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University of Gloucestershire

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**The development of a management accounting
system for decentralised construction companies**

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A thesis submitted to the University of Gloucestershire in accordance with the requirements of the degree Doctor of Business Administration (DBA) in the Faculty of Business, Education and Professional Studies

Author's declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other educational institution in the United Kingdom or overseas. Any views expressed in the thesis are those of the author and in no way represent those of the University.

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“Business administration is the doctrine of logical reasoning.”

Prof. Dr. Michael Lorth

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Abstract

Purpose/objectives: This research deals with the development of a management accounting system [hereafter: MAS] tailored for decentralised construction companies using the critical success factors [hereafter: CSFs] method to support effective decision making at management level within the researched organisation and comparable organisations. In this context, the first research objective is to identify the CSFs within decentralised construction companies and thereby the managers' need for information. Based on this, a MAS has been developed to meet this managers' need for information. The second research objective is the exploration of possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels.

Design/methodology/approach: The empirical research comprises an abductive, qualitative, single case study approach. The need for this research has been identified through an in-depth literature review. The empirical element that contributes to closing the research gap has been divided into following parts: preparation of research, single case study (expert interviews at management level, analysis of commercial documents, as well as process/meeting observations) and result documentation, analysis and interpretation, as well as conclusions, limitations, outlook and recommendations.

Findings: The findings represent a significant contribution to both knowledge as well as business practice.

The literature review produced a need to bring the variables CSFs, informational needs, and the structure of operations together. A contribution to Lönngren et al's (2010) study on success factors related to strategic partnerships in the construction industry can be identified in the fact that this study's outcomes focus more on the operative and tactical CSFs in construction companies. Moreover, this thesis deals with numerous types of performance measurements in decentralised construction companies. This can be seen as a contribution to Yang et al's (2010) study on performance measurements in the construction industry, as Yang et al did not take into account the organisation of the studied companies. In general, the focus of this thesis on the organisation of the studied construction company marks a contribution for numerous conducted research studies (e.g. Kärnä, 2009; Kärnä et al, 2009; Lim, 2011; Spigarelli et al, 2015).

The CSFs in decentralised construction companies could be identified and clustered into four categories: customer-, construction management-, staff-, and decentralised organisation-related. On this basis, three different MASs designs (for PM, BM, and MD level) could be developed. These MASs contain classic target-performance comparisons related to the

particular CSFs that could be identified. As not all identified CSFs can be measured, in some cases, surveys or annual in-house appraisal interviews are recommended in order to estimate the achievement rate of single CSFs. In addition, a greater level of awareness could be achieved by this research and by the involvement of experts regarding a better understanding and more transparency in many areas of activity of decentralised construction companies.

Limitations: As the researcher dealt with the social actors in a particular organisation only, the findings of the research are limited to this group of people. Should a generalisation of the findings be intended, further research work would be necessary. In this context, it should be mentioned that even within the studied organisation and therefore in the group of social actors that were studied, different opinions and perspectives were identified.

Recommendations for further research: Future research could for instance mean a test run of the developed MAS in business practice. For this purpose, the MAS could be tested in the studied organisation or another decentralised construction company. A study in several companies at once is also possible.

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List of abbreviations and acronyms

ABC	Activity-based accounting
ADM	Administration
AG	Aktiengesellschaft (English: incorporation)
Approx.	approximately
BM(s)	Branch Manager(s)
CEO(s)	Chief Executive Officer(s)
CM(s)	Construction Manager(s)
CP	Commercial personnel
CSF(s)	critical success factor(s)
DBA	Doctor of Business Administration
€	Euro(s)
Edn.	edition
E.g.	exempli gratia (for example)
ERP system	enterprise resource planning system
Etc.	et cetera
EUFH	Europäische Fachhochschule, Brühl (European University of Applied Sciences, Brühl)
f./Ff.	following
GmbH	Gesellschaft mit beschränkter Haftung (English: limited company)
HR	Human Resources
I.e.	this means (Latin: id est)
IMA	Institute of Management Accountants
Incl.	including
LSF(s)	Long-term-factor(s)

Ltd.	Limited
LTG(s)	Long-term-goals(s)
m	million(s)
MA	management accounting
MAS(s)	management accounting system(s)
MCS	management control system(s)
MD(s)	Managing Directors(s)
MSF(s)	medium-term-success factor(s)
MTG(s)	medium-term-goals(s)
n/a	not applicable
No./no.	number
OWN	owner
P./Pp.	page(s)
PM(s)	Project Manager
QM	Quality Management/Manager
RO	research objective
RQ	research question
SSF(s)	short-term success factor(s)
STG(s)	short-term-goal(s)
TC	target cost
Vol.	volume
Vs.	versus

List of photographs

Picture 1: High-quality sales area in a car dealership.

Picture 2: Insulated piping in a plant.

Picture 3: Cable bulkhead through a wall.

Picture 4: Floor cleaning.

1 Introduction

1.1 Introduction

The objective of this research is the development of a MAS for decentralised construction companies to support effective decision-making on all management levels (project management, branch management and top management) within the studied company based on the previously identified CSFs. The research results will be reflected in a theoretical management accounting [hereafter: MA] framework and will be applicable to decentralised construction companies in Germany.

In the introduction chapter, the background of this research is presented. The research questions as well as the underlying research aims and objectives are illustrated accordingly. Furthermore, the researcher's motivation as well as the significance for theory and practice is briefly discussed. Finally, the thesis' structure is explained.

1.2 Background

Modern MA has its roots in the United States of America. During the period of growth towards the end of the 19th century, increasing competition and company sizes made it impossible for company owners to monitor their business operations well (Holland-Letz, 2009).

Nowadays, managers of decentralised construction companies have similar problems. According to Johannes Lunz – chief executive officer [hereafter: CEO] of a business consultancy specialised in the construction industry – there are specific business characteristics within the construction industry leading to a high bankruptcy rate compared to other commercial sectors (Lunz; www.zdb.de, 8th September 2015). The main problems in this context are existing price instead of quality competition, low market entry barriers, offers that only inadequately take risks into account, performance risks being shifted on construction companies and that economic tools are hardly used by construction companies (Lunz; Girmscheid & Busch, 2014). Another problem is poor payment performance of many customers: the real time for payments in the German construction industry is 61 days on average (Ries, 2010).

As each construction project varies and contains specific risks for managers of construction companies as well as every project-based business, it is difficult to be well informed about all crucial circumstances (Holland-Letz, 2009; Girmscheid & Busch, 2014). Furthermore, managers – especially top managers in decentralised construction companies – cannot visit all construction sites within their area of responsibility on a regular basis (Girmscheid & Busch, 2014). Thus, only on-site staffs know the answers to many crucial questions (e.g. “Is

the work being carried out of adequate quality?”, “Is the degree of adherence to schedules suitable?”, “What is the degree of customer satisfaction?”). Therefore, it is crucial to have a system available that ensures the flow of information between construction sites and managers (branch managers [hereafter: BMs] and managing directors [hereafter: MDs]) and thereby ensures effective decision making on all management levels.

Within business operations, problems of great importance may arise that make immediate top management involvement necessary (e.g. payment difficulties of an important customer). While a decentralised company organisation with several branches leads to a decision decentralisation (BMs make many decisions), this organisational form also makes it more challenging for top managers - who are usually located at headquarters, far away from the branches and from on-site staff - to maintain a clear overview and make the right decisions (Horváth, 2011).

MA provides managers on all levels with crucial information for the planning, monitoring and controlling of the company’s operations and thereby helps to reach particular business objectives (Fischer, Möller & Schultze, 2012; Jones, Atkinson, Lorenz & Harris, 2012), which are usually defined by the company owner (Klett & Pivernetz, 2010).

One approach to determine which information is crucial is the CSFs method (Rockart, 1979; Lucia & Lepsinger, 1999), which enables managers to identify those few key elements that ‘must go right’ in order to achieve business objectives (Jones & Harris, 1995; Bullen & Rockart, 1981) and reduce the risk of business failure (Baus, 2006; Howell, 2010; Klett & Pivernetz, 2010).



Figure 1: Stages in the CSFs approach (Jones et al, 1995, p. 167).

Figure 1 illustrates the connection among business objectives (here: goals), CSFs (deriving from business objectives), measures (to form the basic management information reports), reports and database. Previous research has identified that there are CSFs specific to individual managers, certain CSFs are common across one specific company and again others are common to a whole industry (Jones et al, 1995). The findings of Jones et al (1995) illustrate that systematic use of the CSFs method within a company can lead to a holistic MA system providing each manager with the specific most needed information.

Existing research into CSFs related to the construction industry usually focuses on single construction projects (e.g. Chan & Chan, 2004; Arain & Asif, 2010). Only Mbugua, Harris,

Holt & Olomolaiye (1999) and Howell (2010) deal with a holistic approach for construction companies by developing key performance indicator systems. This is why the development of an MA system tailored for decentralised construction companies is a significant addition to existing research in this field.

In comparison to centralised organisations, decentralised organisations need to ensure that every BM knows his CSFs that are derived from the overall organisation objectives (Horváth, 2011; Jones et al, 2012). Consequently, BMs' goals and CSFs become explicit within the entire organisation. Managers become able to clearly identify their informational needs and can more easily identify where their focus must be in order to meet the company's objectives (Bullen & Rockart, 1981; Jones et al, 2012).

In order to achieve the research objectives, research depth is crucial. In this case, this means that the researcher needs to know what is critical for the business success of decentralised construction companies. Detailed insight into the studied organisation, its internal processes and contexts are significant. As the MAS to be developed will be based on these findings, an abductive research approach – implying data collection to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth (Saunders et al, 2012) – is applied. In order to ensure in-depth insights, a qualitative research approach that uses the case study method is adopted (Bryman et al, 2011; Saunders, Lewis & Thornhill, 2012). This choice goes in accordance with previous research in this field (e.g. Rockart, 1979; Boynton & Zmud, 1984; Jones, 1995).

In this study, the role of the researcher is crucial. In order to create non-biased findings, it is necessary that the researcher obtains insight into the everyday operations of the studied organisation (Yin, 2014). For this purpose, the researcher works as a member of the organisation and keeps detailed records of his experience (Ryan, Scapens & Theobald, 2009). The researcher depends on the knowledge and experience of the organisation's managers and he has to ensure a functional collaboration between the managers and himself. In order to take up the role of a participant (Ryan et al, 2009), the researcher has chosen the company where he is employed to apply a single case study.

According to Yin (2014), there are several sources of data in case studies. The researcher's employer has permitted expert interviews, access to data, and process observation possibilities.

The analysis of commercial documents and reports of all branches can identify possible abnormalities between the separate branches (e.g. turnover, clients, profits and personnel).

Process observations in branches enables assessment of the flow of information between construction site personnel and managers.

The expert interviews at management level will be conducted as semi-structured interviews. This ensures a set of important questions combined with the necessary flexibility to vary the order in which questions are asked and add new questions in the context of the research situation (Bryman et al, 2011; Saunders et al, 2012).

An interview with the company owner discloses the organisation's goals from which the company's CSFs derive. MDs are interviewed to ascertain their impressions of the collaboration between site personnel and BMs within the separate branches. Interviews with all 20 BMs assure in-depth knowledge of everyday proceedings between site and branch personnel. As skills shortage has become a problem in Germany, an interview with the head of human resources is also intended. The researcher wants to ascertain how the company deals with this rising strategic threat.

Interviews and other data are in either English or German, depending on the data source. The identification of CSFs within interviews follows the processes established by Bullen and Rockart (1981). The results of data analysis as well as researcher observations and semi-structured expert interviews are documented. Interview transcripts are shared with the interviewees to ensure accuracy of the data. The research is conducted in accordance with the ethical guidelines of the University's Handbook of Principles and Procedures (2008).

A thematic data analysis including the organisation of collected data, generation of key themes and coding of data is applied (Fox, 2004). All data is coded, which allows cross-connection of the key words, hypothesis testing, generation of cross-relation matrices, etc.

The outcome of the research contributes to the use of CSFs approaches as well as the design of MASs.

1.3 Research questions

As illustrated in the previous section, the approach of developing a MAS for decentralised construction companies via CSFs method makes a significant contribution to existing research. The aspects within this research that require further exploration can be outlined in two research questions:

1. What are the CSFs within decentralised construction companies?
2. What are possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels?

The answers to these questions will help academics and practitioners to gather information in the fields of CSFs and MA. Furthermore, the research results will be significant for the organisation that is being studied, as the company owner demonstrated in a personal appointment on 3rd August 2017, in which the research objectives, approach and methodology were reviewed.

1.4 Research aim and objectives

The author's aim is to develop a MAS for decentralised construction companies that supports effective decision making on all management levels. In line with this, a qualitative abductive research approach including a single case study has generated the necessary primary data. Prior to this, a literature review was conducted to gain a theoretical understanding, ascertain the current state of science, assess existing connections between CSFs and MA and shine a light on existing knowledge gaps in business research.

In order to close the identified knowledge gaps and meet the overarching aim of this research, two research objectives were formulated by the author:

1. To explore the CSFs within decentralised construction companies.
2. To illustrate possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels.

1.5 Research motivation and importance

The author has been working for the organisation to be studied since 2009. The organisation is a German decentralised construction company with an annual turnover of 130 million [hereafter: m] € and approximately 900 employees spread over 20 branches throughout Germany and further two branches in Poland. The company is 100% family-owned (53.3% author's father; 46.7% author). Since his first days at the organisation, the author has been deployed at the head office, where all administrative departments are located. The assembly departments – the company's profit centres – are located in the decentral branches.

While the business is performing well in general, there are significant differences in profits among the different branches. Annually recurring profit margins from +20% in some branches to -10% in a few other branches in relation to the particular annual turnover are common. With an average annual branch turnover of 6.5m €, the single branch profits can therefore range from +1.3m € to -650,000 €. In addition to that, the profit trend has been worsening during the last business years. For the author, being a pure business economist, this situation is unacceptable.

The first analysis of the production costs conducted by the author remained inconclusive: the reasons for the diverging branch profits do not stem from the labour costs, constituting approximately 70% of the production costs, as wages are almost similar throughout Germany. Only in former Eastern Germany are wages still slightly below those in West Germany (www.gehalt.de, 29.11.2017). The same applies to rural environments compared to urban areas (www.gehalt.de, 29.11.2017). However, the company's branch profits do not decline from former Eastern to West Germany or from rural environment to urban areas. Furthermore, the differences in wages are too small to make a measurable difference. The reasons for the branch profit divergences are not located in materials procurement either, which constitutes the remaining approximately 30% of the production costs, as branches buy all materials through the "central procurement" department located in the head office. According to the head of central procurement and based on the vendor invoices, material prices only very slightly differ from branch to branch, depending on the local suppliers in the different regions. Again, the differences are too low to cause measurable differences. The reason for the diverging branch profits cannot be found among the usual production costs. The author came to the assumption that there have to be extraordinary incidents during the sales procedures or during the execution of the construction works processes that result in low profit margins and losses.

Obviously, some BMs who are mainly responsible for sales (and therefore also for customer selection, tender preparation, quotation and risk assessment prior to the conclusion of contracts) and the supervision of the construction works (and therefore also for quality management, adherence to given schedules on construction sites, ensuring sufficient site personnel and the entire risk management after the conclusion of contracts) within their particular branch often make appropriate decisions, while other BMs with the same responsibilities often make less appropriate decisions. The author came to the assumption that the decision-making processes within the different branches must vary strongly. It is possible that some BMs do not focus on the truly important issues within their area of responsibility.

The author commenced an analysis of the existing business literature in order to find solutions for this kind of problems. A combination of the CSFs method by Rockart (1979) that enables managers to identify those few key elements that 'must go right' within their area of responsibility and MA that provides managers with crucial information about what is needed to plan, monitor and control their business operations (Fischer, Möller & Schultze, 2012; Jones, Atkinson, Lorenz & Harris, 2012) seemed to be a promising approach to solve the problems.

1.6 Structure of the thesis

The thesis is structured into four chapters:

The first chapter – the **introduction** – provides an overview of the theoretical gap between literature and the business practice of decentralised construction companies. The problem of an insufficient flow of information between construction site personnel and managers within decentralised construction companies is presented. Furthermore, the research questions and objectives arising from this problem are defined. Finally, the research approach and the author's research motivation are briefly described.

The second chapter – **literature review** – names relevant literature within the fields of interest MA, CSFs and decentralised organisations. This chapter generates theoretical understanding and compiles the current state of science in the fields of managers' informational needs, CSFs and MA. Furthermore, existing knowledge gaps are presented as the starting point for this research study.

The third chapter – **methodology** – provides detailed information regarding the research approach, data collection and analysis methods, and also shows how the validity and reliability of the research results are ensured.

The fourth chapter – **case study research** – firstly characterises the company in which the single case study (including semi-structured expert interviews, analysis of commercial documents, and process/meeting observations) is conducted. The author provides information regarding the organisation's history, business operations, business environment and internal organisation. The results from the conducted study are presented in a transparent manner. The author provides an overview of the findings from the expert interviews, an analysis of commercial documents, and the process/meeting observations. Moreover, the chapter provides a brief summary of the research findings followed by a discussion of the contribution to theory and business practice. Furthermore, limitations of the research study are indicated and suggestions for further research are given.

2 Literature review

2.1 Introduction

The aim of this literature review is to understand what kind of research exists in the field of CSFs and MA relating to decentralised organisations. In addition, its intention is to understand what kind of literature exists, with respect to decentralised construction companies in these areas that could meet the managers' informational needs. The goal is to identify a possible knowledge gap in the existing literature that needs further attention and more research in this particular field of interest, which contributes to theoretical knowledge as well as better business practice.

As a primary step and in accordance with the suggestions by Tranfield, Denyer and Smart (2003), a scoping study was conducted to gain a first overview of the existing literature in the field of interest, i.e. CSFs and MA. Additionally, the scoping study was used to define the limits of the topic for the in-depth literature review. This preliminary piece of work was submitted as an assignment at the Business School of the University of Gloucestershire to adjust the direction of further research. Furthermore, this assignment was discussed in both action learning sets with other doctoral candidates as well as experts on the side of the researcher's employer. Subsequently, an extensive literature review was conducted to identify a research gap within the fields of interest and review the intended research questions and research objectives. This in-depth literature review, which was mainly conducted throughout 2017, will be described in the following sections. With the advancement of research, the author continued to regularly screen relevant literature throughout the research process.

Literature for this review was searched by using English and German search terms, essentially looking at titles and abstracts of references as well as cross-reading papers, journals, reports, books and bibliographies to generate further search terms and combinations of search terms that were then looked up. The main search terms were as follows:

- CSF(s)
- CSF(s) method
- MA
- Decentralised organisation(s)
- Managers' informational needs

- Construction industry
- CSFs in decentralised organisations
- CSFs in construction industry/companies
- CSFs model
- MAS
- MA model
- manager CSFs
- Management control
- Change management
- Managers' goals
- Executive information system(s)
- Management information system(s)
- Trends in MA
- Trends in CSF(s)
- Decentralised organisational structure disadvantages
- Decentralised organisational structure advantages

All search terms were entered in relevant electronic databases such as SAGE Research Methods, ProQuest and Business Source Complete. Moreover, catalogues of the University of Applied Sciences in Brühl (EUFH) as well as further online sources such as Google, Google Scholar and appropriate homepages were used during the search.

This process created a large diversity and quantity of potential references for the literature review and thereby for the entire study, which is organised in several sections (see following sections) and guides to a knowledge gap in the existing research and in consequence to corresponding research questions and objectives for this thesis.

2.2 CSFs

Developing effective MASs requires an understanding of the specific CSFs in an organisation. For decades, the ideas on what executives need to focus on – as Rockart

(1979) noted – have shaped the research on CSFs that managers need to know when making decisions. According to Bullen and Rockart (1981), these CSFs are the few areas of activity in which favourable results are required for managers to reach their goals. Therefore, there is a need to understand whether these factors still apply in the 21st century. On the same note, organisations continue to face unique challenges depending on the environment in which they operate. For example, a country-specific environment can define CSFs required to assist profit-making organisations in competing with multinational rivals (Brouthers, 1998). Other important considerations include the industry in which a company operates and the organisational structure (whether centralised or decentralised). It is therefore also important to note how these factors contribute to the success of a profit-making organisation.

In the construction industry, a decentralised management structure creates a platform where managers are supposed to make independent and informed decisions. With decentralised structures, managers heading decentralised units have the power to make final decisions on specific projects depending on information that they acquire through MA. A study by Anwar and Tuqan (2006) demonstrated how access to information makes it possible for managers to make evidence-based decisions that lead to the overall success of their organisations. Studies have also shown the importance of MA information in facilitating the decision-making process (Kissi, Dainty & Liu, 2012; Isaksson & Linderöth, 2018; Tan, Zaman & Sutrisna, 2018). For example, Tan et al (2018) noted how construction projects proceed through phases. Therefore, a continuous flow of information, provided by MA, is critical as it assists the executives involved in their decision-making process. Therefore, there is a need to examine the managers' informational needs and the CSFs associated with decentralised organisations. Focusing on the construction industry provides crucial insights regarding the industry-specific success factors.

As CSFs and key performance indicators (KPIs) are often treated similarly, both concepts including their differences and linkages are illustrated: CSFs mark implicit knowledge and underlie the officially formulated company goals (Bullen & Rockart, 1981). Managers need to be aware of this knowledge in order to make effective decision making and therefore to reach the official company goals (Rockart, 1979). The CSFs are the few areas that a particular manager needs to focus on in order to run the business well (Bullen & Rockart, 1981). A KPI on the other hand, is a type of performance measurement. KPIs evaluate the success of an organization or a particular activity (such as projects, programs, products and other initiatives) in which it engages (Fitz-Gibbon, 1990). Such an activity can be a single CSF, too. Therefore, a single CSF can be measured by a single underlying KPI.

2.2.1 The managers' information needs

Research on decision modelling, as well as operation research, shows the crucial role of information in the management of organisations. For decades, researchers continuously evaluated the type and form of information that managers require to make decisions. For example, a piece of empirical evidence needs to be presented in a specific format that can be applied easily. In a study by Rockart (1979), chief executive officers (CEOs) mentioned the type of data that they need in the form of management information systems. Rockart (1979) reveals the challenges that executives face while searching for useful information to aid their decision-making processes. In a recent study, Lyytinen and Grover (2017) show the increasing need for accurate information that will allow executives to make appropriate decisions in a timely manner. In the construction industry, timely decision making is important as projects are time-bound. According to Tan et al (2018), negative implications associated with working behind schedule can range from financial ones to the reputation of the construction company. According to Lyytinen and Grover (2017), management decision models are essential because they offer the executives various options. Hence the need to revisit the management misinformation systems and to replace them with systems that offer accurate information. In another study, Bahmani and Farhadpoor (2017) examine the necessity of accessing quality information in order to eliminate uncertainties. The findings revealed that the accessibility and quality of information are important factors that contribute greatly to the success of an organisation. The practicability and accessibility of the data allows the manager to decide promptly, while the quality of the information ensures the accuracy of the decision (Bahmani & Farhadpoor, 2017). In other words, a decision made based on inaccurate information will lead to an undesirable outcome that can in turn lead to a long-term negative effect on the performance of an organisation. In a similar study, Osunrinde and Tihamiyu (2017) explore the process of identifying, evaluating and utilising information as part of the decision-making process. Osunrinde and Tihamiyu (2017) echo the argument by Bahmani and Farhadpoor (2017) that the identification of relevant information is an essential step in the decision-making process. According to Osunrinde and Tihamiyu (2017), the evaluation of information allows managers to determine whether to use the information or not.

2.2.2 CSFs in the construction industry

There is a need for a better understanding of the CSFs associated with the construction industry. Through better understanding, it becomes possible to develop an efficient MAS for decentralised companies operating in the industry. Studies show several industry-specific CSFs that executives in the construction sector need to be aware of in order to gain a competitive edge (Kärnä, 2009; Spigarelli, Alon & Mucelli, 2015; Yang, Yeung, Chan, Chiang & Chan, 2010). According to Yang et al (2010), CSFs in the construction sector can be

examined on project level as well as on organisational or on stakeholder level. For instance, construction companies operate in a distinctive manner, since they need to handle various separate projects at the same time. Therefore, according to Yang et al (2010), analysing the CSFs on project level can help to understand what managers need to do to ensure the success of a particular project. This insight is important in case the organisation has to operate as a decentralised unit. There is a necessity to assess the CSFs that executives need to know and to determine how MA can assist in utilising the much-needed information. As a consequence, it becomes possible to determine the type of information that managers need in their decision-making process.

The goal of this literature review is to examine the CSFs within the construction industry by focusing on MA. It is critical to tailor these factors to the industry, the company and the individual manager, as Bullen and Rockart (1981) and Hardcastle, Edwards, Akintoye and Li (2005) argue. According to Bullen and Rockart (1981), CSFs are a rare area in which satisfactory results will ensure successful competitive performance for the organisation. This is the area where things must enable the managers to achieve their goals. However, according to Bullen and Rockart (1981), the CSFs depend on the specifics associated with a particular situation that a manager is handling. Therefore, it is necessary to examine the prime source of CSFs that matches the construction industry, especially when a decentralised structure is applied. For example, Bullen and Rockart (1981) suggest five prime sources of CSFs, namely the industry, competitive strategy, environmental factors, temporal factors and managerial position.

In this regard, it is important to note how the construction industry differs from other industries. For example, the operations and construction projects are time-bound with specific deliverables that should be achieved at different stages. A study by Shahu, Pundir and Ganapathy (2012) shows how project managers [hereafter: PMs] in the construction industry work together and make adjustments aimed at prioritising functionality. Therefore, Shahu et al (2012) emphasise the need for flexibility to facilitate the necessary changes. The finding by Shahu et al (2012) is similar to an earlier observation by Toor and Ogunlana (2008) that large-scale construction projects require a flexible working platform. With flexibility, managers can make the necessary changes by adapting the factors of success as the project continues. According to Toor and Ogunlana (2008), the different stages in a construction project strongly differ regarding the required resources, the complexity and other success factors. Therefore, it is important for PMs to understand the dynamics and focus on stage-specific CSFs. Other studies also show the importance of flexibility, especially when an organisation is operating in a rapidly changing environment (Shahu et al, 2012; Yong & Mustafa, 2012; Nirodha, Amaratunga & Haigh, 2014; Gudienne, Banaitis & Banaitiene, 2013). For example, Yong and Mustafa (2012) provide empirical evidence showing that the

effective allocation of manpower ranks as the most critical project-related success factor within the construction industry. As a consequence, flexibility at organisational level allows managers to plan human capital needs depending on the level or stage of the project.

Regarding competitive strategy, Bullen and Rockart (1981) note that each organisation within an industry usually deals with its own individual situation. That is why its history and competitive strategies play a significant role in determining the possibility of success for this organisation. Bullen and Rockart (1981) provide an example of a small company that is keen on protecting its niche within a particular industry. An executive running such a firm will need to focus on specific tactics that can address the limitations, while at the same time exploiting available opportunities for success. This source of CSFs is evident in the construction industry, as a study by Lim and Peltner (2011) shows. In the study, Lim and Peltner (2011) explore the innovation performance of construction companies by comparing German and Singaporean construction enterprises. The findings showed that industry-specific success factors in Germany differ from those in Singapore. Lim and Peltner (2011) reveal that German construction companies were better equipped to compete within the construction industry. In particular, Germany offers a mature and innovative landscape that cultivates the strengths of German construction firms by focusing on unique and company-specific resources. Consequently, German construction companies are better placed to compete with the Singaporean firms in case they ventured into the same market. By contrast, Singaporean construction companies have weak firm dynamics and innovation capabilities, mostly because they rely on the nation's basic science and technology research.

Concerning temporal factors, Bullen and Rockart (1981) observe that some areas of activities within an organisation become critical for a particular period when something out of the ordinary occurs. Bullen and Rockart (1981) offer the example of a crisis that might occur when a large number of executives leave. According to Bullen and Rockart (1981), such an unexpected turn of events should lead to a short-term CSF for hiring new employees to rebuild the executive team. In the construction industry, such occurrences can never be ruled out completely.

Regarding the managerial positions, Bullen and Rockart (1981) argue that each functional managerial position is associated with a generic set of CSFs. Therefore, CSFs tend to differ from one manager to another depending on the individual's hierarchical position within the organisation. For example, an executive and a mid-level manager may end up focusing on different CSFs since their roles and responsibilities strongly differ. A study by Metri (2005) supports the idea by Bullen and Rockart (1981) by offering empirical evidence that ranks top management commitment as the most CSFs in the construction industry. In another study by Altayeb and Alhasanat (2014), the findings highlight leadership, process management and

resource management as the three main success factors in the construction industry. These studies confirm how strongly the managerial positions influence the success factors.

2.2.2.1 Timeliness as a crucial factor for the completion of projects

Timeliness is an important success factor in the construction industry. Since projects can often take years to complete, working on schedule is highly important, especially when the contractee wants to use the finished building for commercial purposes. A study by Mahmood and Sajid (2012) focuses on CSFs associated with the construction companies and how these factors can be manipulated to gain competitive advantage. The study focuses on 36 particular construction companies. The findings reveal that the human factor, the financial factor and the organisational factor are the main factors that determine the success factors in the construction industry. According to Tsigas, Emes, and Smith (2016), technical and environmental factors are equally important in ensuring the success of firms operating in the construction industries.

Another study by Dursun and Stoy (2012) examines the determinants of construction duration for construction projects in Germany. Dursun and Stoy (2012) conclude that predicting the duration for a construction project at an early stage is a critical issue. It can be easily manipulated to ensure the success of the project. The statement regarding the duration of a project forms the foundation for planning, budgeting and progress monitoring, which are equally important elements in the different construction stages. For PMs, the modelling and prediction of construction durations is critical in order to make informed decisions during different stages of execution. In a similar study, Akhavan and Zahedi (2014) examine the CSFs in project-based organisations. The study involved 8,000 participants involved in different activities such as PMs, leaders and junior staff members working in various German project-based organisations. The findings support the outcome by Dursun and Stoy (2012) that knowledge structure is a CSF that contributes significantly to the timely completion of projects. Therefore, according to Akhavan and Zahedi (2014), there is a need for a knowledge strategy, which plays a significant role in ensuring that managers obtain the information that they need to make the most conclusive and correct decisions. Only through informed decisions, it is possible for such organisations to complete their projects within schedule.

2.2.2.2 Human-related CSFs

Effective communication is an important aspect when it comes to ensuring the success of a construction project (Mahmood & Sajid, 2012). According to Mahmood and Sajid (2012), the manner in which people communicate plays a significant role in enhancing communication. When the executive managers communicate with their juniors effectively, they get an opportunity to learn about the challenges facing their organisations. According to Tsigas et al

(2016), feedback is a critical aspect of communication as it allows more effective communication. The success of a construction project is therefore determined by the coordination within the workforce and the effectiveness of communication structures. For instance, one of the critical questions is whether senior managers are in a position to obtain information that they require from experts holding junior positions. Communication is not only vital in the relationship between the team members, but also within the whole organisation. Adeleke, Bahaudin and Kamaruddeen (2016) are in line with Tsiga et al (2016), as they came to the conclusion that effective and proper communication is crucial among employees in the construction industry during project execution and have a positive influence on the company's risk management.

Motivation of workers is another important aspect that affects the success of a construction project. Workers who are rewarded for their contribution to a project often tend to put more effort into their work (Tsiga et al, 2016). Other workers will also strive to be rewarded, which generally benefits the project as a whole. Providing education to all members involved in a particular construction project is vital, as they learn about their roles and how to hone their skills. During education programs, all members – irrespective of their capacity – get to interact and build relationships that will prove useful throughout the duration of the project. The various team members get to learn new skills and knowledge that they can incorporate into all steps of the construction.

Zaidi, Zawawi and Nordin (2019) have studied employees' performance in construction companies. The researchers have come to the conclusion that the employees' performance mainly depends on the employees' commitment, which marks the willingness to actively participate in company's tasks. The employees' commitment in turn, according to the authors, is stimulated by the employees' personal accountability (in decentralised organisations: the transfer of power into the branches), bonuses for managers and employees, and an existing flexibility related to decision-making processes.

Team education plays an essential role in the construction business since it gets every member involved which in turn leads to the success of the project. The interactions between team member in the process of their education help to create a platform for the workers to share their worries as well as their knowledge and also to learn skills (Tsiga et al, 2016). This is a CSF in the construction industry since it allows the management to utilise the human resource fully which leads to a better overall performance. The same interactions also enable the managers to communicate and collaborate more freely with their juniors, which is helpful in speeding up the work progress and providing quality work. Building a strong team usually helps to speed up the decision-making process and to achieve better results. It is essential for PMs to enhance good communication and provide solutions that will sustain strong relationships for the success of the construction project.

2.2.2.3 Finance-related CSFs

The financing capacity of a construction project determines how successful it will turn out to be, according to Myers (1984) who examined the financial theories that apply in different profit-making organisations. According to Myers (1984), financial constraints can lead to shortage of other resources that are required to ensure the success of a particular project. Such a scarcity can potentially stall a project and frustrate the management team that is tasked with ensuring the success of the ongoing construction project. Therefore, as Myers (1984) states, PMs often view success of a project in terms of time, cost, and the quality of the construction. While completing the project in time is important, the costs and quality are equally important factors. Large projects usually require huge amounts of money and other resources in order to achieve a satisfactory outcome (Kikwasi, 2012). Shortage of finances could pose a major setback to the timely completion of the work. The study by Kikwasi (2012) seeks to discuss the factors that can cause delay in construction projects. The study reveals that these delays are caused by financial constraints that prevent punctual payments to contractors, by compensation problems, by devaluation of work done and by lack of funding for the projects (Kikwasi, 2012).

A client's delay in providing payments could also be a great setback for the completion of a project. Cases of misappropriation of allocated funds for a project are not unheard of and represent a significant percentage of all causes for delay. In order to meet all of the financial challenges that could come up in a construction project, the theory of Discounted Cash Flow must be employed to cover budgeting, project valuation and asset valuation (Myers, 2001). This theory has proved to be successful because it calculates the future returns of the project by giving discount to the future cash flow that will yield similar returns in the market.

One possibility to manage the risks arising from late customer payments is the use of bank guarantees (Chovancova, Krejza & Vankova, 2019). According to the authors, bank guarantees help release cash and save costs for financing. In addition, bank guarantees help limit risk arising from a contract and secure the risk of non-payment.

According to Khalied and Kandil (2009), in order to counter delay in construction projects, the implementation schedules as well as the financial accountability should be closely monitored to ensure no funds are misappropriated in any way. Khalied and Kandil (2009) state that large construction projects require a well calculated financial outlay because projects that last long before completion require capital that needs to be developed to last for the period the construction is in progress (Khalied & Kandil, 2009). Providing a large capital input may also be important because currencies tend to fluctuate occasionally.

2.2.2.4 Organisation-related CSFs

The construction industry is complex in nature and there is no shortage of risks. Apart from completing a project within a given time frame, it is also important to ensure that the

allocated resources are sufficient to complete the project without compromising the quality of work (Lönngren, Rosenkranz & Kolbe, 2010). Therefore, the factors within the organisation play a crucial role in ensuring the success of a particular project. In order to achieve this, the organisational structure of the project is vital, from the PMs to site contractors and supervisors. The power of interaction and the working relationship that they build is essential for the timely completion of the project and at the same time it ensures quality work. According to Lönngren et al (2010), a poorly planned work might end up taking longer to complete and might therefore pose more financial threats than initially calculated. Proper organisation of a project ensures that all plans are effective in terms of cost, quality, technology, safety and the environment of the construction. The better organised a project is, the sooner it will also point to any necessary changes of plans which will enable all persons involved to take swift action and avoid financial losses.

With regards to the leadership in construction organisations, the implementation of active leadership is another crucial factor (Adeleke et al, 2016). Adeleke et al (2016) found out that active leadership has a positive relationship to construction companies' risk management. Issues during the project execution process become less likely, if managers of construction companies conduct active leadership (taking into account coaching, motivation, training, inspiring, team building, and mentoring). This is closely connected to the human factors illustrated in Section 2.2.2.2.

2.2.3 Decentralised organisation-related CSFs

When it comes to decentralised organisations, it is important to ensure that the heads of department are given the freedom to practice their forms of management with the objectives of the organisation in mind. Each manager will plan how they will achieve the success of a project and how their decision-making processes can support these plans. CSFs in decentralised organisations are not clearly defined in detail but rely strongly on individual managers and their managerial perspectives. As the system is decentralised, it means that the management of each decentralised unit must be focused on achieving the overall goals set by the organisation. One of the CSFs for decentralised organisations is the devolution of financial resources. According to the Speaker of the National Assembly of Armenia, the devolution of finances and participation by lower management in the decision-making process are critical to the success of decentralised organisations (Illner, 2000). The government is defined as one large decentralised organisation which sets a clear example of how financial devolution is key to the success of other decentralised organisations (Illner, 2000). He continues to say that the devolution of power from the top downwards without the corresponding endowment of financial freedom will hinder the process of decentralisation. He argues that without financial autonomy, managers will lack motivation and will not feel as though they are a part of a team and this frame of mind will inhibit the success of the entire

organisation (Illner, 2008). Providing financial freedom, on the other hand, will allow for integration and cooperation between managers and will thereby ensure rounded productivity within the organisation.

A study by Akhavan, Jafari, and Fathian (2006) uses data from several companies that practise knowledge management. The findings reveal that several CSFs make up an effective knowledge management system. According to Akhavan et al (2006), knowledge strategies, knowledge sharing, training programs, a network of experts, managerial involvement and a good organisational culture were the main factors leading to effective knowledge management. Liebowitz (1999) defined knowledge strategy as the ability of an organisation to turn its objectives into a strategic plan. Organisations that have the right knowledge strategies can utilise their resources well to achieve knowledge management goals. Knowledge sharing is a tool of knowledge management, where the company focuses on the flow of quality information between the departments, its employees, and other stakeholders through training events and other departmental activities (Kucza, 2001). These, among other tools of knowledge management, form an intricate part of CSFs for decentralised organisations. Communication is essential for all of them. The departments of organisations are often quite detached as though they were entities of their own. In some cases, this leads to confusion and to the impression that a department may set its goals too independently, forgetting that it is merely one cog in a much bigger machine. This shows how vital standardisation is to the success of a decentralised organisation. A decentralised organisation needs to have a baseline standard that defines the overall goals of the organisation as a means of guiding the organisation as a whole in a particular direction. An organisation cannot be successful if each department is pursuing its own goals and none of these goals are in accordance with what the company as a whole seeks to achieve. According to a study by Ian, Perry, and Daniel (2015), standardisation is critical for high performance, consistency, and predictability in any organisation's operations. Some of the most profitable companies in the world like Toyota have achieved their success through standardisation of their goals and their production. Looking at Toyota, the company has made sure to profoundly standardise its production process across its several facilities around the world, thereby giving its consumers a consistent product experience irrespective of their location on the planet. There is a high adherence to standards where supervisors make sure that the original organisational vision is maintained across all its facilities and ensure that all facilities have synchronised operations and productivity (Ian, Perry & Daniel, 2015). Without proper standardisation, it is not possible for a decentralised organisation to achieve the same level of consumer satisfaction or product quality throughout all of its units. Standardisation helps to bring together all different management strategies that are

employed by the various managers of the units, to focus on one common goal and to avoid deviation from organisational visions and objectives.

In a recent study about an agricultural district that operates under a decentralised system, Okorley, Gray and Reid (2009) show that, in general, decentralised organisations have a better chance to succeed. Okorley et al (2009) focus on evaluating some of the critical factors that contributed to the success of the project. In the study, it was found that political as well as organisational factors play a vital role in the success of a democratic system which illustrates its qualification as a CSF (Okorley et al, 2009). The political factors discussed in the study include the level of decentralisation among the departments, the availability of a defined legal framework in terms of devolution and the will to decentralise (Okorley, Gray & Reid, 2009). Within an organisation, political factors refer to factors outside the department, either concerning the executive management or other departments within the organisation. Considering this in the context of this study, we must conclude that for a decentralised organisation to be successful, it must focus on ensuring that there is a consistent level of decentralisation within its departments. For example, if one department is given more autonomy than the others, there is the risk of a sinking morale in the departments with limited resources. Uniform decentralisation cannot be achieved if there is no legal framework stating the roles and duties of each authoritative entity within the organisation.

According to Okorley et al (2009), the availability of a legal framework in terms of the decentralisation is a CSF. The trio argues that the willingness of the central authority to devolve power to lower stations, together with a precise definition of duties and responsibilities, is vital for the reduction of interferences experienced in faulty decentralised systems. There must be instructions to follow the chain of command and state the roles of each department head. Without the willingness of the central authority to hand over parts of its power, departments will lack the innovative space to explore their full potentials due to interference and overlapping roles that in turn cause redundancy and inefficiency. Managers should be given sufficient power to make autonomous decisions that are aimed at the objectives of the organisation and geared towards development.

The study defines organisational factors as those variables that affect the extension districts from within. One of the CSFs in these areas includes the empowerment of stakeholders through participation in the district's activities (Okorley et al, 2009). Here, the regions ensured accountability to the stakeholders by providing vital information about their progress and inviting their presence on essential district activities to enhance transparency. According to Akhavan, Jafari, and Fathian (2006), transparency acquired through organisational events facilitates knowledge sharing which is a crucial tool in implementing knowledge management systems which in turn plays a key role in the success of a decentralised organisation. It is

true to say that employee participation in a department's activities is a CSF for decentralised organisations.

One of the supporting pillars of a decentralised system is communication (Husain, 2013). It is the responsibility of the management to ensure that organisational goals are effectively communicated to the employees so that the departments work towards a common goal from a position of autonomy and to practice innovation and creativity (Husain, 2013). In a study to investigate the relationship between organisational success and communication, Husain (2013) ascertains that a strong connection plays a significant role in improving employee morale and inducing organisational change. Seeking to show the position of knowledge management and its components as CSFs of an organisation, Akhavan et al (2006) ascertain that most organisations know the value of knowledge management and its role in improving the organisational success when correctly implemented. Knowledge management is an integrated and systematic approach to gathering, management and sharing of information within an organisation. This also includes individual expertise through enhancing communication among department members (Dan, 2003). According to Michael (2000), knowledge management is a set of strategic measures that is geared towards improving communication within an organisation with the aim of generating innovation, value, and progress.

Another crucial factor is that teams within construction companies are willing to improve their skills and competencies (Adeleke et al, 2016). Adeleke et al (2016) came to the conclusion that construction organisations that stimulate this will usually be more successful compared to other companies that do not focus on this factor.

For example, the Siemens Company focused on a policy that allowed the company to engage in consultancy work because, at the time, solutions selling was a productive venture (Akhavan, Jafari & Fathian, 2006). It is through this strategic idea that ShareNet, a global platform where the company could share quality marketing practices, was born. Knowledge sharing is a tool of knowledge management in the process of which the company focuses on the flow of quality information between the departments, its employees, and other stakeholders with the help of training events and other departmental activities (Kucza, 2001). These, among other tools of knowledge management, form an intricate part of all CSFs for decentralised organisations that focus on the importance of communication.

2.2.4 CSFs in decentralised construction companies

Construction companies make up a significant percentage of registered companies in the United States and other countries around the globe. However, these huge numbers are inconsistent with the number of companies that remain in business for more than five years; there seems to be a high percentage of failures, especially in young start-ups (Lasker,

Schuette, Cox & Beck, 2010). Between 2004 and 2006, more than 24% of the total construction companies failed, with 34% among those failed being small start-up companies (Lasker et al, 2010). In recent years, concurrent engineering and performance management have boosted success in the manufacturing industry. Despite efforts by the construction industry to adopt some of the measures used in the manufacturing industry, it has not been able to gain the same amount of success (Ahmad, Svalestuen, Andersen & Torp, 2016). The staggering numbers of failing start-ups called the attention of researchers and they started to evaluate the causative factors for the low performance in construction companies. The study focuses on the data of several secondary sources in order to identify the root of the problem that seemed to affect the construction companies. According to Mbugua, Harris, Holt, and Olomolaiye (1999), there is a serious need for the construction industry to increase their competitive advantage through performance assessment as a means of organisational improvement. It is said that the study of CSFs plays a central role in improving organisational success in decentralised construction companies (Saqib, Farooqui & Lodi, 2008). This section of the paper will be focused on assessing and evaluating different critical factors of success in the decentralised construction industry. Discussed below are some of the factors that were found to be influential for the success of construction companies. They are arranged into seven categories that are believed to be of utmost importance for the success of a project in the construction industry. They are as follows:

Project management-related CSFs

According to Hubbard (1990), the success of any project lies with project management. Project management is involved with the successful implementation of the project through coordination, planning and devolution of appropriate functions for the project's success (Inayat, 2012). Planning, the decision-making process and prior project management experience are some of the project management factors that highly influence the success of a project (Saqib, Farooqui & Lodi, 2008). In general, project management is the most important CSF in decentralised construction companies.

2.2.4.1 Customer-related CSFs

The participation of the client and other related shareholders in the project plays an essential role in the success of a project. In a recent study that sought to seek a constructor's perspective on factors that affect the success of construction projects, Hamdia (2008) ascertained that customer satisfaction is a key factor in the success of construction projects within the region. In a previous study, Chan and Kumaraswamy (1997) argue that several client factors including the customer's knowledge of construction, financial capability as well risk evaluation affect the success of construction projects. When looking at client-related factors, the cost of the project, timeliness of completion and quality are some of the early

indicators of a project's success. The client's ability to make decisions, their influence on the project as well as a clear definition of project goals are some of the critical factors of success related to the client that highly improve the success of a construction project and consequentially that of the organisation (Lasker, Schuette, Cox & Beck, 2010). Most start-up companies fail because they lack sufficient resources to satisfy customer needs. This is shown by the high failure rate of self-employed workers. These companies constituted 75% of all start-up construction companies in the United States in 2007 (Lasker, Schuette, Cox & Beck, 2010). Without the approval of a client, it is difficult for a construction company to gain new business due to negative reviews and lack of referrals.

2.2.4.2 Procurement-related CSFs

The procurement process is an important stage for construction projects because it gives an overall preview of the organisation's competencies. However, it has been noted that most organisations face challenges due to inadequate procurement procedures that are focused on short-term goals rather than long-term perspectives that are geared towards excellence (Eriksson & Westerberg, 2009). That is why there is a need for construction companies to develop holistic approaches towards procurement to ensure that all project objectives are attained within the procumbent documents. Some of the CSFs related to procurement include economic performance, time performance and quality performance (Eriksson & Westerberg, 2009). Economic performance is best measured by factors within the bidding process where a competitive bidding price, as well as value for money, is evaluated in comparison to the set objectives (Farooqui, Ahmed & Lodi, 2008). In a study conducted by Khisa (2015) it is ascertained that 43 of the 80 participants in the study agreed that costs affect successful completion of roadworks. Khisa (2015) went ahead to add that other factors like the overall cost of the project, cost of maintenance, and the risk factor involved may cause investors to choose other procurement procedures (Khisa, 2015). The transparency of the procurement, as well as the procurement process used by an organisation, play a key role in the success of construction companies.

2.2.4.3 PM-related CSFs

PMs play an important role in the success of a construction project of an organisation. They are tasked with managing the project's resources and ensuring that the project is delivered on time, budget and quality agreed (Sarda & Dewalkar, 2016). They are the coordinators of the project from its inception until its completion. Successful PMs are skilled managers with a technical knowledge of the field and good people relations (Devi, 2013; Mlecnik, 2014). In a study with the aim to evaluate the causes of success in fifteen sampled organisations, it was ascertained that nine of the companies that were ranked as exceptional in performance and project success were run by highly qualified managers (Naoum, Fong & Walker, 2004).

According to Saqib, Farooqui, and Lodi (2008) a manager’s competency in pursuing their goals, their experience in project management, and their ability to coordinate daily activities had a critical value of 4, showing that these are the key CSFs connected to the position of PM. Additionally, successful managers are defined by their ability to communicate organisational goals efficiently and get employees to work (Devi, 2013). In terms of CSFs related to PMs, it is all about the manager’s ability to carry out managerial duties with experience and strategy.

Contract related factors	Mean	Mode	Criticality index
Contract experience	9.22	10	4
Site management	9.11	10	4
Supervision	9.06	10	4
Extent (involvement) of subcontracting	8.33	8	4
Contractor’s cash flow	9.32	10	4
Effectiveness of cost control system	8.50	8	4
Speed of information flow	8.81	9	4

Table 1: List of CSFs related to the contractor (adopted from: Farooqui et al, 2008).

As Table 1 illustrates, it is evident that a contractor’s experience as well as site management and supervision skills play critical roles in the success of a project because they all carry a mean of more than 9 showing the level of importance. The table shows that all contractor-related factors have a criticality index of four, denoting that all roles are of utmost importance in the success of a construction project.

2.2.4.4 Design team-related CSFs

The design team is tasked with the development of construction projects within organisations. CSFs related to the design team include the team experience and its ability to deliver value by developing innovative designs that are within the project’s budget and specifications (Farooqui et al, 2008). The clarity of designs and adherence to specifics carries the highest mean and a criticality index of four shows that the success of the design team is heavily reliant on its ability to deliver quality designs that are mindful of the project requirements.

2.2.4.5 Business environment-related CSFs

The business environment plays a key role in determining the rules of transactions in any industry (Aniekwu, 1995). Some of the business environment factors that commonly affect organisations include the political environment, economic environment, technological environment, and the physical work environment (Farooqui et al, 2008).

The construction industry has two major institutional supporters in the sovereign state, whose political entities render affordable housing and the supply of credit. A core component in modern statecraft, and the finance industry, which rely on the construction industry for high-quality collateral in forms of real estate, and which also expand the stock of credit in the economy. In this finance capital creation role, the finance industry makes various construction projects realisable and attractive investment objects (Styhre, 2019, p. 169).

In Nigeria, for example, the government is the largest investor in the construction industry and due to government proceedings most projects are never completed because of delayed fund dissemination and slow-moving administration (Aniekwu, 1995). According to Farooqui et al (2008), the physical work environment has a criticality index of four which illustrates that it has a major impact on the success of a project. The same phenomenon is evident in the Middle East, where companies have to develop new ways of construction and change working hours due to strong heat waves that make progression difficult because they affect the workers as well as the structural components related to the construction (Alshebani & Wedawatta, 2014). Technological innovation is also one of the key business environments affecting the success of construction industry (Farooqui et al, 2008). For construction companies to be successful in the ever-changing business environment, they need to keep up with innovations and continue to ensure that their focus is on sustainable construction.

2.3 MA

Corporate accountants are required to prepare financial accounting reports and make them available for external users, especially shareholders, who are interested in assessing the performance of the firm. However, according to Jinkens and Yallapragada (2010), there is no similar statutory requirement for the accountants to provide managerial accounting information that would be necessary for effective decision making. For example, Jinkens and Yallapragada (2010) emphasise the need of cost accounting information as an integral part of managerial accounting. A study by MacArthur (2006) compares MA in Germany and the United States by examining the country-specific cultural influences on MA practices. The findings reveal that cultural factors are part of the cost-benefit considerations that underlie the MA practices. In summary, Jinkens and Yallapragada (2010) conclude that German MA practices are country-specific, which means that they are well adapted to the unique culture

of the country. As a consequence, using the same practices in other countries such as the US may not necessary work as planned. Based on these findings, it is important to assess the scope, practice and application of the MA depending on the particular culture. This approach is important considering the position of Germany as an active member of the European Union as well as an independent country with a strong culture that defines its construction industry.

2.3.1 Scope, practice and application

As a member of the EU, Germany is expected to align its accounting specifications with the European accounting system. Harmonisation and standardisation have become the most important features of accounting in the 21st Century (Sacer, 2015). In the wake of increased globalisation and regional integration, the need for a harmonised accounting system has increased dramatically. This is especially critical for companies that are venturing beyond the national borders to take advantage of regional common markets such as the European market. For example, the EU market offers 27 markets for German construction companies to exploit. According to Biondi and Soverchia (2014), the EU has reformed its accounting system by issuing a conceptual framework and eighteen accounting standards from the member states. Another study by Crisan and Nistor (2016) shows the need of a harmonised accounting system as the EU offers a common market, where companies need a level ground to compete fairly. There is a need to examine managerial accounting from a regional perspective to understand how German construction firms comply with European standards. On a national level, it is important to not how EU member states incorporate the International Financial Reporting Standards (IFRS) into their national accounting standards. Since 2005, the EU has required companies based in member states to provide consolidated financial reports for publicly traded firms in accordance with the EU-endorsed IFRS. For MA, the Chartered Institute of Management Accountants (CIMA) published a draft in 2014 entitled Global MA Principles aimed at creating effective MA that can be applied in Europe and beyond in the same way that IFRS are applied in financial accounting (Borker, 2016). In this case, the fact that managerial accounting does not have to comply with the IFRS means that Germany, as an EU member state, not only applies country-specific standards but also industry- or company-level standards (Liao, Sellhorn & Skaife, 2012). As Sacer (2015) notes, MA differs from financial accounting since the former is based on the current performance and future forecasts while the latter concentrates on previous performance. This difference shows the scope for understanding managerial accounting for contraction companies whose operation offers a unique opportunity for predicting future trends as far as demand for construction services and company's performance are concerned. In another study, Borker (2016) gauges the impact of country-specific values on the acceptability of Global MA Principles. The findings reveal the need for accountants at company level to perform internal

MA functions in a more efficient way and in accordance with internationally recognised best practices.

MA refers to the accessibility of financial data and advice to a company and for their use in its organisation and their development of day-to-day business (IMA, 2008). It brings together accounting, finance and management with the necessary skills to add value to the business or organisation. Accountants in this field are qualified to handle all work across the board and to make proper decisions that will bring success to the organisation. Their expert knowledge is vital for decision-making, planning and implementation of good management systems. At the same time, their expertise is also a major advantage to their organisations because they can react with flexibility to change while at the same time delivering outstanding results.

Also referred to as managerial cost accounting, MA has undergone considerable changes in the recent past and has embraced new research topics (Johnson & Kaplan, 1987). Its establishment as an academic discipline has elevated it to a state of credibility and knowledge. There are three major research theories that fall under MA; central theories (they focus on economics and sociology), approaches (decision or control) and survey methods (which are either descriptive or normative). According to Holland-Letz (2009), MA is tasked with providing information to internal users, including historical and forecasted data (Holland-Letz, 2009).

According to the American Institute of Certified Public Accountants (AICPA), MA extends to strategic, performance and risk management (Böer, 2000). The management professionals should use their knowledge to ensure good decisions are made in their organisations. However, this has changed over the past few years of establishing MA as a social science (Baldvinsdottir, Mitchell & Norreklit, 2010). It has led to the neglect of its technical logic and researchers consequentially need to put a stronger focus on empirical research to develop and support practice. Management accountants are the real creators of value in their organisations and should live up to this expectation. Their knowledge is varied in various fields, such as information management, auditing, logistics, marketing and valuation. In order to create the best principles for guiding the management accountancy, Global MA Principles (GMAPS) was born in 2014. It ensures strict adherence to the rules of accountancy for the best results.

2.3.2 MA in the construction industry

MA was initially defined as an essential activity that is required for dealing with the organisation's objectives. However, the construction industry began to experience changes and unpredictability in the 1990s which led the definition of MA to change (Endenich, Hoffjan, Schlichting & Trapp, 2016). According to Endenich et al (2016), the focus of expanding the operations beyond national borders exposed companies to different accounting standards. This created a platform for activity-based accounting, activity management, activity-based

management, strategic MA, local information systems, target costs, balanced scorecards and lifecycle costing. Nowadays, the construction industry relies on activity-based accounting (ABC) and the target cost (TC) for all of their costing calculations (Kim, 2001).

ABC is an effective cost calculator that evaluates the cost and performance of cost goals and activities. It is viewed as a modern system of accounting that has the ability to estimate the usage of resources by activities. According to Akyol et al (2005), this system is meant to replace the old accounting methods. Contrary to this, Cokin (2002) mentions that the system does not replace the old methods but makes accounting more efficient, thereby making it easier for the management. Akyol et al (2005) seems to have contradicting views with Cokin (2002), as the former believes that ABC is an alternative to the TC system while the latter believes that the two systems work hand in hand. The TC system processes data into general ledger accounts while the ABC system processes information and operational decision-making. The two accounting systems are comparable because they both involve the change of overhead costs to ABC and the driving and usage of cost driver activity to trace pooled costs to the product (Cokins, 2002). Cokins (2002) held the belief that the two systems must work hand in hand to provide efficiency in the construction industry.

The MA department is responsible for all financial wants in the construction industry. For instance, the Construction Financial Management Association (CFMA) is the only non-profit organisation that serves construction financial professionals by offering them education of all that pertains to finance in this industry (Bender, 1997). The CFMA was established in 1981 and its members are various kinds of contractors, architects, engineers, and material and equipment suppliers. Other members include all accounting, insurance, legal, surety and banking specialists who work in the construction field. The CFMA has continued to protect the interests of the construction industry for the good of all its stakeholders.

MA involves the creation and use of time-based information, quality, and cost in any company with an objective of effective decision-making. All units in organisations must participate in MA to ensure its success. Among these units are: the financial department, audit department, system professionals, costs accounting department as well as tax department (Mueller & Trost, 2018). A close collaboration helps to bundle resources and to channel them to controlling, planning, decision making and evaluation within the company. MA involves: risk management, performance management and strategic management. Risk management refers to the frameworks and practices that are used for managing, measuring, identification and reporting risks to reach organisational goals. Performance management, on the other hand, involves decision making and management of organisational performance. Strategic management pertains to the duties of MA personnel in a company.

According to Ax and Greve (2007), MA enabled Bilfinger Company to emerge among the best firms in Europe. It achieved this by using the management control system to increase its

market penetration and strengthen its capability to effectively manage its accounts. The company further extended its long-term partnership with its strategic customers. For a long time, the MA studies were focused on larger companies while smaller firms received little or no attention. However, research on smaller companies has been adopted and conducted in a fast-growing and high-tech organisation (Mlecnik, 2014). Systems of management control are essential in decentralised companies. Mlecnik (2014) for example, emphasises the need to involve small and medium size innovators and demonstration projects and using a dedicated regional enterprise network. The most commonly used systems include cash flow statements, monthly income statements, cultural controls and short-term planning. An MAS is therefore essential for every small company. MA plays a vital role in the success of any company. The relevance of MA to the modern businesses is outlined by Johnson and Kaplan through their traditional approach. The importance of MA in contemporary firms not only reports the score but also strives in influencing the score through theoretical approaches and techniques for an improved business.

Management control systems

The terms MA and management control systems (MCS) are usually used interchangeably. An MCS is a passive tool used in managerial decision making. MCSs also comprise control mechanism collections with internal focus. MCSs' main aim is to control employee behaviour in positive ways in order to enhance the effectiveness of the organisation. On the other hand, Cooper, Ezzamel and Qu (2017) define the MCS as a system used to convey important information in order to enable managers to make proper decisions that are crucial in achieving the goals and outcomes of their companies. A new typology of MCS has also been established. The new model seeks for the synthesis of the four decades of study on MCSs. It provides a broad approach and stimulates and facilitates further research and discussions.

Studying management control systems as a package helps to better comprehend how different ways of controlling can help reach the company goals, monitor activities, and fuel performance. However, studying them as a package also comes with various challenges, such as making a distinction between decision support system and MCM or defining the included and excluded elements of MCM. Carrying out empirical research on complex and large organisations can also be challenging. The MCM requires all employees' behaviour to be directed towards achieving the set goals and objectives of an organisation. From the decentralised companies' perspective, this definition raises questions because of its informal, intertwined and interdependent nature. The study seeks to support the use of MCM in smaller and decentralised companies and thereby to enhance decision-making processes and guidance.

Approaches to the MA

Research in MA derives theories from human and social sciences, blended with different methodological approaches. The methods are necessary to capture the complex nature of the operation and design of the MAS. The most significant approaches used in the study of MA are the Life Cycle Theory and the Contingency Theory. The two approaches originate from organisational studies. MA practices have continued to evolve with the changing information requirements. According to Yigitbasioglu (2017), the Contingency Theory offers a theoretical framework that helps to understand how organisations can survive dynamic environments. The Contingency Theory commenced as a contrary research to the universalistic control approach that emanates from a scientific management approach. The universalistic control theory argues that there is a single MCS that fits any situation or organisation (Elgharbawy & Abdel-kader, 2012).

