are biggest. The use of the best fitting concept or tool should be based on the specific customer situation.

From the research findings it also can be inverted that Six Sigma as a process management and improvement methodology can foster successful business strategy implementations through a clearer process mindset and therefore a quicker response to necessary changes of a company's processes due to new strategies. Even if clients are only interested in Six Sigma as a process management and improvement methodology, IBB should point out this additional value of Six Sigma, because this might deliver a supplemental argument when it comes to the decision to implement Six Sigma.

Overall it can be concluded that the intentions for the study are met, as the results can clearly help IBB to improve on its strategy implementation expertise. This fact may not only secure but increase IBBs client satisfaction through more successful strategy implementation projects. It also may increase revenue base and market share through more successful sales activities. The rationale behind this lies in the fact that with the knowledge gained through this research, IBB is able to combine its core competencies strategy development/formulation/implementation with Six Sigma. This should attract new clients who are in need of both competencies and who want to buy them from one single provider. Moreover it should open up new cross selling opportunities. On the one hand clients who so far only relied on IBB's strategy implementation expertise might get interested in applying Six Sigma as a process management methodology after successfully utilizing some Six Sigma tools during strategy implementations. On the other hand Six Sigma users might get interested to apply the methodology in a new field like strategy implementation. IBB shall intensively use this newly gained expertise during acquisitions, tenders or proposals.

### 6.2.3 Limitations

In terms of the generalizability of its outcomes this research project is limited in three specific ways.

First the findings obtained through the literature review are only based on those literature sources, which were available or accessible to the student. Even though numerous different sources were searched, these sources cannot be proclaimed as all-encompassing and more literature with more different aspects to the research topic at hand might exist. To increase the reliability of the literature review it would be essential to scan more sources outside the access field of the student.

Second the research population for the survey was limited to managers and decision makers of clients of IBB. Therefore survey results might have varied using a different or extended population. One reason for a possible bias is that almost 90% of the respondents already know and/or already work with Six Sigma, which might influence their assessment of the questionnaire questions. Secondly the sector distribution of the respondents also might bias the research outcome as there are only two sectors, which are well represented namely financial services with 27% and life science & health care with 20%. All other sectors are more or less underrepresented in the respondent population. Generally the survey results therefore can only be referred back to the specific research population. The transfer of the results within the population has to be done with carefulness, as findings might not be similarly effective for each customer group (Six Sigma or strategy clients) or for each sector (financial services, food and beverages, life science and health care or others). Validity of the results for other organizations or businesses might be possible but cannot be securely assumed. To be able to extend the validity of the survey results it

would be inevitable to include more participants in general, more participants from strategy clients as well as more participants from different sectors.

Third the research population of the semi-structured focus group interview only consisted of three experts in strategy implementation and Six Sigma, due to the fact that more experts in both fields were not available for this study. Although these experts can look back on years of professional expertise in the two fields, the findings from the interview cannot be generalized. In order to reach prevalence of these findings it would be necessary to find and question more such experts.

### 6.2.4 Lessons Learned

The underlying study has taught mainly two lessons.

The first lessons is that the securing of validity in general, in the case of this study especially face validity as well as validity of the translations from English to German, is crucial in order to make sure that the measures applied in a study really measure what they are supposed to. Validity therefore should always be one of the main focuses, when it comes to determining and evaluating a research methodology.

The second lesson learned is not to underestimate the difficulty to investigate a phenomenon for which hardly any literature or practical experience exists. It is fundamental to develop a clear plan, how to deal with such a situation and especially how to obtain the necessary empirical data.

### 6.2.5 Possible Future Research

This research project can be used as a basis for further research.

A starting point can be the comparison of the results between strategy and Six Sigma clients on the one hand and between clients from the different sectors on the

other hand. This may help to get more specific information on the different customers and their experience in strategy implementation and to customize consulting services.

Further limitations of the study are encompassing the research population. To get even more significant results, IBB could extend the research population to more participants in general, more participants from strategy clients as well as more participants from different sectors.

In order to increase the general validity the research should be carried out outside IBB's customer base. Depending on the resources additional sectors as well as more organizations with and without Six Sigma experience even in different regions can be explored. The United States and the United Kingdom might be of special interest as they are countries, where many organizations have adopted the Six Sigma methodology very early and have long-term experience with its application.

Another additional research focus can be laid on organizations with actual experience on the application of Six Sigma as a strategy implementation improvement methodology, as such companies were not among the participants of the actual study. This would yield empirical data on real-life application of Six Sigma in this field. Researchers have to keep in mind that significant resources would have to be dedicated to find such organizations, as they seem to be very rare if not non-existing.

In terms of the application of additional research methodology, researchers should lead qualitative interviews supplemental to surveys, in order to get more specific and detailed first-hand information on the topic. Further focus-groups interviews could also deliver more particular insight into the applicability of Six Sigma during strategy implementations.