Elgharbawy and Abdel-kader (2012) show the application of the Contingency Theory in the context of defining the role of MA in organisations. According to the theory, there is not the one unique “best structure“ that fits all companies regardless of the environment they operate in. Instead, each organisational structure is a response to a set of contingencies that an organisation has identified (Elgharbawy & Abdel-kader, 2012). Therefore, there is no universally applicable MAS that is helpful in all organisations. This is an important observation for this study since it shows the unique decision-making environment for managers in decentralised organisations. It is particularly important to note how the contingency factors in decentralised organisations differ. For example, different decentralised units may operate in different environments or have different organisational decision-making styles, as Elgharbawy and Abdel-kader (2012) note. The Contingency Theory offers a platform for understanding how managerial accounting needs to differ in decentralised units working within the same organisation.

A contingency-based study can be grouped into three streams; the meaning of MCS, outcomes of MCS and contextual variables of MCS. The outcomes refer to the use of MCS as well as the organisational and behavioural outcomes (Mueller & Trost, 2018). It further implies that a good fit between the contextual variable and management control system improves effectiveness. An evaluation of fit is conducted that includes factors like efficiency, job satisfaction, and financial results. From a decentralised company’s perspective, one can reasonably assume that a manager does not implement or adopt a system without proof of its usefulness (Chenhall, 2012). The stream on contextual variables and MCS deals with other variables that are crucial for an understanding of MA in decentralised firms. These variables include: technology, external environment, organisational structure, culture, and size. Every variable has a special impact on the MCS design (Fisher, 1998). According to Fisher (1998), technology is the means a firm uses to transfer inputs to outputs. This also involves the resources utilised during the process. There are three important aspects to note

from the MCS perspective: task uncertainty, interdependence, and complexity. For example, a flexible MCS would be required for complex products (Fisher, 1998). Higher interdependence and task uncertainty would demand informal controls like group and personal controls.

The external environment refers to the factors affecting an organisation's environmental functioning. Companies experience environmental uncertainties that can hinder its efficient functioning (Cadez & Guilding, 2012). Mulligan (2001) notes how decentralised companies may end up facing hostilities, complexity, and turbulence in their operations. Therefore, according to Mulligan (2001), the more complex and uncertain an environment is, the more urgent is the requirement for a focused and open MCS. In an organisation with higher uncertainties, a more sophisticated MCS will be needed. The organisational structure determines the extent of the MCS necessary. MCSs are used in large and decentralised organisations. Larger companies use formal MCS while smaller firms rarely dwell on MCS. Adopting MCS for the management of decentralised companies yields positive results. Small companies prefer to use personnel controls, because they allow a faster adoption of the company's culture by the employees (Mueller & Trost, 2018). As companies grow, they require more sophisticated MCS to compete in the market. Size enables formalisation in the form of laws and work descriptions. Additionally, rewards and compensation are the sole responsibility of a manager in decentralised organisations, but when the company grows, personal performance evaluation becomes difficult. Culture can be categorised into national and organisational. According to Otley (1980), the organisational structure is an equally important factor in MA. Therefore, there is a need to examine how decentralised organisations differ from centralised organisation.

Apart from the Contingency Theory, the Life Cycle Theory offers another platform that can help to understand the changes of environment in and circumstances under which organisations operate. The idea is to examine how the informational needs have changed over time due to the emerging technological advancements. In his theory, Greiner describes evolution from one crisis to another. His model includes five crucial dimensions that affect development, namely the organisation's age, the evolutionary stages, the revolutionary stages and the industrial growth rate. According to Greiner, crisis or revolution comes when management practices become obsolete; hence, newer strategies are essential to evolution. Greiner's five phases are characterised by management practices aimed at achieving growth. The first dimension is creativity, which is usually technology-oriented. As a company grows, managing this growth requires new ideas and innovations. With that comes a need for formal procedures and administration. In this phase, idealism and individualism are also required for organisational success.

Another phase that is mentioned in this theory is good direction. According to Herrige (2016), marketing must be separated from budgets, sales, work standards and accounting systems for purchasing and inventory. In this dimension, companies find solutions in delegating. The third phase is delegation. Managers need responsibility and power (Herrige, 2016). Managers see the bigger picture and have the best interest of the company in mind. Coordination is the fourth dimension. It requires formal and complex coordination systems. Poor coordination always leads to mistrust. Managers should work together and in close cooperation. The fifth dimension is collaboration. New procedures require more than formal handling. They require communication and interpersonal collaboration.

The five life cycle stages as explained by this theory include: growth, maturity, birth, decline and revival. Birth stage signifies that companies are initially young in the beginning and controlled by their owners. Birth develops into growth after a company gains a competitive advantage with a product-market victory. Maturity ensures a rapid level of growth while the companies gain stability. The management emphasises efficient and smooth operations. Revival is the fourth life phase dominated by a necessity to adjust to heterogeneous and complex markets. It is achievable through the creation of sophisticated planning and control systems.

2.3.3 MA in decentralised organisations

Decentralised organisations have multiple facilities that cover larger areas and allow the manufacturing and distribution of products, closer to customers. In highly competitive markets, companies need to provide customised products. Therefore, firms find it useful to formulate an excellent marketing strategy to acquire a competitive advantage and remain relevant in the market. Irrespectively of how companies adapt or grow through their supply chain, poor MAS can lead to its collapse. Decentralised companies in Europe thrive on creativity that leads to growth. Decentralised companies require MA for their success. These firms provide numerous research opportunities to learn about the MA development (Herrige, 2016). Smaller companies provide ideal settings for inquiries. Some decentralised firms assume that MA is bad-natured and does not necessarily guarantee them success. This is a rather narrow-minded view as a better understanding of MA can help them grow to remarkable levels. MAs provide the basis for the necessary managerial infrastructure. Construction companies with decentralised manufacturing tend to gain more benefits from their organisational structure.

The Bilfinger Company is an example of a decentralised construction company that has enjoyed tremendous success in Europe. It so happens that their success is partly based on a smart MAS (Hoque, 2018). Over the years, the company has been effectively using the lifecycle approach. The birth of the company was followed by growth and Bilfinger matured into a broader organisation as intended by the lifecycle management approach. As a reaction

to changed conditions in the market, Bilfinger introduced a new strategy and emerged as a multiservice group. It was renamed to Bilfinger AG in 2001 and in the following years, it acquired other strong companies that were active in the power plant and real estate business. Bilfinger strategised by reducing construction activities, with the intention to improve its operation, and grew from a construction firm to an international service and engineering group.

Numerous debates have emerged regarding the need for MA in decentralised construction companies. There are different management levels in all organisations, all working towards the most effective performance of a company (Bhankaraully, 2018). Every level of management requires relevant information from departments for a smooth operation. Fulfilling the managerial levels can only be possible through MA. An MAS divides an entire unit of operation into different departments, sections, products and function bases. MA helps to control a company and it is crucial especially if there is an enhanced modernisation, a broad scale of production and/or technological changes. A management must be able to set a standard for all running activities within an organisation.

MA allows construction firms with decentralised production to enjoy many benefits, compared to companies with centralised manufacturing. The merits include closeness to customers, flexibility, timely and better information, motivated employees and managers and an ability to enjoy low costs of labour in specific areas (Doerflinger & Pulignano, 2015). If a company is physically close to its customers, it becomes easier for it to meet customers' demands. Through the right management, a decentralised company will only manufacture products that are in high demand. Decentralised companies are more flexible, their local communication is more reliable and more efficient since it does not have to pass through many channels. Most decentralised construction companies in Germany like the Bauer Group have incorporated MAS in their operations and have improved their decision-making processes.

Decentralised production not only enhances decision making but also motivates and empowers employees. It allows them to test and improve their skills without having to wait for an approval from a centralised organisation every single time. Decentralised companies support creativity and push motivation by providing junior managers with more responsibilities (Nuhu, Baird & Bala, 2017). Giving the manager a sense of ownership in an operation increases efficiency of this operation. Firms decentralise when markets are expanding or when demands are increasing (Schmidt & Osebold, 2017). A good example for this is the Hochtief Company in Germany. They identified gaps in the market and became leaders in the construction and services industry around the world. They penetrated the energy and transportation business and social infrastructures and gained a lot of profit.

In MA, decentralised construction companies are required to have larger capital investments, higher per unit costs and maintenance of wide consistency within the organisation (Granlund

& Lukka, 2017). These requirements are sometimes challenging to the companies and seem to make decentralisation disadvantageous. Decentralised construction companies are also using MASs to invest in highly sophisticated technology. Doing that facilitates their operations and places them in a better place among the other complex players in the market. MA and control systems are important keys to the success of decentralised construction companies.

2.3.4 MA in decentralised construction companies

It is necessary to examine the informational needs in decentralised organisation before examining the available MA approaches. Decentralised organisations differ significantly from central organisation regarding the manner in which MA is done (Hughes, Tippett & Thomas, 2004). The most critical question is how management accounting can utilise the much needed information required in specific decentralised units to facilitate independent decision making.

Bullen and Rockart (1981) observed that some areas of activities within an organisation become critical for a particular period when something out of the ordinary occurs. In such a case, hiring of new employees or rebuilding the project team is a possibility in the construction industry (Rockart, 1981). When such events take place, the accounting management should be ready to come up with a solution that will save the firm from stopping a project midway due to shortage of staff or running out of resources. German construction companies, for instance, have an added advantage here because they have a strong innovation capability through their adoption of the decentralised system that ensures effective decision-making processes. Their systems and technology are up-to-date, which makes them able to handle complex projects better than, for instance, their Singaporean counterparts (Lim & Peltner, 2011).

Having a strong team for a project is essential for successful results. Due to strong team building, German construction companies have been able to develop unique resources that are specially designed for their own use (Lim, 2011; Fapohunda, 2014). Through team work projects, their innovation performance has been rated as strongest on a competitive basis. Such a strategy is vital as it enables the company to stay afloat in this competitive industry. Critical analysis of a project from its inception is important to account for vital essentials and still create room for uncertainties and risks ahead. By handling projects in a decentralised way, construction companies are able to examine their projects from all sides. This brings a better understanding of what the managers require to ensure success of the project. When the managers have the right information, they are able to disseminate it to the people in their teams to ensure success of their endeavour.

Decentralisation is a common characteristic among construction companies as they often conduct several projects at the same time. The decentralised company is able to reduce

possible hesitation and threats that may occur due to administrative inefficiencies. Taylor et al attribute the choice of this system to the fact that construction companies are mostly project-oriented. A construction company that uses the decentralised system encourages different perspectives on a matter and enables ideas to emerge from various people or groups. Although the system may seem time consuming, the advantages outweigh the disadvantages by far in the long run. According to Christie, Joye and Watts, decentralisation in construction companies is important because it allows coordination and integration among employees of the organisation (Christie et al, 2003).

In a decentralised system, the accounting managers in a construction company encourage knowledge sharing, networking and easy access of resources (Shields, 1998). Management accountants direct, keep scores and solve problems (Ahrens, 1999). However, the problem-solving part involves providing relevant information to business unit managers that is vital for the process of making decisions. Some scholars argue that this part of their job becomes more dominant due to the uncertainties that lie in the construction industry (Hopper, 1980; Shields, 1998; Osunrinde & Tiamiyu, 2017). Since 1980s, changes have continued to be registered and these changes have been linked to business-oriented management. To manage the changes, decentralisation calls for MA innovations such as strategic MA, activity-based costing, strategic cost management, life cycle costing, profitability analysis and economic value-added measurement (Hopper, 1980).

The distribution of responsibilities is an important aspect in management in general and also, of course, in the construction industry. According to a study by European Firms in a Global Economy, firms with decentralised management systems have higher chances of expansion. They are also more involved in international trade and invest in innovations, research and intensive training for their staff. The construction industry – which requires a lot of high tech and specialisation – was found to account for a large percentage of ranking companies with a decentralised system of operations (UN, 2000). Therefore, in order to ensure success for the firm, management accountants should be given access to data – both current and past – so that they are able to make less risky and less uncertain decisions during the running of a project. The team of management accountants is able to review possible errors and mistakes made in the past and come up with better ideas to sustain the firm as a whole.

However, in order to create a successful decentralised system, the firm ought to provide the management accountant team with the right skills and the right number of team members (Kaplan, 1984). Career structure and personnel management can help to enhance professionalism and performance and also the ethical values. However, the decision to adopt a decentralised system of operations is mainly influenced by its economic advantages and lower costs of management decentralisation. With proper staffing, construction firms using decentralised system are able to stay afloat even in times of recession. This is owned to

different groups of people coming together to give different input, different perspective. Brainstorming done from multiple angles leads to more flexible, more innovative decisions and strategies. A good example is again the Bilfinger Company, which continues to enjoy tremendous growth and success through decentralising its MA unit (Hoque, 2018).

The Great Recession that shook the world in 2008 after the collapse of Lehman's sparked debate on organisational structures that could help companies to face future economic uncertainties (Aghion, Bloom, Sadun & V. Reenen, 2014). According to Aghion et al (2014), decentralisation helps firms to still improve even after they were badly hit during bad times. In his study, Aghion et al point to the fact that companies with a decentralised system were able to stand strong despite the recession of 2008. They might have experienced a slight decrease in their sales but their productivity rose faster after that period. During a recession, uncertainties can run deeper than usual, but decentralised systems with flexible accounting management teams are able to respond better and quickly to dynamic changes (Aghion et al, 2014). In a study on countries that use decentralised management systems, Germany ranked number 5 with 29% of its industries having adopted this system (Johansen, 2007).

Successful accounting managers must have substantial technical knowhow in their field. In order to ensure that the accounts managers are sufficiently competent, a company should adopt periodic training of its staff, which gives additional skills and broadens the knowledge (Akhavan & Zahedi, 2014). This is a critical factor in the success of the firm. Another factor is that they should be able to communicate organisational goals efficiently (Chapman, Hopwood & Shields, 2007). Therefore, their relationship with other employees is essential to enable them to carry out successful managerial duties.

MA has seen the growth of small companies into giant firms (Davila, 2007). Still, this whole issue remains too seldomly tackled, as more emphasis is being laid on large organisations. Which is astounding as a study revealed that 96% of new job opportunities are created by small companies that employ less than 100 people (Arenius & Minniti, 2005). Financial knowledge, profitability and project funding are considered important factors to promote the growth of an organisation. Therefore, small companies have the need to employ accounting managers with sufficient financial knowhow to increase the profitability of the firms. Thereby, they will create a chance of future growth and expansion for the company (Drury, 2012). Through the decentralisation of power, the accounting managers have a better chance of coming up with ideas that will improve the situations of small companies, give them a wider base and help them to adopt the use of high-tech equipment in their construction projects.

The success of a project is the ultimate goal of a construction company. In order to achieve this, the management accountants ought to provide strategies that involve all employees in the project (Akhavan & Zahedi, 2014). This way, they are able to build strong teams which are able to deliver quality designs. Access to both past and present information enables them

to present sound decisions, which is vital for the company's success. Through MA, the Bilfinger Company managed to expand and grow stronger, while at the same time creating long-lasting relationships with its clients.

The purpose of MA in any firm is to provide information for planning and to control and measure the company's performance (Drury, 2012). The information is used to make decisions and improve efficiency in the firm. By adopting management accountancy in a firm, it gains competitive advantage over other companies and will consequentially be successful in its performance (Järvenpää, 2007). The rules that they impose help to govern employee behaviour in an on-going project (Kaplan, 1984). The employee's behaviour ought to be geared towards objectives and strategies that are profitable for the company. A well-organised structure ensures that the employees' needs are met and that they have the freedom to express themselves. This freedom creates room for interactions and sharing of ideas which may be beneficial to the company.

In the construction industry, environmental uncertainties can occur (Mitchell, 2000). According to Mitchell (2000), the environment can at any time be dynamic, static, simple or complex. The more the environment is prone to uncertainties, the more the firm requires a strong accounting management. With the guidance of a competent team of accounting managers, the organisation is able to accumulate sufficient finances to survive an economically challenging period. A company's strategy is important when it comes to defining how successful its projects will be (Porter, 1996). Therefore, it must be the task for a highly competent circle of people to influence and change a company's objectives and gear it towards effective operation. However, while operation effectiveness is a necessity for a successful business, it should not be the goal itself (Sandelin, 2008). The German construction industry has become highly successful. It generates income and creates jobs, thus boosting the German economy (Wagner, 2015). Through decentralisation, this industry has successfully expanded abroad, which brought the country 298 billion Euros in 2015. At the international level, the construction industry nets about 20 billion Euros annually. Through a decentralised accounting management, the German construction industry gains access to high-quality innovations, digital planning and construction and can deliver state-of-the-art constructions (Hoque, 2018). They are a good pace setter for other organisations and construction companies throughout the world.

2.4 Summary: identification of research gap

After having analysed the specialised literature, the researcher came to a point where he recognised that it is not possible to analyse and implement all sources available and brought the literature review to a reasonable end. Therefore, the author decided to stop the literature review at that point of time, where he got the impression that the added value of further

sources would be very limited. Nevertheless, the researcher continued to monitor newly available sources in order to implement significant sources into the thesis at a later time.

The review of the literature provides crucial insights regarding MA in decentralised organisations. In particular, the studies show that MA in decentralised construction companies is a widely researched topic. The CSFs define the specific information that management accountants should utilise for managerial teams to make informed decisions. In summary, the current body of literature shows that CSFs depend on a number of circumstances. First, the CSFs tend to be industry-specific, as Bullen and Rockart (1981) argue. Since Bullen and Rockart (1981) suggested the idea, the MA has evolved thanks to the technological advancement and the environment in which companies operate. However, the review of literature confirms that industry-specific circumstances remain crucial determinants that define the CSFs. In any case, managers in the construction industry will continue to face unique challenges and opportunities. For instance, the construction companies operate in a project-based industry, where projects are managed separately. This arrangement makes it easier for the MA to be conducted based on an individual project. This way it will be possible to determine the most CSFs and provide the much-needed information required to address these factors.

Secondly, the current body of literature provides empirical evidence to support the notion expressed by Bullen and Rockart (1981) and Rockart (1982) that CSFs within an organisation differ from one company to the other. Bullen and Rockart (1981) point towards the importance of competitive strategy and industry position, both being critical when defining the specific factors that executives can use to compete with other organisations within a given industry. In this case, it is important to note how a construction company identifies the CSFs depending on its position. For example, Lönngren et al (2010) show how a construction company can subscribe to strategic partnership as a way of competing with well-established rivals. The idea is to identify the challenges that are specific to an organisation through management account by forecasting possible future trends. The management team can then make a decision that will assist the company to gain a competitive edge. However, the review of literature that focused on the construction industry exposed a research gap as far as organisation-specific evidence is concerned. Instead of concentrating on specific companies, the study involved participants working in different construction firms. The study by Kärnä (2009), for instance, focuses on 831 construction projects across Europe.

Studies illustrate the industry-specific success factors that executives in the construction sector need to focus on in order to gain a competitive edge (Kärnä, 2009; Spigarelli et al, 2015; Yang et al, 2010). The empirical evidence shows that CSFs in the construction industry differ from one country to another. For example, Lim et al (2011) shows how a

mature market like Germany differs from Singapore, which is an emerging market. It is obvious that the construction activity – which is always driven by demand – will always differ strongly depending on the country in question. In particular, Lim et al (2011) show how construction companies in Germany had to deal with country-specific challenges such as low demand for housing. However, the mature and innovative landscape that Germany offered allowed managers to make informed decisions.

Other studies also show various country-specific circumstances that define the success factors. All findings reveal that countries with similar business environment share similar challenges and opportunities. For example, studies that covered construction companies in developing nations (Saqib et al, 2008; Lu et al, 2010; Mahmood et al, 2012) reveal other informational needs for managers than studies conducted in developed nations (Li et al, 2005; Akhavan et al, 2014). This shows that more country-specific evidence is indeed required to develop relevant empirical evidence of specific markets.

Although multiple studies cover the construction industry, the applicability of the findings is limited for a number of reasons. In particular, all of the important variables such as CSFs, informational needs, and the structure of operations (centralised and decentralised) were conducted separately. A better understanding of CSFs and MA in decentralised construction companies can be achieved by bringing these variables together. By doing so, it will be possible to determine the relationship between factors as far as MA is concerned. On the same note, focusing on both centralised and decentralised construction firms will provide a much needed platform for comparison. In other words, it will be possible to determine how decentralised construction companies differ from centralised ones as far the CSFs and informational need are concerned.

Figure 2 illustrates the emerging themes and gaps in the literature review.

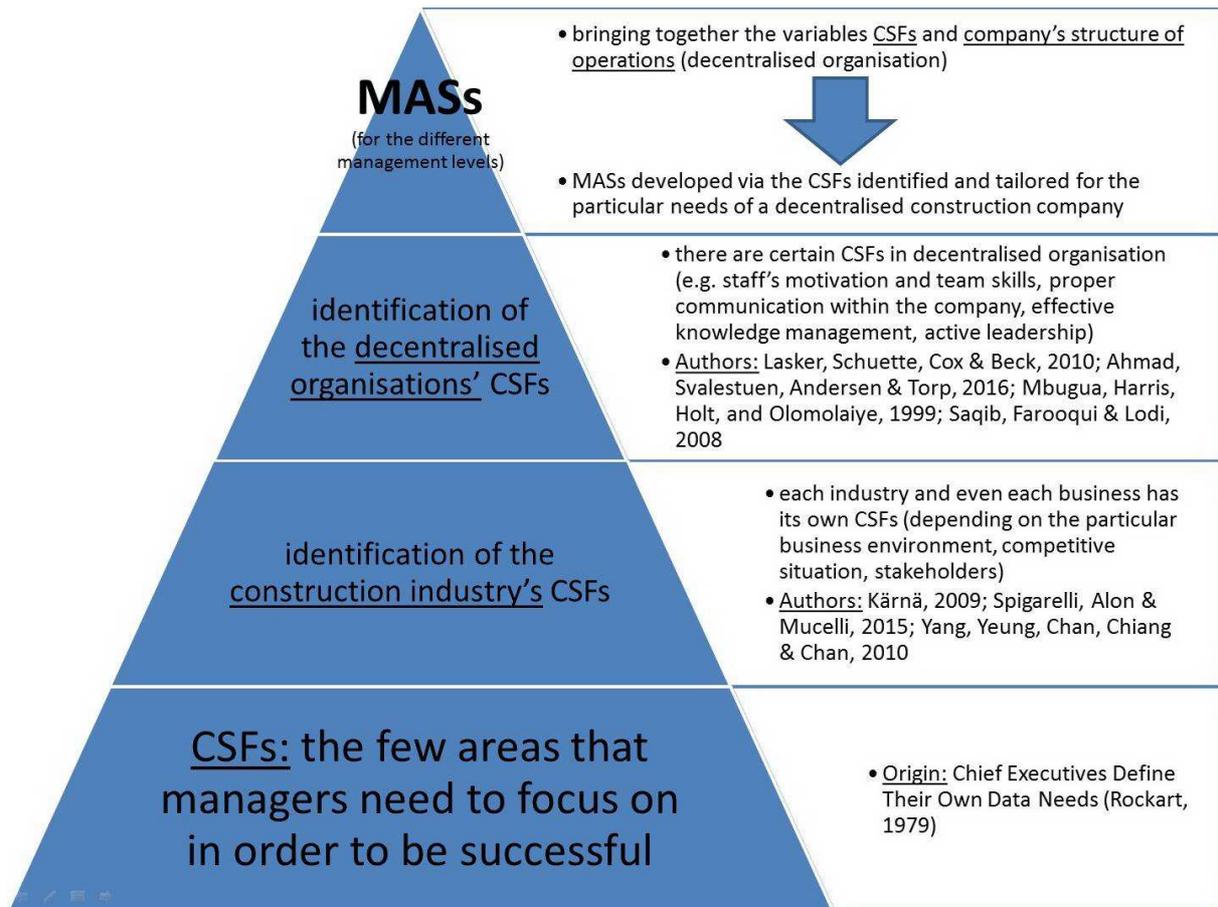


Figure 2: Framework of the emerging themes and gaps in the literature review (own figure).

The intended research questions:

1. What are the CSFs within decentralised construction companies?
2. What are possible designs of MASSs developed via the CSFs identified and tailored for the needs of the different management levels?

are designed to bring the variables CSFs, information need, and decentralised organisation together.

2.5 Reflections: what makes an expert

Upon commencing the search and evaluation of the available literature in the area of study, it became apparent that many authors have previously researched the main areas of this research topic: CSFs, decentralised organisations, MA, and construction industry. It was especially the relatively high number of authors in the less popular, non-traditional business administration areas, decentralised organisations and construction industry that came as a novelty to the author. It was beneficial to learn that these other authors come from all over the world: America, Africa, Asia, Australia, Middle East, and Europe. A high number of references posed a question of whether a knowledge gap can be found at all.

On the one hand, a literature review is the basis of the entire research study, as the researcher gains in-depth theoretical knowledge through the literature review. On the other hand, the literature review determines the study's research direction, as it helps to define or rather review the research questions/objectives depending on the identified knowledge gaps.

Furthermore, the literature review and its results have a strong influence on the research methodology (Chapter 3). Within the literature review, a researcher will find rival positions related to her/his study's topic. This helps the researcher to develop a clear view on her/his topic and the topic's environment.

Another finding the author has gained from the literature review is that it may be complex to deal with a topic in depth. Nowadays, many people are declared experts – for instance, in television – but probably very few among them have invested the time and work within their respective area that a literature review requires. Hence, one should always double-check the background of supposed experts.

From the researcher's perspective, the conducted literature review presents the available literature in an organised way, provides a detailed survey and synthesises the information offered in the literature into a summary, and finally illustrates current knowledge gaps.

3 Methodology

3.1 Introduction

In business management research in general, as in this research as well (Section 1.5), it is usually the researcher's business experiences and personal interests that mark the research motivation (Bryman et al, 2011). There are several approaches available to ensure that the results meet the researcher's expectations in terms of reliability, replication, and validity. All of them have individual advantages and disadvantages (Yin, 2014). The appropriate choice mainly depends on the role of the researcher (Yin, 2014), the role of the research participants, the personal relationship between researcher and the participants, the kind of data the researcher is focused on as well as the main research goal (Ryan et al, 2009).

In this study, the researcher's goal is to develop an MAS for decentralised construction companies to support effective decision-making using the CSFs method.

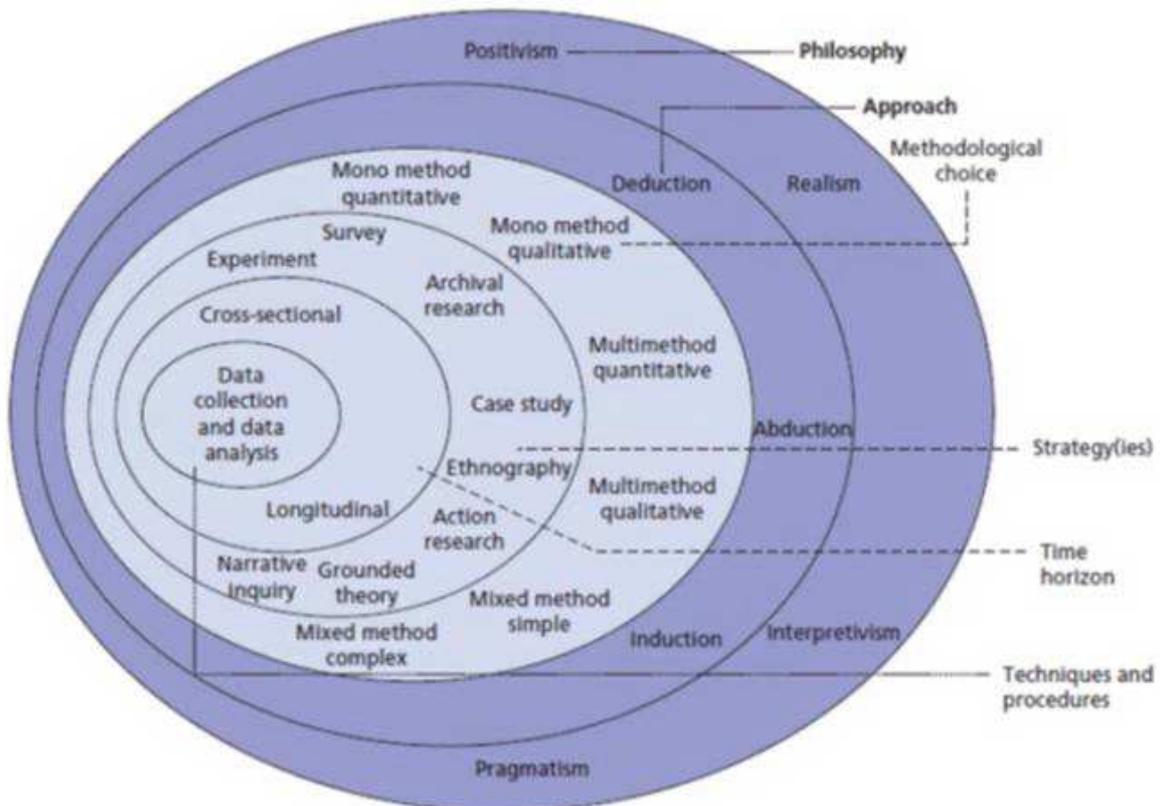


Figure 3: The research 'onion' (Saunders, Lewis & Thornhill, 2012).

Figure 3 illustrates the categories which the researcher has to choose to ensure research results that meet his expectations. These categories are:

1. research philosophy;
2. research approach;

3. methodological choice;
4. strategy(ies);
5. time horizon; as well as
6. techniques and procedures.

The following sections provide an overview in the above-mentioned order as to how the researcher has constructed a holistic research approach that fits this research study including individual justifications for each single choice. In addition, the researcher illustrates how he minimises bias and deals with ethical issues within this research study.

Each choice in the different categories was made to reach the intended research objectives:

1. To explore the CSFs within decentralised construction companies.
2. To illustrate possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels.

At the end of the chapter, the author provides detailed information related to the practical preparation prior to the actual case study conduct.

In this thesis - especially in Chapters 3 and 4 - the author uses male pronouns solely. The reason for this is the extraordinary circumstance that all study's participants were males.

3.2 Research philosophy

3.2.1 Introduction

Identifying a research philosophy is the first choice a researcher has to make to build up a suitable research design.

There is no universal research philosophy for a certain research area or topic (Becker, 1996; Mkansi & Acheampong, 2012). Each researcher needs to determine a research philosophy that he can identify with by working on ontological, epistemological, and then methodological questions (Guba et al, 1994; Johnson & Duberley, 2000; Bryman et al, 2011). In the process, the researcher will recognise his paradigms. Paradigms are basic belief systems depending on personal principles and illustrating an individual worldview of a human being (Guba & Lincoln, 1994; Johnson et al, 2000; Cruickshank, 2007; Saunders et al, 2012).

The choice of an appropriate research philosophy is strongly connected to the paradigms a researcher stands for and marks a milestone within a research study as many further

decisions (e.g. approach, methodology, and methods) depend on the research philosophy that is adopted (Guba et al, 1994).

3.2.2 Types of research philosophies

There are various different compositions of research philosophies throughout literature including individual epistemologies and ontologies (Mkansi & Acheampong, 2012). Guba et al (1994) list positivism, post positivism, critical theory, and constructionism. Bryman and Bell (2011) name positivism, realism, interpretivism, and objectivism. Saunders et al (2012) provide positivism, realism, interpretivism, and pragmatism as available philosophies within business research. Ritchie and Lewis (2003) differ in ontological and epistemological categories and illustrate realism, materialism, critical realism, idealism, and relativism as ontological perspectives as well as positivism, and interpretivism as epistemological perspectives.

Saunders et al (2012, p. 129) explain the benefit “for researchers undertaking a particular study to think of the philosophy adopted as a multi-dimensional set of continua rather than separate positions.”

<u>Question (dimension)</u>	<u>Continua</u>	
What is the nature of reality?	external vs. objective vs.	socially constructed subjective
What is considered acceptable knowledge?	observable phenomena vs. law-like generalisations vs.	subjective meanings details of specific
What is the role of values?	value free vs.	value bound

Table 2: Research philosophy as a multidimensional set of continua (adopted from: Saunders, Lewis & Thornhill, 2012).

Table 2 illustrates the different points a researcher has to take into consideration in order to identify the right research philosophy.

Ontological considerations: “What is the nature of reality?”

As the researcher intends to develop an MAS using the CSFs method, he shares the ontological position that social actors have an influence on social phenomena (constructionism (Bryman at al, 2011) or rather subjectivism (Saunders et al, 2012)). An

objectivistic perspective would lead to the finding that the entire intended research is in vain, as social actors (e.g. employees in a decentralised construction company) have no influence on social phenomena (e.g. CSFs in a decentralised construction company) (Crotty, 1998).

As most authors who conduct studies in business research intend to solve problems occurring in their personal business environment (Sections 1.5 and 3.1), a constructionist perspective is very common among researchers in this field of study. The author found numerous examples in the course of his literature review (e.g. Eriksson & Westerberg, 2009; Lasker, Schuette, Cox & Beck, 2010; Mahmood & Sajid, 2012; Yang, Yeung, Chan, Chiang & Chan, 2010; Yong & Mustafa, 2012).

Epistemological considerations: “What is considered acceptable knowledge?”

The business environment including the existing CSFs in decentralised construction companies is determined by humans in their role as social actors (e.g. BMs, construction site managers, construction workers). Therefore, the focus in this study lies on research among people rather than on objects as it is common in natural sciences. This is the reason why epistemological points of view like positivism and realism that use purely scientific approaches including collecting data and law-like generalisations to create knowledge (Bryman et al, 2011; Saunders et al, 2012), will not be adopted by the author in this research study.

Among existing business research studies, there are those by authors who use different types of epistemology: Hardcastle, Edwards, Akintoye and Li (2005), Johansen and Walter (2007) and Chan and Kumaraswamy (1997) have adopted positivism as leading epistemology and use impersonal questionnaires as major data source. Jones (1991) has adopted an epistemology which is close to interpretivism as he uses the CSFs method including the conduct of interviews with managers in British hotel companies.

The author will adopt interpretivism as the leading epistemology because it helps him to take into account the differences of the social actors and their different perceptions, value systems and goals (Guba & Lincoln, 1994). Especially during the intended semi-structured expert interviews with managers of different levels as part of the CSFs method, this epistemology is necessary to estimate certain outcomes. Each participant has different views and values that need to be taken into account by the researcher to generate acceptable knowledge in this field of study.

Axiological considerations: “What is the role of values?”

According to Saunders et al (2012, p. 137), the author’s own values play an important role in all stages of the research process and must be considered in order to ensure credible

research results. In interpretivism, research is value-bound (Saunders et al, 2012, p. 140). As social actors play an important role in the author's research, from the axiological perspective, a socially constructed interpretivism research philosophy is appropriate. Especially social constructionism indicates that meanings are dependent on human cognition, namely people's interpretation of the events that occur around them (Saunders et al, 2012, p. 546).

3.2.3 Social constructionism

The leading research philosophy in this study will be social constructionism. The samples within the research will be small (e.g. a maximum of 20 participants in semi-structured expert interviews) to conduct in-depth investigations using mainly qualitative research methods.

3.3 Research approach

3.3.1 Introduction

The choice of the most suitable research approach is the second decision the researcher has to make. It is based on the previous decision for social constructionism as major research philosophy and mainly depends on the intended reasoning process (Kuda, Murai & Akama, 2009).

3.3.2 Types of research approaches

A deductive research approach represents the most common view of the nature of the relationship between theory and research (Bryman et al, 2011). It moves from the general to the specific, which means that data collection is used to evaluate hypotheses related to an existing theory (Saunders et al, 2012). According to Ho (1994), deduction cannot lead to new knowledge, as the goal of this approach is theory falsification or verification.

An inductive research approach is the opposite of deduction (Ho, 1994). It implies a reasoning process for providing general rules from specific facts (Kuda et al, 2009). Data collection is mainly used to explore an existing phenomenon and create a conceptual framework to generate a new theory (Saunders et al, 2012).

Abduction includes a reasoning process for providing hypotheses that explain the given facts (Kuda et al, 2009). According to Saunders et al (2012, p. 144), in an abductive research approach, "data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth" to generate theory or modify existing theory. Ho (1994) describes abduction as rather a critical thinking than a symbolic logic.

3.3.3 Abduction

In this study, the author has chosen abduction as the major research approach as this approach best fits the complex research topic, the necessary in-depth investigations, the CSFs method as basis of the expert interviews (major data source), and thereby the chosen research philosophy, which is social constructionism. The empirical results of the author's study will be used to explore a phenomenon (CSFs in a decentralised construction company edited in different themes and patterns) and generate a new theory (an MAS for decentralised construction companies).

3.4 Methodological choice

3.4.1 Introduction

The methodological choice is the third decision and it is based on the previous decisions for social constructionism as research philosophy as well as abduction as research approach.

3.4.2 Types of methodologies

In general, there are quantitative research designs, qualitative research designs, and a combination of both: mixed methods research designs (Saunders et al, 2012). Especially outside of business research, it is common that most researchers focus on quantitative research designs (Tranfield et al, 2003). According to Cameron (2015), 76% of the researchers choose a quantitative research design, 10% a qualitative research design, and 14% a mixed methods research design.

According to Bryman et al (2011, pp. 26 and 27), the quantitative approach is a research strategy that emphasises quantification in the collection and analysis of data and that:

- entails a deductive approach to the relationship between theory and research, in which the emphasis is put on the testing of theories;
- has incorporated the practices and norms of the natural scientific model and positivism in particular; and
- embodies a view of social reality as an external, objective reality.

According to Saunders et al (2012), quantitative research is in principal associated with experimental and survey research strategies (e.g. questionnaires). In the analysis of collected data, mathematical processes are utilised and final results are illustrated and expressed in statistical terminologies (Pandey & Patniak, 2014).

By contrast, Bryman et al (2011, p. 27) describe qualitative research as a research strategy that uses words rather than quantification of the collection and analysis of data that:

- predominantly emphasises an inductive approach to the relationship between theory and research, in which the main goal is the generation of theories;
- has rejected the practices and norms of the natural scientific model and of positivism in particular in preference for an emphasis on the ways in which individuals interpret their social world; and
- embodies a view of social reality as a constantly shifting emergent property of individuals' creation.

Over time, and especially in social sciences like management research, qualitative research has become more important (Attride-Stirling, 2001; Tranfield et al, 2003; Flick, 2009; Miles, Huberman & Saldana, 2014). Qualitative research is associated with an interpretive philosophy, as researchers need to make sense of the subjective and socially constructed meanings expressed about the phenomenon being studied (Saunders et al, 2012, p.163). According to Miles et al (2014) and Saunders et al (2012), data collection within qualitative research is non-standardised so that questions and procedures may alter and emerge during a research process.

3.4.3 Qualitative research

In addition, Miles et al (2014, p. 9) describe the features of qualitative research as follows:

- Qualitative research is conducted through intense and/or prolonged contact with participants in a naturalistic setting to investigate the everyday and/or exceptional lives of individuals, groups, societies, and organisations.
- The researcher's role is to gain a holistic (systematic, encompassing, and integrated) overview of the context under study: its social arrangement, ways of working, and its explicit and implicit rules.
- The researcher himself or herself is essentially the main instrument in the study.
- The researcher attempts to capture data on the perceptions of local participants from the inside through a process of deep attentiveness, empathetic understanding, and suspending or bracketing preconceptions about topics under discussion.
- Most of the analysis is done with words. The words can be assembled, sub-clustered or broken into segments. They can be reorganised to permit the researcher to compare, contrast, and analyse the words and construct patterns out of them.
- Reading through these empirical materials (e.g. data), the researcher may construct certain themes and patterns that can be reviewed with the participants.

- The main task is to describe the ways people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations.
- Many interpretations of this material are possible, but some are more compelling for theoretical reasons or on the grounds of credibility and trustworthiness.

In specialist literature, authors present different opinions regarding qualitative research. Kohlbacher (2006), Bryman et al (2011), and Pandey et al (2014) state several issues regarding qualitative research. According to them, qualitative research is often too specific on a particular social setting to be generalisable to a wider world. In addition, the authors indicate that qualitative researchers are usually very close to their particular research environment and topics, which is why issues of bias and subjectivity with regard to the interpretation of the collected data and consequentially doubts concerning the validity and reliability with respect to the research results may occur. The answer to the question “how to avoid these issues?” comes from Yin (2014, p. 45). The author gives the following recommendations:

- **Construct validity**
 - use multiple sources of evidence
 - establish chains of evidence
 - have key informants review draft case study report
- **Internal validity**
 - do pattern matching
 - do explanation building
 - address rival explanations
 - use logic models
- **External validity**
 - use theory in single case studies
 - use replication logic in multiple case studies
- **Reliability**
 - use case study protocol

- develop case study database

Miles et al (2014) depict various strengths of qualitative research. In qualitative research, the focus is on naturally occurring, ordinary events in natural settings. Thereby, it illustrates what “real life” is like. As data collection takes place in close proximity to a specific situation, confidence is substantiated by local groundedness. Qualitative research emphasises a specific case including an analysis focusing on phenomena (e.g. CSFs) embedded in their context (e.g. decentralised construction company). Possible influences of the local context (e.g. special circumstances within the studied company) are not stripped away but are taken into account. Qualitative research provides the possibility for understanding latent, underlying, or non-obvious issues.

Another advantage according to Geertz (1973) and Miles et al (2014) is the richness and holism of qualitative research. Complex issues can be revealed and collected data (nested in a real context) can be illustrated in a vivid way to create a ring of truth that has a strong impact on the study’s addressees (Denzin & Lincoln, 2005; Miles et al, 2014). Qualitative data goes far beyond snapshots of “what?” or “how many?”, since data is typically collected over a sustained period. That way, causations of certain phenomena can also be assessed. The flexibility relating to data collection times and methods generates additional confidence that researcher and readers really understand what is going on. The emphasis on people’s lived experiences is well suited for determining people’s opinions concerning the events, processes, and structures within their lives and for linking these opinions to the social world (e.g. a decentralised construction company) around them.

Apart from the named strengths of qualitative research, Miles et al (2014) clarify that the competence with which the data analysis is carried out is crucial for drawing and verifying plausible conclusions. The qualitative data analysis is a continuous, iterative process (see “abduction” in Section 3.3). Components of this process are 1. data collection, 2. data condensation (calculating means, standard deviations), 3. data display (correlation tables, regression printouts), and 4. conclusion drawing/verifying (significance levels, experimental/control group differences). All of these components interact with each other (Miles et al, 2014, p. 14).

Figure 4 illustrates possible methodological paths that researchers can choose depending on the complexity of their field of study.

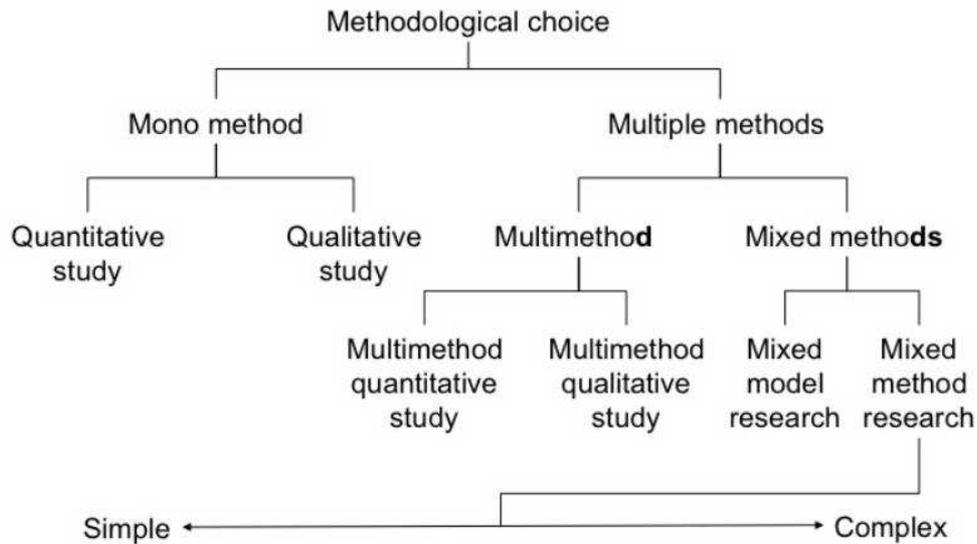


Figure 4: Methodological choice (Cameron, 2015).

3.4.4 Multimethod qualitative study

Since the study's environment is very complex, including many social actors who have an influence on the CSFs to be studied, this research will be conducted as a multimethod qualitative study. In this, the author follows the recommendation from the specialist literature (e.g. Yin, 2014). This decision also fits the previous research in CSFs. Various authors who have researched in this field conducted their studies as qualitative research (e.g. Rockart, 1979; Bullen et al, 1981; Rockart, 1982; Boynton et al, 1984; Jones, 1995; Mbugua et al, 1999; Poon et al, 2001).

3.5 Research strategy

3.5.1 Introduction

The choice of the research strategy is the fourth decision and it is based on the previous decisions for social constructionism as research philosophy, abduction as research approach, and multimethod qualitative study as methodology.

3.5.2 Types of research strategies

The academic literature provides several research strategies within qualitative research. According to Bryman et al (2011), there are experimental research designs, cross-sectional or social survey research designs, longitudinal research designs, case study research designs, and comparative research designs. All named research designs imply different strengths to ensure reliability, replicability, and validity. Bryman et al (2011, p. 68) characterise the relationships between the different research designs and qualitative research as follows:

- **Experimental research designs**
 - not a typical qualitative research design
- **Cross-sectional or social survey research designs**
 - typical form
 - qualitative interviews or focus groups at a single point in time
 - examples: Scase & Goffee's (1989) research into managers in large UK organisations; Blackburn & Stokes's (2000) study of small business owner-managers
- **Longitudinal research designs**
 - typical form
 - ethnographic research over a long period, qualitative interviewing on more than one occasion, or qualitative content analysis of documents relating to different time periods
 - example: Pettigrew's (1985) study of Imperial Chemical Industries (ICI)
- **Case Study research designs**
 - typical form
 - the intensive study by ethnography or qualitative interviewing of a single case, which may be an organisation, a group of employees within an organisation, or an individual
 - examples: Tracy, Lutgen-Sandvik, and Albert's (2006) study of organisational bullying (an organisation); Perlow's (1997) study of software engineers in a high-tech organisation (a group of employees); Marshall's (1995) study of women managers (an individual)
- **Comparative research designs**
 - typical form
 - ethnographic or qualitative interview research on two or more cases where some comparison is sought between them

- examples: Hyde et al's (2006) evaluation study of role redesign in the NHS; Collins and Wickham's (2004) panel study of patterns of female employment across Europe

This brief overview already indicates that the case study research strategy, which is a very popular and widely used research strategy in business research (Bryman et al, 2011; Ryan et al, 2012), is the most suitable strategy for this study.

3.5.3 Case study research

According to Bryman et al (2011 p. 60), the most common use of the term associates the case study with a geographical location, such as a workplace or an organisation. Case studies can help in in-depth research studies related to a setting, a person, or groups (Remenyi, Williams, Money & Swartz, 2003; Yin, 2014). A case is a phenomenon of some sort that occurs in a bounded context (Miles et al, 2014). A case study explores a research topic or phenomenon within its context, or within a number of real-life contexts (Saunders et al, 2012, p. 179). What distinguishes a case study from other research designs is this focus on a bounded situation or system, an entity with a purpose and functioning parts (Bryman et al, 2011, p. 60). The difference between the phenomenon being studied and the context in which it is being studied is not always apparent (Bryman et al, 2011; Saunders et al, 2012; Flyvbjerg, 2013). According to Saunders et al (2012, p. 179), case study research marks the complete opposite of the experimental strategy, where contextual variables are highly controlled as they are seen as a potential threat to the validity of the results. Case studies enable the researcher to gain a rich understanding of the study's context (Yin, 2014; Saunders et al, 2012). Especially if a contemporary (as opposed to entirely historical) phenomenon is investigated, case study research is the preferred strategy (Flyvbjerg, 2013; Yin, 2014).

Case studies often combine a mix of data collection methods (e.g. interviews, documentary analysis, and observations) (Yin, 2014). In order to provide intensive and detailed findings, the interviews are usually conducted as unstructured interviews (Bryman et al, 2011).

3.5.4 Types of case study researches

The specialist literature mentions several types and dimensions of case study research (e.g. Stake, 1995; Bryman et al, 2011; Ryan et al, 2012; Yin, 2014). Some of them will be dealt with in this section.

According to Yin (2014) and Flyvbjerg (2013), there are two types of case study research: single case research and multiple cases research. Both dimensions imply certain strengths and weaknesses (e.g. the role of the researcher) (Ryan et al, 2012). A single case is often

used where it represents a critical case or, alternatively, an extreme or unique case, or a single case may be selected as it is typical or because it provides the researcher with an opportunity to observe and analyse a phenomenon that few have considered before (Saunders et al, 2012, p. 179). In accounting research, a case study usually implies a single unit of analysis (Ryan et al, 2012).

A further distinction is the one between holistic and embedded case studies (Yin, 2014). If a study treats the researched organisation as a whole unit, the specialist literature speaks of a holistic case study (Yin, 2014; Saunders et al, 2012). If the researcher examines a number of sub-units (e.g. departments, branches, or certain management levels) within an organisation, then he/she conducts an embedded case study (Yin, 2014; Saunders et al, 2012).

Bryman et al (2011, p. 60) quote Stake (1995), who distinguishes three types of case studies:

- **Intrinsic case studies:** these cases are undertaken primarily to gain insight into the particularities of a situation, rather than to gain insight into other cases or generic issues.
- **Instrumental case studies:** these studies focus on using the case as a means of understanding a broader issue or allowing generalisations to be challenged.
- **Multiple or collective case studies:** these studies are undertaken jointly to explore a general phenomenon.

Ryan et al (2012, pp. 143 and 144) name five different types of case studies in accounting research. 1. descriptive case studies that aim at describing phenomena in different companies. 2. illustrative case studies, which attempt to illustrate new and possible innovative practices developed by particular companies. 3. experimental case studies that are used to examine the difficulties involved in implementing new proposals (in accounting) and evaluate the benefits which can be derived. 4. exploratory case studies enable the researcher to generate hypotheses about reasons for particular practices (in accounting). And 5. explanatory case studies that attempt to explain the reasons for observed (accounting) practices.

3.5.5 The role of the researcher

Especially in studies involving many social actors, like this study, the role of the researcher is important. There are five different roles of the researcher (Ryan et al, 2012, p. 152):

- **Outsider:** as an outsider, the researcher can maintain a distance from the case, but must rely on available evidence, such as published reports and other secondary sources.
- **Visitor:** this is probably the most common perception of the case researcher, as someone who visits the case 'site' and interviews the subjects of his research. Here the researcher is not directly involved in the issues to be researched, but even the act of talking about these issues could have an impact upon those who are the subject of the research.
- **Facilitator:** here the researcher raises issues, gives advice and opens up the options for the subject of his research. The researcher does not provide solutions, but rather enables the subjects of his research to identify their problems and helps them to find their own solutions.
- **Participant:** in some sociological studies, researchers have taken jobs in the company that they are researching, such as the production line of an automobile company. Being a participant allows the researcher to obtain insights into the everyday workings of the company. In most cases, the researcher does not disclose the research agenda to those with whom he/she is working. The researcher simply works as a member of the organisation but maintains detailed records of his/her experiences.
- **Actor:** in this case, the researcher is directly involved in the organisation, possibly introducing a new system or procedure. As such, the researcher is an active participant in the process that is being researched.

As, in this case, the researcher works for the company to be studied, the roles as outsider and visitor are not available. The researcher's role as participant fits best to this study, as the author has been working in the organisation to be studied for years and detailed insights into the everyday workings of the company are crucial to achieve the research objectives.

3.5.6 Single case study

Research depth is crucial to achieve the objectives of this study. The researcher needs to know what is critical for the business success of decentralised construction companies. A detailed insight into the studied organisation, its internal processes and contexts is essential. The case study will be instrumental, as the study's findings will be generalisable and can be used to comparable organisations. To ensure these in-depth insights, an embedded (certain management levels embedded in an organisation) case study strategy will be adopted. This choice is also comparable to previous research in the field of CSFs (e.g. Rockart, 1979;

Boynton et al, 1984; Jones, 1995). The study will have an illustrative and exploratory nature including typical characteristics: search of literature, interviewing experts in the research subject, and conducting individual in-depth interviews. The interviews will be relatively unstructured to ensure flexibility. Triangulation (Yin, 2014) will be used, especially related to research objective 2, to ensure reliability, replicability, and validity of the findings. In this study, the role of the researcher is crucial (Ryan et al, 2002). In order to create non-biased findings, it is necessary that the researcher obtains insights into the everyday workings of the studied organisation (Yin, 2014). To achieve that, the researcher works as a member of the organisation, but maintains detailed records of his experience (Ryan et al, 2002). The researcher depends on the knowledge and experience of the organisation's managers, therefore he has to ensure adequate collaboration between the managers and himself. In order to slip into the role of a participant (Ryan et al, 2002), the researcher has chosen the company where he is employed (a German decentralised construction company with 20 branches and approximately 900 employees) to develop a single case study design. The application of a multiple case study is not reasonable, as it would not provide the advantages that come with the researcher's role as participant. There are also examples of previous research in this field using the single case study method (e.g. Bullen et al, 1982; Boynton et al, 1984).

3.6 Time horizon

3.6.1 Introduction

The choice of the study's time horizon is the fifth decision and it is based on the previous decisions for social constructionism as research philosophy, abduction as research approach, multimethod qualitative study as methodology, and single case study as research strategy.

3.6.2 Types of time horizons

Most research studies are time dependent. The specialist literature mainly provides two time horizons for business researchers (Bryman et al, 2011; Saunders et al, 2012). **Cross-sectional research** is a research design that entails the collection of data on more than one case (usually quite a lot more than one) and at a single point in time. The goal is to collect a body of quantitative or quantifiable data in connection with two or more variables (usually many more than two), which are then examined to detect patterns of association (Bryman et al, 2011, pp. 713 and 714). The survey strategy is the most common strategy in cross-sectional research (Saunders et al, 2012). **Longitudinal research** is a research design in which data are collected on a sample (of people, documents, etc.) on at least two occasions (Bryman et al, 2011. p. 715). In longitudinal research, the researcher is often participant of the organisation to be studied for many months or years (Bryman et al, 2011). This research

design enables the researcher to study changes and developments (Saunders et al, 2012). In addition, it provides a measure of control over some of the variables in the context of the research topic (Saunders et al, 2012).

3.6.3 Longitudinal study

A longitudinal research will be adopted as the researcher has been participant in the company to be studied for many years – thus having observed social actors and phenomena in the organisation for a long time – and in order to study certain changes and developments in and around the study's topic.

3.7 Techniques and procedures

3.7.1 Introduction

The choice of techniques and procedures of data collection and data analysis is the sixth and final decision to be made. It is based on the previous decisions for social constructionism as research philosophy, abduction as research approach, multimethod qualitative study as methodology, single case study as research strategy, and longitudinal study as time horizon. The processes “data collection”, “data condensation”, “data display”, and “conclusions: drawing/verifying” in this study will follow the recommendation by Miles et al (2014).

3.7.2 Case study components

As data collection proceeds, data condensation occurs in parallel: writing summaries, coding, developing themes, generating categories, and writing analytic memos (Miles et al, 2014, p. 12). In order to design a meaningful case study, Yin (2014) provides five important components – study questions, study propositions, unit of analysis, linking data to propositions and criteria for interpreting a case study's findings – that need to be taken into account. These components will be treated in the following sections.

3.7.2.1 Study questions

The form of the questions – in terms of “who”, “what”, “where”, “how” and “why” – provides an important clue regarding the most relevant research method to be used. Especially “how” and “why” questions fit well with case study research (Yin, 2014). The two intended research questions in this study are:

1. What are the CSFs in decentralised construction companies?
2. What are possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels?

Regarding “what” questions, Yin (2014) recommends taking into account the aim of the question. If “what” means “how much” or “how many”, the researcher should not use the

case study research strategy. However, if the “what” question aims comprises an exploring nature, as in this study (exploring the CSFs in a decentralised construction company), the case study strategy is adequate. As the answers to both research questions require the collection of in-depth insights into the company to be studied, case study research is the most suitable research strategy here.

3.7.2.2 Study propositions

According to Yin (2014), the research questions do not express what the researcher really intends to study.

Therefore, it is important that a researcher is able to state the study’s propositions or rather proposition to steer the case study research in the right direction.

This study’s propositions respectively the author’s assumptions are:

- a. There are CSFs in decentralised construction companies that affect the economic situation (e.g. operating results, liquidity management), the attractiveness of the company as an employer (e.g. working atmosphere, long-term perspectives for employees), and customer satisfaction (e.g. quality, adherence to schedules).
- b. It is possible to steer these CSFs in a decentralised construction company (depending on the different areas of responsibility: from the MDs’ perspective, as well as the BM’s perspective) by using an MAS that takes into account the most important CSFs in the (above-mentioned) different categories.
- c. This MAS to be developed will be tailored for decentralised construction companies and within these companies for different management levels: PMs, BMs, and MDs (Section 4.1.5).

3.7.2.3 Unit of analysis - the “case”

The clear definition of the unit of analysis through questions and propositions also includes the boundaries of the case. These boundaries help to identify the information to be collected to reach the study’s aim. The more a case study obtains specific questions and propositions, the more it will remain within feasible limits (Yin, 2014, p. 31).

This study’s unit of analysis is a German decentralised construction company. In this firm, the study focuses on the influences of certain management levels on the firm’s CSFs exclusively as an embedded unit. Social actors, who are outside the mentioned management levels, will be treated as context within this study.

There are the following time boundaries within the study depending on the variable data collection methods:

- Semi-structured expert interviews: in 2018 (with all managers of above-mentioned management levels)
- Analysis of commercial documents: financial years 2009-2017 (last nine years)
- Observations by the researcher: June 2008-2018 (author’s employment duration)

Table 3 illustrates the study’s unit of analysis.

Single Case	
Description	<ul style="list-style-type: none"> • 100% family-owned decentralised construction company in Germany • approx. 900 employees • approx. 130 Mio. €
Features	<ul style="list-style-type: none"> • 20 branches within Germany, all treated as independent profit centres • one head office incl. administration departments • individual jobs from one hundred € up to several million €
Participants / Data Sources	<ul style="list-style-type: none"> • <u>expert interviews:</u> BMs, MDs, QM (2018) • <u>commercial documents:</u> all branch operational results (2009-2017) • <u>process/meeting observations:</u> BMs, MDs (2009-2018)
Context	<ul style="list-style-type: none"> • social actors outside the above mentioned management levels • external stakeholders: e.g. clients, suppliers, financial institutions, tax authorities, legislators

Table 3: Unit of analysis - the “case” (own table).

3.7.2.4 Linking data to propositions

According to Yin (2014), researchers might collect too much data, wrong data, or even too little data. All three versions lead to problems regarding the linking of the collected data to the research propositions. In order to avoid these problems at a later stage of the study, the

researcher has conducted a pilot expert interview including a following review of the appropriateness of the collected data.

In addition, the author's personal preparation, preparation of the interview guideline, and the focus of the author's observation activities was conducted with respect of a proper and logical linking of data to research propositions.

3.7.2.5 Criteria for interpreting a case study's findings

When doing case studies, an important strategy is to identify and address rival explanations for the study's findings. Addressing such rivals becomes a criterion for interpreting the findings: the more rivals are being addressed and rejected; the stronger the study's findings will be (Yin, 2014, p. 36).

For this research study, the author needs to identify the rivals among different expert interviews, or even among different data sources, e.g. through participant observation and expert interview, and reject them.

3.7.3 Preparation of single case study

Following Yin (2014), before carrying out the actual case study research, the researcher prepares himself for all areas of the study. For this purpose, all information at hand – the results from the literature review, the intended research questions, the developed research propositions, the projected data collection methods, the interview guideline as well as observation possibilities, and access to commercial documents – is presented and discussed with top managers of the organisation to be studied, as well as with the university supervisors.

In addition, the author makes himself familiar with the required research knowledge and skills related to the case research strategy, semi-structured expert interviews, process observation skills, ethical guidelines for social researchers, and further soft-skills that might be of importance in this study.

A further preparation regarding the research topic or the organisation to be studied is not required, as the author has worked in the researched company for ten years. As the head of the MA department, he has known every participant of this study for many years and is also familiar in detail with the research topic as well as the study's context.

Another part of this stage is the preparation of the questionnaire for the semi-structured expert interviews. As all managers to be interviewed are German, the interview guideline is developed in both English and Germany. Before conducting a pilot interview to test approaches, methodologies, and to ensure that adequate results are generated by the actual

interviews that follow, the interview guideline was discussed with the university supervisors and top managers from the studied firm. In order to provide the participants with sufficient information about the research study, the researcher developed an information sheet for every participant that he will hand out prior to the pilot interview as well as the actual interviews. The information sheet is designed to encourage a relationship between the participants and the research study. Thereby, this is the intention; the participants' motivation will be increased.

In a first step, the pilot interview is conducted and its findings related to the research questions, ethical considerations, and possible bias is checked by the author in close cooperation with the company experts and the university supervisors. To ensure honest and critical feedback, the author has selected the manager with whom he has the best personal relationship within the organisation to be studied.

This section illustrates how the author has prepared the single data collection and data condensation processes (Miles et al, 2014), and how the single results will be documented. All collected data will be treated confidentially and stored appropriately in a structured database on the hard disk of the researcher's personal computer. Individuals will not be identifiable in the publications. The research outcomes will be verified by company experts before conclusions are drawn.

Several types of preparation are necessary prior to the actual conduct of the case study research. An interview guideline needs to be developed, a partner for the pilot interview has to be identified, and the author's personal interview skills have to be honed. In addition, ethical considerations and bias minimising measurements are taken into account.

This section is subdivided into the researcher's personal preparation, the methodological preparation, as well as the conduct of the pilot interview including its outcomes related to the interviewees' different objectives and CSFs. At the end of this section, the author provides details to the three data collecting methods.

3.7.3.1 Skills

3.7.3.1.1 A good researcher

Starting with the necessary personal skills related to case study research, Yin (2014) names the following habits a good researcher needs to combine:

- Ask good questions - and interpret the answers fairly.

The basic idea when it comes to asking good questions is to understand that research is about questions and not necessarily about answers. If you are the type of person for whom

one tentative answer immediately leads to a whole host of new questions, and if these questions eventually aggregate to some significant inquiry about how or why the world works as it does, you are likely to be a good asker of questions (Yin, 2014, p. 74).

- Be a good “listener” - not trapped by existing ideologies or preconceptions.

Being a good listener means being able to assimilate large amounts of new information without bias. As an interviewee recounts an incident, a good listener hears the exact words used by the interviewee, captures the mood and affective components, understands the context in which the interviewee is perceiving the world, and infers the meaning intended by the interviewee (not by the researcher) (Yin, 2014, p. 74).

The listening skill also needs to be applied to the inspection of documentary evidence, as well as observations of real-life situations. In reviewing documents, listening takes the form of worrying whether the originator of the document intended to leave any important messages between the lines (Yin, 2014, p. 74).

- Stay adaptive - so that newly encountered situations can be seen as opportunities, not threats.

Few case studies will end exactly as planned. Inevitably, you will have to make minor if not major changes, ranging from the need to pursue an unexpected lead (potentially minor) to the need to identify a new “case” to study (potentially major). The skilled researcher must remember the original purpose of the case study but must also be willing to adapt procedures or plans if unanticipated events occur. When a shift needs to be made, he must maintain an unbiased perspective and acknowledge those situations in which, in fact, he may have inadvertently begun to pursue a totally new study (Yin, 2014, p. 74 f.).

- Have a firm grasp of the issues being studied - even when in an exploratory mode.

Every case study researcher must understand his basic theory as well as policy issues because analytic judgments have to be made throughout the entire data collection phase. Without a firm grasp of the issues, he could miss important clues and not know when a deviation was acceptable or even desirable. The point is that case study data collection is not merely a matter of recording data in a mechanical fashion, as it is in some other types of research. The researcher must be able to interpret the information as it is being collected and to know immediately, for instance, if several sources of information contradict one another and lead to the need for additional evidence - much like a good detective (Yin, 2014, p. 75 f.).

- Avoid bias - by being sensitive to contrary evidence, also knowing how to conduct research ethically.

All of the preceding conditions will be negated if a researcher only seeks to use a case study to substantiate a preconceived position. Case study researchers are especially prone to this problem because they must understand the issues beforehand, and this understanding may undesirably sway them toward supportive evidence and away from contrary evidence (Yin, 2014, p. 76).

As the author has already been working within the organisation to be studied for several years, the danger of a preconceived position related to organisation's managers and CSFs exists. Therefore, it is important that the author attaches great importance to contrary evidence and shows openness to rival positions during data collection, data analysis as well as during conclusions drawing/verifying process.

Avoiding bias is but one facet of a broader set of values that falls into the category of "research ethics". A good case study researcher, like any other social scientist, will strive for the highest ethical standards while doing research. These include having a responsibility to scholarship, such as neither plagiarising nor falsifying information, as well being honest, avoiding deception, and accepting responsibility for his own work (Yin, 2014, p. 76 f.).

The researcher tries to meet Yin's (2014) recommendations during the entire research study process. These recommendations can be seen as a guideline for the author that helps him to always act or react professionally and in a goal-oriented manner. Therefore, the recommendations provide self-confidence for the researcher related to his upcoming fieldwork. Of course, Yin's (2014) suggestions are also valid related to the chosen methods within the intended case study research.

Furthermore, the researcher needs to be familiar with the chosen methodology and therefore with the methods (1. semi-structured expert interviews, 2. commercial documents analysis, and 3. process/meeting observations). The necessary knowledge related to the methodology has been developed and described in Chapter 3.

In addition, the author needs to be a research expert. In this case, the author's focus lies more on the development of personal skills as he is already familiar with the topic of this study: as a member of MA for nine years and later head of MA of the organisation to be studied, he already has in-depth insight into the research topic and its environment including the social actors who have an impact on the CSFs of the organisation to be studied. Furthermore, the literature review has brought additional, more theoretical, insights in the research topic.

The author needs to have a varied skill set in order to conduct a case study research including expert interviews. Personal skills regarding case study research (e.g. What issues

does the researcher need to focus on?; How to minimise bias?; What is part of a case study?), semi-structured expert interviews (e.g. How to ask the right questions?; How not to influence the interviewee?; What are the characteristics of a semi-structured interview?) and direct observations need to be developed by the researcher himself.

Further personal preparation with regard to the commercial documents analysis is not necessary, as the researcher (as head of MA department) has been doing exactly this in his everyday work for several years.

3.7.3.1.2 Semi-structured expert interviews

The conduct of the expert interviews provides the major data source of this study. Qualitative interviews are one of the most established ways for researchers to gain access to the participants' experiences and to the way they make meaning of these experiences (Seidman, 1991). To ensure in-depth insights into the daily work and issues of the participants (BMs, MDs), the interviews will be semi-structured. This ensures a set of important questions, combined with the necessary flexibility to vary the order in which questions are asked and add new questions in the context of the research situation (Bryman et al, 2011; Saunders et al, 2012). This requires active listening by the researcher at all times.

Qualitative interviewing is a flexible and strong method to capture the voices of people and the ways they make meaning of their experiences (Rabionet, 2011). In order to use the positive habits of qualitative expert interviews, which, according to Yin (2014, p. 106), are:

- being targeted - to focus directly on the case study topics
- being insightful - to provide explanations as well as personal views (e.g. perceptions, attitudes, and meanings)

and in order to prevent the negative habits of qualitative expert interviews, which are according to Yin (204, p. 106):

- bias due to poorly articulated questions
- response bias
- inaccuracies due to poor recall
- reflexivity - interviewee gives what interviewer wants to hear,

the researcher needs to develop certain personal skills. Bryman et al (2011, p. 476) provide a guideline in form of a list of twelve criteria of a successful interviewer. He is:

1. Knowledgeable: he is thoroughly familiar with the focus of the interview; pilot interviews can be useful here.
2. Structured: he gives purpose for the interview; rounds it off; asks whether interviewee has questions.
3. Clear: asks simple, easy, short questions; no jargon.
4. Gentle: lets people finish; gives them time to think; tolerates pauses.
5. Sensitive: listens attentively to what is said and how it is said; is empathetic in dealing with the interviewee.
6. Open: responds to what is important to interviewee and is flexible.
7. Steering: knows what he or she wants to find out.
8. Critical: is prepared to challenge what is said - e.g. in dealing with inconsistencies in interviewees' replies.
9. Remembering: relates what is said to what has previously been said.
10. Interpreting: clarifies and extends meanings of interviewees' statements, but without imposing meaning on them.
11. Balanced: does not talk too much, which may make the interviewee passive, and does not talk too little, which may result in the interviewee feeling he or she is not talking along the right lines.
12. Ethically sensitive: is sensitive to the ethical dimensions of interviewing, ensuring the interviewee appreciates what the research is about, its purposes, and that his or her answers will be treated confidentially.

To ensure the necessary personal skills, the author will take this list into account during the entire data analysis process. Similar to Yin's (2014) recommendations related to case study research, this guideline provides self-confidence and stability to the researcher.

Furthermore, the author will take into account the recommended objectives of the interviews related to the interviewees' CSFs by Bullen et al (1981): 1. to understand the interviewee's organisation and his or her mission, 2. to understand the goals and objectives of the interviewee, 3. to elicit CSFs and measures from the interviewee, and 4. to assist the manager in better comprehending his/her own informational needs.

All these recommendations and guidelines together create the feeling of being well prepared for the upcoming single case study including fieldwork.

3.7.3.1.3 Process/meeting observations

As a case study usually takes place in the real world, the researcher has the opportunity to make direct observations (e.g. processes, meetings). In order to use the positive habits of direct observations, which, according to Yin (2014, p. 106), are:

- immediacy - covers actions in real time
- contextuality - can cover the case's context,

and in order to prevent the negative habits of direct observations, which, according to Yin (204, p. 106), are:

- they are time-consuming
- they are selective - broad coverage difficult without a team of observers
- they are reflexive - actions may proceed differently because they are being observed
- they are costly - hours needed by human observers,

certain considerations need to be made by the author. As the researcher is able to work full-time on the study, the time-consumption and the arising costs are not such important factors here.

A possible reflexivity is also not an issue here, as the researcher has already been working for the organisation to be studied for many years. The intended role of the researcher as participant (Sections 3.5.5 and 3.5.6) also ensures authentic actions of people being observed by the author. Of course, ethical considerations have to be made.

Similar to the right selections of interviewees for the expert interviews, the selection of processes and meetings to be observed needs to be well prepared. The researcher always has to keep the objectives of the study in mind in order to conduct goal-oriented observation.

3.7.3.2 Methodology

3.7.3.2.1 Semi-structured expert interviews

1st Interview guideline

The methodology preparation prior to the conduct of the single case study marks another stage in the preparation process. A structure that ensures central themes for the semi-

structured expert interviews and the process/meeting observations needs to be developed. An explanation for the use of semi-structured interviews is given in Section 3.7.3.1.2.

The development of the guide is based on recommendations taken from specialist literature. Bryman et al (2011, p. 475) give the following suggestions with regards to the preparation of an interview guide:

- create a certain order for the topic areas, so that your questions about them flow reasonably well, but be prepared to alter the order of questions during the actual interview;
- formulate interview questions or topics in a way that will help you to answer your research questions (but try not to make them too specific);
- try to use language that is comprehensible and relevant to the people you are interviewing;
- just as in interviewing in quantitative research, do not ask leading questions;
- remember to ensure that you ask or record 'facesheet' information of general kind (name, age, gender, etc.) and a specific kind (position in company, number of years employed, number of years involved in a group, etc.), because such information is helpful for contextualising people's answers.

Rabionet (2011) points out the importance of the way in which the interviewer introduces herself/himself, as the introduction can create an adequate environment and elicit reflection and truthful comments from the interviewee.

As one of the research's objectives is to identify CSFs within the organisation to be studied, suggestions by Bullen et al (1981) are also taken into account by the author. An email from the top management of the company and the researcher to all interviewees had been sent prior to the interviews. The email explains the purpose of the research study and points out that the top management support this study. Background material to prepare the interviewees for the interviews is provided in the email's attachment. Moreover, a brief outline of the interview process is enclosed.

As all interviewees are German, the interview guide was developed in English and German. All interviewees can choose one language prior to the interview.

The development of the interview guide is the next step of the methodological preparation. As suggested by Bryman et al (2011), the author divides the guide into different sections: a brief presentation of the study and the objective of the study as well as an introduction of the

author in his own words, 1. personal questions related to the participant, 2. questions related to the participant's job, 3. questions related to the participant's goals (short-term, medium-term, and long-term), 4. questions related to the participant's CSFs, and 5. questions related to the measures for the discussed CSFs (What the participant does in everyday work in order to achieve her/his CSFs and therefore her/his goals.).

During the conduct of the interviews, the author is aware of possible additional new questions or can alter the order of the questions if necessary. The interview guide is developed in English and German. The final version of the guide was discussed with company experts as well as university supervisors.

Apart from the introductory part that includes a brief description of the topic of the study and its objectives as well as the interviewer's introduction in own words, figure 13 illustrates the structure of questions related to the participant/interviewee (Part 1). This part of the interview is crucial, as the researcher receives important information related to the participant. This makes a later contextualisation of the participant's answers possible. In addition, these questions are easy to answer and therefore offer a nice entry into the interview.

Interview Guideline

Title:
The development of a management accounting system for decentralised construction companies.

Research objectives:

1. To explore the critical success factors within decentralised construction companies.
2. To critically evaluate how the management accounting system supports the achievement of management's critical success factors within decentralised construction companies.

1. Interviewee

- 1.1 What is your name?
- 1.2 How old are you?
- 1.3 How many years are you employed at this organisation?
- 1.4 How many companies in the construction industry have you been employed so far?
- 1.5 How many years do you work in the construction industry overall?
- 1.6 What is your position?
- 1.7 How is your position within the organisation integrated?
- 1.8 How many office workers are employed in your area of responsibility?
- 1.9 How many industrial workers (including external assembly personnel) are employed in your area of responsibility?

Figure 5: Interview Guide - Introduction and Part 1 (own figure).

Figure 7 shows the interviewer's questions related to the participant's job (Part 2) and her/his goals. The participant's answers regarding her/his job are crucial, as the role of the participant, her/his specific tasks, and her/his duties within the organisation to be studied are major influencing factors on her/his perspective on phenomena within the organisation. Furthermore, the answers of this section provide first references related to possible participant's CSFs. The questions about the participant's goals (Part 3) are also of great importance to the author's study, due to the fact that the participant's CSFs to be studied arise from the participant's goals (Figure 7).



Figure 6: Stages in the CSFs approach (Jones et al, 1995, p. 167).

As a reminder: CSFs are those few key elements that 'must go right' to achieve business objectives (Jones et al, 1995; Bullen et al, 1981) and reduce the risk of business failure (Baus, 2006; Howell, 2010; Klett et al, 2010).

<p>2. Job of Interviewee</p> <p>2.1 Please describe the role of a branch manager (chief executive officer, personnel developer, quality manager).</p> <p>2.2 Please describe the specific tasks of a branch manager (or managing director, personnel developer, quality manager).</p> <p>2.3 Please describe the duties of a branch manager (or managing director, personnel developer, quality manager).</p> <p>3. Goals</p> <p>3.1 What are the short-term goals (up to one year) within your area of responsibility?</p> <p>3.2 What are the medium-term goals (one to five years) within your area of responsibility?</p> <p>3.3 What are the long-term goals (more than five years) within your area of responsibility?</p> <p>3.4 <i>Optional: Well, that's a set of goals that you'll be measured by the management. Sometimes, managers also have less formal goals. Often these goals are just as important, if not more important, than the official target agreements. Are there goals that fit into this category within your area of responsibility?</i></p>

Figure 7: Interview Guide - Parts 2 and 3 (own figure).

The interviewer's questions related to the participant's CSFs (Part 4) are the core part of the interview guide. Here, the interviewer's intention is to learn what factors (related to industry, organisation, internal, external, hard, soft, etc.) underlie the participant's goals in everyday work. In other words: which factors deserve the participant's focus in everyday work.

The researcher also repeats certain questions or asks similar questions from different perspectives in order not to miss one or several factors. The objective here is to record all participant's CSFs and, in the next step, to organise them into topics.

4. Critical success factors	
4.1	Are there critical success factors that are typical for the construction industry?
4.2	Which critical success factors underlie the short-term goals within your area of responsibility?
4.3	Which critical success factors underlie the medium-term goals within your area of responsibility?
4.4	Which critical success factors underlie the long-term goals within your area of responsibility?
4.5	In which areas does the performance have to be good in order to achieve the formal goals within your area of responsibility?
4.6	In which areas does the performance have to be good in order to achieve the less formal goals within your area of responsibility?
4.7	In which two or three areas would cause great harm, if a critical success factor is not achieved?
4.8	There are internal critical success factors such as employee motivation. Which critical success factors of this category exist within your area of responsibility?
4.9	There are external critical success factors such as customer satisfaction. Which critical success factors of this category exist within your area of responsibility?
4.10	The organisation is highly decentralised. In this context, are there further critical success factors within your area of responsibility?
4.11	Are there critical success factors that only exist within this company?
4.12	There are backward-looking critical success factors that can only be monitored by managers (e.g. target-performance comparisons). Which critical success factors of this category exist within your area of responsibility?
4.13	There are future-oriented critical success factors that managers can actively influence (e.g. promotion of young talents). Which critical success factors of this category exist within your area of responsibility?
4.14	There are soft critical success factors (e.g. relationship to boss, partner and family support, employee motivation). Which critical success factors of this category exist within your area of responsibility?
4.15	There are temporal critical success factors. Are there critical success factors of this category within your area of responsibility?
4.16	Suppose you were on a three-month training course without access to the outside world. Which three things would you most likely want to know about your area of responsibility?
4.17	Let us now try to put all the critical success factors in an order (descending in importance).
4.18	When looking at the list: are there any further critical success factors within your area of responsibility?

Figure 8: Interview Guide - Part 4 (own figure).

Figure 8 shows the relationship between CSFs and measures - every CSF can be measured. Figure 9 shows the intended questions related to these measures (Part 5). The researcher has only prepared two questions here, because as the last point of the interview, a dialogue

between participant and researcher is expected. Without leading the participant to certain answers, the interviewer tries to develop possible measures in collaboration with the participant. These measures aim at achieving the identified participants CSFs.

<p>5. Measures for Critical Success Factors</p> <p>5.1 Let us now try to develop measures for the critical success factors with which the success in the individual critical success factors can be measured.</p> <p>5.2 In addition, we try to identify or develop the source or a tool for the individual measures.</p>
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Figure 9: Interview Guide - Part 5 (own figure).

The entire interview guideline is provided in Appendix 10.

The MA system to be developed within this research study is based on these CSFs and has the major goal to illustrate operating figures tailored for these CSFs to the managers of decentralised construction companies. The managers in turn are able to see the achievement degrees of each of their CSFs.

During interviews and observation processes, the researcher takes field notes. The observation actions are based on the same presented guideline as the interviews. This way, it is guaranteed that the author always builds up connections between actual fieldwork and the objectives of the study (identification of CSFs, and development of an MA system).

To handle the large amount of data that will be generated through the expert interviews, documents analysis, as well as process/meeting observations, a folder structure was prepared on the author's personal computer (Appendix 11).

2nd Conduct

The organisation's BMs as well as MDs will take part in the expert interviews. During the interviews, the researcher will understand differences, similarities, specialities, etc. in different branches and divisions. Furthermore, he will identify the managers' objectives and how they try to reach these objectives in workaday life (participants' CSFs). The identification of CSFs in the expert interviews will follow processes that were established by Bullen and Rockart (1981).

The results of the expert interviews will be clustered/coded and summarised through tables (according to Miles et al, 2014). Interview transcripts will be shared with the interviewees prior to the analysis to ensure accuracy of data. This research method mainly answers research question 1.

The first regular expert interview was conducted on February 8th, 2018. In total (including pilot), 20 interviews with 17 BMs, one quality manager, and two MDs were conducted between February and March 2018. All interviews were conducted personally. Most interviews took place in the particular participant's branch. The interviews with the quality manager as well as the two MDs were conducted in the head office of the organisation. The interview consent form (Appendix 2) including its entire content was signed by every participant. Therefore, the researcher was able to take notes during all interviews and to record and later transcribe all interviews. The researcher did not record the interviews with the two MDs and the QM. All BMs of the organisation took part in the interviews, as each preselection by the author could have had an undesired impact on the generated data and therefore on the findings (bias minimisation). The QM as well as two MDs were interviewed in order to cross check the findings from the BMs' interviews related to the identified CSFs and to better understand the challenges arising for a decentralised company. Due to personal reasons, the intended interviews with the head of HR development as well as one BM could not take place. Two BM positions were vacant during expert interviews phase.

Based on the interview transcripts, clustering and coding of the results was done in order to ensure an effective analysis of the collected data (as recommended by Miles et al (2014) and Yin (2014)). These clusters and codes are illustrated in Table 4.

Cluster / Code	Meaning
RO	Research objective
STG	Short-term goal
MTG	Medium-term goal
LTG	Long-term goal
SSF	Short-term CSF
MSF	Medium-term CSF
LSF	Long-term CSF
BM	Branch manager (in branch)
PM	Project manager (in branch)
CP	Commercial personnel (in branch)
CM	Construction manager (on site)
ADM	Administration (head office)
MD	Managing director (head office)
OWN	Owner (head office)

Table 4: Clusters/codes of interview transcripts and observation notes (own table).

The main intention of the clustering and coding was to visualise connections between participants' answers and the study research objectives (RO) wherever possible. In addition, the coding highlights company as well as participant goals (STG/MTG/LTG), and CSFs (SSF/MSF/LSF) that underlie these goals and were identified by the researcher. Furthermore, it was the researcher's intention to differentiate between operative/direct CSFs (SSF), tactical CSFs (MSF), and strategic CSFs (LSF).

In this way, it is possible to identify the connections between the main company goals and the CSFs at manager level. All identified official company goals as well as unofficial participants' CSFs were given individual numbers in addition to the code (e.g. SCF-4 means soft CSF no. 4). This helps to work out the mentioned connections between company goals, manager goals, and CSFs.

Table 5 illustrates an example of an interview transcript including corresponding clusters and codes.

Person speaking	Content	Code(s)
Interviewer	Which short-term goals with a range of up to one year are currently being pursued in your area of responsibility?	
Participant	I would name the short-term goals in such a way that one tries to achieve the <u>target sales</u> and <u>target operational result</u> . In addition, we always try to meet the work safety requirements in order to <u>avoid work accidents</u> on our construction sites.	BM, STG-01, STG-02, PM, CM, STG-04
Interviewer	Which <u>CSFs</u> underlie the mentioned short-term goals? The first goal was to meet the budget, so first to keep the sales.	RO-1
Participant	First, of course, to <u>keep the existing customers and continue to generate orders there</u> . Orders from regular customers are low in risk. It is then necessary that one also <u>generates new customers</u> as sales from regular customers are usually not sufficient to reach the target sales.	RO-1, BM, SSF-02, SSF-27
Interviewer	Ok.	
Participant	In addition, especially in connection with the current shortage of skilled workers, it is always important to have enough <u>subcontractors personnel</u> and <u>own blue-collar workers</u> .	RO-1, BM, PM, SSF-09, MSF-03
Interviewer	Why do you differentiate explicitly between subcontractor personnel and own employees?	
Participant	Many regular customers only accept our <u>own assembly personnel</u> on their construction sites. There are several reasons for this: <u>work safety</u> , possible communication problems with foreign subcontractors, etc..	RO-1, PM, CM, MSF-03, STG-04
Interviewer	The next mentioned short-term goal was a high degree of work safety. What <u>CSFs</u> underlie this goal?	RO-1
Participant	It has to be sure that there is <u>no routine related to work safety</u> on the construction sites. It has to be ensured that	RO-1, PM, CM,

<p>prescribed regulations, such as <u>regular toolbox-meetings</u>, SSF-25, are complied with. That all workers get the required SSF-26, protective clothing and that this <u>is also worn</u>. To deal SSF-28 intensively with the particular <u>risk assessments</u> of the respective construction site.</p>
<p>... ...</p>

Table 5: Exemplary interview transcript from participant B2 (own table).

All data arising from the clustering and coding of the outcomes of the semi-structured expert interviews, commercial documents analysis, as well as process and meeting observations was summarised in tables. The data was structured and condensed (as suggested by Miles et al, 2014) in order to provide an analysable basis.

The identified CSFs (short-/medium-/long-term) that support the achievement of participant and company goals mark the major content of the MAS to be developed.

Interview No.	Participant	Position within Company	Job Description	Date - Time	Years of Experience	Interview Mode	Notes	Recording	Comment
0	A8	Branch manager	Middle management	04.01.2018 - 12:00 am	>30	Personal	x	x	Pilot
1	A1	Branch manager	Middle management	08.02.2018 - 12:00 am	>30	Personal	x	x	
2	A2	Branch manager	Middle management	12.02.2018 - 11:00 am	>30	Personal	x	x	
3	B1	Branch manager	Middle management	12.02.2018 - 01:00 pm	>20	Personal	x	x	
4	C1	Branch manager	Middle management	12.02.2018 - 02:45 pm	>20	Personal	x	x	
5	A3	Branch manager	Middle management	13.02.2018 - 05:30 pm	>20	Personal	x	x	
6	A4	Branch manager	Middle management	14.02.2018 - 09:00 am	>10	Personal	x	x	
7	B2	Branch manager	Middle management	14.02.2018 - 11:00 am	>30	Personal	x	x	
8	B3	Branch manager	Middle management	15.02.2018 - 09:00 am	>20	Personal	x	x	
9	A5	Branch manager	Middle management	15.02.2018 - 11:00 am	>30	Personal	x	x	
10	B4	Branch manager	Middle management	19.02.2018 - 11:00 am	>30	Personal	x	x	
11	A6	Branch manager	Middle management	22.02.2018 - 08:00 am	>30	Personal	x	x	
12	C2	Branch manager	Middle management	26.02.2018 - 10:00 am	>30	Personal	x	x	
13	B5	Branch manager	Middle management	26.02.2018 - 01:30 pm	>40	Personal	x	x	
14	A7	Branch manager	Middle management	27.02.2018 - 08:00 am	>30	Personal	x	x	
15	B6	Branch manager	Middle management	27.02.2018 - 06:00 pm	>30	Personal	x	x	
16	A8	Branch manager	Middle management	28.02.2018 - 08:00 am	>30	Personal	x	x	
17	C3	Branch manager	Middle management	28.02.2018 - 10:00 am	>20	Personal	x	x	
18	A9	Managing director	Top management	28.02.2018 - 12:00 am	>30	Personal	x		
19	D1	Quality manager	Middle management	28.02.2018 - 02:00 pm	>20	Personal	x		
20	B7	Managing director	Top management	09.03.2018 - 07:45 am	>30	Personal	x		

Table 6: Overview of the semi-structured expert interviews (own table).

Table 6 presents the experts that took part in the semi-structured expert interviews. The findings from the commercial documents analysis, process/meeting observation, and expert interviews are summarised in tables.

3.7.3.2.2 Analysis of commercial documents

The researcher has access to the operational results of all German branches of the studied organisation from 2009 to 2017. An operational result consists of two complete pages and includes numerous annual commercial figures. All figures relate to one single branch and one business year. Therefore, this data source enables the researcher to identify similarities and/or variations between the single branches. In combination with the other research methods, reasons and possible CSFs for these similarities/variations can be worked out. Furthermore, the researcher has access to internal documents like order announcements. In this way, the author can provide analysis in tables and graphic representations (e.g. charts, graphs).

The operating results include the annual sales, operating gross margins, fixed costs, and operational results of every branch. As a consequence, the researcher is able to analyse the different branches and divisions on a timeline of nine years. Certain developments can also be identified and analysed. Special rankings related to annual sales, operating gross margins, fixed costs or operational results can be generated. Specialities of single branches can be identified and compared to the same type of data of another branch or division. Thus, best or worst practice analyses are possible.

The results will be documented and summarised through tables and graphs (according to Miles et al, 2014). At the end of this data collection process, the author will have gained a detailed overview of all specialities, issues, similarities, and developments of all branches throughout the last nine years. Maybe it will even be possible to identify some opportunities for improvement.

For this research study, the author focuses on the following aggregated figures: sales in Euros, operational gross margin in Euros, operational gross margin in per cent to sales, fixed costs in Euros, fixed costs in per cent to sales, operational result in Euros, operational result in per cent to sales.

The named commercial figures are exported from the operational branch results into Microsoft Excel and illustrated in tables and graphs. Thereby, the author can manage the huge amount of data from more than 20 branches over nine business years. In addition to the annual commercial figures, for each figure, a respective sum of the average of the nine studied business years is provided.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	Sum / Average
Sales in €	4.057.738	3.403.240	4.119.725	4.895.806	4.664.074	4.549.234	4.327.914	3.993.238	4.613.424	38.624.393
Operational gross margin in €	1.170.945	1.286.728	1.573.803	1.856.113	1.822.885	1.639.165	1.586.415	1.454.348	1.754.915	14.145.317
Operational gross margin in % to sales	28,9%	37,8%	38,2%	37,9%	39,1%	36,0%	36,7%	36,4%	38,0%	36,6%
Fixed costs in €	889.741	810.301	791.456	782.941	819.510	755.843	834.711	779.008	808.960	7.272.471
Fixed costs in % to sales	21,9%	23,8%	19,2%	16,0%	17,5%	16,6%	19,3%	19,5%	17,5%	18,8%
Operational result in €	281.204	476.427	782.347	1.073.172	1.003.375	883.322	751.704	675.340	945.955	6.872.846
Operational result in % to sales	6,9%	14,0%	19,0%	21,9%	21,5%	19,4%	17,4%	16,9%	20,5%	17,8%

Table 7: Exemplary operational branch results from 2009 to 2017 (own table).

Table 7 illustrates how the numerous data from of the operational branch results are condensed in order to create a basis that includes the figures that are important in order to meet the research objectives and to work out similarities/variations between the studied branches. The author created a similar table for each German branch.



Figure 10: Exemplary operational branch result over nine business years including trend line (own figure).

In addition to the tables, a graph that illustrates the operational branch results over the nine studied business years as well as a trend line is provided for each branch (Figure 9). The graph enables the researcher to get a first overview before going into detail by analysing the tables including all important commercial figures. All findings from the commercial documents analysis are also documented in a summary table.

3.7.3.2.3 Process/meeting observation

As the researcher has been working in the studied organisation for ten years, he has already made many observations during various meetings. In addition, he has observed many processes within the company: in the head office, between branches and head office, as well as between branches and the company customers.

One of the aims of this data collection process is to compare the processes and meetings of different branches and build up the best practice model including the CSFs affecting the observed processes or meetings. In addition, the researcher intends to understand the differences between the studied branches. Furthermore, the author proposes to identify the different objectives of the observed managers and build up preliminary connections between these objectives and the overall goals of the organisation, to compile CSFs and therefore improvement opportunities related to the diverse management levels and company goals as well as relate the existing theory to business practice.

The results of the process/meeting observations will be illustrated and summarised through clustering and tables (according to Miles et al, 2014). These tables will include observed processes and meetings as well as the author's comments. The selection of the analysed processes also depends on the findings taken from the expert interviews.

The selection of the analysed processes also depends on the findings from the expert interviews, as many important CSFs and therefore processes have been identified there. With this method, the role of the researcher is important (Section 3.5.5). From 2009, the author has been head of MA in the organisation to be studied. Since then, he has been involved in numerous processes (between head office and branches, and also in the head office only). Examples for these processes are: customer acquisition, support of regular customers, acquisition of subcontractors, tendering, cost and result control, HR management of the branch, collaboration with head office, as well as collaboration with the top management.

All observed processes are illustrated in tables including the process participants, the individual participant approach, and if possible, similarities/variations of the different branches.

Figure 11 illustrates examples of the customer acquisition and price calculation process in the studied organisation and how two BMs handle this process. As a reminder, the particular organisation's objective is also provided in each process illustration.

Process:	CUSTOMER ACQ., PRICE CALC.	date: 11.05.18
Participants:		
branch	branch manager	
head-office	none	
external	potential new customer	
Organisation's objective:		
to increase the proportion of regular customers		
Participant's approach:		observation period: 2008-today
Participant A3:	Little thought of what kind of customer makes sense for the company. There are no <u>personal relationships with the customers.</u>	MSF-24
	There are also <u>unrealistic prices offered in order to convince a potential new customer and get the job.</u> Project "Phoenix-See", Dortmund, 2014.	SSF-29
	In that case, the calculated margin was under 0% (approx. -15%).	
Participant A7:	New customers are always acquired with <u>the idea of later developing regular customers from them.</u> If a potential new customer has <u>unrealistic price expectations, no offer will be made</u> and new customers will be sought elsewhere.	SSF-30, MSF-10 SSF-29
	<u>There are personal relationships with (regular) customers</u> (e.g. joint visits of football matches on a regular basis, 2008-present).	MSF-24

Figure 11: Exemplary illustration of the customer acquisition process (own figure).

The exemplary illustration in Figure 11 highlights that BMs can handle processes differently. In connection with the methods analysis of commercial documents and expert interviews, the researcher is able to identify certain behaviour at manager level and therefore CSFs that support or hinder the company in achieving its goals. The researcher's observation in the "participant's approach" section was coded in order to ensure an effective analysis of the collected data (Table 7). More detailed information on the process/meeting observation may not be provided by the researcher after consultation with the company owner. According to the company owner, only short texts including as little information as possible are permitted. All observed processes (not all processes related to all BMs could be observed by the researcher) are documented within a summary table as well.

3.7.3.3 Minimising bias

According to Potts (1990), when it comes to qualitative research, bias lurks in all phases. Some researchers might be tempted to only use a research study to substantiate a preconceived position. Case study researchers are especially prone to this problem because they must understand the issues beforehand, and this understanding may sway them towards supportive evidence and away from contrary evidence (Yin, 2014, p. 76) (Section 3.7.2.5) unintentionally. Bias always occurs, but it is possible for researchers to avoid it and they should try it as thoroughly as possible (Miles et al, 2014).

There are several reasons for bias in qualitative research (Potts, 1990; Miles et al, 2014; Yin, 2014). Miles et al (2014, p. 294) state the following types of bias:

- The holistic fallacy: Interpreting events as more patterned and congruent than they really are.
- Elite bias: Overvaluing data from articulate, well informed, usually high-status participants and undervaluing data from less articulate, lower status ones.
- Personal bias: The researcher's personal agenda, personal demons, or personal "axes to grind", which skew the ability to represent and present fieldwork and data analysis in a trustworthy manner.
- Going native: Losing the perspective or the "bracketing" ability, being co-opted into the perceptions and explanations of local participants.

The specialist literature (Miles et al, 2014; Yin, 2014) provides recommendations on how to minimise these types of bias and these recommendations are presented briefly in this section.

First of all, it is important that the researcher is aware of the risk and the danger of bias within the research study at all stages. Only with this awareness he/she is able to minimise the threats arising from bias (Potts, 1990). To minimise bias in a study, Miles et al (2014, pp. 297-299) recommend to remain on-site as long as possible, use unobtrusive measures, ensure that one's intentions are transparent for the participants, avoid "elite" bias by choosing a broad variety of participants, include information from different positions within the studied organisation, and keep the research questions firmly in mind. In addition, Miles et al (2014) state the danger of being misled by one or more participant(s). In this case, the authors recommend understanding and focusing on why a participant would find it necessary to mislead the researcher. In order to minimise that risk, Miles et al (2014) advise researchers not to give away how much they know. Furthermore, it can be helpful to ask

research colleagues to double-check the analysis of the collected data to identify possible existing bias.

As most of the expert interviews were conducted in German language, the translation process also contains risks related to bias. Therefore, the researcher has decided to code and analyse the German interview transcripts first, and then translate the texts into English language. Thus, bias through the translation process is impossible.

3.7.3.4 Ethical considerations

3.7.3.4.1 Introduction

All research involving human beings has to include ethical considerations and strategies for the protection of the human “subjects” within the study (Yin, 2014). Every researcher has to consider potential “wrongness” of his/her actions as a qualitative researcher in relation to the people whose lives he/she is studying (Miles et al, 2014, p. 56).

Most professions have detailed ethics codes, including guidelines ranging from research participants’ rights to inappropriate forms of relationships between researcher and participant. However, research fieldwork along with the different data collection methods are often unpredictable and site specific (Miles et al, 2014).

As two of the three data sources of this study (expert interviews and process/meeting observations) include human beings in their daily routine, there are ethical considerations that need to be taken into account.

According to the National Research Council (2003, pp. 23-28), which is cited by Yin (2014), a researcher conducting case study research has to ensure the following:

- **informed consent** from all persons who may be part of the case study, by alerting them to the nature of the case study and formally soliciting their volunteerism in participating in the study;
- **protection of those who participate in the study from any harm**, including the use of any deception in the study;
- **protection of the privacy and confidentiality** of those who participate so that, as a result of their participation, they will not be unwittingly put in any undesirable position, even such as being on a roster or on a mailing list to receive requests to participate in some future study;
- conduct of special precautions that might be needed to **protect particularly vulnerable groups** (for instance, research involving children); and

- **equal selection of participants**, so that no groups of people are unfairly included in or excluded from the research.

According to Bryman et al (2011), harm can entail various facets: physical harm, harm to the participants' self-esteem, stress, and harm to career prospects or future employment. Related to this study, physical harm is not an issue. To avoid the other types of harm mentioned, the researcher has to remain objective at all times. He has to make clear to the participants that the participants' business objectives and daily issues mark the research topic, not the participants' skills. In addition, the author has to remain neutral. An evaluation of the given answers by the researcher (this includes facial expression and/or gesture) must not take place at any time.

In this research study, there are no particularly vulnerable groups. In order to ensure an equal selection of participants, the researcher has decided to conduct interviews with all BMs of the organisation to be studied. Therefore, no one is excluded from the research and all opinions are heard. How the researcher ensures informed consent and protects the privacy and confidentiality of all persons taking part in the study is described in Sections 3.7.3.4.2-3.7.3.4.4.

In order to meet the recommendations deriving from the specialist literature, this research is conducted in accordance with the ethical guidelines of the University's Handbook of Principles and Procedures (2008). The entire ethical approach including risk assessment conducted by the author was presented to and approved (approval reference code: REC.18.30.8) by Dr Emily Ryall (University's Research Ethics Committee). A research ethics form, a covert observation consent form, an interview consent form, the research ethics committee correspondence as well as the approval are attached to this thesis (Appendices 1-5).

3.7.3.4.2 Semi-structured expert interviews

In order to meet the ethical standards, the author has created consent forms for the expert interviews (Figure 12 - Appendix 2). Both forms are created in English and German and discussed with each participant prior to the documentation of observations respectively prior to the individual expert interview. Refusal of participation is accepted without reasoning. The participants receive important information regarding the research study prior to the interviews (University's Handbook of Principles and Procedures, 2008, p. 4, paragraphs 3.1 and 3.2). Furthermore, every participant can freely decide if the researcher may use a recording device during interviews. The interview results will be treated confidentially and stored appropriately on the author's personal computer (Appendix 11). All data related to the expert interviews will be destroyed after the completion of the DBA program. Individuals will not be

identifiable within the publications (University’s Handbook of Principles and Procedures, 2008, p. 4, paragraph 3.4). During the development of the forms, the author has taken into account the ethical suggestions of the specialist literature (Bullen et al, 1981; Bryman et al, 2011; Saunders et al, 2012; Yin, 2014). Furthermore, the requirements from of the University’s Handbook of Principles and Procedures (2008) were acknowledged by the researcher.

The forms explain that the participant’s decision to take part or not take part in the study has no effect on his/her employment status or conditions. The participant is informed that the interviewer would like to record the interviews and to create transcripts afterwards in order to conduct a data analysis. It is stated that all data will be treated confidentially and access to the collected data is limited to the researcher. In addition, participants are informed that any summary interview/observation content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymised so that no one can identify the individual participant at any time.

Interview Consent Form

Research project title: The development of a management accounting system for decentralised construction companies.

Research investigator: Tim Daniel Rossenbach

Research participant’s name: _____

The duration of the intended interview will be 60-90 minutes. You have the right to refuse the participation, to stop the interview or withdraw from the research at any time. Your decision will have no effect on employment status or conditions.

Ethical procedures for academic research undertaken from UK institutions require that interviewees explicitly agree to being interviewed and to how the information contained in their interview will be used. This consent form is necessary to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Please would you sign this form to certify that you approve following:

- the interview will be recorded and a transcript will be produced
- you will be sent the transcript and given the opportunity to correct any factual errors
- the transcript of the interview will be analysed by Tim Daniel Rossenbach as research investigator
- access to the interview transcripts will be limited to Tim Daniel Rossenbach
- any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify you is not revealed
- the actual recording will be destroyed after the research project is completed
- any variation of the conditions above will only occur with your further explicit approval

Printed Name: _____

Interview participation: yes ___ no ___

Participant’s Signature: _____ Date: _____

Researcher’s Signature: _____ Date: _____

Figure 12: Interview Consent Form (own figure).

3.7.3.4.3 Analysis of commercial documents

The analysed commercial documents are anonymised, so that no branch as well as no responsible manager is identifiable within the thesis. The analysed branches receive

randomly generated numbers. To make a connection between this number and individual branches or managers is not possible at any time.

3.7.3.4.4 Process/meeting observations

Freely given informed consent will be obtained from all participants prior to or (if not possible otherwise) after the researcher’s observation activities. For this purpose, the researcher has designed a covert observation consent form, which is signed by every participant. A copy of this form is illustrated in Figure 13 and attached to this thesis (Appendix 3).

Covert Observation Consent Form

Research project title: The development of a management accounting system for decentralised construction companies.

Research investigator: Tim Daniel Rossenbach

Research participant’s name: _____

Within this research project, covert observation by the named researcher was undertaken. I hereby can give or refuse my ex post consent to Tim Daniel Rossenbach whose signature appears below, to use the notes taken of my work activities for academic purposes within the research project named. Giving or refusing consent will have no effect on employment status or conditions. I signing this consent form acknowledge and approve the following:

- Tim Daniel Rossenbach is allowed to use these notes within the research project mentioned above
- I will be sent a copy of the notes taken and given the opportunity to correct any factual errors
- the notes of my work activities will be analysed by Tim Daniel Rossenbach as the research investigator
- access to the notes will be limited to Tim Daniel Rossenbach
- any summary observation content, or direct quotations from the notes, that are made available through academic publication or other academic outlets will be anonymized so that I cannot be identified, and care will be taken to ensure that other information in the notes that could identify me is not revealed
- the notes will be destroyed after the research project is completed
- any variation of the conditions above will only occur with my further explicit approval

Printed Name: _____

Consent: yes ___ no ___

Participant’s Signature: _____ Date: _____

Researcher’s Signature: _____ Date: _____

Figure 13: Covert Observation Consent Form (own figure).

The participants receive important information regarding the research study before signing this form (University’s Handbook of Principles and Procedures, 2008, p. 4, paragraphs 3.1 and 3.2). If a potential participant is not willing to sign the form, no information arising from these observation activities flow into the study. Refusal of participation is accepted without reasoning. The observation results will be treated confidentially and stored appropriately on the author’s personal computer. All data related to the observation activities will be destroyed after the completion of the DBA program. Individuals will not be identifiable within publications (University’s Handbook of Principles and Procedures, 2008, p. 4, paragraph 3.4).

3.7.3.5 Pilot

3.7.3.5.1 Introduction

After personal and methodological preparation, the author conducts the pilot in order to review the intended research design. Given that it marks the major data source, the focus here is on a pilot semi-structured expert interview at manager level, conducted in the organisation to be studied. The pilot's objectives are to check if the research design including the author's interview guide ensures the generation of the necessary data in order to answer the study's research questions and if the intended interview guide leads to a fluent conduct of the interviews and a comfortable atmosphere for the participants.

An important decision is the choice of the pilot's participant. The author has selected a BM from the interior works division. He was chosen due to his long experience and high expertise in the field of interior works. Furthermore, this expert has been well known to the researcher prior to this study and in fact for a long period of time. This trustful personal relationship ensures honest and critical feedback from the participant related to interviews as well as observation and marks an enormous additional value to the author's study.

The ethical guidelines are observed in the pilot process as well: the pilot's participant received a brief introduction of the study's topic and context as well as the consent forms several weeks prior to the conduct of the actual pilot interview. He got the information that all personal and organisation data will be treated confidentially and will be deleted after the research study is finalised. In addition, he was informed that refusal to participate will be accepted without reasoning at any time. After the candidate for the pilot agreed to participate, he received an email including the interview guideline as well as a brief introduction to the study's topic and context. Thus, he was able to prepare himself and get familiar with the research topic and context. Furthermore, the author asked the candidate to check the interview guideline relating possible improvements.

The pilot interview was conducted as a regular semi-structured expert interview. The analysis as well as possible suggestions from the candidate were to be processed afterwards. After the interview, interviewee and researcher reviewed the interview guideline, records, and the author's interview notes together in order to identify possible improvement opportunities related to the interviews as well as the observations. In addition, the process of process/meeting observations was discussed with the participant of the pilot interview.

The pilot interview was conducted with interviewee A8 on January 4th, 2018 in the interviewee's branch and lasted 120 minutes. According to the interview guide, the pilot interview was divided into six separate parts: a brief presentation of the study and its objective as well as an introduction of the author in his own words, 1. personal questions

related to the participant, 2. questions related to the participant's job, 3. questions related to the participant's goals (short-term, medium-term, and long-term), 4. questions related to the participant's CSFs, and 5. questions related to the measures for the CSFs discussed (What the participant does in everyday work in order to achieve her/his CSFs and therefore her/his goals.).

3.7.3.5.2 Interviewer and pilot participant

In the first two parts of the pilot interview, the introduction and personal questions related to the interviewee, the author first introduced himself, the topic; and the objectives of the study in his own words. Furthermore, the researcher provided additional information to the CSFs method with a focus on the differences between officially defined goals (of a company or a particular manager within a company) and usually not official CSFs that underlie these official goals. The interviewer named several examples for short-, medium-, and long-term goals including their certain underlying CSFs in order to provide further interview preparation for the interviewee, in addition to the already transmitted information.

In a next step, the interviewee answered the personal questions related to him and his personal experience in the industry respectively in the organisation to be studied. This "simple" part generated the data that are necessary in order to be able to file the entire collected data contextually. In addition, it created a comfortable atmosphere for the interviewee and the interviewer.

3.7.3.5.3 Pilot participant's job and goals

In these parts of the pilot interview, the interviewee provides information regarding his role in the organisation, his tasks, and his short-, medium-, and long-term goals.

Related to his role in the organisation to be studied, the participant sees himself as a link between administration (head office) and top management (CEO of the parent company) on the one hand and his branch including its staff on the other. If there are new organisational requirements by the head office, it is the branch manager's job to push these requirements through.

Related to everyday life, he sees himself as the major contact person for customers (new and regular customers). It is his job to acquire new customers and develop them, together with the branch PMs, into regular ones. This includes the entire quotations and corresponding calculations. In addition, according to the pilot interviews interviewee, the local BM has to have a thorough knowledge of the market potentials of his region (e.g.: Which potential target customers are there?).

The following table illustrates the interviewee’s personal tasks and goals, which were named during the pilot interview. The data in the column “inputs from pilot interviewee” are summarised from the individual interviewee’s answers of selected questions.

Main questions	Inputs from pilot participant
Please describe the role of a BM.	<ul style="list-style-type: none"> • link between MD and branch • major contact person for customers • human resources manager in branch • trouble-shooter • independent entrepreneur within the organisation
Please describe the specific tasks of a BM.	<ul style="list-style-type: none"> • quoting and incl. calculations • acquisition of new customers and their development into regular customers • MA related to all projects • QM • acquisition of new assembly personnel
What are the short-term goals (up to one year) within your area of responsibility?	<ul style="list-style-type: none"> • to reach the given budget (sales, margin) • to ensure utilised capacity • to use synergies between branches
What are the medium-term goals (one to five years) within your area of responsibility?	<ul style="list-style-type: none"> • acquisition of new regular customers • to promote young talents within staff • to avoid/minimise labour turnover • to raise self-motivation of staff • identification of future market opportunities
What are the long-term goals (more than five years) within your area of responsibility?	<ul style="list-style-type: none"> • none

Table 8: Pilot participants tasks and goals (own table).

Given that the researcher, like the interviewee, has a detailed previous knowledge of the studied organisation and the research topic and context, within these two parts of the pilot interview there was a goal-oriented dialogue between them. The entire pilot interview conduct was very fluid and comfortable. There were no comprehension issues between interviewee and interviewer. The interviewee seemed to be well prepared during these interview phases. The atmosphere was professional throughout.

3.7.3.5.4 Pilot participant's CSFs

The questions related to the interviewee's CSFs mark the main part of the pilot interview. In this phase, the interview gives information regarding all kinds of CSFs within his area of responsibility. According to the suggestions by Bullen et al (1981), the interviewer asks similar questions related to possible CSFs that might underlie the aforementioned goals from different perspectives in order not to miss any CSF. In a second step, the named CSFs are sorted by priority by the interviewee in collaboration with the interviewer. Here it is crucial that the interviewer is careful not to have any influence on the interviewee's CSFs ranking.

According to the interviewee, there are a lot of CSFs within his area of responsibility. The most important short-term CSFs according to the interviewee are: a market-driven calculation, a continuous incoming order, the negotiation of advance payments, engagement of (external) assembly personnel in time, and a timely billing. Related to the most important medium-term CSFs, the participant named a good working atmosphere (in the branch and in the entire organisation), a continuous hiring of apprentices, the binding of assembly personnel (internal and external), and the continuous acquisition of new customers to compensate possible losses of regular customers. Related to long-term CSFs, the interviewee did not give any information. Table 9 illustrates the participant's CSFs.

Main questions	Inputs from pilot participant
Are there CSFs that are typical for the construction industry?	<ul style="list-style-type: none"> • the negotiation of advance payments • high work safety standards
Which CSFs underlie the short-term goals within your area of responsibility?	<ul style="list-style-type: none"> • a market-driven calculation • continuous incoming orders • engagement of (external) assembly personnel in time • a timely billing
Which CSFs underlie the medium-term goals within your area of responsibility?	<ul style="list-style-type: none"> • a good working atmosphere (within branch and entire organisation) • a continuous hiring of apprentices • the binding of assembly personnel (internal and external) • the continuous acquisition of new customers to compensate possible losses of regular customers
Which CSFs underlie the long-term goals within your area of responsibility?	<ul style="list-style-type: none"> • as there are no current long-term goals within my area of responsibility, none
There are internal CSFs. Which CSFs of this category exist within your area of responsibility?	<ul style="list-style-type: none"> • a good working atmosphere (within branch and entire organisation) • the existence of a good feedback culture
There are external CSFs. Which CSFs of this category exist within your area of responsibility?	<ul style="list-style-type: none"> • a high degree of customer satisfaction • the existence of unique selling propositions (e.g. several trades from one source) • to demonstrate trust and confidence towards the customers (e.g. by offering highly trained personnel) • the avoidance of quality defects
The organisation is highly decentralised. In this context, are there further CSFs	<ul style="list-style-type: none"> • a good collaboration between branch and head office (administration) • a reliable flow of information between branch and head office / MD / top management

<p>within your area of responsibility?</p>	<ul style="list-style-type: none"> • the existence of transparency of decisions from the head office • clearly formulated and communicated competences of different management levels (MDs, BMs) • integration of BMs in the company's strategic planning
<p>There are soft CSFs (e.g. relationship to boss, employee motivation). Which CSFs of this category exist within your area of responsibility?</p>	<ul style="list-style-type: none"> • signs of honest appreciation to the employees (appropriate company car, modern IT equipment, etc.) • support of partner and family (e.g. related to the very time-consuming job)

Table 9: Pilot participant's CSFs (own table).

Due to the fact that the researcher, like the interviewee, has a high previous knowledge of the studied organisation as well as the research topic and context, there was a goal-oriented dialogue between interviewee and researcher in this part of the pilot interview. The entire pilot interview conduct here was very fluid and comfortable. There were little comprehension issues between interviewee and interviewer regarding the proper distinction of goals and CSFs.

3.7.3.5.5 Measures for CSFs

For this final part of the pilot interview, the interviewer and the participant developed single measures for each of the identified CSFs. In this phase, according to Bullen et al (1981, p. 59), the interviewer is allowed to make suggestions based on his/her initial preparation or subsequently acquired knowledge. There is no danger of "leading" here. The interviewer may suggest a way of measuring that the interviewee did not think of but is fond of and will use.

Table 10 shows selected CSFs in connection with its corresponding developed measures.

CSF	corresponding measure
the negotiation of advance payments	quote: order with advance payments to total number of orders
a timely billing	the amount of not yet invoiced semi-finished works in relation to overall sales (e.g. per PM)
a good working atmosphere (within branch and entire organisation)	surveys within staff
a high degree of customer satisfaction	the conduct of a customer survey and evaluation
the continuous acquisition of new customers to compensate possible losses of regular customers	the quote 'share of sales with regular customers to total sales' will be included in the responsible BM's evaluation
a good collaboration between branch and head office (administration)	surveys within branches and head office
clearly formulated and communicated competences of different management levels (e.g. top management, MD, and BMs)	implement transparent competences of the different management levels in the management system

Table 10: Participant's CSFs and corresponding measures (own table).

This pilot interview phase delivered first measures to CSFs that were identified before. The atmosphere here was professional, but there were situations in which the pilot interviewee had problems with the distinction between CSFs and measures.

3.7.3.5.6 Findings from pilot interview

The pilot interview has shown that there are still comprehensive issues related to the proper distinction of (officially formulated) goals and (not officially formulated) CSFs that underlie these goals.

After the common evaluation with the author's supervisor it was clear that the developed interview guide is not an issue here. Instead, the interviewer's interviewee preparation has to be more intensive and its focus has to be more on the CSFs method (Bullen et al, 1981) and the individual definitions of official company goals, unofficial CSFs, and measures to be

determined in a final step. The researcher has to make sure that all participants of the study know the exact differences of the mentioned terms. Therefore the preparation material that is sent to the participants prior to the interviews was restructured.

Apart from the interview guide and the brief introduction of the topic and context (Appendices 10, 6) of the research study, all participants will receive brief summaries of the academic articles “Chief Executives Define Their Own Data Needs” (Rockart, 1979) and “A Primer On Critical Success Factors - Chapter 3” (Bullen et al, 1981) as well as a brief text containing definitions of the terms “goal” and “CSF” in order to ensure that they are all well prepared. All mentioned papers are attached as Appendices (7, 8, and 9).

In addition to the pilot interview conduct and its evaluation afterwards, the researcher has discussed the two other data sources (process/meeting observations as well as the analysis of commercial documents) with the expert. The expert shares the author’s and supervisor’s opinion that the combination of these three methods will lead to appropriate findings that will ensure the achievements of the study objectives and generate new knowledge in the studied field.

Related to the first research question, the pilot generated the following findings:

1. What are the CSFs in decentralised construction companies?

This research question aims at the identification of the existing CSFs in a decentralised construction company. The identified CSFs (related to the industry, company, a particular manager, etc.) will underlie the MA system to be developed.

The pilot has generated the required data to answer this question and therefore met the author’s expectations. Many CSFs that were mentioned by the pilot participant were already known from the literature review (e.g. motivation of staff, communication among staff, timely billing, and sufficient recourse related to assembly personnel).

The expert emphasises the importance of regular customer development as well as, due to the decentralised company’s organisation, clearly formulated and communicated competences of the different management levels (MD and BMs) including a reliable flow of information between branches and MDs.

It was explained that the existence of regular customers ensures high achievement degrees of numerous CSFs (e.g. timely incoming payments, efficient marketing, and target-oriented cooperation with customers) at once. According to the expert, various construction industry-specific dangers (e.g. payment defaults due to customer’s low credit-worthiness, unrealistic

price/quality/schedule expectations by the customer, and lawsuits for years) might not exist at all, if a branch generated its sales largely with regular customers.

Furthermore, related to the decentralised organisation, the expert mentioned the importance of clearly formulated and communicated competences of the different management levels. According to the expert, this leads to an efficient way of working. He pointed out that a decentralised organisation might lead to an inefficient (e.g. double work steps) way of working (especially in the collaboration between administration departments (head office) and branches) and therefore to displeasure among the staff. Generally, according to the pilot participant, it is crucial to explain to the staff that employees in the head office and branches belong together and are colleagues. The expert mentioned that he often experienced situations, in which branch employees (mainly technical staff) “work against” employees of the head office (mainly commercial staff) and the other way round. In this case, unnecessary costs arise and, even worse, the staff motivation gets damaged. In addition, excuses for mistakes emerge from a conflict between head office and branches, as it is always easy to blame and to hide behind the other side.

Related to the second research question, the pilot generated the following findings:

2. What are possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels?

This research question intends to illustrate possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels.

The pilot has generated the required data to answer this question and therefore met the author’s expectations. After the author’s explanation of the study topic, context, and intention (to use identified CSFs as the basis of an MAS tailored to the needs of decentralised construction companies), researcher and expert (as before researcher and supervisor) discussed the support possibilities of an MAS in this case.

According to the expert, a newly developed MAS, that provides data illustrating the achievement degrees of all crucial CSFs in a manager’s area of responsibility to this manager on a regular basis (e.g. monthly) will have several advantages for the manager and therefore for the company that implements this MAS. The expert explained that, due to the MAS and the CSFs within this system, the managers learn what kinds of information are really important in order to achieve the set goals and which areas are worth to invest their working hours as well as work force in. As an MAS usually informs the connected managers on a monthly basis, the managers receive a regular reminder. The expert believes that an MAS using the CSFs method will “guide” the managers on an efficient and target-orientated

path and will therefore lead to a noticeably higher achievement degree of company goals. Thereby, the expert confirms the existing specialist literature (e.g. Ax et al, 2007; Chenhall, 2012; Mlecnik, 2014).

Apart from the comprehensive issue concerning the distinction of the terms 'goal', 'CSF', and 'measure' mentioned before, the methodological choices related to research philosophy, research approach, methodological choice, research strategy, time horizon, techniques and procedures, minimizing bias, as well as ethical considerations (Chapter 3) have passed the test that the pilot was supposed to be. Especially the chosen methods of semi-structured expert interviews, process-meeting observation, and the analysis of commercial documents present themselves as appropriate tools to generate the required in-depth data. The interviews will ensure the attention of numerous different perspectives on the studied phenomenon. By taking into account all perspectives and possible rival positions, the intended empirical research will provide the necessary data for a meaningful conclusion and new knowledge.

3.7.4 Analysis of collected data

This stage aims to connect the collected data to the research objectives. In order to achieve this, the results of the semi-structured expert interviews, analysis of commercial documents, and process/meeting observations are concentrated into one large illustration which then is related to the study's research questions:

1. What are the CSFs within decentralised construction companies?
2. What are possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels?

An important part of the analysis of the collected data is the data display process. A display is an organised, compressed assembly of information that allows the drawing of conclusions as well as action. Good displays are a major avenue to robust qualitative analysis. Designing displays – deciding on the rows and columns of the matrix for qualitative data and deciding which data, in which form, should be entered in the cells – is an analytic activity (Miles et al, 2014, pp. 12 and 13).

A continuing data condensation is also part of this phase as it reflects the researcher's decisions concerning which data chunks to code and which to pull out, which category labels best summarise a number of chunks, which evolving story to tell. All of which are analytical choices (Miles et al, 2014, p. 12), as is the one for the appropriate display/illustration of the collected data. This includes summaries, overviews and figures. All results will be connected to the findings of the conducted literature review and the research questions that the author

developed. This procedure ensures a meaningful connection of theory (results of the literature review) and business practice (results of the case study research).

The top management of the studied organisation will be involved by verifying all research outcomes in detail. Furthermore, the author's supervisors will have the opportunity to examine all results of the data condensation and data display stages.

3.7.5 Conclusions drawing/verifying, limitations, outlook, and recommendations

From the beginning of the data collection process, the qualitative researcher interprets facts and observations by noting patterns, explanations, causal flows, and propositions. The facts arising from the collected data have to be verified regarding their plausibility, their sturdiness, and their confirmability (Miles et al, 2014). The data condensation process leads the researcher to new ideas on which groups of data should be entered into a data display (Miles et al, 2014).

The outcome of the research will contribute to the design of MASs and the use of a CSFs approach in this.

Possible limitations of the study with regard to the researched organisation and/or environment, the chosen methodology and/or participants, an outlook as well as recommendations for possible future research are given in this stage.

3.8 Summary

The researcher has chosen social constructionism as leading research philosophy. The number of samples within the research will be small to allow in-depth investigations. Due to the necessary in-depth investigations, the study follows an abductive approach. Since the study's environment is very complex and includes many social actors that have an influence on the CSFs to be studied, the research will be conducted as a multimethod qualitative study.

To ensure in-depth insights, an embedded single case study strategy will be adopted. The study will have an illustrative and exploratory nature. The interviews will be relatively unstructured to ensure flexibility.