## 6.3 Implications and Recommendations – Conclusion

The study has accomplished its objective to deliver answers to the research questions posed on the foundation of its pre-defined research intentions. Nevertheless the limitations in terms of the generalizability of the outcomes have to be kept in mind. The study not only provides IBB with valuable information to develop its consulting expertise, but also offers any interested reader a comprehensive overview of the topics strategy implementation and Six Sigma, paired with specific empirical evidence. Moreover the study can also be used as a starting point for further research in these fields.

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## APPENDIX 1 – Questionnaire in English

**Survey Questions**

**Q1**

How many percent of the strategy implementations or implementations of strategic decisions, you have been involved as decision-maker or implementer, have been successful?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 0-25% | 26-50% | 51-75% | 76-90% | 91-100% |

**Q2**

Success factors for strategy implementation can be consolidated into twelve categories. Please indicate how important each of this category is for a successful implementation from your point of view:

| | Not important | Little important | important | Very important |
|---|---|---|---|---|
| Quality of the strategy | 1 | 2 | 3 | 4 |
| Implementation Planning | 1 | 2 | 3 | 4 |
| Implementation Monitoring | 1 | 2 | 3 | 4 |
| Adaptation of Organizational Design & Processes | 1 | 2 | 3 | 4 |
| Allocation of Resources | 1 | 2 | 3 | 4 |
| Allotment of Responsibilities | 1 | 2 | 3 | 4 |
| Employees' Capabilities | 1 | 2 | 3 | 4 |
| Communication | 1 | 2 | 3 | 4 |
| Understanding of Strategy | 1 | 2 | 3 | 4 |
| Acceptance of Strategy | 1 | 2 | 3 | 4 |
| Leadership & Support | 1 | 2 | 3 | 4 |
| Adjustment of Organizational Culture | 1 | 2 | 3 | 4 |

**Q3**

Please specify how well each success factor has been fulfilled during strategy implementations you were involved:

| | Not fulfilled | Little fulfilled | Sufficiently fulfilled | Very well fulfilled |
|---|---|---|---|---|
| Quality of the strategy | 1 | 2 | 3 | 4 |
| Implementation Planning | 1 | 2 | 3 | 4 |
| Implementation Monitoring | 1 | 2 | 3 | 4 |
| Adaptation of Organizational Design & Processes | 1 | 2 | 3 | 4 |
| Allocation of Resources | 1 | 2 | 3 | 4 |
| Allotment of Responsibilities | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| mployees' Capabilities | 1 | 2 | 3 | 4 |
| Communication | 1 | 2 | 3 | 4 |
| Understanding of Strategy | 1 | 2 | 3 | 4 |
| Acceptance of Strategy | 1 | 2 | 3 | 4 |
| Leadership & Support | 1 | 2 | 3 | 4 |
| Adjustment of Organizational Culture | 1 | 2 | 3 | 4 |

**Q4**

Please state which of the following strategy implementation concepts or tools have been applied during strategy implementations you were involved:

| | Never | A few times | Regularly | Often/Always |
|---|---|---|---|---|
| "The Action Model" by Kolks | 1 | 2 | 3 | 4 |
| "The Implementation Process" by Huber | 1 | 2 | 3 | 4 |
| "Three Step Implementation Concept" by Pearce & Robinson | 1 | 2 | 3 | 4 |
| "The Four Stage Implementation Model" by Noble | 1 | 2 | 3 | 4 |
| "The Implementation Model" by Raps | 1 | 2 | 3 | 4 |
| "The Quantum Performance Concept" by Hronec | 1 | 2 | 3 | 4 |
| "The Performance Pyramid" by Mc Nair, Lynch & Cross | 1 | 2 | 3 | 4 |
| "Effective Progress and Performance Measurement" by Adams & Roberts | 1 | 2 | 3 | 4 |
| "The Balanced Scorecard" by Kaplan & Norton | 1 | 2 | 3 | 4 |
| "The Six Sigma Business Scorecard" by Gupta | 1 | 2 | 3 | 4 |
| Others:_____ | 1 | 2 | 3 | 4 |
| Others:_____ | 1 | 2 | 3 | 4 |
| Others:_____ | 1 | 2 | 3 | 4 |

**Q5**

Please assess for which of the success factors for strategy implementation more concept and tool support would be necessary:

| | Not necessary | Maybe necessary | necessary | Very necessary |
|---|---|---|---|---|
| Quality of the strategy | 1 | 2 | 3 | 4 |
| Implementation Planning | 1 | 2 | 3 | 4 |
| Implementation Monitoring | 1 | 2 | 3 | 4 |
| Adaptation of Organizational Design & Processes | 1 | 2 | 3 | 4 |
| Allocation of Resources | 1 | 2 | 3 | 4 |
| Allotment of Responsibilities | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| Employees' Capabilities | 1 | 2 | 3 | 4 |
| Communication | 1 | 2 | 3 | 4 |
| Understanding of Strategy | 1 | 2 | 3 | 4 |
| Acceptance of Strategy | 1 | 2 | 3 | 4 |
| Leadership & Support | 1 | 2 | 3 | 4 |
| Adjustment of Organizational Culture | 1 | 2 | 3 | 4 |