In this study, the role of the researcher is crucial (Ryan et al, 2002). In order to obtain the role of a participant (Ryan et al, 2002), the researcher has chosen his place of employment for his study. A longitudinal research will be adopted as the researcher has been with the company to be studied for many years. He has observed social actors and phenomena within the organisation for a long time. A longitudinal approach will also allow him to study certain changes and developments within and around the study's topic.

In order to design a meaningful case study, Yin (2014) provides five important components – study questions, study propositions, unit of analysis, linking data to propositions, and criteria for interpreting a case study’s findings – that are taken into account in this research.

There are three sources of data in this study: semi-structured expert interviews, analysis of commercial documents and process/meeting observations. The whole research design is shaped after the recommendations by Miles et al (2014) related to qualitative research.

Figure 14 illustrates the entire research design.



Figure 14: Research design (own figure).

Figure 15 illustrates the components of the data analysis process within the intended single case study as an interactive model. In addition, bias minimising (Section 3.7.3.3) as well as ethical considerations (Section 3.7.3.4) have an impact on the data analysis.

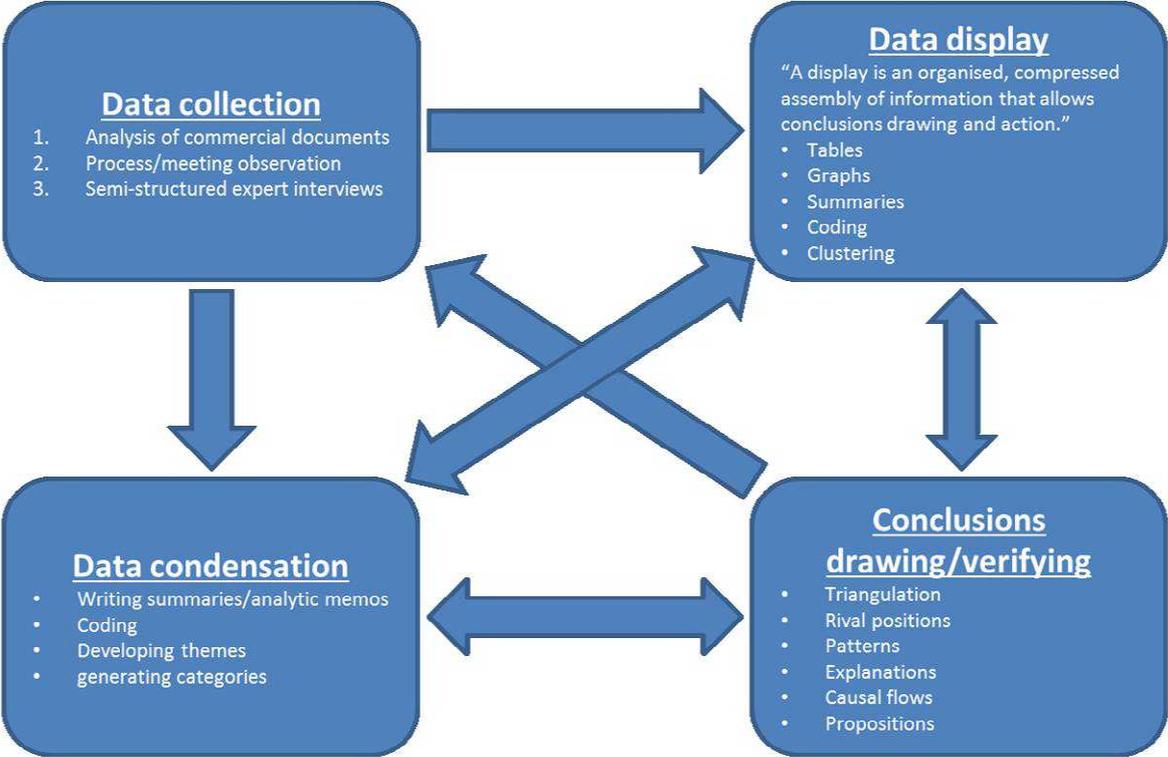


Figure 15: Data analysis (own figure, based on Miles et al, 2014).

3.9 Reflections: Ethics in professional life

As this study is a qualitative research, which usually emphasises words rather than quantification in the collection and analysis of data (Bryman et al, 2011), some reflections about the study’s methodology design and its consequences on the author’s personal development are made here.

The development of the best underlying research philosophy, based on the identification of the author’s paradigms, has led to new perceptions, the author represents related to many everyday phenomena. The researcher has realised that ontological (“What is the nature of reality?”), epistemological (“What is considered acceptable knowledge?”), and axiological (“What is the role of values?”) considerations can develop a researcher’s character and shape his or her view on business and life in general. The question “Who has actually impact on a certain phenomenon?” or even “Is there anybody having an impact on a certain phenomenon at all?” can guide a human being in private life or as a manager in work life on

the right result-oriented path. Sometimes, in work life, there are certain phenomena that no employee is responsible for. The reasons for those phenomena need to be searched in the environment, but not in the individuals. The author has observed that numerous, often older, managers are not reflective with regard to these questions. If certain issues occur, these types of managers always seek a culprit, even though there actually might be no one to blame. These managers follow the maxim "If there is no culprit, the problem is not solved yet." Usually, those managers have problems when tasked with finding sustained solutions for present challenges. Thanks to his considerations in the process of this study and their impact on his mindset, the author will now try his best to always think in a result-oriented manner.

In addition, the author sees parallels between a trustworthy data analysis that ensures validity and reliability on the one hand, and a reliable decision-making process of a manager on the other. Research tools like the use of multiple sources of evidence, logic models and addressing rival positions can support a manager in developing a clear view on a certain issue and based on that to acquire a good basis for his decision-making. The author will integrate these tools into his daily work life to become a better manager.

Familiarising with the required research skills concerning the expert interviews and his participant role has also helped the author with regard to his relationships in work life. The author has learned that developing good relationships with people such as colleagues, inferiors, clients, suppliers and sub-contractors, requires various skills: being a good listener, communicating at eye level, asking clear questions and providing clear answers.

The required ethical considerations have also impressed the researcher. Not only a researcher but rather every manager should be aware of his obligation to protect those who work in his/her area of responsibility from any kind of harm. Especially the non-physical types of harm should be taken into account by all managers. If this is not the case, particularly over a longer period of time, inferiors and other colleagues could be harmed. Nowadays, managers should have an awareness of this and no person should be harmed in their work environment any more. The author will apply the ethical guidelines he developed for this study to his daily work life.

4 Case study research

4.1 Environment

4.1.1 Introduction

This chapter introduces the environment of this research study. The studied organisation including its history, different business operations, business environment, as well as internal organisation is presented in detail.

4.1.2 History

At the beginning, the organisation to be studied here, which was founded in the early 20th century, was mainly active in the fields of industrial insulation works (heat, cold, and sound insulations) for power stations and chemical parks. The reason why the company was founded in a rural environment was that a large power station boiler manufacturer was also based in this region. Due to the proximity, the two companies established an excellent business relationship and workers of both companies would travel together throughout Europe to insulate the power station boilers including pipings surrounding the boilers (personal appointment with company owner on 3rd August 2017). The company also profited from a large city like Cologne – with its chemical parks – in close proximity. As business was running so well, the company was able to branch out and even take over competitors after a few years. The new branches lead to a higher annual turnover in the 1970s. Shortly before that, “interior works”, which today is the largest of the organisation’s four divisions, was added to the portfolio. In 1998, the company added “structural fire protection” to its growing range of products and services. Today, the organisation comprises 20 branches with 900 employees spread all over Germany. The annual turnover is approximately 130 million €. The company is still 100% family-owned.

4.1.3 Business operations

The organisation to be studied comprises four divisions: interior works, industrial insulation, structural fire protection, and services/metal construction (see Figure 16). For each division, there is a separate subsidiary company under the parent company. In each branch, there are between one and three separate specialist departments. Each department within a branch is run by a BM (personal appointment with company owner on 3rd August 2017). More detailed information is given in Section 4.1.5.

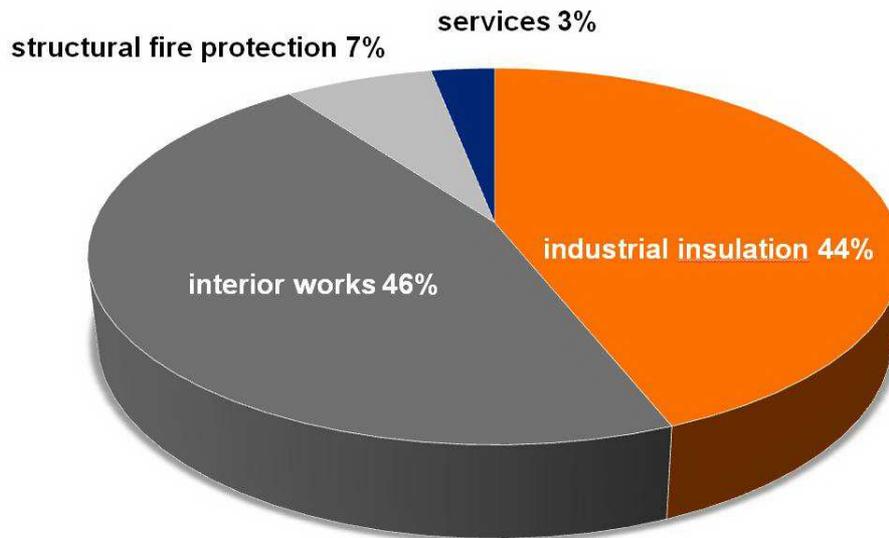


Figure 16: Breakdown of organisation's annual turnover (own figure).

The target customers of the interior works division are architects, public clients, industrial clients and private property developers. Sizes of orders vary from less than 10,000 € up to more than 5 million €. There are only very few long-term contracts with customers, which is why almost all contracts need to be acquired individually. That means each project requires an individual tender including an individual quotation and an individual risk assessment (e.g. “Is the customer solvent?”, “Is there sufficient man power to keep the proposed schedule?”, or “Are there any factors within this project that could lead to higher assembly costs than usual?”). Still, there are also customers who commission the studied company on a regular basis. The assembly work is conducted with own assembly personnel and subcontractors. Approximately 90% of the assembly work is outsourced to subcontractors. The company strongly depends on well qualified subcontractors who have skilled assembly workers available. Usual profit margins (turnover minus production costs) vary from 20 to 30%, depending on the sizes of contracts and the current market situation. After deduction of the fixed costs within branches and administration departments in the head office, the usual operational profit in this division is approximately 5%, depending on the current market situation (personal appointment with company owner on 3rd August 2017). Picture 1 illustrates typical interior works: a high-quality sales area in a car dealership with high-quality ceilings, drywalls and high-quality floor covering.



Picture 1: High-quality sales area in a car dealership.

The division industrial insulation attracts another kind of customers. Power stations, chemical parks, industrial boiler manufacturers, waste-to-energy facilities, car manufacturers, and food industry are among those who might be interested in the service of this division. Sizes of orders vary from less than 10,000 € up to more than 5 million €. More than 50% of the annual turnover in this division comes from long-term contracts with regular customers. That means that only half of the annual turnover requires individual tendering (personal appointment with company owner on 3rd August 2017).

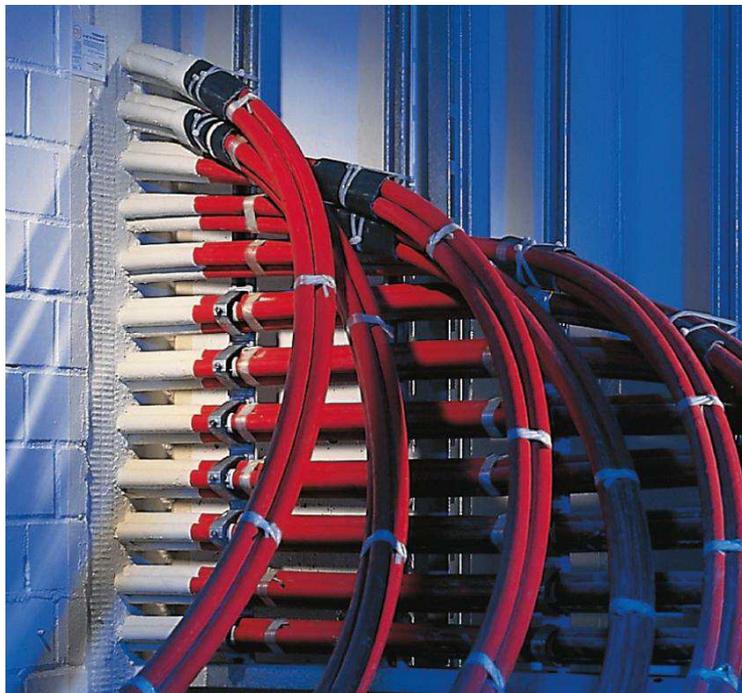


Picture 2: Insulated piping in a plant.

Besides piping including valves - as seen in picture 2 - insulations for industrial boilers, ducts, vessels, road tankers, turbines are typical for works carried out in this division. As in the division interior works, most of the assembly work – approximately two-thirds – is outsourced to subcontractors. Usual profit margins (turnover minus production costs) vary from 10 to 25%, depending on the sizes of contracts and the current market situation. However, the

average size of a contract is higher than in the interior works division. After deduction of fixed costs in branches and administration departments in the head office, the usual operational profit is approximately 5% in this division, depending on the current market situation (personal appointment with company owner on 3rd August 2017).

The structural fire protection division has similar target customers as the interior works division. Order sizes may vary from less than 5,000 € up to a maximum of 1.5 million €. There are only very few long-term contracts with customers. Nearly every contract needs to be acquired individually. In addition to that, the average contract size is lower than in interior works. The assembly work is conducted with own assembly personnel and subcontractors. Approximately two thirds are outsourced to subcontractors (personal appointment with company owner on 3rd August 2017).



Picture 3: Cable bulkhead through a wall.

Due to the lower average size of contracts, the profit margins (turnover minus production costs) are higher and vary from 20 to 40%, depending on the sizes of contracts and the current market situation. After deduction of fixed costs within branches and administration departments in the head office, the usual operational profit in this division is approximately 5%, depending on the current market situation (personal appointment with company owner on 3rd August 2017). Picture 3 illustrates typical structural fire protection works: a cable bulkhead through an indoor wall, preventing a fire from spreading from one fire compartment to another within a building.

Services / metal construction is the fourth and smallest division. This division combines the target customers of the three other divisions. Public clients, industrial clients, private property developers, power stations, chemical parks, industrial boiler manufacturers, waste-to-energy facilities, car manufacturers, food industry, private homeowners, and all other types of industry are potential clients.



Picture 4: Floor cleaning.

Sizes of orders vary from less than 1,000 € up to more than 1 million €. The company's aim is to build up a good mixture of projects and long-term contracts. Almost all works are conducted with company personnel. Usual profit margins (turnover minus production costs) vary from 20 to 50%, depending on the sizes of contracts and the current market situation. After deduction of the fixed costs within branches and administration departments in the head office, a usual operational profit is approximately 10% in this division depending on the current market situation (personal appointment with company owner on 3rd August 2017). Picture 4 illustrates a typical service job. Apart from floor cleaning, industrial cleaning, facade cleaning, window cleaning, care of outdoor facilities, courier logistics, caretaker services, event protection, road cleaning, filter cleaning, cleaning of construction sites, and security services are also part of the portfolio of this division. Furthermore, it also offers metal construction works (e.g. balustrades, winter gardens, doors) (personal appointment with company owner on 3rd August 2017).

All four divisions are instructed by the top management to support each other in building up customer relations (personal appointment with company owner on 3rd August 2017).

One fact that all divisions have to deal with is that the market is extremely competitive with a few major players (incl. the studied organisation) and a large base of smaller competitors.

4.1.4 Business environment

Competitors of the interior works division can be small companies with just one or two employees or large enterprises with a staff of several thousand employees and branches spread over the whole of Europe. These circumstances sometimes lead to a tough price competition among competitors. Especially small companies, due to their low overhead costs, are able to offer extremely low prices (personal appointment with company owner on 3rd August 2017).

The competition in the industrial insulation division is more structured. Apart from the organisation to be studied, there are approximately ten other industrial insulation companies in Germany that are able to work for major customers like power stations and chemical parks. This is why the company is always faced with the same competitors (personal appointment with company owner on 3rd August 2017).

The structural fire protection market is comparable to the interior works market. There are many small companies with no more than one or two employees and a few larger companies competing for the jobs (personal appointment with company owner on 3rd August 2017).

On the metal construction market, however, there are all types of competitors. Small one-person-companies and large enterprises with several billion Euros of annual turnover are competing (personal appointment with company owner on 3rd August 2017).

In all four divisions of the organisation, customers tend to see contractors as replaceable. This way of thinking fuels a price competition instead of a quality competition among competitors (Lunz, zdb.de, 08/09/2017). The tough circumstances in the different markets, in which the organisation runs its business, do not leave much room for mistakes in the sales process or the execution of the construction work (personal appointment with company owner on 3rd August 2017). This quote of the organisation owner sums up the market situation appropriately: "In most cases, a buffer in the operational profit margin simply does not exist. This is why homemade mistakes are forbidden."

4.1.5 Organisation

The organisation comprises four subsidiary companies. These subsidiary companies in turn comprise 20 branches throughout Germany. The parent company of the organisation is a pure holding company that is responsible for all administrative work. The company head quarters are located in one office, this company does not run profit centres. Apart from all

administrative departments, the company owner's offices are located there. The company owner is also CEO of the parent company.

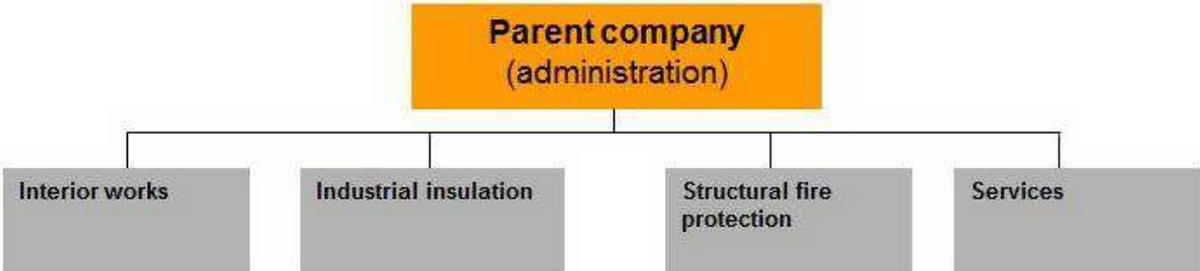


Figure 17: Organisation's structure (own figure).

Underneath the parent company, there are four operational companies according to the four divisions of the organisation. All sales activities and execution of construction work are conducted in these four subsidiary companies. Each subsidiary company comprises several branches, lead by a BM, who is located in the branch.

The internal organisation of head office and branches is presented in detail in sections 4.1.5.1 and 4.1.5.2.

4.1.5.1 Head office

In the head office, which is led by the CEO of the holding company, all administrative departments are located as illustrated in Figure 18 (personal appointment with company owner on 3rd August 2017, observation by the author).

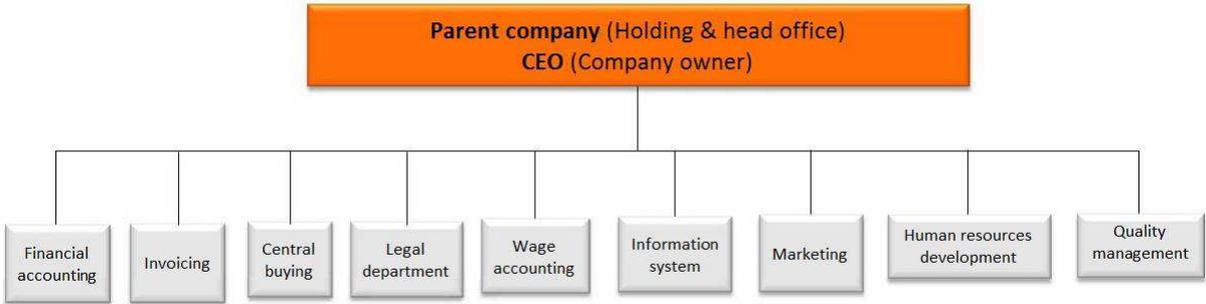


Figure 18: Organisation's head office (own figure).

The detailed responsibilities of the administration departments are as follows:

The financial accounting department is responsible for the booking of incoming invoices on the right cost unit. In addition, incoming payments are booked here and outgoing payments are prepared for the final approval by the top management. Furthermore, all payments between authorities and the company are handled. Another task is the preparation of the annual financial statements of the parent company and all subsidiary companies. The

department has eight employees, including a trainee (personal appointment with company owner on 3rd August 2017, observation by the author).

The invoicing department is responsible for the preparation of all outgoing invoices based on the information coming from the branches as well as the generation of the open item list for each branch. This department has four employees, including a trainee (personal appointment with company owner on 3rd August 2017, observation by the author).

The central buying department is responsible for the procurement and the delivery of all materials. Deliveries are made directly to the individual construction sites. Eight employees, including a trainee, work in this department (personal appointment with company owner on 3rd August 2017, observation by the author).

The legal department advises the branches in all legal issues (e.g. company rights and obligations in contracts with customers). In addition, all major contracts are checked here before signing. Furthermore, labour law issues are dealt with and all employment contracts are drafted. This department has six employees including three lawyers and a trainee (personal appointment with company owner on 3rd August 2017, observation by the author).

In the wage accounting department, all wages of the assembly personnel that works directly for the company are booked. Moreover, this department is responsible for ensuring that all taxes and health insurance payments are paid in time. Four employees including one trainee work in this department (personal appointment with company owner on 3rd August 2017, observation by the author).

The information systems department is responsible for ensuring save running of the necessary hardware (e.g. personal computers) in all branches and the head office. The internal server farm is maintained by this department and all employees can contact this department if they have questions or problems with IT. This department has four employees including a trainee (personal appointment with company owner on 3rd August 2017, observation by the author).

In the marketing department, all advertising brochures and internet ads are developed. In addition, the department searches the websites of all potential target customers for future construction projects. If they find one, they inform the responsible branch. This department has four employees including a trainee (personal appointment with company owner on 3rd August 2017, observation by the author).

The human resources development department is responsible for acquiring new young employees (e.g. trainees for assembly jobs). Therefore, employees from this department regularly visit graduate fairs to get in touch with young women and men who have recently

finished school. This department has one employee (personal appointment with company owner on 3rd August 2017, observation by the author).

Quality management ensures compliance with occupational safety regulations on construction sites. Therefore, this department visits new construction sites to discuss best occupational safety solutions with the personnel on site. One employee works for this department (personal appointment with company owner on 3rd August 2017, observation by the author).

The top management, which is also located in the head office, comprises three MDs. It primarily supports and monitors the activities of the BMs (explained in detail in section 4.1.5.2.1). The three MDs have the following responsibilities (personal appointment with company owner on 3rd August 2017, observation by the author):

- one MD (and company owner in one person) for the administration (parent company),
- one MD for interior works and structural fire protection, as well as
- one MD for industrial insulation.

The two MDs of the subsidiary companies report to the company owner.

4.1.5.2 Branches

The organisation to be studied runs 20 branches in Germany and one in Poland. Each branch is a separate profit centre (personal appointment with company owner on 3rd August 2017, observation by the author). In this study, the author will be focussing on the activities of the company in Germany alone. Figure 19 shows the subsidiary companies of the organisation and its German branches.

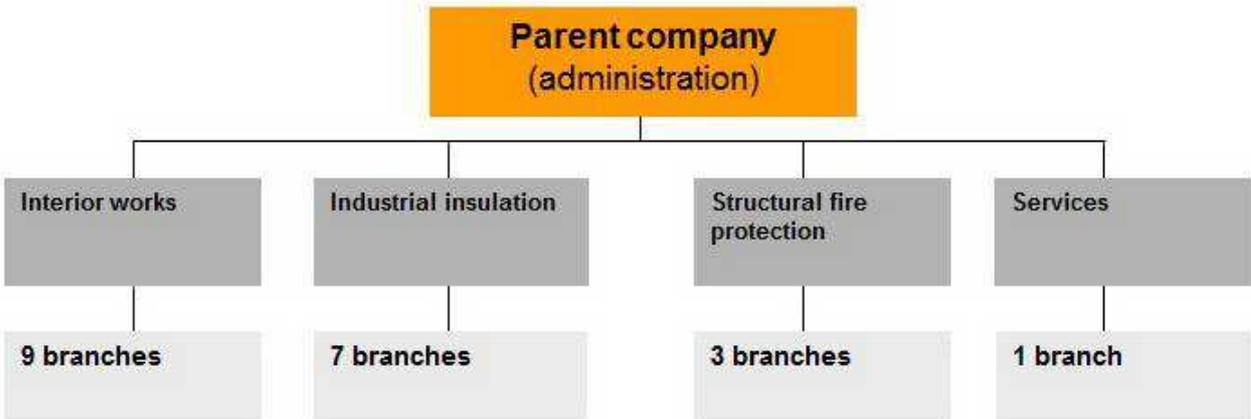


Figure 19: Organisation's subsidiary companies and branches (own figure).

In the branches, there are four different types of job apart from the assembly personnel: BM, PM, commercial staff, and CM (personal appointment with company owner on 3rd August 2017, observation by the author). These four jobs are described in detail in sections 4.1.5.2.1 to 4.1.5.2.4.

A regular team within a branch comprises a BM, 1-4 PMs, 1-6 CMs, and one commercial member of staff (personal appointment with company owner on 3rd August 2017, observation by the author). Figure 20 shows the typical organisation of a branch.

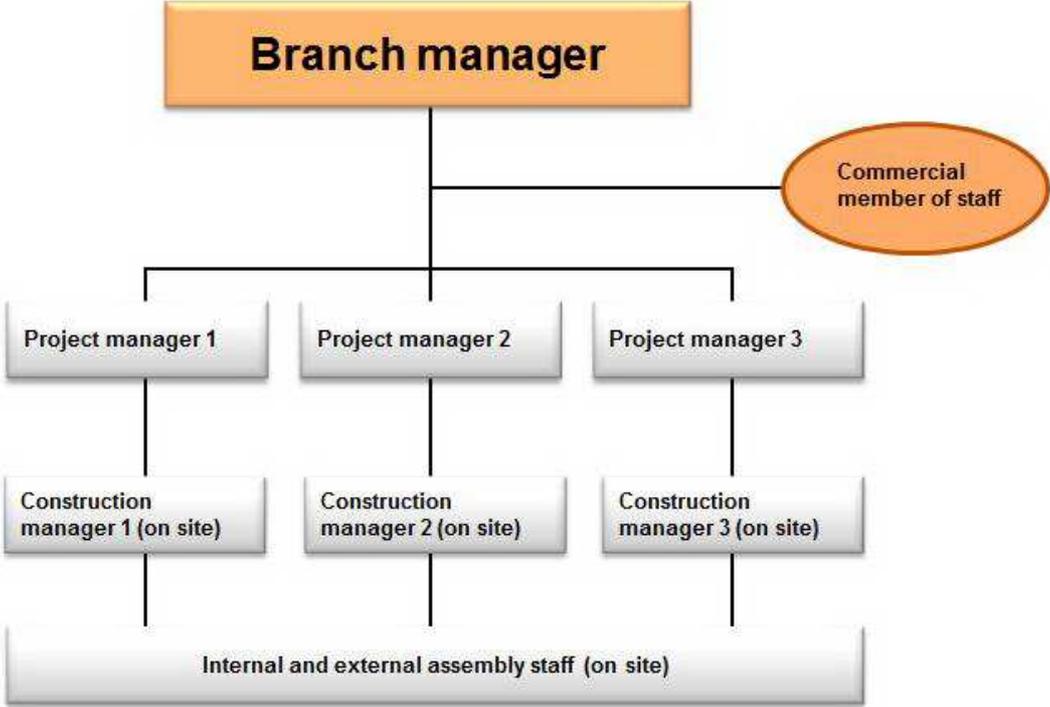


Figure 20: Common organisation of a branch (own figure).

4.1.5.2.1 BMs

The BM is responsible for the acquisition of new customers and the development respectively the support of regular customers. He collects customer (e.g. potentials) and object data (e.g. economic situation of a single construction site) and reports to the responsible MD. Furthermore, he is responsible for the price calculations (personal appointment with company owner and MDs on 7th November 2017, observation by the author).

His tasks also include the creation of market data (e.g. to identify architects, planners, industrial customers, and investors; to obtain information regarding competition and price situation; to investigate, recognise, and take advantage of existing market potential). Furthermore, the BM ensures the bidding on schedule as well as the tracking of placed offers. He is responsible for the conduct and documentation of contract negotiations (price,

terms of payment, schedule, warranties), and the monitoring of customer creditworthiness with informational obligation to the responsible MD. Furthermore, he controls the costs and results of each construction site within his area of responsibility. He is responsible for the economic result of his branch. In addition, he is responsible for tasks related to the branch's employees, as the identification and extension (e.g. application of further education and advanced training) of existing potential within his staff. He is located at the branch and reports to the responsible MD (personal appointment with company owner and MDs on 7th November 2017, observation by the author).

4.1.5.2.2 PMs

The PM is responsible for the assembly personnel, material, and equipment disposition as well as subcontractor management (external assembly personal) and for the technically and economically successful completion of projects (construction sites) as part of his sub-budget within a branch. He advises customers and their representatives in all phases of the projects. This includes coordination of framework conditions, such as: schedule, terms of payment, type and quantity of scope of work, warranties, and fulfilment of all obligations arising from the particular contract. Furthermore, he ensures compliance with all relevant standards, laws, directives, and regulations within his projects. He is responsible for the prompt invoicing of executed works to avoid high pre-financing, the monitoring of incoming payments, and the management of project-related correspondence. His responsibilities include permanent project-related economic reports to the responsible BM. The PM is located in the branch and reports to the responsible BM (personal appointment with company owner and MDs on 7th November 2017, observation by the author). The job is similar to the job of a CM with the exception that a PM is responsible for several construction sites.

4.1.5.2.3 Commercial personnel

The commercial personnel edits the incoming and outgoing invoices and conducts the associated controls (e.g. to check the terms of payment, to request guarantees, and create credits). Furthermore, the commercial personnel edit dunning lists with attention to the associated open item lists. In the event of non-payment or due dates of outgoing invoices, the commercial personnel get in contact with the particular customer. In addition, the daily guidance of the cost centre list, the registration of new orders to the head office, and the entire mail processing are part of the commercial personnel's duties. The commercial staff member is located in the branch and reports to the responsible BM (personal appointment with company owner and MDs on 7th November 2017, observation by the author).

4.1.5.2.4 CMs

The construction manager [hereafter: CM] is responsible for assembly personnel, material, and equipment disposition as well as subcontractor management (external assembly personnel) on a particular construction site. Furthermore, he ensures a successful cooperation with other project participants (e.g. customer, planners, and other contractors) to complete the particular project according to budget and schedule. In addition, he is responsible for the compliance with occupational safety and timely involvement of supporting staff (e.g. the responsible PM). The CM is usually located on a particular construction site and reports to the responsible PM (personal appointment with company owner and MDs on 7th November 2017, observation by the author).

Below the CMs there is the internal or external (subcontractors) assembly personnel, which is located on a particular construction site (personal appointment with company owner and MDs on 7th November 2017, observation by the author).

The job of the CM is similar to the job of a PM. Therefore, many PMs started their career as CMs before being promoted.

4.2 Overview of the conducted fieldwork

A total of 20 interviews were conducted between February 2nd, 2018 and March 9th, 2018. Out of these 20 interviewees, 17 had an operational/tactical background (BMs) and three a strategic background (MDs/QM). With one exception, all interviewed experts have at least 20 years of experience, most more than 30 years, one more than 40 years. All experts began their career on a lower managerial level (e.g. CM or PM), which resulted in a detailed knowledge of the entire business. All experts had come from different regions in Germany (Hamburg, Berlin, Hannover, Düsseldorf, Cologne, Gummersbach, Pulheim, Ludwigshafen, Mannheim, Stuttgart, and Munich) and obtained leading positions in the studied organisation.

All interviews were conducted in one-to-one personal settings. Except for the three interviews with the strategic experts, all interviews were recorded. Handwritten notes were taken during all 20 interviews. The average net duration (excluding interview preparation and review) of the interviews was approx. 95 minutes. An overview of the expert interviewees can be found in table 10. The key points mentioned by the interviewees are summarized and displayed in Appendices 12-15.

Furthermore, available commercial documents (mainly the annual branch results) were analysed and used for this single case study.

In addition to the interviews and commercial documents analysis, findings from the process/meeting observations were included. These observations were conducted in several

branches and in the head office between 2009 and 2018. Many BMs, PMs, CMs, and MDs were observed by the researcher in their everyday work during that period of time.

After having presented the findings of the empirical work, the author describes the limitations of this study and gives an outlook including recommendations for possible future research. At the end, the researcher provides his reflections related to the single case study conduct and its impact on his personal development.

4.3 Company goals

On December 26th, 2017, the researcher had an appointment with the company owner in order to hear about the company goals. These goals are crucial for the research study, as the managers' (MDs, BMs, PMs, and CMs) goals as well as their CSFs depend on and underlie the company goals.

The following company goals, divided into short-, medium-, and long-term goals, have been mentioned by the company owner:

Short-term company goals:

- to achieve the intended annual turnover, margin, and operational result
- to open a new branch building in Munich in time (company-specific)

Medium-term company goals:

- to improve the liquidity position
- to increase the annual operational results

Long-term company goals:

- to develop successors for BMs, PMs, and CMs

4.4 BMs goals

In the expert interviews with the BMs of the organisation, the managers' goals were identified (Appendix 12). The goals that were mentioned most often (> 5 entries) were:

Short-term manager goals:

- to reach target sales (17 of 17 BMs)
- to reach target profit (17 of 17 BMs)

Medium-term manager goals:

- to avoid staff turnover (12 of 17 BMs)
- to initiate a regeneration of staff (9 of 17 BMs)
- to keep up the employee motivation (7 of 17 BMs)

4.5 CSFs within decentralised construction companies

4.5.1 Introduction

This section illustrates the results related to the first research question: What are the CSFs in decentralised construction companies?

In order to present comprehensible and meaningful findings, the CSFs that could be identified were clustered depending on the time required to achieve sustainable improvements in the particular area into short-term success factors (SSFs) and medium-/long-term success factors (MSFs). The determination, if a certain CSF belongs to short- or medium-/long-term CSFs is based on the researcher's knowledge and experience within the studied context.

The order of the numbers within the abbreviations has no meaning for the study. They indicate the order in which the respective CSFs were identified during the data analysis process.

In addition, the identified CSFs (a total of 36 short-term CSFs and 25 medium-/long-term CSFs) underlying the managers' goals were clustered into customer-related, construction management-related, staff-related, as well as decentralised organisation-related. The four categories were developed by the author during the analysis of the expert interviews' outcomes, as it became explicit that all CSFs that were identified could be assigned to at least one of these four categories. A fifth category, the external CSFs, is not dealt with in this section as the organisation managers do not have influence on this type of CSFs. The major data source related to the first research question is the expert interviews conduct on BMs level, but CSFs could also be observed in the process/meeting observations or generated through the analysis of the commercial documents.

During the conduct of the empirical fieldwork it became clear that BMs mainly work tactical/operational, thus focussing on tactical/operational goals. Therefore, a traditional differentiation in short-, medium-, and long-term CSFs is not useful here. That is why the identified CSFs were clustered into short-term and medium-/long-term.

The following short-term CSFs could be identified (sorted in descending order by frequency):

No.	Acronym	Description
1.	SSF-09	to develop partnerships with subcontractors
2.	SSF-04	market-driven (and customer-driven) price calculations
3.	SSF-05	continuous incoming orders
4.	SSF-01	permanent sales activity
5.	SSF-03	to ensure professional handling of first order (new customer)
6.	SSF-32	head office's behaviour towards subcontractors
7.	SSF-13	timely billing
8.	SSF-21	employees' health
9.	SSF-02	permanent contact person for regular customers
10.	SSF-06	to recognise addendum potential at an early stage
11.	SSF-07	to realise addendums
12.	SSF-19	balanced order structure
13.	SSF-33	head office's support on new topics
14.	SSF-24	honest internal communication / flow of information
15.	SSF-20	right construction site / customer to tight PM
16.	SSF-08	to develop a good reputation
17.	SSF-16	to observe new customers closely
18.	SSF-23	to respond on employees' private needs / support of family and partner
19.	SSF-30	to develop new regular customers
20.	SSF-14	good interaction between BM and commercial personnel
21.	SSF-15	to negotiate advance payments
22.	SSF-12	fair distribution of sites on PMs

23.	SSF-22	to pass risks from customer contract to subcontractors
24.	SSF-25	no routine related to work safety
25.	SSF-26	to comply with specifications related to work safety
26.	SSF-27	to generate new customers
27.	SSF-29	no offer, if customer has unrealistic price expectations
28.	SSF-34	further training for CMs, PMs, commercial staff, BMs
29.	SSF-36	quick decisions despite decentralised organisation
30.	SSF-10	to test new subcontractors on small sites first
31.	SSF-11	to order all material directly on site
32.	SSF-17	to work only with written order
33.	SSF-18	customer acceptance asap
34.	SSF-28	to conduct risk assessments on sites
35.	SSF-31	to avoid lawsuits with customers
36.	SSF-35	time of the year / weather

Table 11: Short-term CSFs (own table).

The following medium-/long-term CSFs could be identified (sorted in descending order by frequency):

No.	Acronym	Description
1.	MSF-01	bonuses for PMs and CMs
2.	MSF-05	to offer perspectives to employees
3.	MSF-11	internal feedback culture
4.	MSF-08	team spirit / working atmosphere
5.	MSF-12	internal transparency / clearly formulated and com. competences

6.	MSF-13	adequate working hours / working environment
7.	MSF-17	identification with employer
8.	MSF-02	to train apprentices
9.	MSF-04	regular training of PMs and CMs (technical, legal)
10.	MSF-03	adequate number of own construction workers
11.	MSF-06	to demand and promote responsible work
12.	MSF-07	trust relationship between branches and head office
13.	MSF-15	to recruit young employees
14.	MSF-21	well trained staff (PMs, CMs)
15.	MSF-24	to develop personal relationships to (regular) customers
16.	MSF-16	to recruit new employees (PMs and CMs)
17.	MSF-22	supraregional cooperation between branches
18.	MSF-10	to develop regular customers from new customers
19.	MSF-20	to comply with internal specifications (management system)
20.	MSF-09	trust relationship to other BMs
21.	MSF-14	IT infrastructure (due to decentralised organisation)
22.	MSF-18	to optimise processes between branches and head office
23.	MSF-19	to optimise commercial skills of PMs
24.	MSF-23	reasonable fixed costs in the head office
25.	MSF-25	general economic situation

Table 12: Medium-/long-term CSFs (own table).

Due to the large amount of generated data, a selection of CSFs will be explained in detail in this section. The complete lists of all CSFs identified in this context are attached to the thesis (Appendices 13, 14, and 16-20).

4.5.2 Customer-related CSFs

In the conducted expert interviews, eleven short-term (SSFs) and two medium-/long-term (MSFs) customer-related CSFs were identified (Appendix 16). Figure 21 illustrates the Top 5 (according to entries by participants) customer-related CSFs.



Figure 21: Top 5 customer-related CSFs (own figure).

Market- and customer-driven price calculations

Among the identified customer-related CSFs, according to numerous participants, market- and customer-driven price calculations play an important role. Several interviewees emphasised that in the construction industry, unlike in other industries, every quote - no matter which size - has to be calculated individually as the environmental factors affecting the particular cost situation differ from site to site.

According to interviewee B3, "market-driven price calculations are critical, as they ensure a certain price range - not too cheap, not too expensive. It is very easy to generate orders, if we offer much too cheaply. Indeed, this approach would lead to a full order book, but also to a commercial loss, as the existing fixed costs could not be covered anymore. The other way round, too high prices would lead to an empty order book and therefore to a commercial loss." Thus, market-driven price calculations prevent construction companies from leaving the mentioned price range including the negative consequences for the company's earnings.

A good indicator for a BM to check if his price calculations are within this range, according to many experts, is the hit rate of the calculated quotes. The common hit rate in the

construction industry is 10%, which means that a BM usually has to calculate quotes with a value of 50 million € per business year, if he has a target sales figure of 5 million €. If the hit rate is higher than 10%, the BM's price calculations are probably too low; if the hit rate is lower than 10%, the BM should raise the calculated prices.

A market-driven price calculation depends on several factors. The most important one according to interviewees is the general order situation in the construction industry. Participant C3 mentioned: "It is like in every other industry: if competitors have full order books, prices usually go up. If they are empty, it is the other way round." The current government efforts to end the housing shortage in Germany are an example for a period of time in which most construction companies have good order situations and construction prices are relatively high.

In addition, participant B4 mentioned the general situation of the world economy: "As the customers of large construction companies are often globally active enterprises with worldwide networking and dependencies, issues in other parts of the world can lead to shifts or even cancellations of intended construction projects in Germany." Such a case could be observed within the studied company in 2017. A car manufacturer that belonged to a large American group had financial problems. It became known that the car manufacturer should be sold to a French group. In this context, almost all construction projects in the car manufacturer's plants were stopped or at least shifted to a period after the merger with the French group.

Furthermore, interviewee B1 stated: "Season is also a crucial issue for the current market price. Each year before the winter begins, we can see that construction companies try to fill their order books in order to ensure jobs during the wintertime. Therefore, especially in this time of the year, the prices are relatively low." This explanation fits the researcher's analysis of the internal order announcements that the branches send to the head office in the course of each order. Especially before the wintertime, incoming orders have lower margins than in other times of the year. In the springtime the situation is as follows: construction companies know that the customers' construction activities usually focus on summertime, as conditions like weather and temperature are optimal in this time of the year. Everyone knows that the demand for construction works will rise sharply. The only question is when exactly. In this context, interviewee B1 mentioned: "As a BM you always have the choice in those times: you can offer lower prices to get orders soon or you wait for a higher demand for construction works and therefore for higher market prices. Nobody knows the correct decision exactly. It is important to give thoughts and try to estimate the current market situation including the situation of major competitors as accurately as possible and adapt the calculated prices

appropriately.” Many participants agree that as BMs, they should always act calmly. There is no reason to generally turn away from the market-driven price calculation idea.

Participant A7 mentioned that even if an order goes to a competitor, the approach of a market-driven calculation is not generally invalid. “In that case, it is crucial to ask the customer for the reasons. Sometimes it is possible to get important information - for instance related to a certain unit price - and to modify the next price calculation accordingly.”

In addition to the market-driven price calculation, participant A8 stated, among other things, that the customer-driven price calculation is as an important CSF: “Customer-driven price calculations are crucial in order to maximise the company profits. It is the BM's job to estimate the customer's added value arising from the construction works currently requested and therefore the customer's willingness to pay.” Interviewee B6 added that “A customer-driven price calculation depends on many factors and is individual from customer to customer and from site to site. We had a customer that runs paper mills throughout Europe. We had the order to insulate the pipings and ducts of a newly built paper mill. Shortly before the end of the construction phase the customer contacted us, because they had forgotten to assign an insulation company with the noise insulation of a sewage treatment plant connected to the new paper mill. It was well known that the entire paper mill could not go into operation without a noise insulated sewage treatment plant. It was estimated that the total investment for the paper mill was about 250 million €. A regular market-driven price for the insulation of the sewage treatment plant was approx. 20,000 €. As we knew exactly that there were no other insulation companies available, we offered a little higher in order to maximise our profits.” This example illustrates the importance of a customer-driven price calculation and the resulting opportunities to improve the profits enormously.

According to participant A8, the most common factors affecting a customer-driven price calculation are shortages like deadline situations on sites, situations in which no competitor is available due to a very good general order situation in the construction industry, and sites that are so well-known by the own construction workers that no other construction company is able to conduct the works instead. The last factor often plays an important role with jobs involving power plants or chemical parks, where a high degree of local knowledge - e.g. with regard to work safety specifications - is necessary.

Interviewee A1 stated that, in order to avoid miscalculations, “each employee who is responsible for price calculations, should ask himself plausibility questions and conduct plausibility calculations when a price calculation is finalised. He should also ask a colleague from the same branch, e.g. an experienced PM, to crosscheck the entire price calculation. There are only few mistakes that can become as expensive as a miscalculation.”

Participant C1 summed up: “At the beginning of each price calculation, the responsible BM should always think about the factors affecting the current market price and the individual price with regard to the particular customer. Thereby, managers can avoid unnecessary low quotation prices and improve their earnings.”

Continuing incoming orders and balanced order structure

The continuing income of orders is another identified CSF related to customer relations and marks a direct consequence of the price calculation process described before.

According to participant A1, a continuous flow of orders is crucial for a branch, as it ensures a constant workload for the PMs, CMs, and therefore workers on sites. He continued: “Only a constant workload guarantees an optimal use of the existing resources and therefore highest possible margins. If there are several weeks or even months with a low workload, the existing fixed costs might not be covered by the operational margins generated on sites anymore. In addition, it can happen that workers have to stay at home due to the temporary weak order situation.” In the studied organisation, this could be observed between 2010 and 2012, when the general order situation in the German construction industry was weak. Many companies, including the one studied here, were forced to officially register short-time work. In this context, interviewee A4 mentions: “Each period of weak order flow means that the resulting sales lag needs to be caught up with again before the particular business year ends. This in turn means that there will have to be a period of time with exceptionally high workloads. This is disadvantageous for the relative margins, as the existing resources - PMs, CMs and workers - are consequently overstrained in those times.” In fact, PMs cannot take proper care of their sites under these conditions. In this context, participant B2 delivered practical examples: “Potential addendums are overlooked by PMs, billing is no longer timely, and workers are not properly briefed, which will lead to technical mistakes. In addition, the customer support also suffers from too heavy workloads, as PMs have to take care of five sites or more at the same time.”

In addition to the participants’ statements, it could be observed that relative margins, once declared in the internal order announcements during times of extremely heavy workload, usually worsen. Participant C1 added that there are also situations, in which a sales lag cannot be caught up with in the same business year. In those cases, low workloads lead to a commercial loss, as the target sales figures and therefore target margin figures cannot be reached. Interviewee A6 noted a further factor: “Usually, if there are several weeks without or at least with a too low order income, concerns within the branch team will arise. In this case, the colleagues know exactly that weak order income today means low workload tomorrow and therefore a period of extremely heavy workload the day after tomorrow. Those concerns

within the team usually lead to a lack of concentration, which, as a consequence, declines earnings.” This illustrates that the psychological impact arising from a stagnant order flow on the staff should not be underestimated.

Apart from the continuing order flow, the individual order sizes are also critical according to numerous interviewees. Participant A5 mentioned that it is dangerous to rely on one large order only. He continued: “At the very beginning of a site you can never know how the conditions on site really are, how the customer acts when it comes to the acceptance of legitimate addendums, invoice verification, and payments. Each new site is a little surprise in itself at the beginning.” This is why relying on one large site can be dangerous: if the large site is doing well, the entire branch is doing well. But if there are issues on the large site, these issues will have an impact on the earnings of the entire branch.

In the studied company, several cases in which entire branches have generated commercial losses due to particular sites could be observed: A large construction project in Hannover in 2015 led to a big commercial loss due to manpower issues. The responsible BM and the PMs did not manage to generate a sufficient number of construction workers for the particular site. The consequences were higher than calculated labour costs, a late completion, an expensive contract penalty, lost reputation, and a lawsuit over several years. As the company had to wait for the money, the site also caused interest payments to a credit institution. Another example of the impact of a single site on an entire branch result is a site in Stuttgart in 2017. Access to the site was so difficult that no lorry that transported materials could reach the site. As nobody had taken this case into account in advance, the workers had to carry all the materials from the lorries, that had to be parked at a distance of approx. 500 metres from the site. The consequences were extremely high labour costs and a commercial loss for the entire branch although all other sites of this branch were profitable in that business year. In this context, interviewee C2 mentioned: “With regard to risk spreading, the approach of one large order and only few smaller orders is not reasonable. Therefore, my team and I always try to develop a balanced order structure consisting of few medium-sized orders to cover the existing fixed costs and several smaller orders with relatively high margins in order to maximise the profits.” This can also be verified with an analysis of the operating branch results. Participant A7, who runs a commercially very successful branch, distributes his average annual sales (2009-2017) of approx. 4.3 million € over approx. 250 sites per year. This makes an average order value of only 17,000 €. All in all, the analysis of the commercial documents illustrates that the smaller the site, the higher the margins.

On the other hand, there is also a danger of too many small sites at once. According to interviewee A5, “A large number of small sites contains the risk of high transit times. If the PMs, CMs, and workers only travel to or from the sites, a cost-efficient conduct of the

construction works is not possible. In those cases, the intended margin cannot be reached.” With regard to this, participant B4 added: “Very small sites make a CM impossible, as the generated margin does not suffice to pay a CM. The problem here is that workers that are not supervised by a CM on site usually work slower. This leads to higher labour costs than calculated and therefore to lower margins.”

Permanent sales activity

The conduct of permanent sales activities was mentioned as crucial by various participants during the expert interviews. Interviewee A3 explained: “In practice, permanent sales activity means a regular screening of the branch region for possible new customers, planned construction projects, possible investments from the regional industry in their buildings, and wherever possible personal appointments with possible new or regular customers reformulate their responsible representatives.”

Expert B7 stated: “The tasks related to sales activity are so important for the success of a branch that we have implemented a central sales department in the head office in order to relieve the BMs. In practice, BMs often have to deal with further tasks - issues on different sites or issues with the staff - as well. The central sales department consists of three sales employees. Each is responsible for firmly assigned branches.” It could be observed that the central sales department is indeed a great support for the BMs. Websites of possible new customers or construction-related online platforms are observed on a regular basis in order to identify future construction projects. If a previously unknown construction project is identified, it will be registered in a special internal database. All branches have access to the database and therefore the important information automatically flows to the BMs. In addition, the sales employees also try to organise personal appointments between possible customers and the responsible BM.

The company top management is also aware of this topic, as it could be observed that sales activities are a major issue in all BM meetings that usually take place twice a year. In these meetings, all BMs, central sales employees and the responsible MD get together mainly in order to figure out new ways to improve sales activities.

The idea behind the approach of permanent sales activity, according to participant A7, is to generate alternatives for the existing customers. Interviewee B4 mentioned: “Every customer, even long-term regular customers, can be lost for numerous reasons. If such a case occurs, it is the BM’s job to provide alternatives.” In the studied organisation, there were various examples of customers who were lost. One example is the entire energy provider industry with its challenges regarding the current energy transition and the arising costs. Due to the energy transition, many fossil power plants will be closed sooner or later. Therefore,

most energy providers will not invest their money in construction projects on their fossil power plants anymore. With regard to this, participant B3 stated: “We have lost almost the entire energy provider industry as customers from one day to the other. Until today we have not been able to generate an adequate replacement.” Another example that could be observed in this context is the departure of an entire site team including approx. ten own workers and the CM. They were on site at a chemical park close to Hamburg in 2016 and went over to a competitor. The customer’s representatives wanted to keep the former team on their site and were not interested in a further business relationship with the studied company. Thus, the contract between the customer and the studied organisation that had been agreed upon several decades before was terminated. In this case, due to the prior conduct of permanent sales activities, the responsible BM could close the arising gap within a few months. New customers were acquired and the next business year was already more profitable than the one before, even though this lost customer had been responsible for about a quarter of annual sales.

Quite trivial circumstances can lead to the loss of a customer. It could be, for instance, a retiring architect who had been working with the company for many years. Or as stated by expert A6 “Some customers have longer periods of time without any construction activity. In those phases, it is important not to lose touch with the customer or the responsible representatives, because major competitors will try to butt in and build a connection of their own with our customers and the most dangerous times for maneuvers like that are those without construction activity. It is therefore crucial to maintain a good relationship with the customers’ decision makers.”

With regard to permanent sales activity, interviewee A7 stated: “As a BM, you can never have too many alternatives when it comes to customers. If customer demand should exceed your available resources, you can ask another branch that has resources available for help and you serve the more profitable customers first and in that way, improve your profits.” The expert continued: „Sufficient alternatives help to prevent periods of time with low workloads and put a BM in the favourable position to not be dependent on every single order. Furthermore, this approach leads to a sustainable improvement of the customer structure of a branch. Complicated customers that are usually not so profitable can be sorted out this way.”

If a BM manages to generate a good amount of new customers, it is , according to expert A3, also possible to enlarge that particular branch. The expert explains: “In this case it is crucial to estimate whether the higher number of customers that was generated by increased sales activities is temporary or lasting.” If the responsible BM comes to the conclusion that the situation is only temporary, according to participant A3, the BM should ask for support in

another branch in order to serve all customers. If he assumes that the higher demand will last long-term, the branch can be enlarged through the acquisition of a further PM and/or CMs.” In any case, it could be observed that permanent sales activities are the basis, on which a BM can enlarge his/her branch reasonably.

In order to reach the favourable situation, in which a branch can almost choose their own customers and/or can grow reasonably, all employees of a branch must work together efficiently. For instance, if an employee randomly recognises a new construction site in the branch region, it is important that he/she passes this information to the BM. Then, the BM is able to identify the responsible investor of that site and to get in touch with him. The more information reaches the BM, the better the chances are to build up alternatives with regard to customer relations. All employees, even those who are not mainly responsible for sales, have to keep sales tasks in mind. In this context, participant A3 mentioned: “On a site, our workers, the subcontractor’s personnel and the responsible CM mark the first impression of the company from the customer’s perspective, not the responsible BM in the branch or the salesmen in the head office.” Therefore, it is crucial that the entire staff is able to think from the customer’s perspective and act like salesmen if necessary.

Professional conduct of construction work

According to many experts, the professional conduct of construction work is critical, especially during the first order of a newly acquired customer. This CSF is strongly connected to the CSF identified as SSF-08 “development of a good reputation” in the market. There are many factors that lead to a professional handling of an order. According to interviewee A7, “a professional conduct of construction work means that we deliver high quality with regard to valid technical norms and specifications, keep the customer’s schedule, keep the construction site clean at all times, and, very important, we keep all promises that we made in the construction meetings with the customer.” In this context, several participants added that on sites, where several construction companies are present, there is mostly one company that will be blamed for all issues by the customer or his representatives. Usually it is the company, according to the experts, that did not manage to develop a good reputation at the beginning of the project. Participant A8 kept it short: “Once to blame, always to blame.” The other way round, according to expert A7, if a company was able to build a good reputation on a site from the start, based on professional handling and demeanour, most customers will behave fairly and benevolently towards the particular company as the project progresses. In order to generate such a good reputation, it is crucial that the responsible PM visits the site regularly. Otherwise, he cannot be informed sufficiently about all circumstances. Another general rule is: only quote for construction projects that you are completely familiar with when it comes to the technical background. In this context,

interviewee A8 stated: “Never try to build something that you do not understand technology-wise. It will always lead to issues.”

Several cases could be observed in the studied organisation that sustain the experts' arguments. These cases usually ended in high costs, lawsuits, and commercial losses. In 2017, a large construction site in Stuttgart was not handled professionally. The responsible BM had underestimated the required quality standards in his the price calculation and the calculated prices ended up being too low to meet the customer's quality expectations. What happened next was that the company tried to hold the high technical standards with relatively cheap workers from a subcontractor so that the once calculated margin could be upheld. In the middle of the construction phase, however, the BM together with the responsible PM realised that the technical specifications could not be met with the present workers. In the middle of the construction phase, the entire assembly team on site had to be replaced by another team of highly skilled and more expensive workers from a different subcontractor. The late decision to commission another subcontractor led to high costs and problems related to the schedule, because the new assembly team first had to tear off large parts of the already installed walls and ceilings. In addition to the direct economic damage, the customer relationship was damaged, as the customer did not understand why the required specifications as well as the time schedule could not be upheld by the company.

A similar case could be observed in Stuttgart in 2018. Issues came up on a large construction site due to wrong material orders. The responsible PM had ordered the wrong kind of gypsum plasterboards for the walls to be built. The consequence, apart from schedule issues and higher costs because all materials had to be ordered again, the company got a bad reputation from the very beginning of the construction phase. After this incident, the company was made responsible for almost every issue on site. It took several months and numerous construction meetings to restore the damaged company reputation.

Unprofessional conduct of construction work can have several consequences. In this context, interviewee B2 mentioned: “It is quite possible that unprofessional handling and technical defects arising from this go unnoticed by the customer at first. But it is very likely that defects will stand out sooner or later. In this case, the customer contacts us and we have to fix these defects afterwards. This will be extremely expensive, as the workers and the responsible PM and/or CM will already be working on another construction site then.” According to the expert, this scenario is particularly disadvantageous for the company, as it directly affects two construction sites at once. In addition, the participant explains, buildings at the older site will usually be back in operation and therefore the access will be very limited. Often, the workers will only be allowed to enter the affected buildings at night or on weekends. This leads to higher labour costs due to the legally required night shift or weekend premiums for

the workers. In these cases too, the company reputation and the particular customer relation are damaged. Sometimes, multi-annual lawsuits between the affected customer and the construction company are the consequence. The researcher observed several lawsuits because of unprofessional conduct of construction works and thereby arisen defects in the studied organisation. Usually, those lawsuits bind company resources, as the responsible BM as well as PM and CMs have to prepare themselves for their statements in court. According to participant B2, these preparations take a lot of time, as the particular construction project is usually long finished and the employees who were involved in it have to take this time to brush up their memories. While they do that, the affected employees cannot do their current work, which in turn induces costs. In addition, those lawsuits usually end with the termination of the business relationship including all the negative consequences for the company: the high costs for the fixing of the defects and, even worse, a replacement for the lost customers needs to be acquired.

According to participant C2, “A good reputation in the market that was build up for many years can be destroyed within a few days due to unprofessional handling of a project. A once damaged reputation is only very difficult or impossible to rebuild.” In this context, interviewee A5 added: “It has to do with psychology. Once a customer has lost confidence in a company, he is naturally afraid that he will never be able to trust this company again.”

Interviewee B4 provided a further argument: “Only few industries are as price-driven as the construction industry. Most orders are placed to the cheapest bidder. A 100% professional handling of an order is one of only very few arguments that we have as a construction company to convince a customer to commission us even though we are not the cheapest bidder on his price comparison list. If we destroy this argument ourselves due to unprofessional conduct of construction works, it will be even more difficult to earn reasonable margins.”

Permanent contact person for (regular) customers and personal relationships to (regular) customers

According to numerous experts, the personal factor between the responsible employees of the company on the one hand and the customers’ decision-makers on the other hand should not be underestimated.

According to participant A7, most customers, especially regular customers, expect to have one contact person in the construction company, who is responsible for their entire exchange. Once a personal relationship has been established between the customers’ representative and a company employee, the customers will not want the company to change this contact person - only if this permanent contact person is on vacation, a short-

term vacation replacement by a colleague will be found acceptable. Again, psychological factors are important in this context: nobody wants to lose a once developed and well established trustful relationship with a contact person. According to interviewee A7, in practice, this means that this contact person, usually a PM, has to be permanently accessible for the customer - ideally also late in the evening and on weekends. Expert A7 mentioned: "If the customer has a need or desire, then the contact person must be on hand." According to him, apart from the already mentioned professional conduct of construction work, the permanent accessibility of the responsible contact person is a major benefit for the customer and a further argument for the customer not simply to commission the cheapest bidder of all the available construction companies. In this context, interviewee A8 stated: "The customer has to know that if he asks the company contact person for support that he will not be let down and the requested construction works will be carried out in a high quality manner and on time." Various experts explain that building up this trustful relationship is a long-term process but critical with regard to a sustainable success. Once this relationship of trust between customer and contact person has been established, according to expert C3, it is difficult for competitors to ever get orders again from this customer, as the customer knows now that he can rely on his contact person and therefore on the company as a whole.

The combination of expert interviews on the one hand and analysis of commercial documents on the other discloses that especially the BMs, who were economically very successful in the past have stated this approach as critical. These economically very successful BMs expect from their PMs an unconditional full time customer service. In this context, Participant C2 stated: "The customer is always king. Especially, if the responsible representatives of the customer have made a planning error, we have to be there and help these representatives by reacting very quickly. In this way, you can build up lasting and trustful relationships." According to the experts, this approach can also result in these customer representatives commissioning the company for the next construction project without asking for a discount and without obtaining a large number of alternative quotes from competitors.

Another factor with regard to customer relations is the decentralised organisation of the studied construction company. The mentioned permanent contact person approach is not only valid for a single branch and its employees, but also for the entire company including head office departments. In the studied organisation, it could be observed that sometimes head office employees get in contact with customers. This could be happening for a number of reasons. One reason could be a legal question in connection with the contract between customer and company. In this case, it would be standard procedure for the legal department advocates to get in touch with customer representatives to clarify the matter. In this context,

participant A8 mentioned: "As a matter of fact, no customer wants to communicate with lawyers more than absolutely necessary." Other experts stated that an involvement of the legal department could send the signal to the customers that even in case of small problems on a construction site, the company lawyers will show up on site and cause complications. According to several participants, this signal, which could come across as a threat, should be avoided and as a consequence, direct communication between a customer and the company legal department should only take place in exceptional situations. Another sensitive issue is the dunning list, which is generated weekly by Financial Accounting. Each customer, who appears on the dunning list, receives a dunning letter, which is also written by Financial Accounting. In this context, participant A7 stated: "There can be always a reason - for instance a missing signature of a responsible manager on the side of the customer - why a customer did not pay the bill in time. The financial department doesn't necessarily know this reason." To avoid unnecessary dunning letters and therefore trouble that could damage the customer relationship, the responsible BMs should always have the chance to check the intended dunning letters.

In addition to a permanent contact person for customers, there are other possibilities for building a solid personal relationship with customers. According to numerous experts, it is important to spend time with the decision makers on customer side outside the regular working hours. In the studied company, various strategies for building up customer loyalty could be observed. In 2006, for instance, it was decided to rent a box in the stadium of a famous football team in order to have the possibility to invite important customers. Participant A7, as well as other BMs, favours the joint visits of football or handball matches, depending on the customer's preference. Participants A2, B1, and C1 prefer joint excursions to the Oktoberfest in Munich. Interviewee A3 has visited tennis matches with important customers. In this context, expert A7 mentioned: "The compliance guidelines of the respective customer always have to be met. If the invited guest is not the customer himself, but a customer's employee, then the guest should first find out internally whether he may accept our invitation or not. Otherwise, problems could arise later, which could also damage the business relationship."

A further, more formal, possibility to build up personal relationships to customers and therefore customer loyalty is the conduct of in-house customer trainings for new technical norms or specifications. New building materials that might come onto the market could also make interesting topics for customer trainings. In this case, the technical employees of the company - for instance PMs - could give lectures about new available materials or other technical topics that are of interest to the customers. According to participant C1, it is crucial that the topics of the chosen lectures really are beneficial for the customers.

Numerous experts have stated that the CSFs connected with customer loyalty are especially crucial with regard to higher profits. According to them, the only tools a construction company has available in order to achieve higher sale prices on the construction market, are professional handling of all orders, an excellent customer service and a trustful personal relationship between customers and company employees. As the sale prices are the biggest driver of economic profits, the focus of each construction company manager should be on these factors.

Development of regular customers

According to numerous experts, the proportion of regular customers is a critical factor with regard to the economical success of a branch. The analysis of expert interviews and commercial documents shows that especially the economically successful BMs focus on their regular customers as well as on their development.

Interviewee A8 described the development of regular customers as a “long-term optimisation of the customer structure with an enormous impact on branch profits”. He further stated that “once a business relationship with a regular customer is profitable, we benefit from this every year. If a business relationship with a customer, who commissions us once, is profitable, we benefit from that only this one time. Therefore, regular customers are crucial for the company profits.” For instance, if a construction company generates annual margins of 200,000 € with a regular customer, after ten years the total margin is already 2 million €. In relation to this, a customer who commissions a construction company with one single order that generates a margin of 200,000 € only one time. So, the importance and the impact of long-term regular customers for the company profits becomes clear. However, not all customers are eligible to become regular customers. In this context, participant C2 mentioned: “Customers who will earn most of their money in those cases where we do not earn any money on their construction sites - like for instance classic property developers - are not ideal regular customers for us. Those customers are not interested in a long-term business relationship with a reliable construction company. They only search for the cheapest bidder.” According to the experts, it is crucial that the selection of customers who shall become regular customers is not randomly made, but follows a logical approach.

According to various interviewees, the more professionally a procurement process is organised, the less the technical know-how and customer service of the construction company - exactly the benefits that the organisation managers want to provide to their customers - are taken into account by the customer representatives in the course of commissioning construction works. In this context, “professional” means that the customers’ technical personnel, which is usually located on site or in the customers’ plants and therefore

collaborates closely with the construction company workers, does not have a voice. Instead, the customer's commercial staff makes the decision on which construction company is commissioned. In addition, several experts state that the more decision makers on the side of the customers are involved in the commissioning process, the longer it takes to get a decision and the more complicated contract negotiations are. According to them, the closer the customers' decision makers are to the construction site and the more technically skilled they are, the more likely it is to convince the customer with arguments related to technical knowledge, reliability, and customer support. If, on the other hand, commercial departments or even a legal department is involved in the negotiations on the side of the customer, technical arguments such as a high technical standard of the construction works to be conducted are not appreciated.

Ideally, according to interviewee A8, there is one decision maker, who is mainly technically versed and has a certain budget - for instance 20,000 € - available, up to which he can decide and commission a construction company independently from other departments. Usually, according to the expert, those decision makers are employees of large industry enterprises, who are responsible for the entirety of technical issues including construction works in several production halls. In the studied company, many customers of this type could be observed. In practice, this means that this decision maker receives a quote, which must be below his given budget. Then it is up to him which construction company he commissions. According to participant A8, "in these cases, we usually get the order as this decision maker appreciates our support and reliability. He knows that he will not have any issues with us." These explanations are closely connected to the CSFs professional conduct of construction works and personal relationships to customers mentioned before.

However, there was also a case to be observed in the studied organisation that had developed quite differently. A regular customer from the energy sector, who operates several coal power plants, had commissioned a business consultancy with the complete restructuring of the procurement process in 2015. Henceforth, only commercial personnel could make decisions related to the commission of construction works. A dramatic drift of prices was the consequence. The studied company lost this customer and a competitor got the contract. After six months, the former customer contacted the studied company again and spoke of extreme issues related to the poor reliability of the competitor. After short negotiations, the studied company could win back this customer. It was agreed that the old prices that were valid before the restructuring of the procurement process were to be part of the new contract. In this context, expert B7 stated: "For customers who do not appreciate our technical know-how and our reliability related to work safety and adherence to schedules, but only try to

negotiate the lowest possible prices, we will never seem profitable.” According to various participants, it is important that the procurement process is not mainly commercially shaped.

According to many experts, the customer’s behaviour on site towards the company workers is also a critical factor. The company workers rely on a permanent access to the construction site in order to bring tools or transport materials or other factors that always depend on the customers’ staff as well. The customers’ staff on site is also responsible for the examination of the construction works conducted. In this context, participant A7 mentioned: “If the working atmosphere on site is not good, it can happen that the examination of our work takes longer and is more „accurate“ than strictly necessary.” If the customer’s personnel on site is not willing to cooperate with our workers, additional costs that were not calculated in the quote can arise and shorten the margin. Therefore, according to the experts, it is crucial to generate a good working atmosphere together with the customers’ staff on every site.

According to the experts, the choice of the right regular customers is the first and most effective risk management tool that a construction company can implement. In this context, it could be observed that issues with regular customers related to payments or even lawsuits are seldom. In addition, the margins generated on the sites of regular customers are higher throughout than on other sites. Therefore, it is reasonable to develop a higher proportion of the right regular customers in order to increase profits and to preserve the company resources. Each prevented irregularity, such as payment issues or lawsuits, blocks capacities on BM, PM and worker level that could otherwise be used to maximise profits.

4.5.3 Construction management-related CSFs

In the expert interviews conducted for this study, all in all 15 short-term (SSFs) construction management-related CSFs were identified (Appendix 17). Figure 22 illustrates the Top 5 (according to entries by participants) construction management-related CSFs.



Figure 22: Top 5 construction management-related CSFs (own figure).

Partnerships with subcontractors

Due to the present construction workers shortage in Germany, according to 17 out of 17 BMs interviewed, the development of long-term partnerships with subcontractors is a critical factor that is directly connected with the professional conduct of construction works mentioned before. Participant B2 described the situation as follows: “Already in the near future, the construction companies will get the orders that have the required personnel available.”

The number of workers needed by each branch depends on its annual target sales. According to various participants, one worker generates approx. 100,000 € of sales per year. This means that a branch with annual target sales of 5 million € needs approx. 50 workers to achieve those target sales. With regard to the entire studied organisation and its annual sales of approx. 100 million €, this means that the organisation will require approx. 1,000 construction workers.

According to the experts, it is mainly the BMs’ job to build up partnerships with local subcontractors in their particular region. In this context, interviewee A7 mentions: “Subcontractors are usually small companies with a maximum of ten workers. In most cases, the owners of these companies also work on site as construction workers. These kinds of people want to trust us. For them, we are the customers. Customers who also deliver supervisors, technical knowledge as well as materials, and commission them with the conduct of the actual construction works. As we want to trust our customers, they want to trust us.” According to participant A7, the development of such a trustful relationship is a

long-term process. In this context, expert C3 added: "There are numerous subcontractors out there. Only very few high-quality subcontractors have an interest in long-term business relationships. We need workers who are technically skilled and reliable and we might need them for the next years or even decades. What we do not need are groups of workers who only want to earn fast money." According to various interviewees, the dependence on high-quality and loyal subcontractors is comparable and not less crucial than the dependence on regular customers mentioned before. Interviewee B7 explained that the worker shortage in Germany will become even worse during the next years, as Eastern European workers who have filled the gap so far, will prefer to work in their own countries as soon as the hourly wages in the construction industry of these countries' have caught up with Western European standards. According to the expert, this is just a question of time.

Still, the advantages of using subcontractor personnel compared to having a large number of own construction workers are numerous. If the company order book is empty, the subcontractor workers do not have to be paid anymore. This creates an enormous flexibility, because peaks in short-term manpower demand - for instance on an extraordinary large site - can be managed in this way without the need to hire large numbers of new own construction workers with long-term employment contracts. Another advantage is that subcontractors generally get paid by unit - that means they get a certain unit price for one square metre of wall, floor or ceilings built, which is negotiated before the construction phase begins. As the negotiated unit price remains fixed during the entire construction phase, this offers planning reliability with regard to the calculated margins for the studied organisation. If workers cannot work as fast as originally calculated, the subcontractors are responsible and need to take action to accelerate the works. Otherwise, the subcontractor, but not the studied company, has to deal with the additional labour costs.

The analysis of the commercial documents discloses that the successful branches in particular have managed to build up these important trustful relationships to subcontractors in the past, as these branches have been receiving invoices from the same small groups of subcontractors for many years. In practice, usually between five and ten different subcontractors work for these particular branches almost all the time and they have become almost like own company workers. "Almost" is an important word in this context, as it is legally required that each subcontractor has a certain amount of other customers apart from his major customer, who in this case is the studied company. Otherwise, if a subcontractor only has one big customer, the legislator defines this subcontractor as fictitiously self-employed, which would lead to major legal issues for both the subcontractor and the customer.

According to various participants, a lack of reliable subcontractors is the biggest economical risk in the construction industry today. In this context, numerous cases could be observed in the studied organisation. As an example, one case is explained in detail. On a large construction site in Hannover in 2015 - the renovation of the head offices of a bank - missing manpower led to a major commercial loss. Around 50 workers were needed for this site for the duration of six months. Only about ten of the company's own workers were available, 40 additional workers were required. However, the responsible branch did not manage to find and hire the required number of subcontractor workers in time. The consequence was that the company's own workers had to be brought in from numerous other branches in order to conduct the work. Of course, this had an impact on those other branches, as their personnel was actually scheduled on other sites. In the end, more shortage of workers had to be created throughout many branches, which was a significant cost factor. The additional fact that 50 company workers, all paid in working hours, had to be supervised by only two CMs on site, led to high economic uncertainties. At the end of the construction phase, the once calculated labour costs were exceeded dramatically. The additional costs for the other branches could not even be estimated. When the responsible PM realised that the once calculated labour costs were exceeded, he tried to identify addendum potentials and communicated them to the customer in order to increase the billable amount and therefore to improve the commercial result of the construction site. The customer, a highly experienced general contractor, who had been commissioned by the bank, recognised the PM's plan and reacted with a reference to the valid contract.

In this context, interviewee A5 stated: "Issues related to manpower prior to or in the beginning phase of a new construction site always lead to higher labour costs. It is crucial that the responsible PM recognises this as soon as possible and communicates the situation to the responsible BM. The sooner we accept that a slightly more expensive subcontractor is still much cheaper than the use of large amounts of own personnel, the lower the additional labour costs and therefore the commercial loss will be." Participant C1 added that a large amount of own workers paid in working hours is not controllable at all. According to him, it is crucial to keep the performance risk mainly on the side of the subcontractor. He further states that through long-term and reliable subcontractor partnerships, those issues usually do not arise at all.

Timely billing

Timely billing is a further CSF according to numerous experts. It is the PMs' job to measure up the quantities built on site and to generate the outgoing invoices for the customers from these measurements. In this context, participant A7 mentioned: "Of course, the sooner the particular outgoing invoice is generated, the sooner we get our money." Due to the enormous

capital requirements in the construction industry - the entire labour costs as well as materials have to be pre-financed by the construction companies - it is common that companies already issue invoices during the construction phase. According to interviewee A8, “usually our PMs try to issue at least one invoice per month to keep pre-financing as low as possible.” If we assume one invoice per construction site and month and afterwards further 30 days time for payment, which is common in the construction industry as the customers need a certain period of time to verify the invoice, two entire months have to be pre-financed by the construction company. In a branch with annual sales of 6 million €, which is equal to 500,000 € per month, 1 million € need to be pre-financed. In their everyday work, PMs have to visit the construction sites that they are responsible for on a regular basis to supervise the construction process and the quality of the work already conducted, and to monitor possible needs for materials. In this context, expert A5 mentioned: “PMs should measure up the works conducted during each site visit. Only regular measurements on site ensure a regular generation of outgoing invoices.” If it was managed to issue an invoice every two weeks instead of a monthly basis, the pre-financing of a regular branch could be reduced by 250,000 €, according to the experts. If we assume a present average interest of 5%, which is common in the construction industry, this would improve profits by 12,500 € per year per branch. Within a group of 20 branches this would lead to 250,000 € more in profits.

In addition, the impact on the balance of the construction company should not be underestimated. Due to extraordinarily high pre-financing in the construction industry, credit institutions monitor operating figures like the equity ratio very closely. Depending on the assessment of the particular credit institution of the particular equity ratio situation, interest rates can go up or down. The higher the equity ratio, the lower the interest rates. In the studied organisation, with an annual sales of approx. 100 million € - therefore monthly sales of approx. 8.33 million € - and two months of pre-financing, only one percent interest rate change equals approx. 166,667 € of higher respectively lower costs per year. In general, construction company managers should always focus on ensuring the liquidity of the company. It is possible that several large lawsuits related with 1 million € amount in controversy each occur within a short period of time. If that happens, the pre-financing related to these lawsuits comes in addition to the regular pre-financing during the operational business. Those situations can easily lead to liquidity shortages even though the business of the affected construction company runs well. Several concurrent lawsuits with customers were observed in the studied company. The total sum of all lawsuits together frequently superseded 5 million €.

There are other disadvantages that can arise from a high pre-financing situation. Several cases occurred in the studied company, in which the responsible PM did not measure up all

works conducted on a particular construction site, but was already busy with the subsequent site. In this context, expert A7 mentioned: "If PMs do not measure up all our conducted works in time, there is always the risk that they forget certain details. Those details can be additional works conducted in a neighbouring building of the construction site, scheduled works that can be billed in working hours additionally to the contractually agreed works or further agreements that were made on site." In general, according to the experts, it is always dangerous not to bill the conducted works in time. There are customers who do not think long-term and do not seek a lasting business relationship with the particular construction company. Those types of customers know exactly that the higher the amount of money that was pre-financed by the construction company, the more this company depends on the payment of the particular invoice. In this context, several cases could be observed in the studied organisation, in which customers tried to put the company under pressure. These customers wanted to pressure the company into accepting lower invoice amounts under the threat of not receiving any money at all. In this context, participant B1 mentioned "the higher the construction site-related pre-financing, the more vulnerable we are to customer attacks."

Of course there are also quite ordinary customer-related reasons for a timely billing of conducted construction work. Many customers need the incoming invoices in time in order to be able to generate their monthly balances. Fixed annual budgets for construction works can be another motive for customers to demand timely billing. Industry customers in particular often have fixed annual budgets for construction works. If this budget has not been reached by the end of a business year, customer representatives might want the construction companies to bill their works as soon as possible in order to be able to still account the particular construction company invoices to the old business year. In this context, participant B6 stated that "for many customers, a timely billing is part of a professional conduct of orders. If they have to wait several months for the invoice, they might have issues, because their responsible employees might not remember the details and therefore have to spend more time to verify the invoice."

To sum up we can say that all affected stakeholders benefit from a timely billing. The only exceptions are customers who do not intend to pay the construction company invoice for self-created reasons and credit institutions because of higher interest rates.

Another possibility to save the company liquidity is to negotiate advanced payments during the contract negotiations. Many customers agree to advanced payments as they usually come with discounts. This is possible because most interest rates for construction companies towards credit institutions are higher than those of the customers who often are big global enterprises or real estate investors. The banks take their businesses to be safer than the construction company businesses.

Identification / realisation of addendum potentials

The identification of addendum potentials on the one hand and their realisation on construction sites on the other are further major critical factors according to numerous interviewees.

In the construction industry, the situation with regard to price calculation is different from most other industries. Often, construction companies have to calculate extremely low prices - sometimes not even covering their fixed costs - in their quotes to have realistic chances to get orders. Therefore, according to various experts, it is crucial to have PMs or CMs that are able to identify addendum potentials on the sites and, no less important, to turn the identified potentials into concrete addendums as well. Only with skilled staff on site, construction companies are able to improve their margins during the construction phase. The process of identifying and realising addendum potentials already begins during the price calculation. The employee who is responsible for the price calculation, mostly the BM, must have the ability, according to the experts, to identify addendum potentials before the actual construction begins. Only highly experienced BMs and CMs are able to identify those potentials in a customer request.

According to various experts, there are generally two different types of addendums in the construction industry. The first type emerges from mistakes in the customer's quotation requests. For instance, the customer simply forgets to mention certain works in the specifications. A highly experienced BM is able to identify this type of addendum directly in the price calculation process. Once such an addendum potential is identified, the BM is able to calculate the prices in the quotation request lower to get the order. In this case, that is not an issue, as he already knows that there will be addendums with usually higher margins during the later construction phase. The second opportunity to identify an addendum that emerges on site. There are special factors that influence the work flow on site that cannot be known or calculated by the customer or the company BM in advance. For instance, the construction company renovates a customer's top manager office and shortly after the renovation commences that top manager realises that he does not like the selected type of ceiling panels and as a result of it, the construction company - deviating from the original contract - has to order and install new ceiling panels. This is a classic example of an addendum that emerges on site. In both mentioned cases, it is the responsible PM's job to communicate to the customer that additional costs will occur, as the newly required works were not part of the original contract.

The analysis of commercial documents, which also include the individual internal order announcements prior to the particular construction phases, discloses that especially the

economically successful branches manage to improve the margins during the construction phases. In this context, participant A7 mentioned that he instructs the PMs in his branch each week during the branch staff meeting that “ there is not such a thing as a site without addendums.” It is the expert’s opinion that that it is one of the major tasks of the PMs, respectively the CMs on smaller sites, to improve the construction site margins by identifying and realising addendums. He expects from his PMs and CMs to realise addendums on every single site. The analysis of commercial documents illustrates that especially this expert’s branch generates extremely high margins.

In everyday work, the identification and realisation of addendums bring numerous unpleasant conversations and meetings between responsible PMs and customer representatives. Mostly, customers are not willing to accept that a certain position is not covered by the main contract that was negotiated before. Each addendum means additional costs for the particular customer. Therefore, it is crucial that PMs are personally skilled and able to find the right words in these meetings. In addition, it is important that the responsible PMs always behave honestly towards the customers and their representatives. Only real addendums should be registered and invoiced separately. Otherwise, there is the risk that customers feel cheated and do not commission the particular construction company again. In general, the customer’s behaviour in case of addendums is a major criterion with regard to the choice of the right regular customers mentioned before.

In the studied organisation, there were many cases where the once calculated margin could be improved greatly by the responsible PMs through the realisation of available addendum potential. One case will be discussed in the following in detail. In 2009, a branch could acquire a large order. After the contract negotiations, the order value was approx. 900,000 € and the margin was approx. 11%, which is 99,000 €. The fixed costs, consisting of the branch employees in the office and the costs of the head office were approx. 15% of the sales. After the contract negotiations, the remaining margin was too low to even cover the company fixed costs and would have meant a commercial loss of 4%. As the customer and the customer representatives were well-known and assessed as fair partners by the responsible BM and in order to prevent a competitor from getting the contract and getting in close contact with this customer, the decision was made to accept the order nevertheless. Due to a professional construction management on site, numerous addendums could be identified and realised. In the end, there were twelve addendums in addition to the main contract. Almost 1,7 million € could be billed and the margin was 33%, which is 561,000 €. After deduction of all fixed costs, there was still 18%, which is 306,000 € in profit left. This example illustrates the strong impact that a professional addendum management by the

responsible PMs and CMs can have on the site margins and therefore on the branch and company profits.

In this context, interviewee A1 mentioned: "If we could only manage to improve every construction site margin by 2%, the effect for a branch with 5 million € annual sales would be 100,000 €, for the entire company, even approx. 2 million € per year. That is why I always remind my PMs to identify and realise addendums on every site." In this context, participant B1 added: "As a construction company, we do not have many possibilities to improve our margins. Therefore, we have to make use of the few we have available."

Right PM to right customer / construction site

A sustainable business is usually affected by psychological or personal factors as well. According to many experts, not every PM can be a perfect match for every type of customer. Depending on the type of customer, the entire everyday working atmosphere on a construction site can be quite different from project to project. In this context, interviewee A2 mentioned: "The working atmosphere in an executive suite of a large enterprise is completely different from the working atmosphere in the production halls of an industry customer." Therefore, for each type of customer and even for each type of construction site, the responsible BM has to think about the choice for the suitable PM. The chosen PM should always be able to adapt well to the working atmosphere on site.

Apart from the working atmosphere, which is influenced by the site environment, personal factors also play a role. The main factor here is the customer's everyday contact person on site. The BM has to know what type of character this person has. In this context, participant B6 stated: "We have to take into account the customer contact person's age, experience, sense of humour, private interests, hobbies, and what he considers to be most important on the construction sites. One contact person focuses more on the schedule, another one more on the quality of the works, and the third one is happy as long as the construction site is clean. Some always expect a written correspondence, for others the verbal communication on site is sufficient." According to the expert, the goal is to create conditions in which the customer's contact person on site and the responsible PM understand each other well and develop a good personal connection. Participant A3 added: "If the personal factor on site works, all everyday issues on the construction site can be managed. Ideally, many problems remain on site and can be handled locally." In those cases, according to many experts, the probability that bigger issues or even lawsuits arise is pretty low.

In the studied organisation, numerous cases could be observed that illustrate the importance of a good personal interaction. Two cases shall be described here in detail. A long-term customer of the car manufacturer industry worked with a certain PM for a long period of time.

The annual sales were approx. 1.5 million €, the generated margin approx. 15%, which is 225,000 €. Using full-cost pricing, there was no profit remaining, as the total fixed costs of the studied organisation were approx. 15% of sales. When the responsible BM retired, the new BM decided to change the PM on the mentioned site, because it was his opinion that the formerly responsible PM was not a perfect fit with the regular customer's contact person on site on a personal level. Only one business year later, the annual sales had increased to 2 million €. In addition, the margin increased to approx. 25%, which is 500,000 €. The decision to replace the responsible PM had been mainly based on personal impressions by the new BM and led to 275,000 € higher annual margins. As this could be observed five business years ago, the improvement of company's profits is approx. 1.375m € so far.

Another case could be observed, when a highly experienced PM retired. His main responsibility had been to interact with a regular customer of the energy providing industry. His task was to supervise industrial insulations works at the customer's power plant boilers, pipings around these boilers, and large air ducts. He had worked with the same contact persons on the side of the customer for many years. It was well known that customer and the construction company representatives collaborated extremely well on this site. The annual sales were always approx. 2 million €. The generated margin was approx. 20%, which is 400,000 €. After the PM retired, the situation on site changed. A very young PM, much younger than the customer's contact persons, took over on that site and started to supervise the industrial insulation works and took over the communication with the customer's representatives. No other factor on that site changed. Unfortunately, what used to be a well-oiled collaboration started to become a locking of horns. Criteria that were important for the customer's representatives - e.g. a clean site every night - were not taken into account sufficiently by the new PM. The dissatisfied customer's representatives reacted with the creation of issues in everyday work. For instance, measurements of conducted works were not reviewed in time or minor deficits were officially protocolled in writing. There was no impact on the annual sales, as the studied company was the only supplier of industrial insulation on that site. The sales remained approx. 2 million €. However, due to several everyday issues on site, the margin fell to 12%, which is 240,000 €. This means that the particular site's margin has lowered by 160,000 € p. a. After 1.5 years, the new PM was replaced and transferred to another construction site. On this new site, the PM performed very well and was responsible for good margins there. This case illustrates that a weak performance of a PM on a site does not necessarily mean that he is bad at his job. What it means is that the working atmosphere and the personal relationships on every site play a crucial role and have a big impact on the profits of the construction company.

In this context, interviewee A3 mentioned that “once a PM has reached a certain age, his personal soft skills can only be developed in a very limited way.” According to this expert, it is of crucial importance for the career of a PM, that his personal skills are sufficiently developed and that he remains sensitive regarding this part of his job. The PM in the second case mentioned before was not attentive enough when it came to the development of his soft skills and when he was on site, his main focus were the hard technical facts.

This CSF illustrates that both hard and soft skills are required. PMs should have the ability to adjust to the particular type of customer that they work with. The more this ability is developed, the more flexible he will be able to react to new branch customers and the more useful this PM will be for the BM.

Compliance with norms, technical specifications, and schedules

As mentioned before, compliance with norms, technical specifications, and customer schedules is part of the professional conduct of construction works. Due to its importance, these points are listed as an individual CSF as well. According to numerous interviewees, the PMs’ and CMs’ knowledge concerning valid norms and further technical specifications is a condition, which will be discussed in the identified staff-related CSFs in detail.

Interviewee B6 mentioned that norms and industry-related technical specifications dictate what type of material the construction companies and therefore the workers have to use and how these materials are to be installed. In addition, according to the expert, it is specified which auxiliary materials - for instance what type of glue, screws or nails - are allowed as well as which tools workers have to use under particular circumstances. Numerous cases in which these norms were not complied with could be observed in the studied organisation. As these cases tend to have a major impact on the company profits, a number of them are discussed here in detail.

In 2012, the responsible PM on a large construction site with an order value of approx. 4 million € ordered the wrong type of glue, which was needed to close the gaps between the gypsum plasterboards on newly built interior walls. Due to this mistake, the construction workers used glue that was not allowed according to the valid technical specifications. During the entire construction phase, which was several months, this mistake went unnoticed. It was not until a few years later that problems that could be connected to it arose. Cracks started to become visible in the joints between the gypsum plasterboards that were once closed with the wrong type of glue. In total, this affected several hundred meters of wall. The former customer contacted the studied company with the demand that the defects were to be rectified immediately. Fortunately, all the affected interior walls were in the basement of the building so that the company’s workers had access all the time and

therefore could conduct the necessary works during the regular working hours. Nevertheless, this case led to approx. 200,000 € additional costs and a major damage to the company reputation in that particular region. The affected branch has been shut down in the meantime.

Also in 2012, the studied company was commissioned with a large housing construction site. The contract included several types of different construction works and the order value was about 7 million €. The works that could not be conducted by the company itself - for instance building shell works, floor tiler works, electrical installation works, roofer works, and building equipment works - were commissioned to other companies. For the studied company it is common to commission other companies as subcontractors with the conduct of construction works. However, these are always works from their own portfolio so there are always BMs and PMs available who know the commissioned works in detail and are able to intervene, if mistakes are being made by the subcontractors. In this particular case, however, works were commissioned to other companies that the studied company itself was unfamiliar with. On the site in question, the studied company acted like a classic general contractor. Due to the enormous technical knowledge that was required to supervise several types of construction works at once, the responsible PMs were overstrained. The consequences were deviations from the valid technical specifications in several types of work. Some of these deviations were not discovered until the works were almost finished. Obviously, the customer requested that all deviations from the valid specifications be rectified, which took almost an entire year. Many companies that were commissioned with the works were shut down in the meantime. In addition, the company had to pay fees to the customer, because the single flats could not be sold as planned. All in all, the deviations from the valid specifications led to additional costs of more than 1 million €. Afterwards, it was decided by the top management that the studied company will not act as a general contractor again.

In 2010, on a large power plant site, the studied company did not manage to meet the customer schedule because the responsible BM and PMs had underestimated the required manpower. After a short period of time, the operator of the power plant contacted the company and demanded more workers in order to close the time gap that had opened. As the company could not provide more workers, the plant operator commissioned workers from one of the company's competitors for immediate support. The consequence was that the studied company had to pay the difference between the once calculated hourly rates of the own workers and the hourly rates of the commissioned competitors. In total, approx. 450,000 € of additional costs arose as 150 workers from competitors were used for three months. The original order value was 6 million €.

In 2016, the studied company was commissioned with the installation of ceiling panels in an underground car park owned by the customer. The order value was approx. 100.000 €. After several months, employees of the customer first noticed screws and later even entire ceiling panels on the floor of the underground car park. A technical examination disclosed that the construction workers had used screws that were too short and in addition to that not allowed in combination with the installed type of ceiling plates. The consequences in this case were additional costs of approx. 40,000 €, as two workers had to exchange all screws, which took them almost three months. In relation to the original order value, the scope of this mistake becomes clear.

The described examples illustrate that even small mistakes with regard to compliance - or in these cases, non-compliance - with valid technical specifications can lead to enormous additional costs for a construction company. Moreover, the last case clarifies that this can occur on sites with a low original order value as well. Interviewee B6 mentioned that issues related to a non-compliance with technical specifications are especially dangerous, as the consequences will sometimes take years to become visible. Normally, the period of warranty in the German construction industry is limited to five years after completion of a construction site. In cases where construction companies do not comply with the valid specifications, the period of warranty is extended. According to the expert, that is why construction companies always have to ensure compliance with all valid specifications at all costs.

Observation of new customers on site

Numerous participants mentioned that the observation of new customers in everyday work life on the construction site is crucial. This CSF identified is strongly connected to the CSF right PM to right customer.

According to them, through this observation important characteristics of the new customer and his representatives (e.g. decision makers) can be identified. In this context, interviewee A5 stated that it is mainly the PMs' job to conduct these observations, but especially in the very beginning of the new business relationship the BM should come on site in order to observe as well. Furthermore, the expert stated: "If our first measurement, which is the basis of our first outgoing invoice, is checked by customer representatives on site, I always try to be on site to check if the particular customer is interested in a long-term business relationship, or if he just intends to pay as little as possible." According to the expert, the control of the first measurement is the first opportunity to assess the customer's intentions. If the customer starts a discussion related to this first measurement, further problems will usually follow.

According to interviewee C2, the customer's behavior in everyday work discloses his general view about the type of business relationship that he intends to have with the studied company. According to the expert, there are common issues on each construction site. An example: the construction company workers in a large customer's production hall need a crane to support them temporarily. That crane would be operated by the customer and would help to manage the transport of incoming materials faster. In such cases, there are two possibilities. The customer could decide to support the construction company workers on site, which in this case would mean to provide the crane, or he could refuse to provide this support. The participant mentions that those little everyday issues on a site have a great meaning that should not be underestimated. Therefore, it is critical that company PMs and BMs are sensitive with regard to the possibility of customer observation in everyday work life and also make use of it, as its impact on the company's economic success is enormous.

In the studied organisation, various cases could be observed in which customers did not cooperate well with the company PMs. The first opportunity for a detailed observation is, as already mentioned, during the first measurements control process. The second opportunity is the customer's handling of the construction company invoice. The responsible PM should always control if the customer pays the invoice in time. If not, he should immediately contact the particular customer and ask for the reasons. In this context, expert A7 mentioned that there are of course valid reasons why a customer might not be able to pay in time. For instance, if the construction company made a mistake with regard to the invoice like naming a wrong invoice recipient. In those cases, the construction company has to reissue the invoice. However, in practice, many cases could be observed, in which customers did not pay the company's invoices for dubious reasons. Some customers simply claimed that they never received an invoice. Others mentioned that the stated recipient on the invoice was wrong although it was, indeed, the correct one, or they argue that the mentioned due date for payment was wrong and therefore payment was not possible. Some types of customers even chose to wait until the end of the agreed time of payment until they inform the company about issues they have with the invoice. Another common argument for delayed payments is an allegedly high number of ill staff members in the customer's accounting department. According to the experts, it is crucial to assess each particular situation individually and to identify the customer's real intention behind those assertions. The responsible PM must be able to determine if a customer is not honest and only seeks to save his liquidity and is not willing to pay the construction company's invoices.

Another opportunity to identify customers that do not intend to build long-term and honest business partnerships is during price negotiations related to addendums. Some customers are not willing to pay for addendums at all, as they have already reached their budget limits

for the particular site. If the responsible PM detects signals like that, caution is advised. Usually, these customers will refuse to pay the invoice regarding the addendums. To avoid issues related to payments, advance payment should be negotiated in those cases.

If it was concluded that a customer is not interested in a long-term business relationship, it is according to the experts, important to ensure that as much money as possible is paid as early as possible by this customer, as this customer will only think short-term and not beyond the end of the currently running construction phase. Once the construction works are under way, it will be hard for the construction company to receive payments without allowing discounts or even risking a lawsuit.

However, there are also cases in which customers could be identified as reliable and long-term oriented. There are many customers who will contact the responsible company branch immediately after the reception of a wrong invoice in order to avoid unnecessary additional terms of payment. There are many regular customers who have never paid an invoice too late and many customers who have been working with the company for 20 years and never had contact to the company legal department, as there were never any legal issues on any site. In this context, interviewee A7 stated that most of his customer relations have been on-going for more than ten years. According to the expert, he has always focused on the customers' intention to build an honest partnership. The analysis of commercial documents discloses that especially the economically successful branches have managed to build a proportion of long-term regular customers and therefore honest partnerships. Due to these customer partnerships, these branches have managed to run highly profitable businesses, some of them over decades. According to numerous experts, all these trustful customer relationships began with detailed observations by the responsible PMs and BMs.

Commercial overview

The commercial overview that company BMs and PMs should have includes the knowledge of the single itemised costs and how they are composed, single sales, position of accounts, payments received and future costs and sales of each construction site within the particular manager's area of responsibility. According to various interviewees, in this context, the interaction between the managers and the commercial personnel of the branch is crucial, as the commercial personnel deals with many figures like current costs and sales on the branch sites. In addition, the commercial personnel always monitors all customer payments.

The analysis of commercial documents has disclosed how many construction sites an average manager has to monitor. A BM has to commercially control approx. 100 different construction sites in a business year. A PM, who has to control the sites commercially, is

also responsible for the entire technical conduct of the works and therefore for the supervision of the workers, has to handle approx. 30 different sites during a business year.

In the studied organisation, many observations with regard to the managers' commercial overviews could be made. Once a year, shortly before the end of the business year, all BMs have to join a budget meeting in the head office, where the branch profits are discussed in detail and the target figures related to fixed costs, margin, and profit for the next business year are determined. Apart from the BMs, the responsible MD, MA department, and the company owner take part in these meetings. Especially during the part that deals with the profit of the business year that comes to an end, the particular BM is able to illustrate his commercial overview skills. Many BMs could be observed to know their figures in detail while others seemed to have problems in that regard.

In 2015, the researcher observed a budget meeting where the responsible BM presented annual sales of approx. 7 million €, a margin of 25%, which is 1.75m €, and a profit after the deduction of all fixed cost of approx. 700,000 €. The particular BM seemed to know all the branch internal construction sites in detail. During the meeting there was no detectable reason to doubt his profit forecast. Several months later, when the new business year had already started, it became clear that the profit forecast that the BM had communicated in the budget meeting, did not correspond with the real situation. In the meantime, a lawsuit related to one customer and his construction site had arisen. The subject of this lawsuit was a debt claim towards that particular customer, arising to almost 700,000 €. As the outcome of this lawsuit was still uncertain on the balance sheet day at the end of the business year, the company had to make provision for this lawsuit in the entire amount in dispute. During the following business year, the judgment clarified that the customer had to pay the entire amount to the company. Therefore, over the two affected business years, this case had no impact on the branch profit. It was just postponed for a business year.

Another case could be observed in 2014. An actually highly experienced BM presented his profit forecast in the annual budget meeting. According to this forecast, his branch should generate an annual profit of approx. 400,000 €. A few weeks later, that BM had to correct his figures, as he had overlooked a subcontractor invoice regarding one construction site in the amount of approx. 300,000 €. Due to this mistake, the branch result of this business year had decreased by three-fourths down to 100,000 €.

In another budget meeting, it could be observed that the present BM was not prepared for the meeting at all and had to call his PMs all the time. The BM did not know any costs- or sales-related figures. After a short period of time, the meeting was interrupted by the

responsible MD as it was impossible to develop a solid profit forecast under these circumstances. One week later, the budget meeting was repeated.

According to many interviewees, due to the high number of different construction sites in each branch, the development of a sound commercial overview is a full-time process and several employees have to cooperate. In the case of the studied organisation, these employees are the PMs who have the most detailed information with regard to the individual sites as they visit them personally on a regular basis, as well as the commercial personnel as their main task is to monitor all payments, costs, and sales that relate to the particular branch, and the BM as he has to control the PMs and to make all decisions that are based on the commercial figures for this branch.

The individual commercial overview skills of a BM does not have a direct impact on the company profits, as mistakes that occurred can always be balanced within the following business year respectively years. Nevertheless, they can affect the relationship that the company has with credit institutions. The credit institutions expect official business assessments at least once a quarter. These business assessments are based on the BMs internal commercial reports. If the BM does not have a clear commercial overview with regard to his construction sites and their economic situations, the top management cannot provide meaningful business assessments to the credit institutions. In addition, the company is required by law to generate profit forecasts that are mostly rather pessimistic than optimistic. Therefore, according to several experts, the quality of the BM's commercial overviews is crucial for the overall company success.

All in all, it could be observed that the BMs that lead economically successful branches are usually familiar with their costs- and sales-related figures. According to numerous experts, a clear commercial overview of the business is crucial for most economical decisions. In this context, interviewee A8 mentioned: "How can a manager make a decision with regard to a possible hiring of an additional PM, if he does not know his profit and fixed costs situation in detail? How can a BM conduct price negotiations with a regular customer, if he does not know the margins generated on the previous sites of this particular customer in detail?" According to expert A6, all BMs have to act like independent entrepreneurs and each real entrepreneur should always know his business-related figures in detail.

4.5.4 Staff-related CSFs

In the conducted expert interviews, five short-term (SSFs) and 15 medium-/long-term (MSFs) staff-related CSFs were identified (Appendix 18) all in all. Figure 23 illustrates the Top 5 (according to entries by participants) staff-related CSFs.

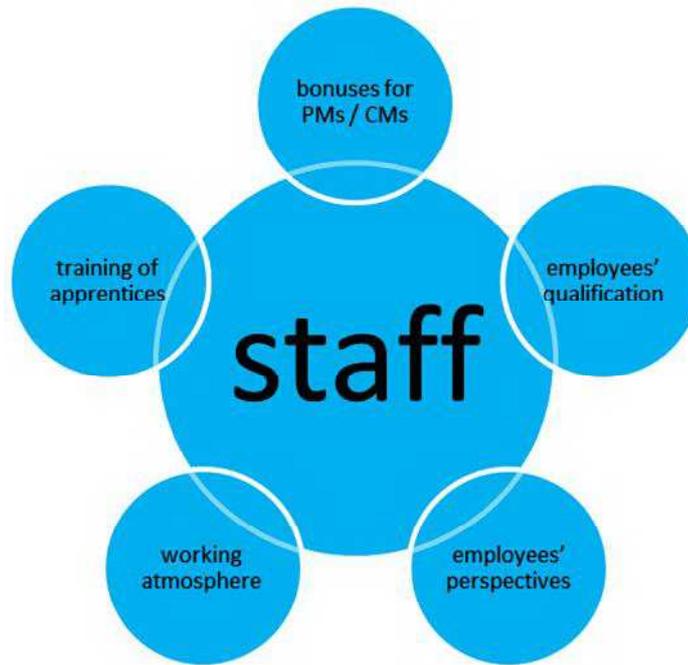


Figure 23: Top 5 staff-related CSFs (own figure).

Bonuses for PMs and CMs

According to numerous experts, PMs and CMs should receive extra bonuses besides their regular salary, depending on the margins generated in their particular areas of responsibility. In the case of a CM, this area of responsibility can even be one particular site only. In this context, BMs and MDs are not mentioned, as managers at this level usually receive extra bonuses throughout most industries anyway.

Those bonuses are especially important in a decentralised company as due to the organisation form, everyday decisions are decentralised, as well. In practice, PMs and CMs have to make decisions on construction sites that often have a great impact on the site's margin and therefore on the company profits as well. Usually, there is no time to contact the responsible BM, if an everyday decision has to be made. Therefore, in most cases, the PMs and CMs act alone and have to make the particular decision on their own. This is why, according to various interviewees, it is crucial to synchronise the managers' and the company interests as well as possible. According to them, monetary incentives are an effective tool to reach this level of synchronisation.

In this context, interviewee B6 mentioned: "Imagine that a CM is on a construction site, which is far away from his home and family, for several months. Furthermore, the BM, who had acquired this order, is also far away in his office in the branch building. The MD is in the head office. The responsible PM visits the site on a weekly basis in order to monitor the progress of the conducted works. The CM on site is the person who makes all decisions and who

leads the workers, often more than 30 men and women, on his own. In addition, he is the contact person for the customer on site in all respects, responsible for the acquisition of the important addendums and to measure up the entire works conducted which is the basis for all outgoing invoices related to this particular site. In other words, he is the crucial person for all tasks that influence the margin that must be generated on this construction site.” According to several experts, top managers of decentralised construction companies - company owner and MDs - do usually not have the possibility to influence the present operative margins on site and therefore the company profits. In this context, various interviewees state that PMs and CMs should always be happy, in line with their employer’s goals and motivated regarding their scope of duties. As, according to the experts, most PMs and CMs do not work directly to generate company profits, but to feed their families and/or to allow themselves an attractive private lifestyle, the connection between a PM’s or CM’s income on the one hand and the company profits on the other hand are significant.

In this context, participant B2 added another factor: “We should not forget that managers in the construction industry, even on lower levels like the construction site management, get in contact with large amounts of money. They are responsible for the verification of the subcontractors’ invoices. At the same time, they work together as a team in everyday work life. In this context there is the risk that some subcontractors might attempt to bribe the company construction site managers in order to get higher billing amounts.” In this context, it is therefore crucial for the company to ensure the loyalty of their managers. The idea is similar to the idea of motivation mentioned before - a construction company has to synchronise the managers’ with its own interests.

In the studied organisation, many cases related to the loyalty or motivation of individual managers could be observed. Some of them are discussed here in detail.

In 2009, a CM did not communicate a large addendum potential on his construction site, because after several months on site, he just wanted to join his family at home again. Due to the CM’s behavior, a competitor was commissioned with this addendum that had an order value of approx. 500,000 €. The margin was approx. 25%, which is 125,000 €. This CM did not receive extra bonuses beside his regular salary. Therefore, he did not have any personal advantages related to an additional addendum. The company lost approx. 125,000 € of profits.

On a construction site in 2012 a CM, who happened to live several hundred kilometres away from the site, was hired by the responsible BM. It was agreed that the CM would receive a special bonus related to the site margin. The assumed duration of the works to be conducted was two months and the original order value was approx. 400,000 € with a calculated margin

of 18%, which is 72,000 €. No PM was installed, as the responsible BM expected that the CM would be experienced enough to manage the entire construction site on his own. The CM was solely responsible for all margin-related decisions. When the construction site was finished, however, the works had taken up almost an entire year, the total amount that was invoiced by the company was approx. 2 million € with a margin of 25%, which is 500,000 €. The CM had managed to increase the generated margin by approx. 428,000 € on his own.

The analysis of the commercial documents discloses that the successful BMs in particular try to provide extra variable bonuses that depend on the particularly generated margins to their PMs and CMs. Most PMs in the sustainably profitable branches receive bonuses in addition to their regular salaries. Many CMs even have agreements that include extra bonuses in these branches. In contrast, BMs who did not manage to generate profits mostly did not focus on this type of monetary incentives either. There is a connection between generated site margins and therefore branch profits on the one hand and extra bonuses for managers on the other hand.

Related to extra bonuses for PMs and CMs, interviewee B5 mentioned that it is important that the particular manager knows from the beginning of a new construction site that he will profit from the generated margin to a certain percentage. According to the expert, this ensures a high motivation and synchronisation of manager and company interests from the beginning.

Employee qualifications

According to numerous interviewees, the availability of qualified personnel for all management levels and of qualified and reliable workers has become a major issue due to the present skills shortage in Germany.

In this context, participant C1 mentioned: “The construction industry used to have no issues at all regarding qualified personnel. On the contrary, the supply of qualified workers and managers at all levels exceeded the need in the construction industry. But today things have changed. There is a battle between the construction companies for the few remaining qualified workers and managers on the job market. The issues began ten years ago with a shortage of construction workers only. This workers gap could be closed through Eastern European personnel that came to Germany to work here and feed their families at home.” Even today, most subcontractors that cooperate with the studied organisation are originally from Poland, Romania or Croatia. The proportion of German subcontractors, according to the experts, is less than 25%. The expert continued: “But now, all management levels of the construction industry are affected. An additional problem is now that Eastern European

workers start to stay in their countries as salaries there have almost reached the German level. There is no reason for them to come here any more.”

There are several other major issues, according to the interviewees, that contributed to the present skills shortage as well. The experts mentioned that most young people intend to study at a university or university of applied sciences. A traditional traineeship like in the construction industry is not attractive to them anymore. In addition, the entire reputation of the construction industry regarding, for instance, the working conditions is not good. Young people associate dirt and hard physical work with that industry. Furthermore, people assume that the salary of a construction worker or low level manager is low and that working hours in this industry are extremely long. Various experts explained that the solution of this situation is a long-term process. According to them, there is no construction company in Germany that has developed a satisfactory strategy in this context.

Another issue related to the skills shortage was presented by participant A2, who mentioned: “The number of different talents that managers in the construction industry have to combine is a further problem. The managers need to have great technical knowledge including knowledge of numerous norms and specifications, they need to be well educated with regard to soft skills, personal relationships, legal issues, and they need to be good entrepreneurs with a wide economical expertise and a well developed risk assessment.” According to the expert, this type of person is rather rare. And if you should find a person like this, who can offer all of these qualifications, it is highly unlikely that this person would be interested in working in the construction industry.

In the studied company, several observations with regard to this critical factor could be made. The BMs in the company have an average age of almost 55 years. As the average retirement age in Germany is between 63 and 65 years, most BMs have around nine years on the job left. It could be observed that in many branches, the BM's succession is not organised so far. In several branches there are no PMs below the present BM that will be able to follow in the footsteps of the present BM for different reasons - for instance, because of their own age or their lack of abilities. According to interviewee A9, the average job experience that a PM needs to become a BM is at least 10 years. That means that there are several branches that will have personnel problems when their current BM retires. The only possibility will be to acquire external managers as future BM in these branches. Several cases could be observed already, in which the top management tried to hold older BMs in the company even though they had reached retirement age. In some cases, the top management was successful, in some cases not. All in all, according to the participants, this approach is not a permanent solution.

This is not just a future problem. It could be observed that even today there are already numerous cases in which the company was not able to answer particular quotations requests because there simply was not enough personnel. The biggest problems at this point arise at CM level. Between 2009 and 2018, numerous quotation requests could not be answered. It is not possible to calculate the missed profits because of this issue. Most participants estimated the missed annual sales at approx. 2 million € throughout the entire organisation. If we assume a common margin of 20%, the lost profits are approx. 400,000 € per year, even today. According to most experts, the situation will get worse every year and it affects the entire industry.

Many interviewees made clear that the skills shortage of construction workers can only be solved swiftly by the development of valuable subcontractor partnerships. At management levels, according to the participants, it is necessary that employees of competitors are contacted in order to convince them to change the employer. In this context, a good reputation as an employer is crucial. Interviewee B4 mentioned related to a short-term solution of the skills shortage at management level: "The entire package consisting of regular salary, additional variable bonuses, company car, equipment, team, and company reputation is crucial. Today, no one changes his employer only for a slightly higher regular salary."

In this context, the decentralised organisation and the professional HR development department in the head office play an important role, too. According to the experts, the in-house collaboration between the central HR development and the BMs in the particular regions will be important in order to develop an approach that is able to solve the HR problems. Participant C3 summarised the whole situation: "If the construction companies do not find an overall solution of the HR problem within the upcoming five years, many companies will not be able to conduct construction works in the future."

Employee perspectives, trainings, and recruiting of young employees

An approach that can help to solve the issues arising from the lack of qualified personnel in the construction industry is the development of own junior employees. According to numerous interviewees, this approach will not solve the present issues - like the contact to present competitors' employees that was mentioned before would - but it is necessary all the same to improve and stabilise the situation in the future.

In this context, numerous experts stated that future staff from the own ranks that identifies themselves with their employer can only be developed, if the construction companies manage to hire a large number of young people today. Related to these young employees, interviewee B7 stated: "We always have to take into account that a certain proportion of the young employees will leave the company again for different reasons. Some will discover that

they do not like the work in the construction industry, others will move to another region.” Furthermore, according to several experts, there is always a proportion of young employees that will not meet the company expectations and therefore will have to leave the company. Participant B7 continued: “If you hire ten young employees today, you will have five reliable CMs or PMs in five years. Therefore, you have to multiply the actual staff requirements by two, and in addition take into account that it will take at least five years to train the new employees.”

Moreover, it could be observed that there are only few young people who are interested in a professional career in the construction industry. Therefore, according to numerous interviewees, it is crucial to provide perspectives for the new employees. These new employees want to know what they can achieve in the construction industry, what money they will earn, what tasks they will be responsible for, and what position within the company management they will be able to reach. In this context, participant C1 mentioned: “Today, young employees think differently from the way we did in the past. They want to know exactly which opportunities the employer can provide throughout their entire professional careers. The young generation thinks extremely long-term.” In addition, according to the experts, the young people that enter the job market today know that the need for workforce exceeds the present supply. They know exactly how valuable they are for the construction companies. This, according to various participants, manifests itself in high salary demands, too.

Therefore, companies have to understand that they have to invest into these young people, even if the particular labour costs exceed the added value for the company in the beginning. In this context, participant A8 drew as a conclusion: “There really is no alternative to this approach.”

In the studied organisation, several different approaches could be observed. The central HR development department visits graduate fairs that specialise in the presentation of professional career possibilities to young people who just finished school. Mostly, the head of HR development and a current apprentice of the particular region visit the graduate fairs together. In this way, they get in contact with young people who have just finished school and are interested in a professional career in the construction industry. People who are not interested in the construction industry will not visit the company stand. This way, the studied company managed to hire several new employees. In addition, the company HR team is present on several online platforms that are specialised in the mediation between young people entering the job market, who search for an adequate employer on the one hand, and companies that search for new young employees on the other hand.

Furthermore, it could be observed that the head of central HR development regularly visits graduating classes in schools and presents the career possibilities available in the construction industry. However, this approach proves to be less successful than the visits of specialised fairs, as usually only a very small proportion of graduating students is interested in the construction industry at all.

In this context, the decentralised organisation of the studied company is an advantage. The fact that there is a central HR development department in the head office enables the BMs to focus on the important operative business all the time. The strategic and time-consuming tasks related to the acquisition and hiring of new young employees are taken over by the experts of the HR development department.

Central HR development has generated possibilities for young employees to combine their everyday work in the company and academic studies at a technical university or university of applied sciences. In this context, several partnerships with universities that are specialised in one of the two large studied company divisions - interior works or industrial insulation - were founded. In practice, the company's young employees work as regular employees in the company for three months. Afterwards the employees go to university for three months. These two phases are repeated between six and eight times, depending on the particular chosen course of studies. Usually, all costs connected with the studies are paid by the studied company. In return, the particular employee has to stay in the company for at least five years after his studies.

In the studied organisation, it could be observed that there is a risk that, in the branches, young employees and their particular needs get out of the BMs' and PMs' focus due to their various operative tasks on the construction sites. For this reason, regular personal meetings in the particular branches were implemented by the central HR development department. For these meetings, the head of HR development visits all branches at least twice a year in order to maintain contact with all young employees. In addition, all young employees have the contact information of the head of HR development and have the possibility to contact him at all times. In the branches of the studied company it could be observed that most young employees appreciate this offer. In this context, participant A4 stated that these personal meetings between the central HR development and the young employees in his area of responsibility help to hold these young people in the company. He further mentioned: "Possible problems are dealt with in these meetings. Sometimes, due to the everyday collaboration between the young employees and myself, they do not have the courage to address these problems. Therefore, I am happy to have the colleagues from the central HR development as they act like a buffer."

In this context, a case could be observed, where a young employee had personal problems with a PM in his branch. The HR development recognised this in a personal meeting with this affected young employee. It was agreed upon that the employee could change to another branch. He did not have further contact to the PM. As a consequence, this young employee remained in the studied company and became a reliable PM in his new branch. Without the central HR development and the possibilities arising out of it, the studied company would have lost a young and valuable employee.

Working atmosphere and internal feedback culture / transparency

The working atmosphere and the internal feedback culture and transparency with regard to information were identified as another critical factor. This CSF is strongly connected to the decentralised organisation of the studied company as well as to the aforementioned employee motivation.

The decentralised organisation and the distances between the branches that come with it have the effect that there will not be one homogenous work atmosphere in the company but different work atmospheres in different branches as well as in the head office. In this context, interviewee A9 mentioned: "When I visit different branches one after the other, I sometimes get the feeling that I visit different companies." According to numerous experts, this situation is not unproblematic because there is no uniform work atmosphere and therefore no uniform motivation or overall identification within the company. For the company top management, it is difficult to establish how the particular situation is in the different branches. Participant B6 stated with regard to this: "If there are only two or three branches with a bad working atmosphere, there is the risk that the involved BMs talk to each other and a kind of domino effect is set in motion. All of a sudden, there are several branches with dissatisfied staff and we are at risk of seeing the staff motivation decline or, even worse, seeing some of our employees look for a new job."

In order to minimise these risks, the top management of a decentralised company should establish the following: an honest internal feedback culture and transparency of information and decision making. This means that it should be a given that in the entire company employees are able to talk openly and to give each other honest feedback. In this context, interviewee B5 stated: "Related to feedback between colleagues there is always the risk that this feedback, which can be criticism as well, is taken personally. In those cases, a helpful and unemotional discussion will no longer be possible. Instead, there will be emotional dispute among the company staff." According to numerous experts, whenever those emotional interactions between colleagues occur, there is often the chance that after that there will be no more feedback given at all.

If the responsible BM is well trained for interaction on a personal level, there is a realistic chance of solving such issues immediately in the branch. In this case, according to various experts, the issues stay within the affected branch and will be solved through personal meetings with the employees, in which the BM acts as mediator. Through measures like that, the team spirit can grow and the team can come out even stronger. It is the BM's job to understand the personal relationships between the PMs, CMs, and the commercial personnel within his area of responsibility and to intervene in time, if it is necessary. In addition, the BM should always encourage his staff to give each other honest feedback, as this type of communication minimises the risk of personal issues between staff members. Usually, cases in which the responsible BM solves arising issues in the branch will not be observed from outside the affected branch at all.

There was one case in the studied organisation where it could be observed that the responsible BM was unable to cope with personal issues in his team. In 2012, there was a branch where employee motivation was low due to personal issues at PM level. The bone of contention in this case was a request for time off by a PM. He wanted to take three weeks off in a row when the general rule was that a maximum of two weeks in a row was allowed in order to provide the best service to all customers. The other PMs in the branch felt treated unfairly. Two of them became rather displeased and lost their motivation and one PM even ended up leaving the company. Had the responsible BM recognised the issues arising from his decision to grant the PM's request for time off, he could have tried to mediate and therefore solve the problems before they escalated. It is likely that the PM who quit would still be with the company today, had an honest and sober discussion between the affected employees taken place. With regard to this case, interviewee B5, who is informed about the incident, mentioned: "Actually, we cannot afford incidents like that in a time that is marked by skills shortage." In this case, the decentralised organisation was part of the problem, too. The top management had no knowledge of the issue until after the affected PM had handed in his notice.

In certain branches of the studied company, it could be observed that missing honest internal feedback can lead to situations where colleagues only talk about each other and no longer to each other. The decentralised organisation can even worsen this effect, as the top management - MDs or company owner - often take notice of an issue too late and cannot act as a mediator also because it is located too far away from the affected branch. When in times of conflict, a branch is left to its own devices like that, a kind of momentum can occur, that will increase the conflict even more.

The top management of a decentralised organisation should also, according to various experts, always ensure transparency with regard to information and decision making. In this

context, interviewee A8 mentioned: “There are few factors that influence the personnel motivation of a branch as negatively as missing transparency of the top-down information flow regarding decisions that were made by the top management.” Again, the decentralised organisation of the company plays an important role, as the staff in the branches depends on regular information because of the long distances between branches and the top management in the head office. It could be observed that personnel in the branch offices lost motivation due to missing information about top management decisions. For the staff, not being informed is equal to not being seen or valued by the top management.

In 2016, for instance, it could be observed that the top management decision not to pay any Christmas bonuses was met with very little understanding among the staff members. The issue was not so much the decision itself. However, the announcement of the decision by the top management came very late, in November, and people felt alienated and disrespected by the top management. The late and sparse communication by the management leads to a long-lasting damage of staff motivation.

Training of apprentices

The permanent training of apprentices in all branches of a decentralised construction company is an important factor according to numerous interviewees. This CSF is connected to perspectives and opportunities for the trainees, for trainings in general and for the recruiting of young employees. It focuses mainly on the development of the future workers and CMs of the company. In this context, participant A9 mentioned: “The need for own construction workers will increase, as the development on the subcontractors market is very uncertain from what we know today”. According to various experts, the fact that more and more Eastern European workers stay in their own countries could mean that the need for own workers will increase in the near future. With regard to this situation, interviewee A7 mentioned: “Today, about 75% of our works are carried out by subcontractors. If there will not be enough external subcontractors in the future, who will carry out our construction works?” According to the experts, there will be an increasing demand for construction workers in the future, apart from the need for PMs and BMs that was discussed above.

The difference between the need for construction workers on the one hand and the need for PMs and BMs on the other is, according to the experts, that as far as the need for workers is concerned the construction companies depend on the developments on the subcontractors market. This means that the companies are not able to solve these issues on their own. In this context, interviewee A6 mentioned: “Nobody knows what will happen regarding the availability of external workers in the future. This is an external factor that we have little influence on.” Most experts stated that there are two main possibilities. The first one is a

broad price increase for the use of subcontractors. This would not be a big issue for German construction companies as this would affect all companies in the same way and would therefore lead to higher selling prices to their customers. The second and, for the studied organisation, more dangerous possibility is that most subcontractors would indeed prefer to stay and work in their home countries, as the price levels there will have caught up with German standards because of the enormous need for workers in these markets. In this context, several experts explained that even today the Polish, which is the major country of origin of the subcontractors' personnel in Germany, and German price levels, are almost the same, if the external costs for accommodation and food for the workers in Germany are taken into account. According to the experts, the gap between the Polish and German price levels of construction works becomes smaller and smaller. This second possibility would lead to major problems for the studied organisation and the entire German construction industry. If the external construction workers, provided by the mostly Eastern European subcontractors, stay and work at home, there are in fact not enough workers left to take on the jobs for the customers. According to numerous interviewees, nobody is able to say if or when this situation might occur. In this context, participant A2 mentioned: "With regard to the threatening worker shortage, one thing should be quite clear to all affected companies: there is no time to lose." The sooner a construction company finds a workable approach and therefore permanent solutions for this issue, the better.

According to most experts, seeking contact to workers, who work for competitors, is not an alternative for the current use of subcontractors and will not be sufficient to close the gap. Most of them have been working for their employers for a long time and have a strong identification with those employers and are usually quite happy with their current situation. In addition to that, the German employment laws provide numerous advantages for workers, who stay with their company for a long time. If a worker considered a change of employer at all, then only under the condition of extremely high hourly wages that would be difficult to earn for the new employer. Consequently, according to the experts, the only possible solution for closing the manpower gap permanently is the continuous training of own apprentices.