**Q6**

Please evaluate, if the following statement is consistent with your perceptions of previous strategy implementations:

"Process oriented organizations or organizations with existing process management systems are more likely implementing new strategies successfully, than organizations with a departmental orientation or mindset!"

| Not true | Possibly true | Most Probably True | True |
|---|---|---|---|
| 1 | 2 | 3 | 4 |

# APPENDIX 2 – Questionnaire in German

**Fragen**

**F1**

Wie viele Prozent der Strategieimplementierungen bzw. Umsetzungen von strategischen Entscheidungen, an denen Sie als Entscheider beteiligt oder während der Umsetzung beteiligt waren, waren erfolgreich?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 0-25% | 26-50% | 51-75% | 76-90% | 91-100% |

**F2**

Erfolgsfaktoren für Strategieimplementierungen können zu zwölf Themenbereichen konsolidiert werden. Bitte geben Sie an, wie wichtig jeder Themenbereich für eine erfolgreiche Implementierung aus Ihrer Sicht sind:

| | Nicht wichtig | Kaum wichtig | wichtig | Sehr wichtig |
|---|---|---|---|---|
| Qualität der entwickelten Strategie | 1 | 2 | 3 | 4 |
| Implementierungsplanung | 1 | 2 | 3 | 4 |
| Monitoring der Implementierung | 1 | 2 | 3 | 4 |
| Anpassung der Strukturorganisation und der Prozesse | 1 | 2 | 3 | 4 |
| Zuweisung von Ressourcen | 1 | 2 | 3 | 4 |
| Zuordnung von Verantwortlichkeiten | 1 | 2 | 3 | 4 |
| Fähigkeiten der Mitarbeiter | 1 | 2 | 3 | 4 |
| Kommunikation | 1 | 2 | 3 | 4 |
| Verstehen der Strategie | 1 | 2 | 3 | 4 |
| Akzeptanz der Strategie | 1 | 2 | 3 | 4 |
| Führung und Unterstützung durch das Management | 1 | 2 | 3 | 4 |
| Anpassung der Unternehmenskultur | 1 | 2 | 3 | 4 |

**F3**

Bitte spezifizieren Sie, wie gut jeder einzelne Erfolgsfaktor umgesetzt bzw. erfüllt wurde, während Strategieimplementierungen, bei denen Sie involviert waren:

| | Nicht erfüllt | Kaum erfüllt | Ausreichend erfüllt | Sehr gut erfüllt |
|---|---|---|---|---|
| Qualität der entwickelten Strategie | 1 | 2 | 3 | 4 |
| Implementierungsplanung | 1 | 2 | 3 | 4 |
| Monitoring der Implementierung | 1 | 2 | 3 | 4 |
| Anpassung der Strukturorganisation und der Prozesse | 1 | 2 | 3 | 4 |
| Zuweisung von Ressourcen | 1 | 2 | 3 | 4 |
| Zuordnung von Verantwortlichkeiten | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| Fähigkeiten der Mitarbeiter | 1 | 2 | 3 | 4 |
| Kommunikation | 1 | 2 | 3 | 4 |
| Verstehen der Strategie | 1 | 2 | 3 | 4 |
| Akzeptanz der Strategie | 1 | 2 | 3 | 4 |
| Führung und Unterstützung durch das Management | 1 | 2 | 3 | 4 |
| Anpassung der Unternehmenskultur | 1 | 2 | 3 | 4 |

**F4**

Bitte geben Sie an, welche der nachfolgend genannten Konzepte bzw. Werkzeuge zur Strategieimplementierung bei den Implementierungen, an denen Sie involviert waren, wie oft zur Anwendungen kamen:

| | Niemals | Einige Male | Regelmäßig | Oft/Immer |
|---|---|---|---|---|
| "Vorgehensmodell" von Kolks | 1 | 2 | 3 | 4 |
| "Implementierungsprozess" von Huber | 1 | 2 | 3 | 4 |
| "Three Step Implementation Concept" von Pearce & Robinson | 1 | 2 | 3 | 4 |
| "The Four Stage Implementation Model" von Noble | 1 | 2 | 3 | 4 |
| "Implementierungsmodell" von Raps | 1 | 2 | 3 | 4 |
| "The Quantum Performance Concept" von Hronec | 1 | 2 | 3 | 4 |
| "The Performance Pyramid" von Mc Nair, Lynch & Cross | 1 | 2 | 3 | 4 |
| "Effective Progress and Performance Measurement" von Adams & Roberts | 1 | 2 | 3 | 4 |
| "The Balanced Scorecard" von Kaplan & Norton | 1 | 2 | 3 | 4 |
| "The Six Sigma Business Scorecard" von Gupta | 1 | 2 | 3 | 4 |
| Andere:_____ | 1 | 2 | 3 | 4 |
| Andere:_____ | 1 | 2 | 3 | 4 |
| Andere:_____ | 1 | 2 | 3 | 4 |