Related to this, it could be observed that the studied organisation has focused on young people who were suggested by the regional employment offices in the past. According to the experts, this approach was not very successful. In this context, participant B2 mentioned: "We had to learn that most young people that were suggested by the local employment office were not motivated at all. Some of them did not even show up to start the apprenticeship in the first place. Others were unreliable or obviously not interested in the work." According to the expert, the construction companies have to find ways to identify young and motivated

people, who are genuinely interested in an apprenticeship in the construction industry. In contrast to the young students who were hired to become the future PMs or BMs, which was mentioned before, the apprentices in the construction industry do not focus as much on the future perspectives of their jobs. The young people know that they will in all likelihood stay on site after their apprenticeship is finished. For them, according to most experts, the focus lies on having a safe job and a safe income afterwards. The decentralised organisation of companies with a central HR development department offers great advantages in this regard, compared to centralised ones. Decentralised companies can identify suitable candidates for apprenticeships better and therefore secure their own future better, because the branch managers are not left with the task. They are able to focus on their actual everyday responsibilities regarding their customers and construction sites while the time-consuming tasks connected with the search for and hiring of new young apprentices are taken over by the HR development experts in the head office.

Ever since the company realised that the support by the employment offices would not lead to lasting solutions, the central HR development department has developed strategies of its own for the acquisition of young apprentices in order to be more independent from subcontractors in the future. Those strategies are quite similar to the ones which are used on the lookout for students and future PMs and BMs that were mentioned before.

4.5.5 Decentralised organisation-related CSFs

From the conducted expert interviews, four short-term (SSFs) and seven medium-/long-term (MSFs) decentralised organisation-related CSFs were identified (Appendix 19) all together. Figure 24 illustrates the Top 5 (according to entries by participants) decentralised organisation-related CSFs.



Figure 24: Top 5 decentralised organisation-related CSFs (own figure).

The behaviour of the head office towards subcontractors

The behavior of the head office towards subcontractors of the company is another critical factor that was identified. For several reasons, e.g. the payments or workers' health insurance proofs, there is direct contact between the subcontractors and the administration departments in the head office on a regular basis.

According to numerous participants, the employees in the head office often do not realise how important the subcontractors are for the studied company. In this context, interviewee A8 mentioned: "There are situations, where the communication of the financial accounting department with our subcontractors can only be described as arrogant. Sometimes, the subcontractors are being treated like opponents rather than like partners." According to several experts, the administrative departments should rather act as service providers who support the actual business which takes place in the branches and on the construction sites. In this context, it could be observed that due to its decentralised organisation, there is the risk that two opposing parties develop within the company. On the one hand the purely commercial employees in the administrative departments who focus on the correct accounting of all bills and receipts related to the construction sites and on the other hand the more technical employees who supervise the works on the sites, are the direct service partners of the company customers and are in contact with all of the external stakeholders of the company like subcontractors, material suppliers and customers. Of course the correct

accounting of all bills and receipts is necessary and required by law. However, according to several experts, this must not happen at the expense of the subcontractors.

For a better understanding of this matter, one example that has had a great impact on the everyday work and therefore on the success of the company is discussed here in detail. According to the participants, most subcontractors depend on fast payments, as they have to pay their works, rents, tax, and several other incoming invoices. Usually it is agreed between the subcontractors and the studied company that the subcontractor invoices are paid within 14 days and that the studied company is allowed to draw a cash discount within this period of time. If the responsible PMs do not manage to check the particular subcontractor invoice in this period, the company may pay the particular invoice net within 30 days. In most cases though, the subcontractor does not have the time to wait the full 30 days for the payment because of his own expenses. Quite often, if the subcontractor realises that the studied company has not paid within the first 14 days, he would call the financial accounting department and would ask the person in charge for a payment before the deadline of 30 days. In many cases, according to the interviewees, the responsible employee would deny that request categorically with reference to the written contract that says 14 days inclusive cash discount respectively 30 days net. The position the financial accounting department chooses to take regularly leads to liquidity squeezes for the subcontractor as he will not be able to pay his salaries and incoming invoices. The consequences from this might even be that the subcontractor's workers on site will not receive their wages in time, which then in turn leads to a declining motivation among these workers and damage done to all parties involved. According to interviewee A2, this even encouraged external workers to leave the construction site, start working for another subcontractor or to go back home and start working there. In all three scenarios, the worker in question leaves the site as he has lost his trust in his employer and in the studied company as a trustful business partner.

Especially with regard to the already mentioned skills and worker shortage on the German construction market, scenarios like this should, according to various experts, be avoided under all circumstances. In this context, interviewee B4 mentioned: "The situation is comparable to the one in most decentralised construction companies: Employees in the head offices only focus on the factors that they can control. Payments to subcontractors are the biggest factor here. Employees in the branches usually see the big picture and they carefully weigh every decision." With regard to the mentioned example this means that employees in the branches assess whether an earlier payment to the subcontractor or the saved interest rates for a later payment to the subcontractor mark the bigger added value for the company. If we assume an average interest rate for the company's working capital credits of 5% and a regular subcontractor invoice with an amount of 10,000 €, the saved interest rate for the

difference between 14 and 30 days is approx. 20.00 €. Compared to the possible commercial damage that may occur if one or possibly even several workers leave a construction site, this is a relatively small amount of money.

In the studied company it could be observed that because of the large distances between head office and construction sites, the employees in the administrative departments usually do not have a sense for the critical factors that have a significant effect on the company success. Often, these employees see their particular area of responsibility and have a hard time thinking outside the box. This observation was confirmed by various experts during the interviews.

According to numerous interviewees, the company top management should implement regulations to minimise or even avoid incidents where administrative employees treat subcontractors like opponents including the associated consequences mentioned before. For instance, as several interviewees suggested, the administrative employees could be instructed by the top management that the financial accounting has to pay a particular subcontractor earlier than actually agreed upon in the contract, if the responsible BM wants the financial accounting to do so. Thus, it would be regulated that not every PM is able to initiate payments to subcontractors that he may personally prefer, and that a superior manager has to confirm each earlier payment. According to expert A4, this arrangement would be a momentous solution that all affected stakeholders would benefit from. The company owner would not have to fear overpayments of the subcontractors as each payment would have to be approved by the responsible BM beforehand. The subcontractors would see that the studied company is interested in a trustful partnership and takes their needs into account, too.

Head office support

According to various interviewees, the company's head office and therefore the administrative departments are involved in numerous processes within the studied organisation. Mainly, there are two types of processes. On the one hand there are the regular processes between branches and head office like, for instance, the material sourcing between the central buying department and the affected branch; on the other hand there are rare processes like the implementation of a new IT tool or new specifications issued by the top management.

With regard to all possible processes, the head office departments should act as service providers who support their colleagues in the branches that are responsible for the direct customer service, conduct of construction works, and contact to subcontractors. If they are supported by the head office staff in their everyday work, they have more time to focus on

the important topics within their particular areas of responsibility. As an example for this idea, the material sourcing process is discussed in detail. According to interviewee A8, the central buying department in the head office supports the employees in the branch by searching for the best available external material supplier, by helping with the associated price negotiations, and by organising the delivery to the particular construction site in time. From the branch perspective, the entire process is outsourced to the head office. The only job of the responsible PM in the branch is to list the correct materials that are needed on the construction site. In addition, the central buying department also announces if there are new and better materials available, which could be cheaper or of better technical characteristics than the actual requested one. By doing so, a lot of capacities within the studied company are saved. In the central buying department, all technical knowledge is bundled - knowledge that takes a long time to acquire - and all tasks related to material sourcing can be performed.

Another critical regular process between branches and head office, that could be observed, is the handling of lawsuits with customers, suppliers or subcontractors. In this case, the legal department as well as the affected branch are involved. In this context, interviewee A1 stated: "Related to lawsuits, it is crucial that managers outside the legal department make the decisions." It could be observed that lawyers often do not see the big picture and tend to not take into account all factors that have an impact on the company success when it comes to lawsuits. According to numerous experts, the company lawyers focus on legal issues only. This means that they figure out what possibilities the applicable laws provide to the studied company and based on these findings, they make further decisions. With regard to this, participant A1 mentioned: "Lawyers usually do not take into account the impacts of lawsuits on existing customer relations. If we save 30,000 € through a lawsuit, but afterwards lose a customer with an annual sales value of 500,000 € and an operational margin of 20%, which is 100,000 € per year, we, as a company, did not make a good deal. Not from an economic perspective." According to various experts and as it was the case with the afore mentioned behavior of the head office towards subcontractors, the top management should instruct the lawyers in the legal department that economic decisions are made by the BMs. Lawyers should have an advisory function. Not before a defined level of controversy is reached, according to the experts, should the top management get involved.

Because of the decentralised organisation of the company and the resulting division of labour, there are specialised experts in all the different departments of the company. For instance, the employees in the IT department focus on IT issues only. The same goes for legal issues or everything related to material sourcing. The decentralised organisation provides numerous advantages, as all required tasks can be performed in a high quality

manner by specialised experts and during a reasonable amount of time. However, in the case of, for instance, an implementation of a new IT tool, the IT experts have to take into account that the employees in the branches do not have their level of expertise. Therefore, according to the interviewees, they have to organise in-house trainings prior to the official implementation of the new IT tool. If they neglect to do this, the implementation of a new tool could overstrain the staff in the branches. The consequence would most likely be chaos over several weeks that would lead to major additional costs. In the studied company, it could be observed that the implementation of new price calculation software was not communicated to the BMs in time. Consequentially, no trainings were planned or at least not a sufficient number of trainings. Therefore, when the software actually was implemented, most BMs did not know how to use it. The consequence was that no quotes could be made in the interior works division for several days. It was estimated that there were around 150 quotes that could not be made. The costs that arose from this bad internal planning between head office and branches were estimated at approx. 150,000 €. It was assumed that the total value of quotes that could not be made was approx. 7.5 million €, with an average hit rate of 10%. This leads to approx. 750,000 € lost order value including 20% standard operational margin, which is 150,000 €.

The mentioned examples illustrate that the top management should always try to see the big picture. It is crucial that an informed decision is made for each process and who should handle it and make the final decisions. Otherwise, an adverse organisation and failed internal planning could lead to unnecessary additional costs. It should be the top priority of the management to avoid those costs and to use the decentralised organisation and the division of labour to the advantage of the company. In this context, participant B5 mentioned: "Each single service provided by the head office should be monitored regularly regarding to its added value for the company and regarding the fixed costs. Based on these findings, the top management should then decide whether the particular service is still needed, whether it could be cancelled or whether it should be outsourced to the branches." According to the experts, due to new processes and circumstances, the instructions coming from the top management with regard to the collaboration between head office and branches should be reviewed on a regular basis. Otherwise, the experts mentioned, there is the risk of disadvantageous internal proceedings that may cause additional costs.

Trustful relationship between branches and head office

According to various interviewees, a trustful relationship between the branches and the head office departments is of great importance, especially in decentralised organisations where the managers of different levels do not meet on a regular basis. In this context, interviewee A6 mentioned: "The necessary trustful relationship between head office and branches and

therefore between the different management levels can only be developed, if the company has a good feedback culture, transparency and a good team spirit.” The afore mentioned big picture plays an important role in this context, too. Expert B1 stated that although each employee has a different responsibility in the everyday work, all employees have to keep in mind that they work together with one mutual aim: the success of the company. He further mentioned: “Every single employee has to understand that it is not his own interests or needs that are most important here. Instead, we all have the same goal: to ensure lasting success for the company.”

Numerous cases could be observed in the studied company that illustrate the dynamics that can be set in motion by a bad atmosphere brought on by individual employees, if a trustful relationship was not developed before. According to the experts, the decentralised organisation even enhances this effect. For this reason, top managers in decentralised companies should always be aware of the risks and focus on their limitation respectively their avoidance. Four processes that need particular attention in this regard and that also have a psychological component are discussed here in detail.

Disagreements between the legal department in the head office and the BMs in the branches related to different issues connected with customers or subcontractors are a regular occurrence in the company. The main expertise of the legal department is a very detailed knowledge about the company’s possibilities with regard to the current legislation. The responsible BM, however, takes into account the particular characteristics of a customer or the character of the relationship to a subcontractor, as these aspects are his expertise. In order to generate the greatest possible added value for the company, both parties have to invest their particular expertise in order to find the best possible solution for the company’s success. In this context, interviewee A4 mentioned: “It is not about who is right or who has contributed more to the particular solution. Lawyers on the one hand and managers on the other hand have to focus on the company’s benefits as a team.” In numerous observed cases, the desired collaboration of legal department and affected branch was not detectable. Mostly, the search for a useful approach ended in a power struggle between both parties. Often enough, the focus of the parties was not on the facts, but on their personal interests and needs. Numerous interviewees confirmed these observations in the conducted expert interviews.

The second observed process concerns the monthly working hours of the construction workers. These are documented in the branches. At the end of each month, these documentations are sent to the central wages accounting in the head office after the responsible PMs have checked the records. Afterwards, the working hours are accounted to the particular construction site and the wages are paid to the workers. In the Central Wages

department, the internal specifications require an additional random check. According to the experts, this this is meant to be a plausibility check in order to identify possible slips. In the studied company, however, many cases occurred where these routine random checks have led to major disputes between the responsible employee in the wage accounting department on the one hand and the affected PM in a branch on the other hand. Sometimes, even very small deviations of less than 1 € were criticised by Central Wage accounting and the PM was asked to correct the wage documentation of the entire month for this worker. Otherwise, it was stated, wages for this worker could not be paid. In this context, interviewee B5 mentioned: “Those situations are hard to understand for the affected PM, who has to make decisions on his sites that have a major impact on the company profits.” On the other hand, it could also be observed that there are PMs in the branches who are not able to take criticism at all. For them, each query from the wage accounting department is a personal affront. A more trustful relationship and an understanding for each other’s perspectives could help to avoid unnecessary conflicts and costs and could therefore contribute to the company profits.

Another internal process that requires a trustful relationship is the material sourcing process that involves the Central Buying department in the head office and the responsible PM in the branch. Various cases were observed where mistakes on one site or the other led to additional costs. Usually, these mistakes are about wrong shipping addresses, delivery dates, or even wrong materials. According to the internal company regulations, all materials requests prepared by the PMs and send to the Central Buying department have to be made in writing. In everyday work, however, this is not always possible, as very often the PMs do not have the time to prepare a written materials request or simply do not have access to a computer, as they are on their construction sites for several days in a row. In those cases, a trustful relationship between the PM and the employee in the Central Buying department would allow exceptions like a materials request via phone in order to meet the material requirements on site as quickly as possible. If there is no trust between parties that are involved in the process, the employee in the Central Buying department will always insist on a written materials request. Otherwise, in case of a mistake, how would he be able to prove his innocence? In situations like this, the employee’s focus is no longer on the mutual company goals. Instead, according to expert A2, his personal goals are more important to him and the parties involved in such conflicts will sometimes even start to work against each other.

The fourth process that is discussed here is the entire communication between the administrative departments in the head office on the one hand and the branch personnel on the other hand. In the studied organisation it could be observed that often enough employees do not communicate like partners but with a lot of barely hidden distrust. In this context,

several experts mentioned that when issues arise that need clarification, they themselves or their staff try to avoid direct communication with the administrative departments. They have made the experience that this tends to end up in a mutual placing of blame. Still worse, it is not only the communication between head office and branches that could be identified as a problem here, it is also the way employees talk about their colleagues in the branches respectively in the head office that is problematic. In this context, expert A6 mentioned: "Mutual distrust between the head office and the branches is a common issue in decentralised companies throughout the entire construction industry. I observed this in every company I have worked for." According to the expert, the reason for this phenomenon are the different types of employees on both sites: the exclusively commercially versed employees in the head office who do not leave their offices and therefore do not know about the issues that may arise on the construction sites, and the exclusively technically versed and more hands-on employees in the branches who mainly focus on the issues related to the compliance with technical specifications, acquisition of customers, or issues regarding the workers and who jump from construction site to construction site all day. Due to their stressful everyday work, according to the expert, the employees in the branches are used to improvising and often forget that there are various commercially driven principles that have also to be complied with. On the other side, there are the commercial employees, who are used to working very accurately. These differences are the roots for the afore mentioned mutual distrust that could be observed throughout the entire company.

Most interviewees agreed that these time-consuming and sometimes expensive issues could be avoided, if the management implemented clear internal specifications regarding the competences that described the rights and obligations of all departments in detail. In a second step, the top management should demand as well as work on a trustful working atmosphere between all employees. Otherwise, the issues between head office and branches cannot be solved permanently.

Cooperation between branches

Numerous interviewees pointed out that, in addition to the afore mentioned trustful work relationship between branches and administrative departments, a good cooperation among the branches is of vital importance as well.

In this context, participant B3 stated: "One part of a good cooperation between the branches is the mutual support of customers who are affected by an overstrained order situation in their branch of choice" According to several experts, this is also a very effective way of compensating peaks and valleys in the branch order books. Through the mutual support of customers, a branch with a no capacity situation will receive support from another branch

that currently searches for new orders. Another situation might be that a customer of a particular branch has a possible construction site that is located in the territory of another branch. In this case, a good inter-branch collaboration is important, too. If the mutual support system between the branches was not stable, the customer would be lost to a competitor. In this case, the BM of the branch that is interesting for the customer and his planned construction activity depends on the other branch to supply all details and information about this customer. Only if this flow of information between the branches is active and well-structured, all parties involved are well briefed and there is a good chance of not losing the order to the competition securing the sales and the margin for the studied company.

Several cases could be observed in the studied organisation, where a BM informed another BM about a customer who, at that time, built in the territory of the this BM. Often, the branches able to keep the customer in the company that way instead of losing him to a competitor. In 2015, for instance, it could be observed that one BM informed another BM about a large construction site of one of his regular customers in the other BM's territory. The order could be acquired and an order value of approx. 3 million € and a margin of 25%, which is 750,000 €, could be kept in the company. The basis for this kind of cooperation is a mutual trust in the skills of the other branches. Unfortunately, it could also be observed that BMs did not inform other branches about regular customers' construction sites, as these BMs did not trust in the skills of the other branch. They feared that issues on the construction site would encourage the customer to see the studied company as a whole as deficient and might therefore end the entire business relationship. In this context, interviewee B3 mentioned: "In our branch we had this one case, in which another branch caused issues on a construction site of one of our regular customers. Afterwards, because of these issues, the customer ended the business relationship with us. We, as a branch, lost approx. 500,000 € of annual sales although we had no influence on the procedures on that particular construction site at all." The conclusion is that the decentralised organisation offers special opportunities that only this kind of organisation can offer. However, if there is no basis of trust between the BMs in the skills of the other branches, these opportunities are not made use of. According to the experts, instructions by the top management are not very useful here, as the BMs would rather try to bypass those instructions in order to protect their customers and therefore the success of their branch than to comply with the instructions. Instead, the top management should find ways to create and nurture a relationship of mutual trust between the BMs. This could, of course, be a long-term process, according to numerous participants, but it is the only viable solution, if the top management intends to make use of the opportunities offered by a decentralised organisation.

Another important area of cooperation between branches is cooperation based on the special technical knowledge of individual branches. It could be observed that several branches have specialised in particular technical niches. For instance, one branch has detailed technical knowledge with regard to the production of doors, another branch has detailed skills regarding luminous ceilings and a third one has experience with the construction of special raised floors with compartments where the customer can place electrical cables or other technical equipment. In this context, interviewee A8 mentioned: "These special technical skills are door openers for the entire company. On their own, they might not generate large sales. But, if we use these skills smartly, we are able to acquire additional orders because we have sparked the interest of customers with this kind of special technical knowledge." Many experts support this point of view. Several experts named the issue of mutual trust as crucial as well. Those three put together, good support between the branches to keep the customer, the development of trustful relationships between the branches and the combined offering of specialised technical knowledge, are the basis for any purposeful cooperation.

Another opportunity for support and cooperation between the branches is the acquisition of external workers. Often, this is necessary during peaks where a shortage of manpower might occur. A branch needs between 30 and 60 workers in average to achieve the annual target sales. However, according to the experts, there are periods of time where this need for workers increases to more than 100 workers. With regard to these peaks, interviewee A6 mentioned: "In times of need for additional manpower, it would be great, if the branches helped each other out with external workers that are expendable in other branches." According to the expert, this is only possible, if the BMs agree to share their subcontractor contacts with other BMs. As these subcontractors are a delicate issue, as was already explained above, most BMs are not willing to do this. They fear that the other BMs would keep these external workers longer than actually agreed upon and if that happens, they might get problems on their own construction sites.

In this context, participant A8 stated: "If the top management wishes to establish a reliable cooperation between the branches, it should ensure that the BMs have an incentive to want to cooperate with other branches in their everyday work." Several experts share this opinion. During the interviews they made clear that team spirit and mutual trust are lacking and need to be developed and practiced by all stakeholders that are involved in the daily processes of the company.

Compliance with internal specifications

According to numerous interviewees, the compliance with internal specifications is another critical factor in decentralised organisations. Those internal specifications, that are usually defined by an in-house management system, have multiple purposes. In this context, expert D1 mentioned: "On the one hand, they help to ensure that processes within branches or between head office and branches are handled in the same way throughout the entire company, on the other they ensure that certain external specifications - e.g. legal requirements - are met by the company employees during all steps of the working process." Participant A2 stated: "If in a decentralised organisation every employee carried out the different processes as he or she sees fit, the top management would soon lose track of things and the results would no doubt be chaotic. A certain standard is needed. A management system that all employees have to comply with."

In the studied organisation, several cases could be observed in which compliance or non-compliance with internal specifications had a big influence on the company success.

The internal specifications of the studied company dictate that a branch has to bind a subcontractor in a written contract before any contract with a customer can be signed by the responsible BM. Otherwise, according to expert D1, the branch has no planning reliability. In this context, he mentioned: "If a subcontractor is not reliably bound in time, the company cannot ensure that the required amount of workers will be available if the construction works commence. In addition, the branch cannot estimate exactly how expensive these workers will be. If a subcontractor realises that we do not have bound another subcontractor so far, he will try to take advantage of that situation and offer high prices to us." In this context it could be observed that, in 2014, a branch did not commission a subcontractor before the customer contract was signed. One week before the construction works were planned to commence, the responsible BM contacted the MD to communicate that he still had not found a subcontractor who was willing to agree to the calculated prices. The order value of the construction site was approx. 2 million €, the margin approx. 20% which is 400,000 €, the calculated costs for subcontractors approx. 700,000 €, and the amount of necessary workers approx. 30. The fact that during this time there was a lot of activity on the German construction market made matters even worse because most subcontractors were fully booked. Because of this, the responsible BM was not able to find a sufficient number of external workers. In the end, own workers from the Polish subsidiary company had to be hired to carry out the construction works. The big disadvantage was that these workers are paid per working hour and not per unit as external workers are. In addition to that, due to the very short-term solution, the hourly rates were higher than they would have been in case of an early commissioning. When the construction work was over after approx. six months, the

total labour costs had reached more than 1.1 million €. Due to these additional costs, the entire calculated margin of 400,000 € was equalised.

Another observation that was being made concerned the structure of the in-house job folders. Each PM has to create a job folder for every order that he is responsible for as soon as this order is commissioned by the customer. This folder contains all documents that are important for the particular order - e.g. price calculation, customer contract, contracts with subcontractors, material requirements forms for the Central Buying department, delivery notes and technical data sheets of all installed materials - in a certain order. In this context, participant A9 mentioned: "The folder order ensures that employees, who are not familiar with the details of a particular order can work on this order, too. Especially, the lawyers who work with the company legal department depend on the correctness of all order folders." It could be observed that especially the technically versed PMs in the branches do not focus on the correctness of the order folders. Interview C2 stated with regard to this: "If everything goes right and at the end of the construction process the customer pays our bill, nobody will care for the job folder. But if something goes wrong and the paperwork and therefore the lawyers' work become important, the company success might just depend on this job folder." In this context, it could also be observed that even a single missing document in a job folder can have a great impact on the company profits. In a case observed in 2012, it was forgotten to file a notice of delay that was written and sent to the customer by the responsible PM at an early stage of the affected construction site. In the end, the company was not able to keep the once agreed completion date and the customer decided to sue for compensation. The in-house lawyer who was responsible for this case did not see a chance to avoid the contractually agreed fine for late completion and considered accepting it. Just before he did so, the responsible PM found the notice of delay he had written the previous year. This notice of delay was proof that it was not the company's fault that the completion date could not be kept, but the fault of another construction company that had worked on the construction site in question prior to the studied company. This single sheet of paper prevented the company from having to pay a fine of approx. 100,000 €. If the responsible PM had focused on the correctness and therefore completeness of the order folder, the case would have been clear from the beginning. Another process, where the regulation by the management system is of great importance, is the materials procurement that is carried out by the Central buying department in the head office. The PMs are instructed to inform the Central Buying department by using the material requirements form. According to the internal specifications, no branch is allowed to order materials directly from the supplier. In this context, participant B7 mentioned: "There are numerous reasons why branches are not allowed to order materials directly. For one, the central buying department gets lower purchase prices. In addition, this approach avoids situations where a supplier tries to

influence the company PMs in order to generate higher sales. The employees in the central buying department are far away from the suppliers and totally neutral in their decisions.” Nevertheless, various cases could be observed in which PMs did not comply with this specification and ordered materials directly. The additional costs that arose through this could not be estimated.

Quick decisions in spite of a decentralised organisation

In all decentralised organisations, situations may occur that make top management involvement and quick decisions necessary. According to the experts, those quick decisions are necessary in order to equalise the disadvantages that come with large distances between the branches, different management levels, construction sites and decision makers.

With regard to top management decisions in decentralised construction companies, interviewee A9 mentioned: “It is crucial that there is a constant flow of correct information towards the top management. All CMs and PMs have to comply with the instructions of the management system related to in-house data processing. Otherwise, the responsible MD is not able to understand and process the incoming data.” In this context, participant B7 stated: “With regard to typical everyday situations that make quick decisions necessary, a clear definition of all terms is crucial. Every employee who is involved needs to know what sales, itemised costs, labour costs, material costs and operational margin exactly mean. If this is not the case, managers will not understand each other and there will not be a joint basis for decision making.” In order to provide such a reasonable basis for decision making to the top management, the aforementioned compliance with internal specifications is crucial.

Various situations could be observed in the studied organisation that made quick decisions necessary. The most common situation that makes a quick decision by the top management necessary is the everyday bidding process. The BMs have an individual limit - usually between 200,000 € and 1 million € quotation value - up to which they are allowed to make quotes to the customers on their own. For quotes above that limit, each BM has to contact the responsible MD and ask for his approval. In this context, interviewee A8 mentioned: “All BMs have to calculate in the same way so that the MD is able to understand the entire calculation in a reasonable period of time. If each BM used his own approach, the MD approval of each quote would take hours and hours.” Several experts mentioned that it is crucial that the company provide technical capabilities that make the joint work on a quote via internet possible. With regard to this, interviewee B3 stated: “Usually, the BM uploads the quote in a particular folder on the in-house server and contacts the MD. Afterwards, both managers work together online on the quote until the MD is satisfied with the entire quote. Sometimes even single unit prices are discussed. Only when the MD is completely happy

with the entire quote, the BM is allowed to send the quote to the customer.” According to the participants, this quote approval process takes place several times a day. Therefore, it is critical that the company provides efficient internet capabilities for joint work of the described kind.

Another situation that demands quick decisions by the top management are periods of time, where the hit rate of quotes drops below 10% for more than a few weeks. If this occurs, the BMs depend on a quick decision by the top management, as all BMs have individual minimum margins - usually between 15 and 23% - below which they are not allowed to calculate at all. In special cases, the top management needs to decide if the BMs may go below these minimum margins in their price calculations for a certain period of time to generate orders and therefore to avoid empty order books. According to numerous experts, those crucial decisions have to be made by the top management, as they are likely to have a long-term impact on the company success. According to them, BMs are mainly responsible for purely operational decisions.

In the studied organisation, it could be observed that BMs often take part in contract negotiations in their regions on their own, as the high amount of contract negotiations make it impossible for the MDs to join every single one of them. As many contract negotiations take a different course than previously planned, it is common that during contract negotiations decisions by the top management are required. According to expert A8, those decisions may concern the price, the time schedule, conditions of payment, or the required quality of the construction works. If the order value to be negotiated exceeds the particular BM's limit for any of those reasons, a quick decision by the top management is required.

In addition, it could be observed that in the case of issues between the studied organisation and customers, it is the BMs' responsibility to try to negotiate compromises in order to avoid lawsuits. Those issues can relate to technical defects, outstanding payments, or scheduling. Often enough, the responsible MD cannot join the particular negotiations. Therefore, the BMs have to lead these negotiations on their own and contact the responsible MD before final decisions are being made.

Staff-related issues in decentralised organisations may also require quick decisions. Because of the high number of branches, the decision makers are not able to take part in every job interview. Sometimes, decisions need to be made without meeting the particular candidate in person. In those cases, the top management relies on the opinion of the managers that took part in the interviews.

All cases have in common that the actual decision makers were not able to develop a reasonable basis for decision making as they were not present during the particular

negotiation or job interview. Instead, they depend on the opinion and groundwork of other managers. For the company success, according to numerous experts, it is critical that every manager that is involved in a particular process knows what information the decision maker needs to receive in order to be able to make a reasonable decision. In addition to these factors caused by the decentralised company organisation, there are also the factors caused by the fast moving construction industry that increase the need for quick decisions. Especially in the construction industry, the circumstances that affect necessary decisions concerning a particular construction site or customer can sometimes change within a short period of time.

4.6 Possible designs of MASs developed via the CSFs identified

4.6.1 Introduction

This section describes the results regarding the second research question: What are possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels?

The management in the studied organisation is divided into the following levels:

1. PMs,
2. BMs, as well as
3. MDs.

In the studied organisation, there are two MDs subordinate to the company owner who is located in the head office. Both share the responsibility for all company branches. Each branch is managed by a BM, who is located in the particular branch. In the individual branches, there are several PMs that are technically and commercially responsible for multiple sites. On large construction sites there is a CM, who is located on the particular site.

The CSFs that were presented in section 4.5 are now sorted according to the different management levels of the studied organisation. This sorting process is mainly based on the findings from the process/meeting observations as well as the semi-structured expert interviews. A CSF can appear on multiple management levels. Within the individual management level groups, the CSFs are sorted into different categories: customer-, construction management-, staff-, and decentralised organisation-related. The priority of the CSFs within the different categories is based on the rankings identified in the expert interviews. Due to the large amount of generated data, the Top 5 CSFs of each category and management level will be explained in detail in this chapter.

The individual management level groups mark the basis for the different MASs tailored for the special needs of the different management levels mentioned above. In the end, for each management level a particular MAS is generated, which covers all CSFs that underlie the particular goals of this management level. These individual MASs support the managers in question to focus on the few working areas (their CSFs) that have a strong impact on the achievements of their particular goals and therefore on the achievements of the overall company goals. However, the CSFs and associated measurements developed in this thesis are an addition to the still necessary traditional target-performance comparisons with regard to sales, margin, fixed costs, and pre-financing. An identified CSF might fit multiple company goals. In such a case, the particular CSF is assigned to the company goal that fits the context most. One specific CSF might fit different company goals, depending on the area of responsibility of this management level. Normally, long-term company goals are the company owner's responsibility, as he provides the strategy. But the company's employed managers also have an influence on the long-term company goals in their everyday work life. For instance, to become a first class employer, the BMs and PMs have to respond to employees' private needs in everyday work life. Therefore, an SSF might fit a medium- or even long-term company goal. The lines between short-, medium-, and long-term goals and therefore between SSFs, MSFs, and LSFs are blurred.

There are connections between the results related to RO2 and the Balanced Scorecard-approach, which is a strategy performance management tool that can be used by managers to keep track of the execution of activities by the staff within their particular area of responsibility (similar to the CSFs-approach) and to monitor the consequences arising from them (Balanced Scorecard Usage Survey, 2018). The Balanced Scorecard-approach takes into account the points of view of several stakeholders (e.g. customers, staff, contractors, and finance providers). The illustration of the results related to RO2 is similar. The author intends to take into account different stakeholders, who are all important for the company's success: customers, contractors (here especially subcontractors), staff and HR development, and the finance providers and company owners' points of view. This is especially evident in the higher management levels' MASs (BMs and MDs), as their area of responsibility is wider than the one of the lower management levels and therefore takes into account more stakeholders.

Target values that are determined in the developed MAS will have to be checked in business practice and adjusted if necessary.

4.6.2 MAS for PMs

In the studied organisation, it could be observed that the area of responsibility of a PM is complex and multi-layered. The PM is responsible for several construction sites at the same

time. Therefore, according to interviewee A8, the PM's job is divided into approx. 50% working time in the office and 50% working time on the construction sites. Due to this proximity to the construction sites, the PM's job mainly consists of operational and therefore short-term goals that can mainly be divided into customer-related goals, construction management-related goals, and staff-related goals.

For example, the PM is responsible for the assembly personnel, material and equipment disposition, subcontractor management on site, as well as the technically and economically successful completion of the construction sites. Furthermore, the PM advises customers in all phases of the construction site. This includes coordination of framework conditions, such as: schedule, terms of payment, type and quantity of scope of work, warranties, and realisation of all obligations arising from the particular contract. In addition, he ensures the compliance with all relevant standards, laws, directives, and regulations of his projects. He is responsible for the prompt invoicing of executed works, the monitoring of incoming payments and the management of project-related correspondence.

Table 13 illustrates the Top 5 customer-, construction management-, and staff-related CSFs identified in the PMs' area of responsibility.

Customer related CSFs		Construction management related CSFs		Staff related CSFs	
SSF-01	permanent sales activity	SSF-09	to develop partnerships with subcontractors	SSF-21	employees' health
SSF-03	to ensure professional handling of first order (new customer)	SSF-13	timely billing	SSF-24	honest internal communication / flow of information
SSF-02	permanent sales contact person for regular customers	SSF-06	to recognise addendum potential at an early stage	SSF-23	to respond on employees' private needs / support of family and partner
SSF-08	to develop a good reputation	SSF-07	to realise addendums	MSF-05	to offer perspectives to employees
MSF-24	to develop personal relationships to (regular) customers	SSF-16	to observe new customers closely	MSF-11	internal feedback culture

Table 13: Top 5 CSFs in the PMs' area of responsibility (own table).

Although the PM's everyday tasks are mostly operational, he has influence on all short-, medium-, and long-term company goals (Section 4.3). It is the BM's task to supervise the individual achievements of CSFs of the PMs.

Achieving the target sales, margin, and result (short-term company goal)

SSF-01 permanent sales activity

In the studied company it could be observed that the personnel, which is located on site, is indeed the first and therefore crucial contact for the customers. Within everyday work life, not the BMs or MDs get in touch with the customers, but the personnel on site: CMs and PMs. In order to ensure customer satisfaction and therefore future orders, it is crucial that the site

personnel is aware of this role. Interviewee A8 mentioned in this context: "For our customers, it is mainly the PMs or even the workers who represent our company." Related to this CSF, it is not possible to develop a classic performance figure in order to measure the particular PM's performance with regard to her/his permanent sales activity. Therefore, in order to still ensure the achievement of this CSF, the studied company has to conduct regular sales trainings for the PMs. In these trainings, the PMs learn the basic rules for sales activity, and even more important, they are made aware of their important role as representatives of their company and sales staff. This is crucial, as it could be observed that especially technically oriented staff often fails to understand the importance of the customers. In many cases, it could be observed that customers were treated in an unprofessional way. For instance, it could be observed that a PM argued with a customer about a technical problem on a construction site, instead of technically supporting the customer and trying to acquire an addendum.

SSF-03 ensuring professional handling of first order (new customer) (professional conduct of construction works)

Ensuring a technically and economically professional handling of orders - especially the first orders of new customers - is a further CSFs identified within the PMs' area of responsibility. According to interviewee A7, the professional handling of orders includes all processes of the construction site management, but especially the compliance with current technical norms and the particular customer's target schedule. According to the experts, a construction company should ensure the professional handling of orders through regular technical trainings for its PMs. In addition, the Top 5 sites (according to order value) should be indicated in the PM's MAS incl. order value, current itemised costs, construction time, current position of accounts, as well as previous incoming payments. Moreover, the Top 5 open invoices should be indicated. These important commercial figures ensure that the PM is informed and in the position to act in time, when problems in his/her area of responsibility appear.

SSF-06 recognising addendum potential at an early stage

The recognition of addendums at an early stage is a further identified CSF. The PMs must be able to understand the entire schedule of services of a particular construction site. And, even more importantly according to the experts, they must know which services were forgotten within the schedule of services and/or which services cannot be conducted in the way that was planned in the schedule of services. Indeed, this ability is only the basis for the next CSF: the realisation of addendums.

SSF-07 realising addendums

According to most interviewees, the realisation of addendums is one of the most important tasks of a PM. As the present competitive pressure has led to low prices on the construction market, the realisation of addendums became more important. In this context, participant A7 stated: "The realisation of existing addendum potentials is the only effective opportunity that construction companies have in order to ensure margins that are sufficient to cover the existing fixed costs. The present quotation prices are simply not high enough." According to the interviewees, another crucial factor related to addendums is the fact that usually addendums contain a higher margin than the original quotation prices. The PMs' performance related to this CSF can and should be measured. Therefore, all addendums acquired by the particular PM have to be documented. The construction company has to define target figures for the PMs, e.g. each PM has to make additional 10% of sales with addendums in addition to his actual target sales. In the above mentioned example of 1.5 million € target sales, the PM would be instructed to acquire additional 150,000 € sales through the realisation of addendums, which would lead to 1.65 million € annual target sales.

SSF-21 the employees' health

The construction workers on site are crucial for the company success. Due to the shortage of manpower - especially in the construction industry - a construction company has to ensure the compliance with work safety regulations at all times. As the PMs are the managers, who are closest to the workers in everyday work life, they have to take care of the workers' health. In addition, it was observed in the studied organisation, that many customers are concerned about the compliance with work safety regulations, too. The achievement of this CSF can be measured by a performance figure. The number of work accidents within the particular PM's area of responsibility divided by 20,000 working hours. As one construction worker usually works approx. 2,000 hours per year, the performance figure illustrates the amount of work accidents in relation to ten workers over an entire year. The company should accept a maximum of 1 here.

Improving the liquidity position (medium-term company goal)

SSF-13 timely billing

Timely billing is a further identified CSF with a large impact on the operational result. According to the experts, it is the PM's job to invoice delivered services as soon as possible, in order to avoid unnecessary high interest expenses. It could be observed that the sooner a PM invoices delivered services, the better he can remember all the details on the particular construction site that is being invoiced. In this context, interviewee B7 stated: "The later the PM writes the bills, the more services he forgets to invoice." With regard to this CSF, the performance figure in the MAS is the amount of pre-financing in days. Each PM has a target

sales figure - for instance 1.5 million € per business year. The studied company could instruct all PMs to have to stay below 60 days of pre-financing. In the case of 1.5 million €, this would mean a maximum of approx. 246,575 € ($1.5 \text{ m €} \times (60/365 \text{ days})$). The calculation of pre-financing is simple: (all itemised costs plus the surcharge for the calculated margin) minus all previous incoming payments. The example of 60 days is realistic, as usually the customer contracts allow only one invoice per month and common terms of payment are between 14 and 30 days.

SSF-16 close observation of new customers

As the PMs are the managers that spend most of their working hours close to the customers on the particular construction sites, it is their job to observe (especially new) customers closely. In the studied organisation, many cases could be observed, in which PMs did not observe customers closely. According to most participants, problems or even a lawsuit between a customer and a construction company do not occur out of thin air. Usually, those issues are the consequences of prior occurrences like quality or schedule issues on site. If the responsible PM observes the customers respectively their reactions to the particular problem closely, further issues can be avoided. For example, the PM in question could approach the customer in order to discuss the problem openly or, in major cases, ask his BM for help. The PMs have to learn how the standard personal issues on construction sites can be solved, before further expensive problems or even lawsuits with impacts on the liquidity position arise. Therefore, a construction company should provide special psychological trainings for its PMs. A direct performance measurement related to the PMs' observation of customers is not possible. In any case, all lawsuits and the responsible PMs should be documented in order to be able to draw long-term conclusions.

SSF-24 honest internal communication / flow of information

Honest internal communication and therefore a constant flow of important information towards the responsible BM is another identified CSF. According to the experts, it is crucial that the PMs do not cover up possible problems on the construction sites. In the studied decentralised organisation, numerous cases could be observed in which PMs who hid information caused major lawsuits with big impacts on the company liquidity and operational result. In this context, interviewee A8 mentioned: "If there is a problem on a site, PMs have to inform the BM at an early stage. As a team we can solve most problems best. If the PM tries to solve the problems on his own in order to hide his mistakes, very often the company ends up losing large amounts of money." In addition, according to numerous experts, most major lawsuits with customers could have been avoided, if the responsible PM had informed the responsible BM immediately. Furthermore, a construction company should provide special

trainings for the PMs that tackle teamwork issues. In addition, the BMs and MDs have to remind the PMs again and again that all company managers should work together as a team. Again, it is not possible to measure the PMs' performance related to this CSF with a classic performance figure. However, all issues respectively economical losses due to bad in-house communication should be documented in order to draw long-term conclusions.

Increasing future profits (medium-term company goal)

SSF-02 permanent contact person for regular customers

Usually, the BM acquires new customers. When the acquisition process as well as the contract negotiations is over, it is the PM, who has the closest contact with the (new) customer. According to the interviewees, in the beginning, new customers tend to still contact the BM in order to discuss everyday issues on site. To relieve the BM, who has to deal with all customers of the branch, the PM has to take over and to become the regular contact person. According to participant A8, "contact person" means being available for the particular customer where- and whenever possible. The customer must get the impression that he gets the best possible service. The BMs have to remind the PMs on a regular basis that this CSF is one of the most important tasks as a PM. It is not possible to implement this CSF into the MAS as a performance figure. Instead, the responsible BM needs to supervise the service that his PMs provide to the branch customers in detail. These findings have to be part of the annual appraisal interview between PM on the one hand and BM as well as MD on the other hand.

SSF-08 development of a good reputation

The development of a good reputation is another identified critical factor. According to numerous experts, a good reputation as a construction company is founded on the quality of the work they deliver and on their adherence to schedules. Ensuring these both aspects is the essence of what a PM's work is about. It is crucial for the company reputation and therefore for the future profits that the PMs focus on this CSF. A PM in a construction company must be well-trained with regard to the company reputation and how to uphold it. A construction company should also conduct customer surveys on a regular basis in order to figure out how the customers perceive the company respectively its strengths and weaknesses. In the analysing process it is important that the customers and responsible PMs are connected. The rating of the customers should then be presented to the responsible PM, so that he/she can draw conclusions from it. For example, participant A7 suggested to provide the ratings of the Top 5 (according to annual sales) customers to each PM.

MSF-24 developing personal relationships to (regular) customers

The development of personal relationships to the customers, respectively their representatives on the sites, is another CSF that affects the PMs. In the studied organisation, it could be observed that branches that have managed to develop those personal relationships to the customer representatives on site generate much higher profits. The analysis of the internal commercial documents confirms these observations. The successful implementation of this CSF in everyday work life is very individual as it depends on many factors, such as the willingness of the particular customer representative to develop a personal relationship that goes beyond the actual everyday work on site. The company should at least ensure attempts to develop personal relationships between its managers and its customers. In this context, the construction company should expect from its PMs to conduct a customer event with each of his/her Top 5 (according to annual sales) customers per year. Such an event could for instance be a joint visit of a sporting event. As a reminder for the particular PM, these customer events with his/her Top 5 customer representatives should be part of the PM's individual MAS.

SSF-09 developing partnerships with subcontractors

The development of partnerships with subcontractors and the acquisition of further subcontractors is another critical factor. As the PMs are the managers who are in contact with the subcontractors in everyday work life, they are the major contact persons for the subcontractors. According to various experts, many subcontractors are looking for long-term partnerships. They share this interest with the company management. In order to develop these important partnerships, according to participant A7, a mutually trustful relationship is crucial. This means, that both parties have to be honest with each other at all times. In the studied organisation it could be observed that some PMs tried to improve their profits by shortening the payments to the particular subcontractor. According to the experts, in times of worker shortage, this is not a practicable way of conducting business. In order to measure the achievement of this CSF, a construction company should measure the proportion of long-term subcontractors used by the individual PM. In this context, a construction company could specify, as a reasonable target value, that each PM use at least two-thirds subcontractors that have been working for the company for three years or more.

Developing successors for BMs, PMs, and CMs (long-term company goal)

SSF-23 responding to the employees' private needs / support of family and partner

In times of worker shortage, the response to an employee's private needs is a CSF in decentralised construction companies. According to the experts, construction companies have to avoid fluctuations within staff at almost any cost. A PM is responsible for approx. 2-4 CMs and approx. 20 internal and external construction workers in his/her everyday work life.

Therefore, it is crucial that the PMs understand that the subordinate staff should feel comfortable in their current position. As the PM is in contact with the CMs and workers almost all the time, he/she is the manager with the biggest influence on the working conditions of the CMs and the workers. As it is not possible to measure the performance related to this CSF directly, a construction company should raise the PMs' awareness for the needs of the employees they are responsible for. Moreover, all complaints from the particular PM's area of responsibility should be documented. If there are multiple complaints, the company has to contact the PM in question to find a solution that benefits the company.

MSF-05 offering perspectives to employees

To offer perspectives to the employees is another CSF identified in decentralised construction companies. According to the experts, most young employees expect perspectives in their work life. In the studied organisation, many young employees could be observed who hold a close contact the company HR department in the head office in order to be well informed about possible career opportunities in the company. In this context, the PM, too, has to communicate with the young colleagues in his/her area of responsibility on a regular basis. In addition, he/she has to identify existing potential among the personnel and communicate this potential to the BM. It is not possible to measure the PMs' performance related to this CSF directly. As a reminder, the Top 5 construction workers and CMs in the particular PM's area of responsibility incl. their training levels could be documented in the PM's MAS.

MSF-11 internal feedback culture

The internal feedback culture is a further important factor in decentralised construction companies. According to the experts, young employees expect an open communication within the company and therefore between the different management levels as well. As the PMs are responsible for the site personnel, they should provide open and honest feedback to all employees within their particular area of responsibility. In addition, the PMs should encourage feedback from the site personnel towards their own person. In the studied organisation it could be observed that especially older managers have problems with regard to this form of interpersonal openness. A direct measurement of the PMs' performance related to this CSF is not possible. A construction company should provide psychological trainings for its PMs in order to achieve this important CSF.

An exemplary MAS for PMs consisting of classic target-performance comparisons and CSFs identified is attached to this thesis (Appendix 22). This chart should be provided to the PMs on a regular basis.

4.6.3 MAS for BMs

In the studied organisation, it could be observed that the area of responsibility of a BM is complex and multi-layered. The BM is responsible for the customer acquisition and all construction sites within his branch at the same time. Therefore, according to interviewee A8, the BM's job is divided into approx. 50% working time in the office, approx. 30% working time with the customer, and approx. 20% working time on the construction sites. The BM's job mainly consists of operational/tactical and therefore short-/medium-term goals that can mainly be divided in customer-related goals on the one hand and staff-related goals on the other hand. In addition to that, a few construction management-related goals are of importance as well.

For example, the BM is responsible for the acquisition of new customers and the development respectively the support of regular customers. He documents customer and object data and reports to the responsible MD. Furthermore, he is responsible for the price calculations and the ensuring of bidding on schedule as well as tracking of placed offers. He is responsible for the conduct and documentation of contract negotiations (price, terms of payment, schedule, warranties), and the monitoring of customer creditworthiness. In addition, the cost and result control of each construction site within his area of responsibility is part of his responsibilities. He also has to deal with all issues related to the branch employees, as for instance the identification and support of existing potential within his staff.

Table 14 illustrates the Top 5 customer-, staff-, and construction management-related CSFs identified in the BMs' area of responsibility.

Customer related CSFs		Staff related CSFs		Construction management related CSFs	
MSF-24	to develop personal relationships to (regular) customers	MSF-01	bonuses for PMs and CMs	SSF-09	to develop partnerships with subcontractors
MSF-10	to develop regular customers from new customers	MSF-05	to offer perspectives to employees	SSF-20	right construction site / customer to right PM
SSF-04	market-driven (and customer-driven) price calculations	MSF-08	team spirit / working atmosphere	SSF-16	to observe new customers closely
SSF-05	continuous incoming orders	MSF-12	internal transparency / clearly formulated and communicated competences	SSF-14	good interaction between BM and commercial personnel
SSF-01	permanent sales activity	MSF-06	to demand and promote responsible work	SSF-22	to pass risks from customer construct to subcontractors

Table 14: Top 5 CSFs in the BMs' area of responsibility (own table).

Although the BM's everyday tasks are mostly operational and tactical, he has influence on all short-, medium-, and long-term company goals (Section 4.3). It is the MD's task to supervise all CSFs achievements of the BMs.

Achieving target sales, margin, and result (short-term company goal)

SSF-04 market-driven (and customer-driven) price calculations

The price calculations are mostly conducted by the BMs. A market- and customer-driven price calculation ensures a sufficient order inflow (market-driven) on the one hand and highest possible margins (customer-driven) on the other hand. Therefore, this CSF marks a major premise for the economical success of a construction company. BMs should get regular trainings related to new materials or new ways of installing certain materials in order to be always up to date about the most efficient installation methods available. The performance with regard to this CSF can be measured by the so-called hit rate

(commissioned quotes / total amount of quotes). A common hit rate is approx. 10 %. The MAS should include a hit rate related to the amount of quotes (100 orders / 500 quotes = 20%) and the overall values in Euros (100,000 € total order value / 800,000 € total quote value = 12.5 %).

SSF-05 continuous inflow of orders

Ensuring a continuous inflow of orders is one major task in the BM's area of responsibility. In this context, according to the experts, the BM has to avoid longer periods of time without incoming orders as well as periods of time with order peaks. The performance related to this CSF can be measured. Therefore, the annual target sales are divided by twelve months (e.g. 6 m € annual target sales / 12 months = 500,000 € monthly target order income). The entire order inflow should be documented in the company and added to the BMs' MAS as a target-performance comparison.

SSF-01 permanent sales activity

Another task of the BMs in a decentralised construction company is ensuring permanent sales activities. While the PMs are responsible for the sales activities connected to existing customers, the PMs have to discover which companies are potential new customers. Once these companies are identified, the BM organises a personal meeting with this potential customer respectively its representatives. In order to be in the position to measure and analyse the BMs' performance related to this CSF, a decentralised construction company should instruct its BMs to create protocols of all personal meetings with potential new customers. In addition, a total amount of those personal meetings should be determined for each year between responsible MD and the BMs. The current achievement of the CSF should then be documented as a target-performance comparison in the BMs' MAS.

SSF-20 right construction site / customer to right PM

According to the experts, pairing the right PM with a particular construction site is a critical factor. The personal relationship between a particular PM and a customer is crucial here. A decentralised construction company should make its BMs aware of the importance of this CSF on a regular basis. A direct performance measurement is not possible.

SSF-14 good interaction between BM and commercial personnel

Although it is the BM's job to present the economical figures to the responsible MD, it is common that the commercial personnel in the branches work on the economical figures like sales, costs, and margins in everyday life. Nevertheless, once a month when the monthly result is determined, the BMs have to deal with their economical figures in detail. If the

collaboration between BM and commercial personnel is a good one, the economical figures incl. target-performance comparisons that are communicated to the responsible MD are correct and sound. However, if the particular BM does not focus sufficiently on the economical figures and the collaboration with his commercial personnel is rocky, it could happen that the communicated figures are not correct. Cases in which economical figures that were communicated by a PM are not correct need to be documented. If those cases occur, a decentralised construction company needs to train the particular manager until he/she is able to deal with the economical figures in detail. Due to the decentralised organisation it is crucial that all affected managers understand all economical figures. In the BMs' MAS, it should be documented if the last monthly results were correct, or if deviations could be identified by the central MA department. In addition, the Top 5 sites (according to order value) should be listed in the BM's MAS incl. order value, current itemised costs, construction time, current position of accounts, as well as previous incoming payments. Moreover, the Top 5 open invoices should be presented. Documenting these important commercial figures ensures that the BM is informed and in the position to act in time, when problems in his/her area of responsibility become apparent.

SSF-22 passing risks from customer contract to subcontractors

The BMs are responsible for all contract negotiations involving their branch. If there are risks in the customer contract, according to the experts, it is his task to pass those risks on towards the subcontractor contract. In this context, a decentralised construction company should provide legal trainings for its BMs that focus on contract law. A direct performance measurement with regard to this CSFS is not possible. Nevertheless, it should be documented if a BM did not pass those risks on to the subcontractor in order to be able to draw long-term conclusions.

Improving the liquidity position (medium-term company goal)

MSF-12 internal transparency / clearly formulated and communicated competences

Internal transparency between as well as clearly formulated and communicated competences of the different management levels is another identified CSF. According to the experts, internal transparency between the management levels ensures a flow of important information from the construction sites to the middle and top management of the company. In addition, several participants mentioned that clear competences lead to quick decisions by the management. Both might be necessary in order to solve problems on site and therefore to avoid lawsuits with customers. It is not possible to measure the performance related to this CSF in an MAS. Instead, the compliance with internal regulations for transparency of each BM should be topic in the annual appraisal interviews. Furthermore, a decentralised

construction company should implement clear competences for its PMs, BMs, and MDs within its management system (catalogue of jobs for the different management levels). Lawsuits caused by a lack of internal transparency should be documented to be able to draw long-term conclusions.

Increasing future profits (medium-term company goal)

MSF-24 developing personal relationships with (regular) customers

The development of personal relationships with customers respectively their decision-making representatives is another CSF that falls into the responsibility of the BMs. In the studied organisation it could be observed that branches that have managed to develop those personal relationships to the customers' decision makers generate much higher profits. The analysis of the internal commercial documents confirms these observations. Ensuring the implementation of this CSF in everyday work life is very individual as it depends on many factors, such as the willingness of the particular customer decision maker to develop such an interpersonal relationship outside the actual everyday work on site. Therefore, a construction company should at least ensure attempts to develop personal relationships between its managers and the customers' decision makers. In this context, a construction company should expect from its BMs to conduct a customer event each of his/her Top 5 (according to annual sales) customer decision makers per year. For instance, such an event could be a joint visit of a sporting event. As a reminder for each BM, these customer events with his/her Top 5 decision makers should be part of the BM's individual MAS.

MSF-10 turning new customers into regular customers

According to most experts, even more important than the acquisition of new customers is turning new customers into regular, lasting customers. In the studied company it could be observed that BMs and PMs work hand in hand to achieve this CSF. The PMs try to provide a high quality service to the customers on site, while the BMs intend to quote attractive prices to the customers respectively their decision-makers. The performance related to this CSF can be measured. Part of the MAS should be a performance figure that measures the proportion of the regular customers in relation to the total amount of customers. In addition, the proportion of the annual sales conducted with regular customers in relation to the total annual sales should be documented in the BMs' MAS. A decentralised construction company should provide a minimum regular customers proportion. In the studied company it could be observed that economically successful branches generated at least 50% of their annual sales with regular customers. Therefore, 50% seems to be a reasonable target value here.

MSF-01 bonuses for PMs and CMs

So far, according to the experts, it is common in the construction industry that only BMs and MDs receive bonuses. However, most experts mentioned that construction companies should provide variable bonuses to its PMs and CMs, too. In the studied organisation it could be observed that especially the lower management levels ensure the achievement of numerous operation CSFs within everyday work life. If these managers are not motivated, a decentralised construction company cannot ensure the important achievements of these CSFs (e.g. realisation of addendums, compliance of work safety specifications, etc.). This CSF affects all other identified CSFs and their achievement probabilities. The variable bonuses - depending on the profits of these particular CMs/PMs - should be documented in the BMs' MAS.

MSF-08 team spirit / working atmosphere

As it could be observed that the BMs are the personnel managers in the branches, they have a great impact on the working atmosphere, the team spirit in the branches and therefore on the overall staff motivation, too. Although this is a soft CSF, the performance related to this CSF can be measured. According to the experts, decentralised construction companies should conduct an annual and anonymous survey for all employees on this topic. The results should be analysed by the central HR department and be part of the annual appraisal interview between BMs and MDs.

SSF-09 developing partnerships with subcontractors

In the studied organisation it could be observed that this CSF is mainly part of the PMs' area of responsibility in everyday work life. Nevertheless, the subcontractor negotiations are conducted by the BMs. Like the everyday work on the construction sites between PMs and subcontractor workers, these negotiations should also be conducted in an atmosphere of partnership. In order to measure the achievement of this CSF, a construction company should measure the proportion of long-term subcontractors in the BM's area of responsibility. In this context, a construction company could specify a reasonable target value according to which each BM should use at least two-thirds subcontractors that have been working with the company for three years or more.

SSF-16 observing new customers closely

The PMs are mainly responsible for the acquisition of new customers. After the acquisition and the contract negotiations, it is the PM's task to supervise the construction site. Therefore, it is usually the PMs who have everyday contact with the customers and therefore the best opportunity to observe new customers within everyday work life. Nevertheless, a BM should visit the new customers' construction sites at the beginning of a new business relationship on

a regular basis in order to assess the new customer's behaviour on site. According to the experts, it is crucial that the manager, who is responsible for possible future contract negotiations with the particular customer, knows the customer's preferences on site. This knowledge puts the BM in the position to focus on the customer's preferences during the next contract negotiation. A direct performance measurement related to the BMs' observation of customers is not possible. However, the proportion of regular customers is an indicator.

Developing successors for BMs, PMs, and CMs (long-term company goal)

MSF-05 offering perspectives to employees

The BM is the personnel manager of his branch as well. Therefore, it is the BM's job to offer perspectives to the staff. A direct performance measurement related to this CSF is not possible. Instead, a decentralised construction company should ensure that the particular employee's perspective and career opportunities are part of the annual appraisal interview. In addition, the PM should be required to create a protocol of all appraisal interviews and to provide these protocols to the central HR department in the head office. As a reminder, the Top 5 workers, CMs, and PMs in the particular BM's area of responsibility incl. their training levels could be illustrated in the BM's MAS.

MSF-06 demanding and promoting responsible work

In order to form CMs and PMs who are able to make decisions on their own and therefore to work successfully, according to the experts, BMs should demand and promote responsible work in everyday work life. In this context, interviewee A8 mentioned: "It should be allowed to make mistakes. Otherwise, the employees are afraid of making decisions on their own." In the studied organisation it could be observed that especially technically versed managers have problems related to this CSF. Therefore, decentralised construction companies should provide trainings for their BMs that teach the managers how to deal with problems made by their employees in a reasonable and result-oriented way. According to the experts, the aim related to this CSF should always be to improve the staff's abilities to achieve their particular CSFs. A direct performance measurement is not possible. Instead, this CSF could be part of the appraisal interview of all employees.

An exemplary MAS for BMs consisting of classic target-performance comparisons and identified CSFs is attached to this thesis (Appendix 23). This chart should be provided to the BMs on a regular basis. The BMs have access to the MASs of the PMs within their area of responsibility, too.

4.6.4 MAS for MDs

In the studied organisation, it could be observed that the area of responsibility of a MD is complex and multi-layered. The MD's main job is the tactical and strategic development of the branches and its employees in his area of responsibility. In addition, he is responsible for all issues that may arise in the branches or on the construction sites. Therefore, according to interviewee B7, the MD's job is divided into approx. 40% working time in the head office, approx. 30% working time in the branches, approx. 20% working time with and for the customer, and approx. 10% working time on the construction sites. The MD's job mainly consists of tactical/strategic and therefore medium-/long-term goals that can mainly be divided in customer-related goals, staff-related goals, and decentralised organisation-related goals.

Due to the large distances between MDs and customers respectively construction sites, the MDs' responsibilities have a more supervisory character. Normally, the MDs only provide a strategy, or intervene in case of problems related to customers, subcontractors, or issues on a particular construction site.

Table 15 illustrates the Top 5 customer- staff-, and decentralised organisation-related CSFs identified in the MDs' area of responsibility.

Customer related CSFs		Staff related CSFs		Decentralised organisation-related CSFs	
SSF-05	continuous incoming orders	MSF-11	internal feedback culture	MSF-07	trust relationship between branches and head office
SSF-01	permanent sales activity	MSF-12	internal transparency / clearly formulated and communicated competences	MSF-22	supraregional cooperation between branches
SSF-19	balanced order structure	MSF-17	identification with employer	MSF-20	to comply with internal specifications (management-system)
SSF-08	to develop a good reputation	MSF-06	to demand and promote responsible work	MSF-18	to optimise processes between branches and head office
SSF-30	to develop new regular customers	SSF-24	honest internal communication / flow of information	SSF-32	head office's behaviour towards subcontractors

Table 15: Top 5 CSFs in the MDs' area of responsibility (own table).