**F5**

Bitte führen Sie an, für welche der Erfolgsfaktoren zur Strategieimplementierung mehr Unterstützung durch passende Konzepte und Werkzeuge notwendig wäre:

| | Nicht notwendig | Vielleicht notwendig | notwendig | Unbedingt notwendig |
|---|---|---|---|---|
| Qualität der entwickelten Strategie | 1 | 2 | 3 | 4 |
| Implementierungsplanung | 1 | 2 | 3 | 4 |
| Monitoring der Implementierung | 1 | 2 | 3 | 4 |
| Anpassung der Strukturorganisation und der Prozesse | 1 | 2 | 3 | 4 |
| Zuweisung von Ressourcen | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| Zuordnung von Verantwortlichkeiten | 1 | 2 | 3 | 4 |
| Fähigkeiten der Mitarbeiter | 1 | 2 | 3 | 4 |
| Kommunikation | 1 | 2 | 3 | 4 |
| Verstehen der Strategie | 1 | 2 | 3 | 4 |
| Akzeptanz der Strategie | 1 | 2 | 3 | 4 |
| Führung und Unterstützung durch das Management | 1 | 2 | 3 | 4 |
| Anpassung der Unternehmenskultur | 1 | 2 | 3 | 4 |

**F6**

Bitte evaluieren Sie, ob das folgende Statement mit Ihren Erfahrungen aus vergangenen Strategieimplementierungen übereinstimmt:

"Prozessorientierte Organisationen bzw. Organisationen mit etablierten Prozessmanagementsystemen implementieren Strategien erfolgreicher, als Unternehmen mit ausgeprägtem Abteilungsdenken!"

| Falsch | Möglicherweise richtig | Wahrscheinlich richtig | Richtig |
|---|---|---|---|
| 1 | 2 | 3 | 4 |

## APPENDIX 3 – Semi-Structured Interview/Focus Group – Typical Discourse

| Questions | Answers |
|---|---|
| Can the tool SIPOC (Supplier, Input, Process, Output, Customer) support one or more strategy implementation success factors? | |
| | Expert 1: "I believe the tool SIPOC can especially support the success factor "Adaptation of Organizational Design & Processes", because a new strategy needs the adaptation of processes. SIPOC is the perfect tool to develop and display a new process on a higher-level to gain a general understanding of the new process." |
| | Expert 2: "I agree. And SIPOC furthermore provides an overview of all supplier/customer relations within the new process. This is particularly helpful to define all departments, units, teams and employees that have to be considered and involved in the adaptation and implementation of the new process." |
| | Expert 3: "SIPOC can definitely enhance the strategy implementation success factor "Adaptation of Organizational Design & Processes"." |
| Can SIPOC contribute to other strategy implementation success factors as well? | |
| | Expert 2: "In my opinion SIPOC can also improve the "Understanding of Strategy". It is important that the organization learns about the new strategy reflected in the adapted processes. SIPOC gives an important, easy to understand overview of these processes." |
| | Expert 3: "Yes. Without going into process details people can obtain a complete outline of the new processes developed to implement new strategies." |
| | Expert 1: "I also believe that SIPOC can contribute to a better understanding of the new strategy." |
| Are there any other possible applications of SIPOC to support strategy implementation success factors? | |
| | Expert 1: "I do not see any other success factor, where SIPOC can be helpful." |
| | Expert 3: "Me neither!" |
| | Expert 2: "As SIPOC helps to make people understand new processes and therefore new strategies it also has a positive impact on the success factor "Acceptance of Strategy", because employees are more likely to accept new things, when they also understand these new things. But I do not think that SIPOC is directly applicable to boost "Acceptance of Strategy". It is rather indirectly influencing this success factor." |

# BIODATA

**Thomas Pirker-Krassnig** works as a management consultant for ifss – Institute for Six Sigma in Vienna, Austria. He received a Master in Law from the University of Vienna Faculty of Law, Austria and is currently writing his MBA thesis to obtain a Master of Business Administration from the Graduate School, Bangkok University. He has co-authored the book “Lean Six Sigma Toolkit”. His research interests lie in the fields of strategy development and implementation as well as in the applications of the Lean Six Sigma methodology.

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