Although the MD's everyday tasks are mostly tactical and strategic, he has influence on all short-, medium-, and long-term company goals (Section 4.3). It is the company owner's task to supervise the MD's achievement of individual CSFs.

Achieving the target sales, margin, and result (short-term company goal)

SSF-05 securing a continuing inflow of orders

According to the interviewees, the supervision of a continuing order inflow in all branches within the MD's area of responsibility is a major task for the MD. In order to be in the position to take action in time, like for instance supporting the BM who is involved in sales or price

calculations, the MD has to be informed about the branches that deviate from the target order income figures. Therefore, the MD's MAS is the incoming orders of the branch.

SSF-19 maintaining a balanced order structure

The supervision of the order structure of all branches is another crucial task for the MD. In the studied organisation, it could be observed that branches that focus on a few large construction sites are more at risk to get into economical trouble than branches with a balanced order structure. Therefore, the order structures of all branches have to be clustered into certain order value ranges (e.g. 1 - 20,000 €; 20,001 - 100,000 €; 100,001 - 250,000 €; 250,001 - 500,000 €; and 500,001 € and above) and illustrated in the MDs' MAS. This helps the MD to get an overview of the individual order structures and to take action if necessary.

SSF-32 the behaviour of the head office towards subcontractors

Due to its great impact on the relationship between the construction company and subcontractors, the behaviour of the head office towards subcontractors is another CSF identified in decentralised construction companies. It could be observed that the MDs act as a link between head office and branches. Therefore, they have the ability to influence the administrative employees' behaviour towards subcontractors. A direct performance measurement related to this CSF is not possible. Nevertheless, all complaints by subcontractors about the head office should be documented and communicated to the MDs. If those complaints repeatedly refer to the same administrative department in the head office, appropriate action needs to be taken.

Improving the liquidity position (medium-term company goal)

MSF-12 internal transparency / clearly formulated and communicated competences

Internal transparency between as well as clearly formulated and communicated competences of the different management levels is another identified CSF. According to the experts, internal transparency between the management levels ensures a flow of important information from the branches to the company top management. It is not possible to measure the performance related to this CSF in an MAS. However, the MDs in decentralised construction companies have to focus on the compliance with the required internal transparency regulations. If PMs or BMs attract attention with intransparent behaviour, the MDs have to address the persons concerned and make sure that this does not happen again. Furthermore, a decentralised construction company should implement clear competences for its PMs, BMs, and MDs within its management system (catalogue of jobs for the different management levels).

SSF-24 honest internal communication / flow of information

An honest internal communication and therefore a constant flow of important information between the different management levels is another identified CSF. According to the experts, it is the MDs' job to demand and supervise this honest communication from all PMs and BMs. Apart from offering teamwork trainings for managers at all levels, a decentralised construction company should document all issues respectively economical losses due to bad in-house communication in order to draw long-term conclusions.

Increasing future profits (medium-term company goal)

SSF-01 permanent sales activity

In the studied organisation, it could be observed that MDs monitor whether all branches have permanent sales activities. According to the experts, the MD needs to know exactly how often each branch has sales activities and what kind of sales activities it has. Hence, the total amount of each BM's new customer appointments should be documented in the MD's MAS. In this context, a target-performance comparison (target figure of annual new customer appointments - real new customer appointments) could be conducted.

SSF-08 developing a good reputation

The development of a good reputation is an identified CSF that greatly influences the future profits of a decentralised construction company. In this context, interviewee A4 mentioned: "An effective way to develop the required good reputation, apart from high-quality customer service, is the regular presence at trade fairs." Multiple experts recommended determining trade fairs on which the company should exhibit at the beginning of each business year. According to them, the BMs then have to visit the particular trade fairs within their region. The trade fair appearances should be monitored by the responsible MD. Therefore, the agreed trade fairs appearances should be documented in the MD's MAS.

SSF-30 developing new regular customers

The development of new customers is another CSF, as a construction company is always at risk of losing regular customers for numerous reasons. It is mainly the BMs' job to acquire these new customers. The MDs, according to the experts, have to monitor this new customer acquisition. Therefore, the amount of new customers in each branch in relation to the particular total amount of customers should be part of the MDs' MAS. In addition, the proportion of annual sales with new customers should be documented in the MAS, too.

MSF-07 trustful relationships between branches and head office

The trustful relationship between branches and the departments of the head office is another critical factor. As the MDs act as a link between the branches and head office, according to most experts, they should monitor the required level of trust permanently. A direct performance measurement of this soft CSF is not possible. Instead, anonymous in-house surveys with regard to the trustful relationship between branches and head office as well as own experiences and improvement opportunities should be conducted on a yearly basis. The findings from these surveys should then be translated into action by the company MDs.

MSF-22 superregional cooperation between branches

The superregional cooperation between the branches of a decentralised construction company is another identified CSF. According to the experts, it is common in decentralised construction companies that the branches have individual technical specialisations. In order for the entire company to profit from this specialisation, it is necessary that the branches cooperate with each other. In the studied organisation, there are branches that are specialised on luminous ceilings, raised floors, as well as the own production of doors. In order to be able to monitor the superregional cooperation between branches, the MDs' MAS should document the internal turnover of all branches with these specialised branches.

MSF-20 complying with internal specifications

According to the experts, there are internal specifications in decentralised construction companies that ensure a certain quality of all conducted work processes. The compliance with these internal specifications is another identified CSF. A direct performance measurement related to this CSF is not possible. However, all violations of these internal specifications incl. the involved employees should be documented and communicated to the responsible MD. In this way, the MDs are in the position to draw necessary conclusions.

MSF-18 optimising processes between branches and head office

The optimisation of the processes between branches and head office is another CSF in decentralised construction companies. In this context, interviewee A8 mentioned: "The more efficient and service-orientated these processes are, the better for the economical success of the company." As the MDs are the link between head office and branches, they are in the position to monitor these internal processes and identify possible potential for improvement. A direct performance measurement related to this CSF is not possible. The MDs have to be open-minded, as BMs might identify improvement potentials, too. In such a case, it is the MD's job to analyse the BM's idea and possibly to act on it.

Developing successors for BMs, PMs, and CMs (long-term company goal)

MSF-11 internal feedback culture

The internal feedback culture is a further important factor in decentralised construction companies. According to the experts, employees expect an open communication within the company. As the MDs are responsible for all branches, they should provide open and honest feedback to all employees within their particular area of responsibility. In addition, the MDs should allow feedback from the BMs and PMs towards themselves. In the studied organisation it could be observed that especially older managers have problems with this level of personal openness. A direct measurement of the MDs' performance related to this CSF is not possible. A construction company should provide psychological trainings for its managers in order to achieve this important CSF.

MSF-17 identification with the employer

Like in many industries, the employees' identification with the employer is another CSF identified in decentralised construction companies. In the studied organisation, it could be observed that due to the long distances between the branches, it is difficult to find and uphold a universal business culture that promotes employees' identification with their employer. As the MDs are present in all branches, they are in the position to convey a business culture to all branches that promotes identification with the company. A direct performance measurement related to this CSF is not possible. Instead, this topic should be part of the annual employees' survey. In this way, the company could learn if and how the employees identify themselves with the company.

MSF-06 demanding and promoting responsible work

The demand and promotion of responsible work from all employees is another CSF identified in decentralised construction companies. Due to the long distances between the construction sites, branches, and therefore managers, cases in which a manager has to work and decide on her/his own are common. As construction companies have to develop successors for all management levels, employees should have the opportunity to work on their own and therefore to make decisions on their own, too. According to the experts, it is the MDs' duty to monitor this. A direct performance measurement related to this CSF identified is not possible. Instead, MDs should analyse the annual appraisal interviews and figure out if the employees feel that they can work and decide on their own in a reasonable framework.

An exemplary MAS for MDs, consisting of classic target-performance comparisons and identified CSFs, is attached to this thesis (Appendix 24). This chart should be provided to the

MDs on a regular basis. The MDs should also have access to the MASs of the BMs and PMs within their area of responsibility.

5 Conclusions

5.1 Introduction

In this chapter, the researcher draws conclusions from the findings he generated in this thesis and provides an overview of the contributions of his study to theoretical knowledge and business practice. He also points towards the limitations of the research he conducted and gives an outlook towards possible future research in this field of interest.

All conclusions presented are based on the findings of the thesis (e.g. results from empirical research). Furthermore, all conclusions were cross-checked by business experts from the studied organisation as well as a university supervisor.

This chapter is divided into six sections: introduction, contributions to knowledge, contributions to business practice, limitations, outlook incl. recommendations for future research, as well as researcher's reflections related to the study's influence on his personal development.

5.2 Contributions to knowledge

5.2.1 Introduction

The conducted literature review identified gaps in the existing specialist literature. Although numerous studies cover the construction industry, researchers have treated the variables CSFs, managers' informational needs and organisation (both centralised and decentralised) separately, so far. This thesis brought these variables together and created a complete picture of the CSFs in decentralised construction companies as the basis for the developed MASs for the different management levels. Therefore, the two research objectives of this study - 1. to explore the CSFs in decentralised construction companies and 2. to illustrate possible designs of MASs developed via the CSFs identified and tailored for the needs of the different management levels - have been addressed. Both research objectives contribute to the overall aim of this study which is the development of an MAS for decentralised construction companies.

When looking at the outcome of this thesis, it can be seen that knowledge contributions to the existing specialist literature related to CSFs on the one hand and MA on the other have been made. A contribution to Lönngren et al's (2010) study on success factors for the implementation of strategic partnerships in the construction industry can be identified in the fact that the research outcomes of this study focus more on the operative and tactical CSFs in the construction companies. A successful operative and tactical business usually marks the basis for strategic partnerships and the necessary mutual trust among cooperating partners. Moreover, this thesis deals with numerous types of performance measurements in

decentralised construction companies. This fact can be seen as a contribution to Yang et al's (2010) study on performance measurements in the construction industry, as Yang et al did not take into account the organisation of the studied companies. In general, the fact that the focus of this thesis is on the organisation of the studied construction company marks a contribution for numerous conducted research studies (e.g. Kärnä, 2009; Kärnä et al, 2009; Lim, 2011; Spigarelli et al, 2015).

5.2.2 Customer-related connections

In 2008, Hamdia ascertained that customer satisfaction is a key factor in the success of construction projects. This factor also played an important role in the findings of this study, for which reason the CSF SSF-02 permanent contact person for regular customers was identified.

Kikwasi (2012) illustrated the issues related to customers' delays in providing payments. In this context, various experts have reported on late or even no payments of customers. In order to meet these problems, several CSFs could be identified (e.g. MSF-10 to develop regular customers from new customers, SSF-13 timely billing).

5.2.3 Construction management-related connections

In 2012, Toor and Ogunlana identified the effective allocation of manpower as the most critical project-related success factor within the construction company. This study's results affirm the findings of Toor et al (2012), as all participants named the development of partnerships with subcontractors (SSF-09) as the most important CSFs today. Numerous citations of interviewees relate to this CSF.

Lönngren et al (2010) came to the conclusion that apart from completing a construction project within a given time frame, it is also crucial for construction companies to ensure that the allocated resources are sufficient to complete the project without compromising the quality of work. This is connected to several CSFs identified in this study: SSF-09 to develop partnerships with subcontractors, SSF-32 head office's behavior towards subcontractors, and MSF-03 adequate number of own construction workers. Furthermore, Lönngren et al (2010) recognised that a poorly planned work might end up taking longer to complete and might therefore pose more financial threats than initially calculated. According to the researchers, the better organised a project, the sooner it will also point to any necessary changes of plans which will enable all persons involved to take quick action and therefore avoid financial losses. This is strongly connected to the findings of this study, as many participants reported on issues during the project execution phase and slow reactions of the employees involved in the particular project. The participants named a swift reaction as a critical factor for construction companies (SSF-36 quick decisions despite decentralised organisation).

Bullen et al (1981) observed that some areas of activities within an organisation respectively on a construction site might become critical for a particular period when something out of the ordinary occurs (so-called temporary CSFs). This finding is also connected to the CSF SSF-09 (to develop partnerships with subcontractors), as many participants reported on unforeseeable deviations to erection-timetables or new orders that led to a high need of manpower on sites, which cannot be covered by its personal. In this case, sufficient partnerships to subcontractors are crucial for construction companies. Another connection to the findings of Bullen et al (1981) is the possible loss of an important long-term regular customer. In such a case, managers of construction companies need to generate replacements for the former customer in a short period of time. Such examples illustrate that the findings of Bullen et al (1981) are still valid. During the conduct of the expert interviews, various examples of events which were out of the ordinary were given by the interviewees. Therefore, numerous further CSFs that could be identified throughout the fieldwork are connected to the findings of Bullen et al (1981).

A study by Mahmood et al (2012) identified that timeliness is an important CSF in the construction industry, as projects can take years to complete. During the fieldwork of this study, many interviewees reported on issues related to late completion of construction sites. In this context, several CSFs that are connected to timeliness could be developed (e.g. SSF-16 to observe new customers closely, SSF-25 no routine related to work safety, SSF-31 to avoid lawsuits with customers). Dursun et al (2016) concluded that predicting the duration for a construction project at an early stage is a critical issue. This fits to the results of the expert interviews, as several participants named this as an important habit of successful PMs.

In 1984, Myers came to the conclusion that financial constraints can lead to shortage of further resources that are required to ensure the success of a construction project. This was confirmed by several participants of this study (SSF-13 timely billing).

Hubbard (1990) concluded that the success of any project lies with the project management. This finding is connected to the CSFs SSF-20 right construction site / customer to right PM as well as MSF-21 well trained staff (PMs, CMs) that could be identified in this study.

5.2.4 Staff-related connections

Toor et al (2008) realised that PMs in the construction industry need to know and understand the single CSFs (e.g. customer satisfaction, adherence to schedule) of the different stages in a construction project (e.g. planning, erection) in order to be successful. During the fieldwork, the researcher could identify several CSFs that are connected to this: MSF-04 regular training of PMs and CMs, MSF-06 to demand and promote responsible work, MSF-21 well

trained staff (PMs, CMs), MSF-19 to optimise commercial skills of PMs as well as the more construction management-related CSF SSF-20 right construction site / customer to right PM.

Metri (2005) and Altayeb et al (2014) examined leadership, process management, and resource management as three main success factors in the construction industry. Beside leadership and process/resource management, the researchers identified customer satisfaction, training of staff, communication, and continuous improvements as important CSFs in the construction industry. These findings fit to various CSFs that were identified in this study (e.g. MSF-02 training, MSF-21 employees' qualifications, SSF-33 head office's support on new topics, SSF-24 honest internal communication / flow of information).

In 2016, Tsiga et al recognised that feedback is a critical aspect of communication in the construction industry as it allows more effective communication. The researchers' findings were affirmed by the results of this study, as the development of an internal feedback culture (MSF-11) was identified as one CSF in decentralised construction companies. The decentralised organisation of the studied company even strengthens the need for proper communication.

Further findings of Tsiga et al (2016) were affirmed by this study. For instance, the researchers recognised that motivation of workers (e.g. MSF-08 team spirit / working atmosphere, MSF-05 to offer perspectives to employees) is crucial for the success. Furthermore, they explained that workers who are rewarded for their contribution to a project often tend to put more effort into their work (e.g. MSF-01 bonuses for PMs and CMs).

In 2009, Khalied et al identified that the financial accountability of the single employees in construction companies should be monitored closely to ensure no funds are misappropriated in any way. During the fieldwork of this study, the author recognised these needs as well (MSF-12 internal transparency / clearly formulated and communicated competences).

5.2.5 Decentralised organisation-related connections

In 2014, Akhavan et al studied the relationship of knowledge strategy and effective decision making in the construction industry. In this context, the researchers made clear that construction companies need to ensure that the responsible decision makers obtain the information that they need to make correct decisions. There are numerous CSFs that could be identified in this study, which fit to the findings of Akhavan et al (2014) (SSF-24 honest internal communication / flow of information, MSF-07 trust relationship between branches and head office, MSF-08 team spirit / working atmosphere). In this context, the findings of Mahmood et al (2012) are important, as they came to the conclusion that the manner in which people communicate plays a significant role in businesses. According to the researchers, junior managers get an opportunity to learn effectively, if senior managers take

sufficient time to communicate with them. This study's fieldwork showed that this finding is even more valid in decentralised organisations, where senior managers in the head office are in the position to obtain information from experts in the branches or on the sites holding junior positions.

In 2010, Illner came to the conclusion that the devolution of finances and participation by lower management (e.g. CMs, PMs) in the decision-making process is critical to the success of decentralised organisations. This fits in this study's findings, as several participants asked for those devolutions (connected to MSF-20 to comply with internal specifications (e.g. management system)).

According to Akhavan et al (2006), an effective knowledge management including knowledge strategies, knowledge sharing, training programs, a network of experts, managerial involvement, and a good organisational culture are crucial for successful construction companies. This study came to similar results, as the following CSFs could be identified: MSF-11 internal feedback culture, MSF-08 team spirit / working atmosphere, MSF-12 internal transparency / clearly formulated and communicated competences, MSF-04 regular training of PMs and CMs (technical, financial), MSF-06 to demand and promote responsible work, and MSF-22 supraregional cooperation between branches.

In 2001, Kucza identified knowledge sharing of a critical factor related to decentralised organisations. In this study, the flow of information from the single construction sites to the managers was also identified as crucial for successful construction industries with decentralised organisations. Kucza (2001) further concluded that the single branches of decentralised organisations are often quite detached as they are entities on their own. In some cases, according to Kucza (2001), this can lead to confusion and to the impression that a branch may set its goals too independently. The author of this study came to the same result, as he identified a trust relationship between branches and head office as a CSF (MSF-07). This also fits to the CSF MSF-20 to comply with internal specifications (management system) that could be identified in this study.

Further researchers (Dan, 2003; Kucza, 2001; Michael, 2000) focused on the importance of knowledge sharing within decentralised organisation. The researchers defined knowledge management as an integrated and systematic approach of information within an organisation. In this context, this study identified CSF MSF-22 supraregional cooperation between branches.

In 2009, Okorley et al recognised that it is crucial for decentralised organisations that all branches are given the same autonomy. If one branch is given more autonomy than the others, according to the authors, there is the risk of a sinking morale in the departments with

limited resources. In this context, an important requirement is the willingness of the central authority (e.g. company owner and MDs) to devolve power to lower management levels (e.g. BMs) together with a precise definition of duties and responsibilities. The author of this study came to similar results, as many participants reported on same issues related to different degrees of autonomy. In this context, the CSFs MSF-07 trust relationship between branches and head office as well as MSF-20 to comply with internal specifications could be identified. According to Okorley et al (2009), such a uniform decentralisation cannot be achieved without a legal framework stating the roles and duties of each authoritative entity within the organisation. This study's author identified MSF-20 to comply with internal specifications in order to meet this requirement.

5.2.6 MA

In 1981, Bullen et al argued that each functional managerial position is associated with a generic set of CSFs. The author came to the same result, which is why he developed different MAS designs tailored for the different management levels (PMs, BMs, MDs) of the studied organisation. During the fieldwork it became clear that the managers of the different management levels need to focus on different areas and therefore CSFs in order to be successful in their area of responsibility.

In 2001, Kucza concluded that a decentralised organisation needs to have a baseline standard that defines the overall goals of the organisation as a means of guiding the organisation as a whole in a particular direction. In 2015, Ian et al came to the same conclusion, as they recognised that a decentralised organisation cannot achieve the same level of customer satisfaction or product quality throughout all of its units without a proper standardisation. According to the researchers, standardisation helps to bring together all different management strategies that are employed by the various managers (e.g. BMs) of the branches, to focus on common goals (e.g. MSF-10 to develop regular customers from new customers) and to avoid deviation from organisational visions. According to Husain (2013), it is the top management's responsibility to ensure that organisational goals are effectively communicated to the employees so that the departments work towards a common goal. The findings of Kucza (2001) and Husain (2013) fit to this study's findings, as this "working in one direction" is exactly what the researcher wants to achieve via the single MASs: all branches shall focus on the same CSFs and therefore the same goals.

5.3 Contributions to business practice

5.3.1 Introduction

Apart from contributions to knowledge, contributions to business practice could also be made during the research phase. In order to be in the position to answer the research questions of

this study, the researcher conducted a single case study within a decentralised construction company. The generated data was used to identify the CSFs in decentralised construction companies as well as to develop MASs for the different management levels that are based on the identified CSFs. In order to make the developed MASs applicable in business practice, they need to be understood as flexible and customisable templates that can be adjusted according to the particular needs of a decentralised construction company. Therefore, the attached MASs (Appendices 22-24) are exemplary designs. The developed MASs have the potential to support managers in decentralised construction companies effectively in their everyday decision-making. Managers that use the developed MASs should be able to identify the topics they need to focus on in order to achieve their own goals and therefore the overall company goals.

The three developed MASs (for PMs, BMs, and MDs) contain classic target-performance comparisons related to sales, itemised costs, and margins figures of the particular manager's area of responsibility. In addition, the identified CSFs were assigned to the different management levels and added to the particular MAS. This way, the managers are informed about the critical factors that have great impact on the achievement of management and company goals. Not all identified CSFs could be measured and added to the developed MAS. In some cases, surveys or annual in-house appraisal interviews are recommended in order to estimate the achievement rate of a particular CSF.

In business practice, the MASs should be provided to the managers on a regular basis. Many experts suggested a weekly basis for the PMs and a monthly basis for the BMs and MDs.

In addition to the identified CSFs as well as the developed MASs, a greater level of awareness could be achieved by this research and by the involvement of experts regarding a better understanding and more transparency in many areas of activity of decentralised construction companies, which does have a strong impact on the overall success of these companies. It could also be observed that all participants of this study were very interested in its results and curious about the implementation of these results in their everyday work lives.

5.3.2 Contributions to PM level

The PM's area of responsibility consists of several construction sites. It is the PM's main task to ensure a technically and commercially proper conduct of the construction works on the different sites (Section 4.1.5.2.2).

The developed MAS for PMs (Appendix 22) is divided into the company goals (Section 4.3) incl. the underlying CSFs that are manipulable by PMs. Thus, the PMs have a instruction manual for their job illustrating all CSFs at a glance. Hence, the PMs are able to focus on the

factors that really underlie their goals, to work more efficiently and to make better decisions. Table 16 illustrates the content of the MAS for PMs.

<u>Company goals</u>	<u>Underlying CSFs</u>
to achieve the intended annual turnover, margin, and operational result	<ul style="list-style-type: none"> - sales, margin, and result - Top 5 construction sites (according to order value) - Top 5 invoices (according to amount) - realisation of addendums - work safety
to develop successors for CMs	<ul style="list-style-type: none"> - candidate(s)
to improve liquidity position	<ul style="list-style-type: none"> - timely billing (in days)
to increase future profits	<ul style="list-style-type: none"> - development of good reputation - development of personal relationships to (regular) customers - partnerships with subcontractors

Table 16: Content of the MAS for PMs (own table).

The MAS will be provided to the PMs on a regular basis (e.g. weekly), in order to keep the PMs focused on their CSFs.

5.3.3 Contributions to BM level

The BM's area of responsibility consists of a branch. It is the BM's main task to generate sufficient order income in order to achieve the planned branch budget (Section 4.1.5.2.1).

The developed MAS for BMs (Appendix 23) is divided into the company goals (Section 4.3) incl. the underlying CSFs that are manipulable by BMs. Thus, the BMs have a kind of user manual for their job illustrating all CSFs at a glance. Hence, the BMs are able to focus on the factors that really underlie their goals, to work more efficiently and to make better decisions. Table 17 illustrates the content of the MAS for BMs.

<u>Company goals</u>	<u>Underlying CSFs</u>
to achieve the intended annual turnover, margin, and operational result	<ul style="list-style-type: none"> - sales, margin, and result - market- and customer-driven price calculations // continuous incoming orders
to develop successors for PMs	<ul style="list-style-type: none"> - candidate(s)
to improve liquidity position	<ul style="list-style-type: none"> - branch's prefinancing
to increase future profits	<ul style="list-style-type: none"> - development of personal relationships to (regular) customers - development of new customers - development of regular customers from new customers - bonuses for PMs/CMs - partnerships with subcontractors

Table 17: Content of the MAS for BMs (own table).

The MAS will be provided to the BMs on a regular basis (e.g. monthly), in order to keep the BMs focused on their CSFs.

5.3.4 Contributions to MD level

The MD's area of responsibility consists of all branches within the division, the MD is responsible for. It is the MD's main task to monitor and support the single BMs in achieving their goals.

The developed MAS for MDs (Appendix 24) is divided into the company goals (Section 4.3) incl. the underlying CSFs that are manipulable by MDs. Thus, the MDs have a user manual for their job illustrating all CSFs at a glance. Hence, the MDs are able to focus on the factors that really underlie their goals, to work more efficiently and to make better decisions. Table 18 illustrates the content of the MAS for MDs.

<u>Company goals</u>	<u>Underlying CSFs</u>
to achieve the intended annual turnover, margin, and operational result	<ul style="list-style-type: none"> - sales, margin, and result - market- and customer-driven price calculations // continuous incoming orders - balanced order structure
to develop successors for BMs	<ul style="list-style-type: none"> - candidate(s)
to improve liquidity position	<ul style="list-style-type: none"> - branch's prefinancing
to increase future profits	<ul style="list-style-type: none"> - development of new customers - development of regular customers from new customers - supraregional cooperation between branches - partnerships with subcontractors - bonuses for BMs / PMs / CMs

Table 18: Content of the MAS for MDs (own table).

The MAS will be provided to the MDs on a regular basis (e.g. monthly), in order to keep the MDs focused on their CSFs.

Especially the MDs are responsible for the existence of supraregional cooperation between the single branches. It is their task to bring the different BMs together and to stimulate an active knowledge transfer between the branches.

5.4 Limitations

With regard to the conducted research and therefore the developed MASs, there are limitations that need to be taken into account.

Several limitations arise from the chosen methodology (e.g. research philosophy). As the researcher dealt with the social actors in a particular organisation only, the findings of the research are limited to this group of people. Should a generalisation of the findings be intended, further research work would be necessary. In this context, it should be mentioned

that even within the studied organisation and therefore in the group of social actors that were studied, different opinions and perspectives were identified. Still, the results provide a robust baseline for further research.

The MAS cannot replace a proper technical and commercial education or work experience of the managers in a decentralised construction company. Though, the MAS is able to support managers in making decisions affecting the achievement of their goals. In addition, the developed MAS has not been implemented or even tested in business practice. Whilst all identified CSFs as well as the MASs have been generated in a trustful cooperation with business experts, an implementation in business practice incl. necessary tests have to be conducted as part of another research study.

5.5 Outlook: recommendations for future research

Future research could for instance mean a test run of the developed MAS in business practice. For this purpose, the MAS could be tested in the studied organisation or another decentralised construction company. A study in several companies at once is also possible.

Another research approach could be an in-depth investigation of certain CSF clusters (e.g. customer-related CSFs, construction management-related CSFs, staff-related CSFs, or decentralised organisation-related CSFs) or even individual CSFs that were identified in this thesis. Particular CSFs that come to mind are price calculations, partnerships with subcontractors, variable bonuses for managers or the necessary trustful relationships between branches and head office.

As all management levels in a decentralised construction company have different tasks, another possibility for future research would be the conduct of a study that focuses on one management level and its CSFs exclusively.

5.6 Reflections: the influence of the study on personal development

This research study is based on two research objectives concerning the CSFs in decentralised construction companies as well as the development of an MAS for the managers in decentralised construction companies. Throughout the entire research journey, (literature review, fieldwork, and thesis) the researcher was able to get to know the company in which he has been working for 10 years much better.

The cooperation with the managers of the studied organisation has led to a mutually trustful relationship between the managers on the one hand and the researcher on the other. It could be observed that both parties could benefit from the study and the conducted fieldwork. The

experts that have taken part in the study appreciate the newly gained understanding of their jobs and of the tools that are available to support each manager in achieving his goals. The researcher appreciates the newly developed personal relationships to many managers in the studied organisation.

Moreover, the researcher has learned that each job has its own CSFs. In order to exercise a job successfully, it is reasonable to think about the CSFs affecting the goals of the particular job. The researcher was surprised how important the soft CSFs are and how greatly these factors influence the achievement of business goals. He has resolved to focus more on those soft, interpersonal factors in the future.

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Appendices

Appendix 1: Research ethics form



UNIVERSITY OF GLOUCESTERSHIRE –RESEARCH ETHICS APPROVAL

Please ensure you have read the University of Gloucestershire Research Ethics Handbook of Principles and Procedures before completing this form (see, <http://insight.glos.ac.uk/ResearchDevelopment/Documents/Research%20Ethics%20Handbook%20final%20Nov%202010.pdf>)

To be completed by the researcher/s and supervisor/s (where appropriate)

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University e-mail Address:		University e-mail Address:	

Project Title:	The development of a management accounting system for decentralised construction companies
Start Date:	Saturday, 01 July 2017
Completion Date:	Friday, 30 November 2018

Brief (no more than 500 words) description of the project^a (do not attach you RD1, P3, P6, or any other research proposal):

The aim is to develop a management accounting system for decentralised construction companies. Further research objectives are to explore the critical success factors within decentralised construction companies and to critically evaluate how the management accounting system supports the achievement of management's critical success factors within decentralised construction companies.

As each construction project varies for managers of construction companies it is hard to be well-informed about all circumstances. Furthermore, managers cannot visit all construction sites within their area of responsibility on a regular basis. Thus, only on site staff know answers to many crucial questions. Therefore, it is important to have a system available to ensure the flow of crucial information between construction sites and managers. One approach to determine what information is crucial is the CSFs method, which enables the manager to identify those few key elements that 'must go right' to achieve business objectives.

To achieve the objectives of this study, detailed insights into the studied organisation are significant. As the management accounting system to be developed will be based on these findings, an inductive research approach will be applied. To ensure in-depth insights, a qualitative research approach by using the case study method will be adopted. To create non-biased findings, it is necessary that the researcher obtains insights into the everyday workings of the studied organisation. To achieve that, the researcher works as a member of the organisation, but maintains detailed records of his experience. To get into the role of a participant, the researcher has chosen the company where he is employed (a German decentralised construction company consisting 20 branches and 900 employees) to develop a single case study design.

Data sources:

1. Analysis of commercial documents and reports of all branches to identify possible abnormalities between the separate branches.
2. Process and meeting (between site personnel and branch managers) observation in branches to assess the flow of information between construction site personnel and branch managers.
3. Expert interviews at manager level. The interviews will be semi-structured. This ensures a set of important questions combined with the necessary flexibility to vary the order in which questions are asked and to add new questions in the context of the research situation.

The research will be conducted in accordance with the ethical guidelines of the University's Handbook of Principles and Procedures (2008). As participants (e.g. site personnel, branch managers) would not behave authentically during author's observation, it is not possible to inform the participants about the upcoming observation. Therefore, the participants' anonymity has to be

^a Include here the research objectives or questions, participant recruitment criteria, research design, data gathering and analysis techniques, any potential sources of conflicts of interest, and details of persons/agencies/organisations who have funded the project who may financially benefit from it.

safeguarded by the researcher (see page 5, paragraph 4.3).

Freely informed consent will be gained from all participants prior to the interviews. The participants will receive important information (including information regarding the benefits arising from the research for every single participant (e.g. more effective decision making as every participant will know his information needs better)) regarding the research study and a list of questions in advance (see page 4, paragraphs 3.1 and 3.2). Furthermore, every participant can freely decide if the researcher may use a recording device during interviews. The interview-results will be treated confidentially and stored appropriately (On a structured database on the researcher's computer. The IT department sets up an additional password protecting the data. After the research project all data will be destroyed.). Individuals will not be identifiable within publications (see page 4, paragraph 3.4).

Is there any element of this proposal that makes reference to REC/FREP mandatory?

Choose an item.

If yes, please indicate which:

Choose an item.

About the proposed project

1) Is partnership /collaboration with another institution involved?	no	Name of institution: Click here to enter text.
2) Has another Ethics Committee scrutinised the project?	no	Ethics Committee & date of scrutiny: Click here to enter a date.

3a) Will the participants/respondents/ subjects include children and/or young people and/or members of other vulnerable populations?	no	Brief details: Click here to enter text.
3b) If you have answered yes to question, 3a, will the participants be under 5 years of age?	Choose an item.	Brief details: Click here to enter text.
4) Are participants at risk of experiencing psychological, social or physical harm or discomfort? (If yes, see sections on 'risk of harm' and 'voluntary informed consent' below)	no	Brief details: Click here to enter text.
5) Have any training needs been identified for the researcher(s)?	no	Brief details: Click here to enter text.
6) Have relevant professional guidelines been consulted?	yes	Source of guidelines: The ethical guidelines of the University's Handbook of Principles and Procedures (2008)
7) Have actions been taken to ensure compliance with the Data Protection Act	yes	Actions taken: All personal data (names or branch membership) resulting from the observation and/or expert interviews will be anonymised. Nobody will be able to make connections between individual interviews or observation and individual employees.
8) Has another form of 'risk assessment' been undertaken (in addition to this form)?	no	Brief details (and, if appropriate, please append documents): Click here to enter text.

Clinical Trial Questions: Does the research involve:

a) investigating or participating in methods of contraception?	no	Brief details: Click here to enter text.
b) assisting with or altering the process of conception?	no	Brief details: Click here to enter text.
c) the use of drugs?	no	Brief details: Click here to enter text.
d) the use of surgery (other than biopsy)?	no	Brief details: Click here to enter text.
e) genetic engineering?	no	Brief details: Click here to enter text.
f) subjects under 5 years of age?	no	Brief details: Click here to enter text.
g) subjects known to be pregnant?	no	Brief details: Click here to enter text.
h) pharmaceutical product/appliance designed or manufactured by the institution?	no	Brief details: Click here to enter text.
i) work outside of the United Kingdom?	yes	Brief details: Germany

Voluntary Informed Consent

a) Please indicate what form of consent will be used in this investigation	Verbal
<p>If not written, please explain</p> <p>Semi-structured expert interviews: Freely informed consent will be gained from all participants prior to the interviews.</p> <p>Process/meeting observation in branches: As participants (e.g. site personnel, branch managers) would not behave authentically during author’s observation, it is not possible to inform the participants about the upcoming observation. Therefore, the participants’ anonymity has to be safeguarded by the researcher (see page 5, paragraph 4.3).</p>	
<p>b) How and by whom will the voluntary informed consent from participants be undertaken? Please indicate in particular if participants/respondents/subjects are children or young people, or are members of other ‘vulnerable populations’. (Letters to participants and/or any information sheets should be attached to this form.)</p>	
<p>The researcher will gain the consent prior to the expert interviews.</p>	

Benefits and risks

What are the benefits of the proposed research to the participants and/or for scientific knowledge in general?

As the participants of the research are employees of a decentralised construction company, they could be interested in the research results, as these results can ease their future everyday work.

Previous research into CSFs related to construction industry usually focuses on single construction projects. The development of a management accounting system tailored for decentralised construction companies, therefore would make a significant contribution to previous research in this area.

What are the adverse effects may result from the research? How will these adverse effects be dealt with?

From the researchers point of view, there are no adverse effects arising from the research, in general.

Though, as sensitive issues may arise during covert observation and/or expert interviews, the anonymity of all participants need to be safeguarded at any time.

A risk could be that the research results are unsatisfactory and thus the participants have lost time. To prevent negative consequences for the participants, the researcher has to ensure the backing of the entire top management prior to the expert interviews. It is the researcher’s duty to make clear within the company that he on his own is responsible for the success of the research. In this case, as the researcher is owner of the company, the risk for the participants is small.

Risk of Harm

a) Please indicate any possible risks to the **researchers, participants, other persons or the environment**: *(Please tick as appropriate)*

1. Environmental	Not applicable	Click here to enter text.
2. Legal	Not applicable	Click here to enter text.
3. Physical	Not applicable	All participants and the researcher know each other for many years. There is no risk of physical violence or similar.
4. Physiological	Not applicable	Click here to enter text.
5. Psychological	Psychological intrusion from questionnaires, interview schedules, observation techniques	
6. Social, Cultural and Professional	Contravention of social/cultural boundaries	Click here to enter text.

b) If you have ticked any of the previous remarks, please describe the actions that will be taken to minimise the risk.

As the covert observation already took place in the past, it is the researcher’s duty to explain exactly why he observed internal processes within the company. It is also the researcher’s duty to explain to every participant that there are no negative consequences arising from the observation and that the observation findings only are used for research purpose and have no affect on the employment.

- c) If this project requires the use of any special procedures or techniques, please describe any training or competency assessment to be undertaken by investigator(s).

[Click here to enter text.](#)

Anonymity / Confidentiality

Please indicate measures that will be taken to protect and maintain the anonymity and/or confidentiality of participants.

Individuals (not even the branch of the single participant) will not be identifiable within publications (see page 4, paragraph 3.4).

Expert interviews:

The interviews with all approximately 23 experts are simply numbered from 1 to 23. No names or branches will be recorded by the researcher.

Covert observation:

Within the notes of the covert observation, the researcher does not record any names of individuals or branches at any time. This ensures 100% anonymity also in this research part.

After the Viva, all stored data will be deleted by the researcher.

Data storage

Where will your data be stored?	Structured database on the researcher's computer	
Will data be stored in secure premises (e.g., locked lab or office, password protected computer)	yes	The IT department sets up an additional password protecting the data resulting from observation and expert interviews.

Signature of researcher(s)	Tim Daniel Rossenbach	Monday, 26 March 2018
		Click here to enter a date.
Signature of supervisor (s) (if appropriate)	Dean Williams	Monday, 26 March 2018
		Click here to enter a date.
		Click here to enter a date.

NB: forms not fully completed and signed by researcher/s and supervisor/s (where appropriate) will be returned.

Risk assessment (see pages 10-12 for more information)

Risk assessment		
Faculty/Department:	Click here to enter text.	
Campus	Park	Click here to enter text.
Location:	Cheltenham	Click here to enter text.
Activity/Task Assessed:		
Assessment Date:	Click here to enter a date.	
Manager/HoD/Dissertation Supervisor Signature:		
Date	Click here to enter a date.	
Assessment Review date:	Click here to enter a date.	

RISK ASSESSMENT RECORD SHEET (see pages 10-12 for more information):

Assessed by: Tim Daniel Rossenbach

Possible Hazards	Severity (without control measures)	Persons exposed (employees, students etc)	Risk Control Measures Currently in place	Likelihood (with control measures)	Risk Level	Action Required	Action Completed (date and signature)
Lone working	low	n/a	n/a	Unlikely	low	n/a	Click here to enter a date.
Pregnant workers	low	n/a All participants in the research are males		Unlikely	low	n/a	Click here to enter a date.
Working with children or vulnerable groups	low	n/a All participants in the research are adults and not disabled		Unlikely	low	n/a	Click here to enter a date.
Violence	low	Participants, researcher	Organisation's code of conduct	Unlikely	low	n/a	Click here to enter a date.
Allegations of inappropriate behaviour	low	Participants, researcher	Organisation's code of conduct	Unlikely	low	n/a	Click here to enter a date.
Lack of first aid provision or support provision for psychological trauma	low	Participants, researcher	first-aid kits in all branches	Unlikely	low	n/a	Click here to enter a date.
Physical hazards in the research area	low	n/a All research work takes place in offices		Unlikely	low	n/a	Click here to enter a date.

Hazard: Something that has the potential to cause harm

Severity:The degree of harm which the uncontrolled hazard has the potential to cause

Likelihood:The probability that the hazard potential will be realised, taking into account any risk control measures in place

Risk:Risk expresses the likelihood that the harm from a particular hazard is realised, taking into account Severity.

Before submitting your application to FREP/REC please check and complete the following check list.

Checklist	
Have you completed all sections of the ethics approval form?	yes
Have you completed a risk assessment (and noted risk to participants AND researchers?)	yes
Have you included recruitment materials (e.g., posters, email pro forma, flyers)	not applicable
Have you included your information letter (s) – this includes letters to parents, participants and organisations	no
Have you included your consent form (s) – includes consent to parents and/or assent to participants if they can make an informed judgement about whether they want to participate (even if under 18 years)	yes
Have you enclosed a copy of your CRB (if appropriate)	no
Have you enclosed a copy of interview questions / questionnaires (if appropriate)?	yes
Have you included information regarding how long you will keep data, where it will be stored, and how you will destroy data	yes
Have you indicated measures that will be taken to protect and maintain the anonymity and/or confidentiality of participants	yes
Have you enclosed any other supporting material (please specify)	no

Appendix 2: Interview consent form

Interview Consent Form

Research project title: The development of a management accounting system for decentralised construction companies.

Research investigator: Tim Daniel Rossenbach

Research participant's name: _____

The duration of the intended interview will be 60-90 minutes. You have the right to refuse the participation, to stop the interview or withdraw from the research at any time. Your decision will have no effect on employment status or conditions.

Ethical procedures for academic research undertaken from UK institutions require that interviewees explicitly agree to being interviewed and to how the information contained in their interview will be used. This consent form is necessary to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Please would you sign this form to certify that you approve following:

- the interview will be recorded and a transcript will be produced
- you will be sent the transcript and given the opportunity to correct any factual errors
- the transcript of the interview will be analysed by Tim Daniel Rossenbach as research investigator
- access to the interview transcripts will be limited to Tim Daniel Rossenbach
- any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that you cannot be identified, and care will be taken to ensure that other information in the interview that could identify you is not revealed
- the actual recording will be destroyed after the research project is completed
- any variation of the conditions above will only occur with your further explicit approval

Printed Name: _____

Interview participation: yes ___ no ___

Participant's Signature: _____ Date: _____

Researcher's Signature: _____ Date: _____

Appendix 3: Covert observation consent form

Covert Observation Consent Form

Research project title: The development of a management accounting system for decentralised construction companies.

Research investigator: Tim Daniel Rossenbach

Research participant's name: _____

Within this research project, covert observation by the named researcher was undertaken. I hereby can give or refuse my ex post consent to Tim Daniel Rossenbach whose signature appears below, to use the notes taken of my work activities for academic purposes within the research project named. Giving or refusing consent will have no effect on employment status or conditions. I signing this consent form acknowledge and approve the following:

- Tim Daniel Rossenbach is allowed to use these notes within the research project mentioned above
- I will be sent a copy of the notes taken and given the opportunity to correct any factual errors
- the notes of my work activities will be analysed by Tim Daniel Rossenbach as the research investigator
- access to the notes will be limited to Tim Daniel Rossenbach
- any summary observation content, or direct quotations from the notes, that are made available through academic publication or other academic outlets will be anonymized so that I cannot be identified, and care will be taken to ensure that other information in the notes that could identify me is not revealed
- the notes will be destroyed after the research project is completed
- any variation of the conditions above will only occur with my further explicit approval

Printed Name: _____

Consent: yes ___ no ___

Participant's Signature: _____ Date: _____

Researcher's Signature: _____ Date: _____

Appendix 4: Research ethics committee correspondence

[ROSSENBACH, Tim] (REC/19/18)

The development of a management accounting system for decentralised construction companies

Research Ethics Committee discussed the research proposal and requested further information, clarification or action from the Researcher in relation to the following:

- a) Clarification from the Researcher that permission has been granted from his employer for research, and that there will not be any intellectual property rights or Data Protection issues?
Please see separate letter (written and signed by the researcher as he is owner of the company and therefore has sole power of attorney).
- b) If there is a contract in place between the Researcher and his employer, Bohle, the Insurance Manager at the University (a member of the Research Ethics Committee) has offered to review this in terms of liability.
Not necessary, as the researcher is owner of the company.
- c) Under question 7 of the form, regarding actions to comply with the Data Protection Act, the answer is 'no'. Clarification is sought as to whether there is no personal data, or whether there is, and if there is, what action will be taken to comply with the act.
The answer must be 'yes'. The following actions have been taken to ensure compliance with the Data Protection Act: All personal data (names or branch membership) resulting from the observation and/or expert interviews will be anonymised. Nobody, except the researcher, will be able to make connections between individual interviews or observation and individual employees.
- d) Under 'benefits', the Researcher makes the statement: '*As the participants of the research are employees of a decentralised construction company, they are interested in the research results, as the results will assist their future everyday work*'. It would be prudent to amend this to say that they could be interested.
Correct. The researcher has amended the wording.
- e) Under 'adverse effects', the Researcher states that anonymity of the participants will ensure negative consequences are prevented. The Committee would like to know how the Researcher will achieve this.
The researcher has amended the wording: A risk could be that the research results are unsatisfactory and thus the participants have lost time. To prevent negative consequences for the participants, the researcher has to ensure the backing of the entire top management prior to the expert interviews. It is the researcher's duty to make clear within the company that he on his own is responsible for the success of the research. In this case, as the researcher is owner of the company, the risk for the participants is small.
- f) Under 'Risk of Harm', the answer is 'no' against each question. The Researcher should consider whether questions 3, 5 and 6 (physical, psychological and professional) should actually be answered as 'yes', particularly if the person who has been covertly interviewed was not happy about it. The Researcher should consider these areas and advise on actions to minimise the risk.
 3. **The researcher cannot identify a risk of physical harm within the intended research. All participants and the researcher know each other for many years. There is no risk of physical violence or similar.**
 5. **As the covert observation already took place in the past, it is the researcher's duty to carefully explain why he observed internal processes within the company. It is also the researcher's duty to explain to every participant that there are no negative consequences arising from the observation and that the observation findings only are used for research purpose and have no affect on the employment.**
 6. **Pretty similar to 5.. It is not common to observe colleagues during their work. Therefore, the researcher has to ensure that every participant understands why the researcher has observed them during work.**
- g) Data Storage: will the data stored on the Researcher's computer be password protected (in addition to the password to access the computer)?
The IT department sets up an additional password protecting the data resulting from observation and expert interviews.
- h) Under the risk assessment: the Researcher appears to be working alone with one employee, which should be noted as lone working. The Researcher would need to consider lone working in the risk assessment, including taking interviews whilst onsite, and consider 'what ifs', scenarios such as how to end an interview without upsetting the participant.
The researcher does not agree here. There is no lone working at any time. Scenarios as how to end an interview without upsetting the participant are clearly regulated within the company's code of conduct ("respectful interaction at any time").
- i) The Committee has asked that the Researcher send them a copy of the Code of Conduct (relating to violence and allegations of inappropriate behaviour). The Researcher should also advise how he intends to handle such situations.

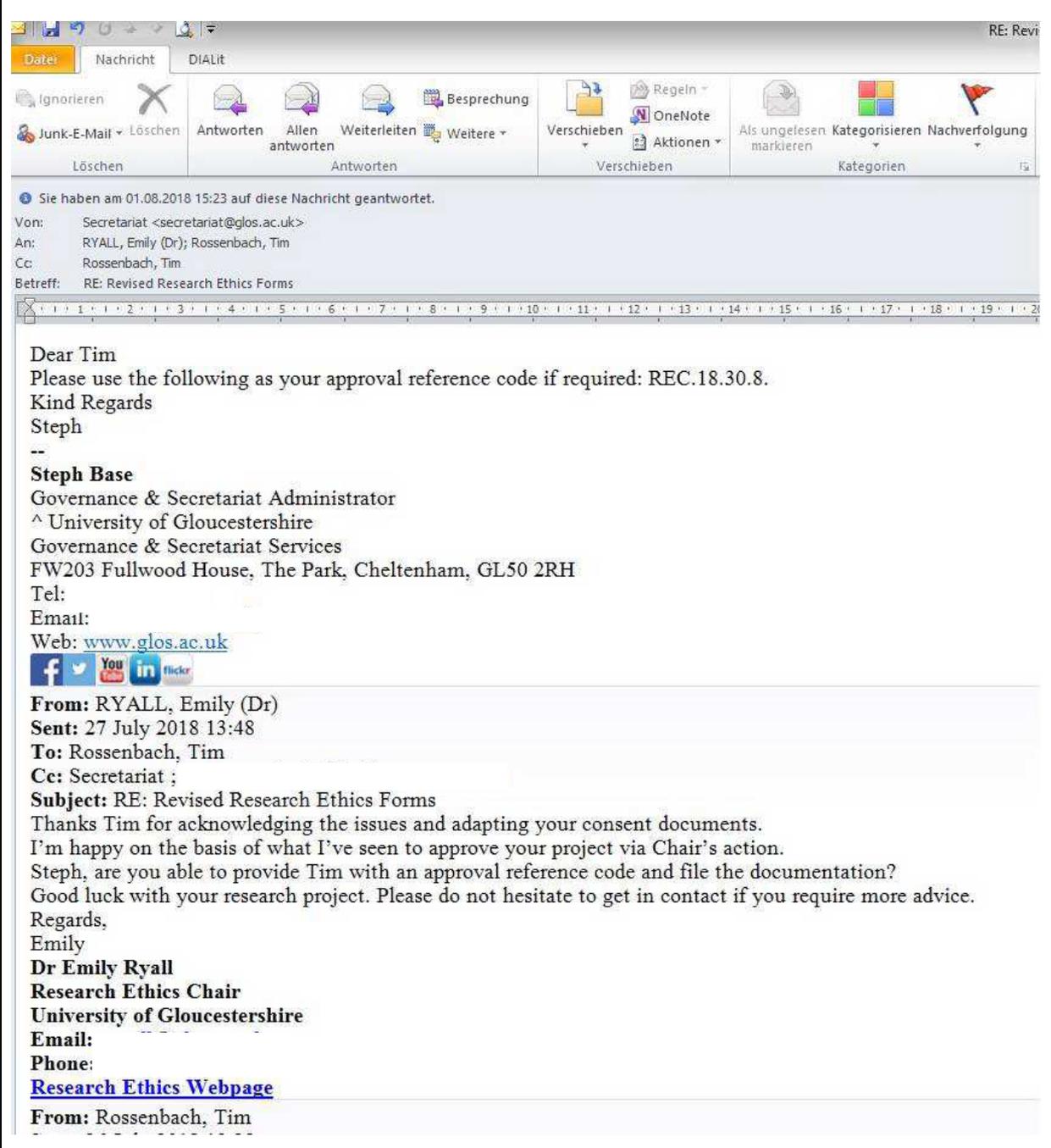
Translated from the Code of Conduct (page 6): "No supervisor/colleague/employee is sexually or personally harassed, discriminated or even threatened by language, gestures or even physical contact."

- j) The last paragraph of the form states 'participants will receive important information regarding the research study'. Clarification is sought on what is included within this.
This includes information regarding the benefits arising from the research for every single participant (e.g. more effective decision making as every participant will know his information needs better).
- k) The last paragraph also states that "interview results will be stored appropriately". Further information is required in relation to this to determine exactly how the results would be stored.
All data will be stored on a structured database on the researcher's computer. The IT department sets up an additional password protecting the data. After the research project all data will be destroyed.
- l) Finally the Committee would like to advise that consent cannot be given after the event has already occurred, but that participants can only give their consent for the data collected to be used. Clarification is also required about who will be told about the data collection, whether this would only be the interviewees?
Correct. The wording of the covert observation consent form is: "Within this research project, covert observation by the named researcher was undertaken. I hereby give my ex post consent to Tim Daniel Rossenbach whose signature appears below, to use the notes taken of my work activities for academic purposes within the research project named".

Resolved: the Researchers were asked to address the above points of clarification, or amendments to the research proposal. The Committee recommended that the Chair should take Chair's Action to approve this outside the meeting, on the provision that evidence to demonstrate the above amendments and clarifications had been presented.

Action: Researcher / Chair / Officer

Appendix 5: Approval by ethics committee (Email)



The screenshot shows an email client window with a ribbon menu at the top. The ribbon includes tabs for 'Datei', 'Nachricht', and 'DIALit'. The 'Nachricht' tab is active, showing various actions like 'Ignorieren', 'Junk-E-Mail', 'Löschen', 'Antworten', 'Allen antworten', 'Weiterleiten', 'Besprechung', 'Weitere', 'Verschieben', 'OneNote', 'Aktionen', 'Als ungelesen markieren', 'Kategorisieren', and 'Nachverfolgung'. Below the ribbon, a status bar indicates 'Sie haben am 01.08.2018 15:23 auf diese Nachricht geantwortet.' The email header shows: 'Von: Sekretariat <sekretariat@glos.ac.uk>', 'An: RYALL, Emily (Dr); Rossenbach, Tim', 'Cc: Rossenbach, Tim', and 'Betreff: RE: Revised Research Ethics Forms'. The main body of the email contains the following text:

Dear Tim
Please use the following as your approval reference code if required: REC.18.30.8.
Kind Regards
Steph
--
Steph Base
Governance & Secretariat Administrator
^ University of Gloucestershire
Governance & Secretariat Services
FW203 Fullwood House, The Park, Cheltenham, GL50 2RH
Tel:
Email:
Web: www.glos.ac.uk

Below the main text is a social media bar with icons for Facebook, Twitter, YouTube, LinkedIn, and Flickr.

From: RYALL, Emily (Dr)
Sent: 27 July 2018 13:48
To: Rossenbach, Tim
Cc: Sekretariat ;
Subject: RE: Revised Research Ethics Forms

Thanks Tim for acknowledging the issues and adapting your consent documents.
I'm happy on the basis of what I've seen to approve your project via Chair's action.
Steph, are you able to provide Tim with an approval reference code and file the documentation?
Good luck with your research project. Please do not hesitate to get in contact if you require more advice.
Regards,
Emily
Dr Emily Ryall
Research Ethics Chair
University of Gloucestershire
Email:
Phone:
[Research Ethics Webpage](#)

At the bottom of the email body, there is a separate header: **From:** Rossenbach, Tim

Appendix 6: Brief introduction into research study and context

Title of research project

The development of a management accounting system for decentralised construction companies

Purpose of the research project

The aim of this research is to develop a management accounting system for decentralised construction companies to support effective decision-making.

Research objectives:

1. To explore the critical success factors within decentralised construction companies.
2. To critically evaluate how the management accounting system supports the achievement of management's critical success factors within decentralised construction companies.

As each construction project varies and contains specific risks for managers of construction companies it is hard to be well-informed about all circumstances. Furthermore, managers in decentralised construction companies cannot visit all construction sites within their area of responsibility on a regular basis. Thus, only on site staff know answers to many crucial questions (e.g. quality of the work carried out, degree of adherence to schedules, degree of customer satisfaction). Therefore, it is crucial to have a system available to ensure the flow of information between construction sites and managers (branch managers, division managers, and senior management) to ensure effective decision making.

Within business operations, problems occasionally arise that are so important that they necessitate senior management involvement (e.g. payment difficulties of an important client). Although a decentralised company organisation with several branches leads to decision decentralisation (i.e. the branch managers make many decisions), this organisational form also makes it more challenging for managers to maintain a clear overview and make the right decisions.

Management accounting provides managers at all levels with crucial information to plan, monitor and control organisations' operations and therefore to reach particular business objectives. These business objectives are usually formulated by the company owner.

One approach to determine what information is crucial is the CSFs method by Rockart. This method enables the manager to identify those few key elements that 'must go right' to achieve business objectives and to reduce the risk of business failure.

Appendix 7: Brief summary of “Chief Executives Define Their Own Data Needs” (Rockart, 1979)

Summary: “Chief Executives Define Their Own Data Needs”, (Rockart, 1979)

Rockart deals with the problem of the information explosion related to management information systems.

Many managers have to go through reams of reports and try to determine for themselves what are the most critical pieces of information contained in the reports so that they can take necessary action and correct any problems that have arisen. It is clear that a problem exists with defining exactly what data a manager needs.

There are several approaches related to information needs.

By-product technique

In this method, little attention is actually paid to the real information needs of the manager. The organisation's computer-based information process is centred on the development of operational systems that perform the required paperwork processing for the company. Attention is focused therefore, on systems that process payroll, accounts payable, billing, inventory, accounts receivable, and so on.

Null approach

This method is characterised by statements that might be paraphrased in the following way: “Managers' activities are dynamic and ever changing, so one cannot predetermine exactly what information will be needed to deal with changing events at any point in time. These managers, therefore, are and must be dependent on future-oriented, rapidly assembled, most often subjective, and informal information delivered by word and mouth from trusted advisers.”

Key indicator system

This procedure is based on three concepts. The first concept is the selection of a set of key indicators of the health of the business. Information is collected on each of these indicators. The second concept is exception reporting - that is, the ability to make available to the manager, if desired, only those indicators where performance is significantly different from expected results. The third concept is the expanding availability of better, cheaper, and more flexible visual display techniques.

Total study process

In this approach, numerous managers are queried about their total information needs, and the results are compared with existing information systems. The subsystems necessary to provide the information currently unavailable are identified and assigned priorities. This

approach is a reaction to two decades of data processing during which single systems have been developed for particular uses in relative isolation from each other and with little attention to management information needs.

New CSF method

The CSF method focuses on individual managers and on each manager's current information needs - both hard and soft. Moreover, it takes into consideration the fact that information needs will vary from manager to manager and that these needs will change with time for a particular manager.

CSFs are, for any business, the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation. They are the few key areas where "things must go right" for the business to flourish. If results in these areas are not adequate, the organisation's efforts for the period will be less than desired. As a result, the CSFs are areas of activity that should receive constant and careful attention from management. The current status performance in each area should be continually measured, and that information should be made available.

Goals represent the end points that an organisation hopes to reach. CSFs, however, are the areas in which good performance is necessary to ensure attainment of those goals.

Appendix 8: Brief summary of “A Primer On Critical Success Factors” (Bullen et al, 1981)

Summary: “A Primer On Critical Success Factors - chapter 3”, (Bullen et al, 1981)

The expert interview will mainly follow the guidelines from Bullen et al, 1981.

Objectives of the interview:

1. The interviewer intends to understand the interviewee’s organisation and the mission and role (the “world view”) of the interviewee within the context of his organisation as the interviewee perceives them.
2. Furthermore, the interviewer wants to understand the goals and objectives of the interviewee and elicit CSFs and measures from the interviewee.
3. In addition, the interviewer would like to assist the manager in better comprehending her own information needs.

Interview procedure:

1. Opening of the interview (incl. brief introductory statement of how the CSF method is used to determine managerial information needs)
2. Questions related to the interviewee’s mission and role within the organisation
3. Discussion of manager’s goals
4. Development of the manager’s CSFs
5. Prioritisation of CSFs
6. Determination of measures

Appendix 9: Definitions of “goal” and “CSF”

Definitions

“Goal”

A goal is an idea of the future or desired result that a person or a group of people envisions, plans and commits to achieve. People endeavour to reach goals within a finite time by setting deadlines.

In organisations, goal management consists of the process of recognising or inferring goals of individual team-members, abandoning goals that are no longer relevant, identifying and resolving conflicts among goals, and prioritising goals consistently for optimal team-collaboration and effective operations.

For any successful commercial system, it means deriving profits by making the best quality of goods or the best quality of services available to end-users (customers) at the best possible cost. One distinguishes three fundamental categories of goals related to technological system management: production goals, safety goals, and economy goals.

Organisational goal-management aims for individual employee goals and objectives to align with the vision and strategic goals of the entire organisation. Goal-management provides organisations with a mechanism to effectively communicate corporate goals and strategic objectives to each person across the entire organisation. The key consists of having it all emanate from a pivotal source and providing each person with a clear, consistent organisational-goal message so that every employee understands how their efforts contribute to an enterprise's success.

“Critical success factor”

Critical success factor (CSF) is a management term for an element that is necessary for an organisation or project to achieve its goals. The CSFs underlie the officially communicated goals. CSFs are not officially communicated and are those few things that must go well to ensure success for a manager or an organisation and, therefore, they represent those managerial or enterprise areas that must be given special and continual attention to bring about high performance. CSFs include issues vital to an organization's current operating activities and to its future success.

Appendix 10: Interview guideline

Interview Guideline

Title:

The development of a management accounting system for decentralised construction companies.

Research objectives:

1. To explore the critical success factors within decentralised construction companies.
 2. To critically evaluate how the management accounting system supports the achievement of management's critical success factors within decentralised construction companies.
-

1. Interviewee

- 1.1 What is your name?
- 1.2 How old are you?
- 1.3 How many years are you employed at this organisation?
- 1.4 How many companies in the construction industry have you been employed so far?
- 1.5 How many years do you work in the construction industry overall?
- 1.6 What is your position?
- 1.7 How is your position within the organisation integrated?
- 1.8 How many office workers are employed in your area of responsibility?
- 1.9 How many industrial workers (including external assembly personnel) are employed in your area of responsibility?

2. Job of Interviewee

- 2.1 Please describe the role of a branch manager (chief executive officer, personnel developer, quality manager).
- 2.2 Please describe the specific tasks of a branch manager (or managing director, personnel developer, quality manager).
- 2.3 Please describe the duties of a branch manager (or managing director, personnel developer, quality manager).

3. Goals

- 3.1 What are the short-term goals (up to one year) within your area of responsibility?
- 3.2 What are the medium-term goals (one to five years) within your area of responsibility?
- 3.3 What are the long-term goals (more than five years) within your area of responsibility?
- 3.4 *Optional: Well, that's a set of goals that you'll be measured by the management. Sometimes, managers also have less formal goals. Often these goals are just as important, if not more important, than the official target agreements. Are there goals that fit into this category within your area of responsibility?*

4. Critical success factors

- 4.1 Are there critical success factors that are typical for the construction industry?
- 4.2 Which critical success factors underlie the short-term goals within your area of responsibility?
- 4.3 Which critical success factors underlie the medium-term goals within your area of responsibility?
- 4.4 Which critical success factors underlie the long-term goals within your area of responsibility?
- 4.5 In which areas does the performance have to be good in order to achieve the formal goals within your area of responsibility?
- 4.6 In which areas does the performance have to be good in order to achieve the less formal goals within your area of responsibility?
- 4.7 In which two or three areas would cause great harm, if a critical success factor is not achieved?
- 4.8 There are internal critical success factors such as employee motivation. Which critical success factors of this category exist within your area of responsibility?
- 4.9 There are external critical success factors such as customer satisfaction. Which critical success factors of this category exist within your area of responsibility?
- 4.10 The organisation is highly decentralised. In this context, are there further critical success factors within your area of responsibility?
- 4.11 Are there critical success factors that only exist within this company?
- 4.12 There are backward-looking critical success factors that can only be monitored by managers (e.g. target-performance comparisons). Which critical success factors of this category exist within your area of responsibility?
- 4.13 There are future-oriented critical success factors that managers can actively influence (e.g. promotion of young talents). Which critical success factors of this category exist within your area of responsibility?
- 4.14 There are soft critical success factors (e.g. relationship to boss, partner and family support, employee motivation). Which critical success factors of this category exist within your area of responsibility?

- 4.15 There are temporal critical success factors. Are there critical success factors of this category within your area of responsibility?
- 4.16 Suppose you were on a three-month training course without access to the outside world. Which three things would you most likely want to know about your area of responsibility?
- 4.17 Let us now try to put all the critical success factors in an order (descending in importance).
- 4.18 When looking at the list: are there any further critical success factors within your area of responsibility?

5. Measures for Critical Success Factors

- 5.1 Let us now try to develop measures for the critical success factors with which the success in the individual critical success factors can be measured.
- 5.2 In addition, we try to identify or develop the source or a tool for the individual measures.

Appendix 11: Folder structure on researcher's personal computer

Data base on researcher's personal computer

- DBA
 - 01 Application
 - 02 Assignments
 - DBA503 Systematic literature review
 - DBA501 Methodology and methods
 - DBA502 Action and case research
 - DBA504 Reflective professional development
 - 03 RD1
 - 1. attempt
 - 2. attempt
 - 3. final attempt
 - 04 Thesis
 - Backup copies
 - 00 Methods
 - 01 Analysis of commercial documents
 - branch 01
 - branch 02
 - branch ...
 - Overviews
 - 02 Process/meeting observations
 - Customer acquisition
 - Participant A1
 - Participant A2
 - Participant ...
 - Support of regular customers
 - Participant A1
 - Participant A2
 - Participant ...
 - ...
 - 03 Semi-structured expert interviews
 - Interview guideline
 - Participant's preparation
 - Participant A1
 - Transcript
 - Notes
 - Participant A2

- Transcript
- Notes
- Participant ...
- 04 Ethics
- 01 Introduction
- 02 Literature review
 - CSFs
 - Construction industry
 - Decentralised organisations
 - Decentralised construction companies
 - MA
 - Construction industry
 - Decentralised organisations
 - Decentralised construction companies
- 03 Methodology
- 04 Case study
 - Pilot
- 05 Bibliography
- 06 Appendices
- Viva voce



Appendix 12: Participants' goals

Short-term goals		<small>(sorted in descending order by entries)</small>																						
		A1	A2	B1	C1	A3	A4	B2	B3	A5	B4	A6	C2	B5	A7	B6	A8	C3	A9	D1	B7	Entries per goal		
STG-01	to reach target sales	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	x	x	x	17 / 17	100%
STG-02	to reach target profit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	x	x	x	17 / 17	100%
STG-04	to avoid work accidents							1								1			x	x	x	2 / 17	12%	
STG-06	to ensure a low pre-financing								1	1									x	x	x	2 / 17	12%	
STG-03	to avoid project with negative margin																	1	x	x	x	1 / 17	6%	
STG-05	to reduce the fixed costs													1					x	x	x	1 / 17	6%	
Entries per participant		2	2	2	2	2	2	3	3	3	2	2	2	3	2	3	2	3	2	3	0	0	0	
Medium-term goals		<small>(sorted in descending order by entries)</small>																						
		A1	A2	B1	C1	A3	A4	B2	B3	A5	B4	A6	C2	B5	A7	B6	A8	C3	A9	D1	B7	Entries per goal		
MTG-01	to avoid staff turnover	1	1	1	1			1	1		1	1	1	1			1	1	x	x	x	12 / 17	71%	
MTG-02	to initiate a regeneration of staff	1		1				1	1	1			1			1	1		x	x	x	9 / 17	53%	
MTG-04	to maintain employees' motivation	1		1	1			1	1				1					1	x	x	x	7 / 17	41%	
MTG-03	to maintain employees' health						1						1		1	1			x	x	x	4 / 17	24%	
MTG-06	to increase annual sales	1	1	1			1												x	x	x	4 / 17	24%	
MTG-05	to increase proportion of regular customers								1				1						x	x	x	3 / 17	18%	
Entries per participant		4	2	4	2	0	3	3	4	1	1	2	4	2	1	2	2	2	2	0	0	0		
Long-term goals		<small>(sorted in descending order by entries)</small>																						
		A1	A2	B1	C1	A3	A4	B2	B3	A5	B4	A6	C2	B5	A7	B6	A8	C3	A9	D1	B7	Entries per goal		
LTG-01	to develop a successor	1																	x	x	x	1 / 17	6%	
Entries per participant		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Appendix 13: Short-term CSFs

Short-term CSFs		<small>(sorted in descending order by entries)</small>																							
Code	Description	A1	A2	B1	C1	A3	A4	B2	B3	A5	B4	A6	C2	B5	A7	B6	A8	C3	A9	D1	B7	Entries per CSF			
SSF-09	to develop partnerships with subcontractors	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	x	x	x	17	/ 17	100%
SSF-04	market-driven (and customer-driven) price calculations	1		1	1		1	1	1	1	1	1			1	1	1	1	1	x	x	x	13	/ 17	76%
SSF-05	continuous incoming orders	1		1			1	1	1	1	1	1	1	1	1	1	1	1	1	x	x	x	13	/ 17	76%
SSF-01	permanent sales activity					1			1	1	1	1	1	1	1	1	1	1	1	x	x	x	9	/ 17	53%
SSF-03	to ensure professional handling of first order (new customer)				1	1	1	1		1	1		1		1		1			x	x	x	9	/ 17	53%
SSF-32	head office's behaviour towards subcontractors		1		1		1		1	1	1	1	1	1		1				x	x	x	9	/ 17	53%
SSF-13	timely billing	1	1					1	1	1					1	1	1	1		x	x	x	8	/ 17	47%
SSF-21	employees' health	1	1	1		1	1	1					1	1						x	x	x	8	/ 17	47%
SSF-02	permanent contact person for regular customers				1		1	1					1		1		1	1	1	x	x	x	7	/ 17	41%
SSF-06	to recognise addendum potential at an early stage	1		1	1	1			1					1				1	x	x	x	7	/ 17	41%	
SSF-07	to realise addendums	1		1	1	1			1					1				1	x	x	x	7	/ 17	41%	
SSF-19	balanced order structure		1	1						1	1	1	1			1				x	x	x	7	/ 17	41%
SSF-33	head office's support on new topics		1				1		1	1	1			1		1				x	x	x	7	/ 17	41%
SSF-24	honest internal communication / flow of information	1	1	1	1	1			1			1								x	x	x	6	/ 17	35%
SSF-20	right construction site / customer to right PM		1			1			1							1		1	x	x	x	5	/ 17	29%	
SSF-08	to develop a good reputation			1									1		1	1				x	x	x	4	/ 17	24%
SSF-16	to observe new customers closely								1				1		1	1				x	x	x	4	/ 17	24%
SSF-23	to respond on employees' private needs / support of family and partner			1	1	1							1							x	x	x	4	/ 17	24%
SSF-30	to develop new regular customers							1						1	1		1			x	x	x	4	/ 17	24%
SSF-14	good interaction between BM and commercial personnel									1	1					1				x	x	x	3	/ 17	18%
SSF-15	to negotiate advance payments	1							1	1										x	x	x	3	/ 17	18%
SSF-12	fair distribution of sites on PMs									1					1					x	x	x	2	/ 17	12%
SSF-22	to pass risks from customer contract to subcontractors					1			1											x	x	x	2	/ 17	12%
SSF-25	no routine related to work safety							1								1				x	x	x	2	/ 17	12%
SSF-26	to comply with specifications related to work safety							1								1				x	x	x	2	/ 17	12%
SSF-27	to generate new customers							1						1		1				x	x	x	2	/ 17	12%
SSF-29	no offer, if customer has unrealistic price expectations														1		1			x	x	x	2	/ 17	12%
SSF-34	further training for CMs, PMs, commercial staff, BMs	1	1																	x	x	x	2	/ 17	12%
SSF-36	quick decisions despite decentralised organisation									1				1						x	x	x	2	/ 17	12%
SSF-10	to test new subcontractors on small sites first															1				x	x	x	1	/ 17	6%
SSF-11	to order all material directly on site															1				x	x	x	1	/ 17	6%
SSF-17	to work only with written order									1										x	x	x	1	/ 17	6%
SSF-18	customer acceptance asap									1										x	x	x	1	/ 17	6%
SSF-28	to conduct risk assessments on sites							1												x	x	x	1	/ 17	6%
SSF-31	to avoid lawsuits with customers	1																		x	x	x	1	/ 17	6%
SSF-35	time of the year / weather				1															x	x	x	1	/ 17	6%
Entries per participant		10	8	12	9	11	8	12	11	11	10	9	11	10	16	12	10	8	0	0	0				

Appendix 14: Medium-/long-term CSFs

Medium-/long-term CSFs																													
<small>(sorted in descending order by entries)</small>																													
Code	Description	A1	A2	B1	C1	A3	A4	B2	B3	A5	B4	A6	C2	B5	A7	B6	A8	C3	A9	D1	B7	Entries per CSF							
MSF-01	bonuses for PMs and CMs		1			1	1	1	1			1	1	1	1	1	1	1	1	x	x	x	12	/ 17	71%				
MSF-05	to offer perspectives to employees			1	1	1	1	1	1		1	1	1	1	1	1	1	1		x	x	x	12	/ 17	71%				
MSF-11	internal feedback culture		1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	x	x	x	12	/ 17	71%				
MSF-08	team spirit / working atmosphere	1		1	1	1	1	1	1	1	1		1					1	1	x	x	x	11	/ 17	65%				
MSF-12	internal transparency / clearly formulated and communicated competences			1	1		1	1	1	1	1		1	1		1		1	1	x	x	x	11	/ 17	65%				
MSF-13	adequate working hours / working environment			1	1	1	1	1	1	1	1		1	1				1	1	x	x	x	10	/ 17	59%				
MSF-17	identification with employer	1	1	1	1		1				1	1	1				1			x	x	x	9	/ 17	53%				
MSF-02	to train apprentices		1		1			1	1	1	1	1				1				x	x	x	8	/ 17	47%				
MSF-04	regular training of PMs and CMs (technical, legal)	1				1	1						1	1				1	1	x	x	x	7	/ 17	41%				
MSF-03	adequate number of own construction workers		1					1		1					1	1		1	1	x	x	x	6	/ 17	35%				
MSF-06	to demand and promote responsible work					1				1	1		1					1	1	x	x	x	6	/ 17	35%				
MSF-07	trust relationship between branches and head office	1	1	1			1							1				1		x	x	x	6	/ 17	35%				
MSF-15	to recruit young employees	1		1	1			1		1						1				x	x	x	6	/ 17	35%				
MSF-21	well trained staff (PMs, CMs)				1		1		1		1	1					1			x	x	x	6	/ 17	35%				
MSF-24	to develop personal relationships to (regular) customers	1		1		1	1						1							x	x	x	5	/ 17	29%				
MSF-16	to recruit new employees (PMs and CMs)			1	1			1								1				x	x	x	4	/ 17	24%				
MSF-22	supraregional cooperation between branches				1				1				1					1		x	x	x	4	/ 17	24%				
MSF-10	to develop regular customers from new customers							1	1	1										x	x	x	3	/ 17	18%				
MSF-20	to comply with internal specifications (management-system)		1	1									1							x	x	x	3	/ 17	18%				
MSF-09	trust relationship to other BMs											1						1		x	x	x	2	/ 17	12%				
MSF-14	IT infrastructure (due to decentralised organisation)							1	1											x	x	x	2	/ 17	12%				
MSF-18	to optimise processes between branches and head office	1	1																	x	x	x	2	/ 17	12%				
MSF-19	to optimise commercial skills of PMs	1										1								x	x	x	2	/ 17	12%				
MSF-23	reasonable fixed costs in the head office												1							x	x	x	1	/ 17	6%				
MSF-25	general economic situation											1								x	x	x	1	/ 17	6%				
Entries per participant		8	8	11	11	7	11	12	11	8	9	11	10	6	3	8	9	8	0	0	0								

Appendix 15: Summary table of empirical work 1/5

Summary of findings from semi-structured expert interviews, analysis of commercial documents, and process/meeting observations 1/5					
Participant	A1	A2	B1	C1	
Position	BM	BM	BM	BM	
Years in current position	5	2	6	10	
Method	Description	Years of experience	>30	>30	
Method	Description	Years of experience	>20	>20	
Semi-structured expert interviews	Short-term goals STG-01 to reach target sales STG-02 to reach target profit	Short-term goals STG-01 to reach target sales STG-02 to reach target profit	Short-term goals STG-01 to reach target sales STG-02 to reach target profit	Short-term goals STG-01 to reach target sales STG-02 to reach target profit	
	Short/medium-long-term goals (sorted in descending order by entries)	Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff MTG-04 to maintain employees' motivation MTG-06 to increase annual sales	Medium-term goals MTG-01 to avoid staff turnover MTG-06 to increase annual sales	Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff MTG-04 to maintain employees' motivation MTG-06 to increase annual sales	Medium-term goals MTG-01 to avoid staff turnover MTG-04 to maintain employees' motivation
	Long-term goals LTG-01 to develop a successor	Long-term goals n/a	Long-term goals n/a	Long-term goals n/a	
	Number of short-term goals	2	2	2	
	Number of medium-term goals	4	2	4	
	Number of long-term goals	1	0	0	
	CSFs (internal, external, temporary, hard, soft) that underlie the short-term goals (sorted in descending order by entries)	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-13 timely billing SSF-21 employees' health SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-19 balanced order structure SSF-33 head office's support on new topics SSF-24 honest internal communication / flow of information SSF-20 right construction site / customer to right PM SSF-15 to negotiate advance payments SSF-34 further training for CMs, PMs, commercial staff, BMs SSF-31 to avoid lawsuits with customers	SSF-09 to develop partnerships with subcontractors SSF-32 head office's behaviour towards subcontractors SSF-21 employees' health SSF-19 balanced order structure SSF-33 head office's support on new topics SSF-24 honest internal communication / flow of information SSF-20 right construction site / customer to right PM SSF-08 to develop a good reputation SSF-23 to respond on employees' private needs / support of family and partner	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-13 timely billing SSF-21 employees' health SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-19 balanced order structure SSF-24 honest internal communication / flow of information SSF-08 to develop a good reputation SSF-23 to respond on employees' private needs / support of family and partner	SSF-04 market-driven (and customer-driven) price calculations SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-08 permanent contact person for regular customers SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-24 honest internal communication / flow of information SSF-23 to respond on employees' private needs / support of family and partner
	CSFs (internal, external, temporary, hard, soft) that underlie the medium-long-term goals (sorted in descending order by entries)	MSF-08 team spirit / working atmosphere MSF-17 identification with employer MSF-04 regular training of PMs and CMs (technical, legal) MSF-07 trust relationship between branches and head office MSF-15 to recruit young employees MSF-24 to develop personal relationships to (regular) customers MSF-18 to optimise processes between branches and head office MSF-19 to optimise commercial skills of PMs	MSF-01 bonuses for PMs and CMs MSF-11 internal feedback culture MSF-17 identification with employer MSF-02 to train apprentices MSF-03 adequate number of own construction workers MSF-07 trust relationship between branches and head office MSF-20 to comply with internal specifications (management-system) MSF-18 to optimise processes between branches and head office	MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours / working environment MSF-17 identification with employer MSF-15 to recruit young employees MSF-24 to develop personal relationships to (regular) customers MSF-16 to recruit new employees (PMs and CMs) MSF-22 cross-branch cooperation between branches MSF-20 to comply with internal specifications (management-system)	MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours / working environment MSF-17 identification with employer MSF-02 to train apprentices MSF-15 to recruit young employees MSF-21 well-trained staff (PMs, CMs) MSF-16 to recruit new employees (PMs and CMs) MSF-22 cross-branch cooperation between branches
	CSFs (internal, external, temporary, hard, soft) that underlie the long-term goals (sorted in descending order by entries)	medium-term CSFs related to HR	n/a	n/a	n/a
	Number of short-term CSFs	10	8	8	9
Number of medium-term CSFs	8	8	11	11	
Number of long-term CSFs	all medium-term CSFs related to HR	0	0	0	
Analysis of commercial documents	Short-term CSFs SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-31 to avoid lawsuits with customers	Short-term CSFs SSF-32 head office's behaviour towards subcontractors SSF-24 honest internal communication / flow of information SSF-33 head office's support on new topics SSF-19 balanced order structure	Short-term CSFs SSF-05 continuous incoming orders SSF-04 market-driven (and customer-driven) price calculations SSF-06 to recognise addendum potential at an early stage SSF-13 timely billing SSF-07 to realise addendums	Short-term CSFs SSF-02 permanent contact person for regular customers SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-23 to respond on employees' private needs / support of family and partner SSF-24 honest internal communication / flow of information	
	Medium-term CSFs MSF-04 regular training of PMs and CMs (technical, legal) MSF-19 to optimise commercial skills of PMs MSF-18 to optimise processes between branches and head office MSF-17 identification with employer MSF-08 team spirit / working atmosphere	Medium-term CSFs MSF-03 adequate number of own construction workers MSF-20 to comply with internal specifications (management-system) MSF-18 to optimise processes between branches and head office MSF-11 internal feedback culture MSF-01 bonuses for PMs and CMs	Medium-term CSFs MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-15 to recruit young employees MSF-16 to recruit new employees (PMs and CMs) MSF-05 to offer perspectives to employees	Medium-term CSFs MSF-15 to recruit young employees MSF-21 well-trained staff (PMs, CMs) MSF-16 to recruit new employees (PMs and CMs) MSF-02 to train apprentices MSF-05 to offer perspectives to employees MSF-21 well-trained staff (PMs, CMs)	
	Long-term CSFs LSP-02 medium-term CSFs related to HR	Long-term CSFs n/a	Long-term CSFs n/a	Long-term CSFs n/a	
	average annual sales in € 2009-2017	2.824.199 €	1.843.925 €	4.291.115 €	738.876 €
	average operational gross margin in € 2009-2017	607.716 €	75.596 €	1.036.000 €	182.105 €
	average operational gross margin in % to sales 2009-2017	21,5%	4,1%	24,1%	24,6%
	average fixed costs in € 2009-2017	588.870 €	389.568 €	736.543 €	195.440 €
	average fixed costs in % to sales 2009-2017	20,9%	21,1%	17,2%	26,5%
	average operational result in € 2009-2017	18.846 €	-313.972 €	299.457 €	-13.335 €
	average operational result in % to sales 2009-2017	0,7%	-17,0%	7,0%	-1,8%
average order value in €	47.890 €	45.977 €	99.478 €	14.781 €	
average number of construction sites per business year	59	40	43	50	
graph: operational branch results 2009-2017 in € incl. trends					
related to customers - mainly BM's remit - (sales activities, customer acquisition, price calculations, order structure, support of regular customers, ...)	SSF-02 each customer has a contact person within the branch, pers. c. 2016 SSF-30 focus on new regular customers, BM systematically searches for c. having regular c. potential (e.g. Daimler, Porsche, Bosch), 2014-pr. SSF-29 minimum margin of 15% in his price calculations, pers. c. 2016 MSF-24 BM develops personal relationships to customers resp. to customers' representatives (e.g. Daimler purchase d.), 2014-present SSF-03 no professional handling of orders: project "Boisch", 2017 and "Porsche", 2018	SSF-01 poor sales activities (almost no orders between October 2017 and summer 2018, reason unknown) SSF-19 BM tried to acquire many very small orders (each < 3.000 €), 2016-pr. - transit times for PMs/workers - target sales figure w.n.b. achieved MSF-24 joint visits of the Oktoberfest with customers, 2010-present	SSF-01 permanent search for possible new customers in Bavaria, close collaboration with central marketing department (monthly meetings) SSF-02 weekly visits to important customer in Gunzenhausen during the last years, 2010-present MSF-24 joint visits of the Oktoberfest with customers, 2010-present	SSF-02 focus more on projects' margins, less on total sales figures (annual budget meetings 2011-present) SSF-08 focus on high quality service and expertise related to technical know-how (feedback from customer "Strabag", 2014-present) MSF-24 joint visits of the Oktoberfest with customers, 2010-present MSF-24 customer in-house trainings related to new materials	
related to construction management - mainly PMs/CMs' remit - (behaviour towards subcontractors, quality/control/contract, technical handling, billing, ...)	SSF-09 several partnerships with subcontractors (e.g. subcontractor from Spain that works regularly for the branch), 2015-present SSF-13 focus on timely billing (low billable semi-finished works in billing list), 2015-present SSF-14 close collaboration between BM and commercial member of staff (joint handling of billing list), 2015-present SSF-11 no access to a site, workers had to carry materials from lorries to site, 2017 SSF-31 major lawsuit with regular customer, consequences: impact on liquidity and a lost regular customer, 2014 SSF-24 weekly branch meetings with all PMs/CMs, where all current projects are discussed openly, 2015-present SSF-21-22 discussed PM was allowed to stay home in order to get well again (BM's decision without MD involvement), 2017 MSF-01 demand for bonuses for PMs/CMs in the annual budget meetings, 2014-present MSF-08 issues at PM-level due to three weeks vacation of one PM, 2012	SSF-09 regular issues related to the acquisition of external workers (projects, where no external workers were available), 2010-present SSF-18 several projects with very late customer acceptance, 2016-present SSF-11 PMs/CMs have issues related to ordering materials according to the internal specifications (several examples in 2018) SSF-16 poor observation of new customers during construction works by BM - BM is generally far away from the construction sites, 2014-present	SSF-09 regular issues related to the acquisition of external workers (projects, where no external workers were available), 2010-present SSF-14 commercial member of staff may work very independently, trust relationship between CMs and BM, 2000-present SSF-17 focus on a legally proper order processing from PMs, also related to written orders, 2017-18 SSF-22 tries to pass all risks arising from the customer contracts to subcontractors, several projects 2017-2018	SSF-06 acquisition of addendum potentials through a detailed technical support during construction works (many strongly rising order values) after acquisition, customers (very often) also order the addendum tenders due to the clearly illustrated technical necessity, 2014-pr. SSF-07 MSF-13 focus on regular further trainings for branch's PMs/CMs, 2010-present MSF-05 regular personal conversations with young PM about future career possibilities within the company, 2016-present MSF-13 focus on adequate working hours in order to be an attractive employer, 2016-present MSF-13 decision to move into a new branch building in order to provide a better working environment, 2017	
related to staff - mainly BM's remit - (internal communication, responsiveness on employees' needs, ...)	MSF-01	MSF-11 missing branch internal feedback culture, 2015-present	MSF-13 decision to move into a new branch building in order to provide a better working environment, 2017		
related to decentralised organisation - mainly MDs' remit - (collaboration with MDs and administration departments in the head office, ...)	MSF-31 BM tries to avoid lawsuits and therefore involvement of head office's legal department in order not to lose a customer, pers. c. 2017 MSF-14,19 BM gives suggestions related to the implementation of a new IT tool ("Jobrouter"), 2016-2017 SSF-33 lawyers made decisions that led to additional costs, Daimler, 2014	MSF-07 regular issues between BM and "central buying" related to operational topics - mutual finger-pointing (2017-present) MSF-20 no quoting due to the last planned implementation of a new price calculation software, 2015 SSF-33	MSF-07 close collaboration with central marketing department (monthly meetings in branch or head office), 2009-present MSF-18 regular complaints about processes between branch and head office (e.g. HR processes, 2014-present)	n/a	

Appendix 15: Summary table of empirical work 2/5

Summary of findings from semi-structured expert interviews, analysis of commercial documents, and process/meeting observations 2/5						
Participant	A3	A4	B2	B3		
Position	BM	BM	BM	BM		
Years in current position	5	4	5	16		
Method	Description	Years of experience	>20	>10	>30	>20
Semi-structured expert interviews	Short-term goals	STG-01 to reach target sales STG-02 to reach target profit	Short-term goals STG-01 to reach target sales STG-02 to reach target profit	Short-term goals STG-01 to reach target sales STG-02 to reach target profit STG-04 to avoid work accidents	Short-term goals STG-01 to reach target sales STG-02 to reach target profit STG-06 to ensure a low pre-financing	
	Short-medium-long-term goals (sorted in descending order by entries)	Medium-term goals MTG-02 to initiate a regeneration of staff MTG-03 to maintain employees' health MTG-06 to increase annual sales	Medium-term goals MTG-02 to initiate a regeneration of staff MTG-03 to maintain employees' health MTG-06 to increase annual sales	Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff MTG-04 to maintain employees' motivation	Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff MTG-04 to maintain employees' motivation MTG-05 to increase proportion of regular customers	
	Long-term goals	n/a n/a	Long-term goals n/a n/a	Long-term goals n/a n/a	Long-term goals n/a n/a	
	Number of short-term goals	2	2	2	3	
	Number of medium-term goals	3	3	3	4	
	Number of long-term goals	0	0	0	0	
	CSFs (internal, external, temporary, hard, soft) that underlie the short-term goals (sorted in descending order by entries)	SSF-09 to develop partnerships with subcontractors SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer)	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-03 to ensure professional handling of first order (new customer) SSF-13 timely billing SSF-21 employees' health SSF-02 permanent contact person for regular customers	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-01 permanent sales activity SSF-32 head office's behaviour towards subcontractors SSF-13 timely billing SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-33 head office's support on new topics SSF-20 right construction site / customer to right PM SSF-15 to negotiate advance payments SSF-22 to pass risks from customer contract to subcontractors	
	CSFs (internal, external, temporary, hard, soft) that underlie the medium-long-term goals (sorted in descending order by entries)	SSF-21 employees' health SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-24 internal communication / flow of information SSF-20 right construction site / customer to right PM SSF-23 in respond an employees' private needs / support of family and partner SSF-22 to pass risks from customer contract to subcontractors	SSF-21 employees' health SSF-02 permanent contact person for regular customers SSF-33 head office's support on new topics	SSF-12 internal transparency / clearly formulated and communicated competences SSF-13 adequate working hours / working environment SSF-17 identification with employee SSF-02 to train apprentices SSF-10 to develop regular customers from new customers SSF-16 to recruit new employees (PMs and CMs) SSF-10 to develop regular customers from new customers SSF-14 IT infrastructure (due to decentralised organisation)	SSF-12 internal transparency / clearly formulated and communicated competences SSF-13 adequate working hours / working environment SSF-02 to train apprentices SSF-21 well trained staff (PMs, CMs) SSF-10 to develop regular customers from new customers SSF-14 IT infrastructure (due to decentralised organisation)	
	CSFs (internal, external, temporary, hard, soft) that underlie the long-term goals (sorted in descending order by entries)	n/a n/a	n/a n/a	n/a n/a	n/a n/a	
	Number of short-term CSFs	11	8	12	11	
Number of medium-term CSFs	7	11	12	11		
Number of long-term CSFs	0	0	0	0		
Top-5 short-medium-long-term CSFs (sorted in descending order by importance according to participant)	SSF-04 market-driven (and customer-driven) price calculations SSF-09 to develop partnerships with subcontractors SSF-24 internal communication / flow of information SSF-03 to ensure professional handling of first order (new customer) SSF-06 to recognise addendum potential at an early stage	SSF-05 continuous incoming orders SSF-02 permanent contact person for regular customers SSF-09 to develop partnerships with subcontractors SSF-21 employees' health	SSF-04 market-driven (and customer-driven) price calculations SSF-13 timely billing SSF-21 employees' health SSF-25 no routine related to work safety SSF-26 to comply with specifications related to work safety	SSF-04 market-driven (and customer-driven) price calculations SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-13 timely billing SSF-15 to negotiate advance payments		
Analysis of commercial documents	average annual sales in € 2009-2017	7.522.837 €	3.728.024 €	4.468.563 €	6.640.143 €	
	average operational gross margin in € 2009-2017	891.728 €	650.946 €	1.105.478 €	1.343.159 €	
	average operational gross margin in % to sales 2009-2017	11,9%	17,5%	24,7%	20,2%	
	average fixed costs in € 2009-2017	1.190.658 €	719.512 €	877.500 €	1.283.594 €	
	average fixed costs in % to sales 2009-2017	15,8%	19,3%	19,6%	19,3%	
	average operational result in € 2009-2017	-298.930 €	-68.566 €	227.978 €	59.565 €	
	average operational result in % to sales 2009-2017	-4,0%	-1,8%	5,1%	0,9%	
	average order value in €	124.741 €	55.762 €	69.413 €	28.463 €	
	average number of construction sites per business year	60	67	64	233	
	graph: operational branch results 2009-2017 in € incl. trendline					
related to customers (mainly BM's remit - sales activities, customer acquisition, price calculations, order structure, support of regular customers, ...)	SSF-29 low prices offered in order to convince a potential new customer and to get the job (project "Hotel", Munich in 2012) MSF-24 only superficial relationships to customers or customers' representatives, 2012-present MSF-24 joint visits of Tennis matches in Hannover, 2010-2011 SSF-19 one large construction site led to a big loss, Hannover, 2015	SSF-27 focus on the development of alternatives for public authorities jobs, from 2016 SSF-05 minimum margin of 15% in his price calculations, pers. c. 2017 focus on one customer: issues after retirement of an architect, who was an important regular customer for many years, 2014	SSF-01 BM regularly tries to identify new ways of how to acquire new customers (e.g. customer trainings), 2015-present SSF-03 BM is regularly on site, if an order for a new customer is processed (especially in the beginning), personal conversation 2015-present after the loss of a large regular customer (approx. 25% of annual sales), the focus is on the gen. of new regular customers, 2017-pr.	SSF-01 customer alternatives required, when German construction industry came into trouble - short-time work, 2010-2012 SSF-04 implementation of an employee who is responsible for price calculations only, 2015 SSF-01 regular appointments with possible new customers, 2012-present MSF-24 very close personal relationships to (old) regular customers incl. joint private activities, 2012-present		
related to construction management (mainly PMs/CMs' remit - behaviour towards subcontractors, quality/control, technical handling, billing, ...)	SSF-09 big commercial loss on site in Hannover due to marginover issues (no workers available), 2015 SSF-20 always tries to figure out which PM is the right one for a particular customer (personal conversations with BM), 2012-present SSF-16 poor observation of new customers during construction works by BM - BM is generally far away from the construction sites, 2012-present many risks arising out of the customer contract were not passed to subcontractors, (projects "Phönix", "Sparkasse Hannover", 2014-pr.) SSF-10 several times, new subcontractors were used on huge projects first (projects "Phönix", "Sparkasse H.", "Gertler", 2012-pr.) SSF-23 good relationship to branch's staff due to responsiveness on employees' needs wherever possible (personal conv.), 2012-pr.	SSF-09 several partnerships with subcontractors (e.g. "AS Baueing", Hamburg) 2012-present customer tried to put company under pressure due to slow billing, project "Hotel" in 2015 PMs are clearly instructed only to begin with works, if a written order is available, 2013-present major lawsuit with regular customer, consequences: impact on liquidity and a lost regular customer, 2013	SSF-09 focus on long-term partnerships with subcontractors (only very few different subcontractors for the size of the branch), 2015-present PMs' focus on timely billing (low billable semi-finished works in billing list), 2015-present SSF-20 major issues on a regular customer's site due to the retirement of a highly experienced PM, 2013-2014 focus on work safety due to several industrial customers, close collaboration with CM, 2015-present	SSF-06,08 intention to hire a new PM, who should mainly identify and realise addendum (potential), personal conversation 2018 SSF-09 regular issues related to the acquisition of external workers (projects, where no external workers were available), 2013-present customer tried to put company under pressure due to slow billing, project "Vattenfall" in 2010 a PM that did not fit to a particular customer's representative, caused a major commercial loss on a site, 2011 as a PM did not comply with valid technical specifications and schedule, in order to work closer to his family, 2013 regular further trainings for PMs/CMs to improve their technical and legal knowledge, 2014-present MSF-02 annually new apprentices are hired, 2012-present		
related to staff (mainly BM's remit - internal communication, responsiveness on employees' needs, ...)	MSF-03 focus on an adequate number of own CMs and workers, 2014-pr. • a CM did not communicate an existing addendum potential, as he was not motivated to stay on site for a longer time, 2009	MSF-03 focus on an adequate number of own CMs and workers, 2016-pr.	MSF-01 PMs get bonuses depending on the annual profit, 2010-present close contact to young employees in order to illustrate possible careers within the company, 2016-present MSF-02 annually new apprentices are hired, 2015-present entire site team incl. CM departed to a competitor, 2016 young CM could change to another branch due to interpersonal problems with a PM, support by central HR department, 2014	MSF-02 to offer perspectives to employees MSF-01 bonuses for PMs and CMs MSF-14 IT infrastructure (due to decentralised organisation) MSF-12 internal transparency / clearly formulated and communicated competences MSF-02 to train apprentices		
related to decentralised organisation (mainly MDs' remit - collaboration with MDs and administration departments in the head office, ...)	MSF-07 BM usually wants to decide on his own (related to HR, material sourcing, legal issues, etc.), 2012-present MSF-20 BM often does not comply with internal specifications (e.g. BM demanded for a company car that did not fit into his budget), 2015 no trust relationships to other BMs as BM often appears unreliable in BMs' meetings (e.g. obvious disinterest), 2014-present no quoting due to the bad planned implementation of a new price calculation software, 2015	SSF-32 demands partnership behaviour towards subcontractors from head office (e.g. related to payments in time), 2017-present expects more support from the head office related to new topics (e.g. training for a new IT tool), several pers. c. from 2016 no quoting due to the bad planned implementation of a new price calculation software, 2015	SSF-32 demands partnership behaviour towards subcontractors from head office (e.g. related to payments in time), 2016-present expects more support from the head office related to new topics (e.g. training for a new IT tool), several pers. c. from 2014	SSF-31 BM tries to avoid lawsuits and therefore involvement of head office's legal department in order not to lose a customer, 2013-present MSF-07 close collaboration with central marketing in head office, 2015-present SSF-33 layers made decisions that led to additional costs, Vattenfall, 2010		

Appendix 15: Summary table of empirical work 3/5

Summary of findings from semi-structured expert interviews, analysis of commercial documents, and process/meeting observations 3/5					
Participant	A5	B4	A6	C2	
Position	BM	BM	BM	BM	
Years in current position	3	6	5	16	
Method	Description	Description	Description	Description	
Semi-structured expert interviews	Years of experience	>30	>30	>30	
	Short-term goals (sorted in descending order by entries)	Short-term goals STG-01 to reach target sales STG-02 to reach target profit STG-06 to ensure a low pre-financing Medium-term goals MTG-02 to initiate a regeneration of staff Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit Medium-term goals MTG-01 to avoid staff turnover Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit Medium-term goals MTG-01 to avoid staff turnover MTG-05 to increase proportion of regular customers Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff MTG-04 to maintain employees' motivation MTG-03 to maintain employees' health Long-term goals n/a n/a
	Number of short-term goals	3	2	2	
	Number of medium-term goals	1	1	1	
	Number of long-term goals	0	0	0	
	CSFs (internal, external, temporary, hard, soft) that underlie the short-term goals (sorted in descending order by entries)	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-03 to ensure professional handling of first order (new customer) SSF-13 timely billing SSF-19 balanced order structure SSF-16 to observe new customers closely SSF-15 to negotiate advance payments SSF-12 fair distribution of sites on PMs SSF-17 to work only with written order SSF-18 customer acceptance asap	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-19 balanced order structure SSF-33 head office's support on new topics SSF-14 good interaction between BM and commercial personnel SSF-36 quick decisions despite decentralised organisation	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-19 balanced order structure SSF-33 head office's support on new topics SSF-24 honest internal communication / flow of information SSF-14 good interaction between BM and commercial personnel SSF-19 balanced order structure	SSF-09 to develop partnerships with subcontractors SSF-04 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-21 employees' health SSF-02 permanent contact person for regular customers SSF-19 balanced order structure SSF-08 to develop a good reputation SSF-16 to observe new customers closely SSF-23 to respond an employees' private needs / support of family and partner
	CSFs (internal, external, temporary, hard, soft) that underlie the medium-long-term goals (sorted in descending order by entries)	MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours / working environment MSF-02 to train apprentices MSF-03 adequate number of own construction workers MSF-06 to demand and promote responsible work MSF-15 to recruit young employees MSF-21 well-trained staff (PMs, CMs) MSF-10 to develop regular customers from new customers	MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-17 identification with employer MSF-02 to train apprentices MSF-06 to demand and promote responsible work MSF-15 to recruit young employees MSF-21 well-trained staff (PMs, CMs)	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours / working environment MSF-17 identification with employer MSF-02 to train apprentices MSF-04 regular training of PMs and CMs (technical, legal) MSF-06 to demand and promote responsible work MSF-01 well-trained staff (PMs, CMs) MSF-24 to develop personal relationships to (regular) customers MSF-22 supranational cooperation between branches MSF-09 trust relationships to other BMs MSF-19 to optimise commercial skills of PMs MSF-23 reasonable fixed costs in the head office	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours / working environment MSF-17 identification with employer MSF-04 regular training of PMs and CMs (technical, legal) MSF-06 to demand and promote responsible work MSF-20 to comply with internal specifications (management-systems)
	CSFs (internal, external, temporary, hard, soft) that underlie the long-term goals (sorted in descending order by entries)	n/a n/a	n/a n/a	n/a n/a	n/a n/a
	Number of short-term CSFs	11	10	9	11
	Number of medium-term CSFs	8	9	11	10
Number of long-term CSFs	0	0	0	0	
Top-5 short-medium-long-term CSFs (sorted in descending order by importance according to participant)	Short-term CSFs SSF-05 continuous incoming orders SSF-09 to develop partnerships with subcontractors SSF-13 timely billing SSF-16 to observe new customers closely SSF-04 market-driven (and customer-driven) price calculations Medium-term CSFs MSF-02 to demand and promote responsible work MSF-09 team spirit / working atmosphere MSF-02 to train apprentices MSF-03 adequate number of own construction workers MSF-10 to develop regular customers from new customers Long-term CSFs n/a n/a	Short-term CSFs SSF-03 to ensure professional handling of first order (new customer) SSF-01 permanent sales activity SSF-05 continuous incoming orders SSF-19 balanced order structure SSF-09 to develop partnerships with subcontractors Medium-term CSFs MSF-02 to train apprentices MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences Long-term CSFs n/a n/a	Short-term CSFs SSF-01 permanent sales activity SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-14 good interaction between BM and commercial personnel SSF-04 honest internal communication / flow of information Medium-term CSFs MSF-01 bonuses for PMs and CMs MSF-23 reasonable fixed costs in the head office MSF-13 adequate working hours / working environment MSF-17 identification with employer MSF-22 supranational cooperation between branches Long-term CSFs n/a n/a	Short-term CSFs SSF-01 permanent sales activity SSF-05 continuous incoming orders SSF-02 permanent contact person for regular customers SSF-03 to ensure professional handling of first order (new customer) SSF-08 to develop a good reputation Medium-term CSFs MSF-02 to offer perspectives to employees MSF-06 to demand and promote responsible work MSF-08 team spirit / working atmosphere MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences	
Analysis of commercial documents	average annual sales in € 2009-2017: 6.009.144 € average operational gross margin in € 2009-2017: 1.008.535 € average operational gross margin in % to sales 2009-2017: 16,8% average fixed costs in € 2009-2017: 1.110.346 € average fixed costs in % to sales 2009-2017: 18,5% average operational result in € 2009-2017: -101.811 € average operational result in % to sales 2009-2017: -1,7% average order value in €: 95.348 € average number of construction sites per business year: 63	988.446 € 339.020 € 34,3% 444.123 € 44,9% -105.103 € -10,6% 2.849 € 347	3.869.418 € 555.229 € 14,3% 645.522 € 16,7% -90.293 € -2,3% 77.388 € 50	4.472.332 € 1.311.947 € 29,3% 999.048 € 22,3% 312.899 € 7,0% 23.849 € 188	
Process/meeting observations	related to customers - mainly BM's remit - (sales activities, customer acquisition, price calculations, order structure, support of regular customers, ...) related to construction management - mainly PMs/CMs' remit - (behaviour towards subcontractors, quality/contract control, technical handling, billing, ...) related to staff - mainly BM's remit - (internal communication, response on employees' needs, ...) related to decentralised organisation - mainly MDs' remit - (collaboration with MDs and administration departments in the head office, ...)	SSF-05 BM has a weekly target order income = annual target sales / 52 weeks, 2017 SSF-01 new trend: joint tenders with "partner companies" (e.g. electricians, painters, etc.), 2016-present SSF-03 BM is regularly on site, if an order for a new customer is processed (especially in the beginning), personal conversation 2017 SSF-29 minimum margin of 30% in his price calculations, pers. c. 2018 SSF-30 regular customers' everyday contact person with own budget, 2010-present SSF-09 focus on long-term partnerships with subcontractors and "partner companies" (e.g. electricians, painters, etc.), 2016-present SSF-13 PMs focus on timely billing (low billable semi-finished works in billing list), 2016-present SSF-16 PMs are instructed to observe new customers in detail (customer's behaviour during first measurements check), 2016-present SSF-11 PMs are instructed to order all material directly on site, 2016-present SSF-14 major issues in a budget meeting due to weak commercial overview of the former BM, 2014 SSF-24 weekly branch meetings with all PMs/CMs, where all current projects are discussed openly, 2016-present MSF-08 has a feeling for the current atmosphere within his branch and reacts to this atmosphere, 2016-present MSF-13 has set a maximum weekly working time for entire branch's staff, 2017 • BM's succession is not organised so far, present	SSF-01 weekly appointments with possible new customers, pers. c. 2017 SSF-03 BM is regularly on site, if an order for a new customer is processed, personal conversation 2017 SSF-29 minimum margin of 30% in his price calculations, pers. c. 2018 SSF-30 regular customers' everyday contact person with own budget, 2010-present SSF-17 clear instruction to PMs: "no work without written order", 2017 SSF-14 good commercial overview due to good cooperation between technical and commercial staff, 2014-present SSF-24 BM and PMs share a large office to ensure that everybody is well informed about all branch's current sites, 2014-present MSF-05 close contact to young employees in order to illustrate possible careers within the company, 2014-present MSF-22 as customers often are internal here, BM tries to build up a supranational cooperation between branches, 2014-present MSF-09 regular visits of other branches in order to build up trust relationships to other BMs, 2014-present MSF-14 intention to implement a new IT tool, that simplifies the design of insulating pads (online connection betw. site and workshop), 2017	SSF-03 regular customer complains related to quality (several projects in Cologne), 2016-present SSF-02 poor customer service in general - if there are issues (e.g. related to quality), customers are regularly left alone, 2016-present SSF-08 poor reputation, therefore many projects for public authorities (e.g. City of Cologne), 2016-present SSF-30 poor development of new regular customers due to poor customer service, 2016-present SSF-09 poor subcontractor partnerships (some subcontractors do not work for this branch anymore - e.g. "Werkshoer"), 2017-present SSF-14 BM has only poor commercial overview over all branch's projects (annual budget meeting), 2015 SSF-11 regularly additional material orders, as material was forgotten by branch's PM (e.g. windows on project "Aachen"), 2014-present SSF-26 as PMs did not comply with sales technical specifications, a big commercial loss on a site occurred, 2016 SSF-23 PM had to work on vacation, as no representation was organised before (in 2016) SSF-24 two other BMs complain about communication related to a joint project "raised floor in fair building" in Düsseldorf, 2017/18 MSF-07 no trust relationships to "central buying", as BM regularly complains decisions made from head of CB, 2014-present MSF-09 no trust relationships to other BMs as BM often appears unreliable in BMs meetings (e.g. to be all-knowing), 2016-present MSF-22 BM informed another BM about a large construction site of a regular customer in the other BM's territory, 2015 MSF-23 complains about the fixed costs in the head office, 2016-present	SSF-03 focus on high quality processing of construction sites related to technical norm/customer service (e. feedback), 2015-present SSF-02 responsible PM is expected to be always available for her/his regular customers, 2010-present SSF-19 BM tries to acquire a balanced order structure (small projects with h. margins and large ones to reach target sales), annual b.m., 2010-pr. SSF-08 tries to develop a good reputation within his region in order to be an attractive supplier for possible new customers, 2010-present SSF-30 new customers are acquired in order to develop new regular customers out of them in a second step (personal contacts), 2010-pr. SSF-09 long-term partnerships with most subcontractors (sometimes already for several decades), 2010-present SSF-06,07 after acquisition, customers (very often) also order the addendum (orders due to the clearly illustrated technical necessity), 2010-pr. SSF-20 always tries to figure out which PM is the right one for a particular customer (personal conversations with BM), 2010-present SSF-26 as a PM did not comply with sales technical specifications, a big commercial loss on a site occurred, 2012 SSF-23 BM tries to implement a nursery school close to the branch together with neighbouring companies for female employees, pers. c. 2018 MSF-01 demand for bonuses for PMs/CMs in the annual budget meetings, 2010-present MSF-13 emphasises the importance of adequate working hours in order to be an attractive employer (for young people), pers. c. 2018 MSF-02 focus on an annual hiring new apprentices, pers. c. 2018 • BM's succession is not organised so far, present SSF-32 demands partnership behaviour towards subcontractors from head office (e.g. related to payments in time), 2014-present SSF-33 expects more support from the head office related to new topics (e.g. training for a new IT tool), several pers. c. from 2015 MSF-23 complains about the fixed costs in the head office, 2017-present

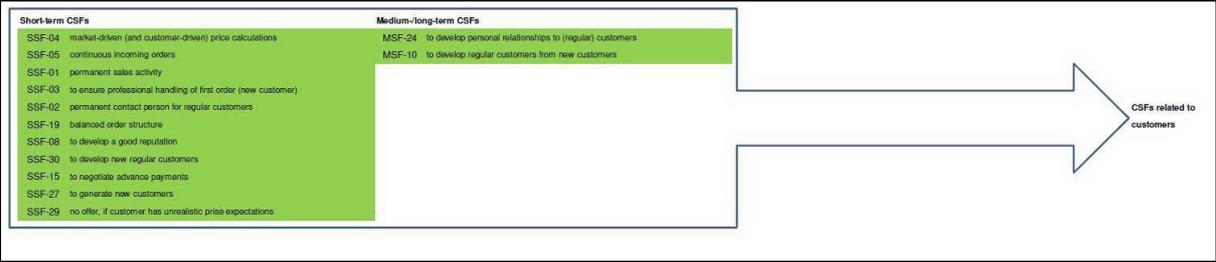
Appendix 15: Summary table of empirical work 4/5

Summary of findings from semi-structured expert interviews, analysis of commercial documents, and process/meeting observations 4/5					
Participant	B5	A7	B6	A6	
Position	BM	BM	BM	BM	
Years in current position	6	25	5	5	
Method	Years of experience >40	>30	>30	>30	
Semi-structured expert interviews	Short-term goals STG-01 to reach target sales STG-02 to reach target profit STG-05 to reduce the fixed costs Medium-term goals MTG-01 to avoid staff turnover MTG-06 to increase proportion of regular customers Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit Medium-term goals MTG-03 to maintain employees' health Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit STG-04 to avoid work accidents Medium-term goals MTG-02 to initiate a regeneration of staff MTG-03 to maintain employees' health Long-term goals n/a n/a	Short-term goals STG-01 to reach target sales STG-02 to reach target profit Medium-term goals MTG-01 to avoid staff turnover MTG-02 to initiate a regeneration of staff Long-term goals n/a n/a	
	Number of short-term goals	3	2	3	
	Number of medium-term goals	2	1	2	
	Number of long-term goals	0	0	0	
	CSFs (internal, external, temporary, hard, soft) that underlie the short-term goals (sorted in descending order by entries)	SSF-09 to develop partnerships with subcontractors SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-32 head office's behaviour towards subcontractors SSF-21 employees' health SSF-33 head office's support on new topics SSF-24 internal communication / flow of information SSF-30 to develop new regular customers SSF-27 to generate new customers SSF-36 quick decisions despite decentralised organisation	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-13 timely billing SSF-02 permanent contact person for regular customers SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-08 to develop a good reputation SSF-16 to observe new customers closely SSF-30 to develop new regular customers SSF-12 fair distribution of sites on PMs SSF-29 no offer, if customer has unrealistic price expectations SSF-10 to test new subcontractors on small sites first SSF-11 to order all material directly on site	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-32 head office's behaviour towards subcontractors SSF-13 timely billing SSF-19 balanced order structure SSF-33 head office's support on new topics SSF-20 right construction site / customer to right PM SSF-08 to develop a good reputation SSF-16 to observe new customers closely SSF-30 to develop new regular customers SSF-14 good interaction between BM and commercial personnel SSF-25 no routine related to work safety SSF-26 to comply with specifications related to work safety SSF-27 to generate new customers SSF-29 no offer, if customer has unrealistic price expectations	SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-03 to ensure professional handling of first order (new customer) SSF-13 timely billing SSF-02 permanent contact person for regular customers SSF-30 to develop new regular customers SSF-14 good interaction between BM and commercial personnel SSF-29 no offer, if customer has unrealistic price expectations
	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	
	CSFs (internal, external, temporary, hard, soft) that underlie the medium-long-term goals (sorted in descending order by entries)	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-04 regular training of PMs and CMs (technical, legal) MSF-07 trust relationship between branches and head office	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-02 to train apprentices MSF-03 adequate number of own construction workers MSF-15 to recruit young employees MSF-16 to recruit new employees (PMs and CMs)	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-17 identification with employee MSF-03 adequate number of own construction workers MSF-15 to recruit young employees MSF-16 to recruit new employees (PMs and CMs)	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-08 team spirit / working atmosphere MSF-04 regular training of PMs and CMs (technical, legal) MSF-06 to demand and promote responsible work MSF-07 trust relationship between branches and head office MSF-21 well-trained staff (PMs, CMs) MSF-22 supranational cooperation between branches MSF-09 trust relationship to other BMs
	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	
	CSFs (internal, external, temporary, hard, soft) that underlie the long-term goals (sorted in descending order by entries)	n/a n/a	n/a n/a	n/a n/a	n/a n/a
	Number of short-term CSFs	10	16	12	10
Number of medium-term CSFs	6	3	8	9	
Number of long-term CSFs	0	0	0	0	
Short-term CSFs	SSF-01 permanent sales activity SSF-05 continuous incoming orders SSF-09 to develop partnerships with subcontractors SSF-30 to develop new regular customers SSF-21 employees' health	SSF-01 permanent sales activity SSF-02 permanent contact person for regular customers SSF-03 to ensure professional handling of first order (new customer) SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders	SSF-04 market-driven (and customer-driven) price calculations SSF-19 balanced order structure SSF-20 right construction site / customer to right PM SSF-16 to observe new customers closely SSF-27 to generate new customers	SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-09 to develop partnerships with subcontractors SSF-13 timely billing SSF-14 good interaction between BM and commercial personnel	
Medium-term CSFs	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-04 regular training of PMs and CMs (technical, legal) MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences	MSF-01 bonuses for PMs and CMs MSF-02 to train apprentices MSF-03 adequate number of own construction workers	MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-03 adequate number of own construction workers MSF-15 to recruit young employees MSF-17 identification with employee	MSF-04 regular training of PMs and CMs (technical, legal) MSF-05 to offer perspectives to employees MSF-01 bonuses for PMs and CMs MSF-07 trust relationship between branches and head office MSF-06 to demand and promote responsible work	
Long-term CSFs	n/a n/a	n/a n/a	n/a n/a	n/a n/a	
Top-5 short-medium-long-term CSFs (sorted in descending order by importance according to participant)	MSF-01 bonuses for PMs and CMs MSF-05 to offer perspectives to employees MSF-04 regular training of PMs and CMs (technical, legal) MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences	MSF-01 bonuses for PMs and CMs MSF-02 to train apprentices MSF-03 adequate number of own construction workers	MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-03 adequate number of own construction workers MSF-15 to recruit young employees MSF-17 identification with employee	MSF-04 regular training of PMs and CMs (technical, legal) MSF-05 to offer perspectives to employees MSF-01 bonuses for PMs and CMs MSF-07 trust relationship between branches and head office MSF-06 to demand and promote responsible work	
Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red		
Analysis of commercial documents	average annual sales in € 2009-2017: 7.652.610 € average operational gross margin in € 2009-2017: 1.540.237 € average operational gross margin in % to sales 2009-2017: 20,1% average fixed costs in € 2009-2017: 1.148.373 € average fixed costs in % to sales 2009-2017: 15,0% average operational result in € 2009-2017: 391.864 € average operational result in % to sales 2009-2017: 5,1% average order value in €: 78.461 € average number of construction sites per business year: 98	average annual sales in € 2009-2017: 4.291.599 € average operational gross margin in € 2009-2017: 1.571.702 € average operational gross margin in % to sales 2009-2017: 36,6% average fixed costs in € 2009-2017: 808.052 € average fixed costs in % to sales 2009-2017: 18,8% average operational result in € 2009-2017: 763.650 € average operational result in % to sales 2009-2017: 17,8% average order value in €: 17.058 € average number of construction sites per business year: 252	average annual sales in € 2009-2017: 17.201.498 € average operational gross margin in € 2009-2017: 4.081.443 € average operational gross margin in % to sales 2009-2017: 23,7% average fixed costs in € 2009-2017: 2.547.458 € average fixed costs in % to sales 2009-2017: 14,8% average operational result in € 2009-2017: 1.533.985 € average operational result in % to sales 2009-2017: 8,9% average order value in €: 180.566 € average number of construction sites per business year: 95	average annual sales in € 2009-2017: 5.846.607 € average operational gross margin in € 2009-2017: 1.449.836 € average operational gross margin in % to sales 2009-2017: 24,8% average fixed costs in € 2009-2017: 1.063.274 € average fixed costs in % to sales 2009-2017: 18,2% average operational result in € 2009-2017: 386.562 € average operational result in % to sales 2009-2017: 6,8% average order value in €: 77.955 € average number of construction sites per business year: 75	
	graph: operational branch results 2009-2017 in € incl. trends				
	related to customers (mainly BM's remit - sales activities, customer acquisition, price calculations, order structure, support of regular customers, ...)	SSF-01 customer alternatives required, when German construction industry came into troubles - short-time work, 2010-2012 SSF-04 focus on customer-driven price calculations ("What is the added value for the customer?"), (e.g. project "Cold-Box", BASF), 2016 SSF-09 PMs are expected to focus on high quality processing of works related to customer service and quality of works conducted, 2014-pr. SSF-27 BM always screens his region for possible new customers - close collaboration with central marketing, 2014-pr. SSF-30 regular customers' everyday contact person with own budget, 2010-present	SSF-19 average order value less than 20.000 € (spread of risks), 2010-present SSF-29 no tenders to potential customers with unrealistic price expectations, 2010-present SSF-30 BM sees each new customer as a potential future regular customer, 2010-present MSF-10 joint visits of football matches with (regular) customers, 2008-present MSF-24 joint visits of football matches with (regular) customers, 2008-present	SSF-01 customer alternatives required, when German construction industry came into troubles - short-time work, 2010-2012 SSF-15 approx. 1/3 of the orders include an advance payment (first position in the entire company), 2015-present SSF-27 focus on the generation of new customers (as old regular customers like RWE invest less in their buildings), 2010-present MSF-24 joint visits of football matches with (regular) customers, 2014-present MSF-25 loss of a regular customer in 2015, after the customer has restructured the entire procurement process	SSF-01 customer alternatives required, when it became known that Opel will be sold - most constr. activ. were stopped in that phase, 2017 SSF-04 focus on detailed and proper price calculations, which relate to the present possible customer and willingness to pay, 2015-pr. SSF-29 minimum margin of 16% in his price calculations, pers. c. 2018 SSF-30 if there are only a limited number of workers (internal/external), a regular customer is always served first, 2015-pr. MSF-10 several examples of regular customers developments (e.g. Conplast, Wuppertal), 2012-present
	related to construction management (mainly PMs/CMs' remit - behaviour towards subcontractors, quality/control/contract, technical handling, billing, ...)	SSF-09 close partnerships with subcontractors, even a joint workshop is run together with a subcontractor, 2015-pr. SSF-25 as major customer BASF focuses on work safety, this branch's focus is also on work safety - a PM specialised on WS issues, 2015-pr. SSF-16 issues related to the bad cooperation between a particular customer and a PM led to additional costs, 2014 SSF-20 experienced PM retired, consequences out of this were issues between new PM and customer's representatives on site, 2012-2014	SSF-06 PMs are expected to identify addendum potentials on each construction site, 2010-present SSF-09 long-term partnerships with most subcontractors (sometimes already for several decades), 2010-present	SSF-09 long-term partnerships with most subcontractors (e.g. Unibau, too-Perfekt, Merkwil), 2010-present SSF-17 reminds his PMs to not accept any order without written order, 2014-present SSF-22 any risks from customer contracts are passed to the subcontractor contract (e.g. deadlines), 2014-present SSF-25 a PM mainly deals with issues related to work safety, 2016-present SSF-06 Project "LYNNPMP": improvement of margins calculated due to the identification/realisation of addendums on site, 2009	SSF-06 several construction sites, on which PMs could improve the originally calculated margin due to addendums, 2014-present SSF-09 long-term partnerships with most subcontractors, 2012-present SSF-20 focus on the choice of the right PM for a new customer (one PM serves RWE only, another one serves Opel only), 2014-present SSF-20 higher margins on a regular customer slides to a new responsible PM, 2013
	related to staff (mainly BM's remit - internal communication, response on employees' needs, ...)	MSF-23 a commercial member of staff was allowed to work half-day in order to take better care of her children, 2016 MSF-01 demand for bonuses for PMs/CMs in the annual budget meetings, 2014-present • BM's succession is not organised so far, present	MSF-01 PMs get bonuses depending on the annual profit, 2010-present MSF-02 annually new apprentices are hired, 2010-present MSF-19 focus on the development of PMs' commercial skills (regular meetings of BM and PMs with commercial topics), 2010-pr. • BM's succession is not organised so far, present	MSF-01 PMs get bonuses depending on the annual profit, 2015-present MSF-05 discusses possible career paths with young employees in order to illustrate in-house perspectives, 2014-present	MSF-12 focus on a fair distribution of sites on all PMs (no advantages or disadvantages for any PM), 2015-present MSF-23 every year, one PM is allowed to take vacation for three weeks in a row, 2017-present MSF-11 every person within the branch is allowed to criticise a colleague, 2015-present MSF-15 currently, there are two PMs under 30 years, from 2016 MSF-17 expects identification with the employer from his PMs, CMs to build up a sustained team within the branch, 2015-present
	related to decentralised organisation (mainly MDs' remit - collaboration with MDs and administration departments in the head office, ...)	SSF-33 expects more support from the head office related to new topics (e.g. training for a new IT tool), pers. c. from 2018	n/a	SSF-31 BM negotiates almost all issues with customers (or subcontractors) on his own in order to avoid lawsuits, 2016-present SSF-32 demands partnership behaviour towards subcontractors from head office (e.g. related to payments in time), 2015-present	MSF-09 organises regular smaller BM meetings with selected BMs to discuss (technical, etc.) issues in a small group, 2016-present MSF-22 cooperations with the branch in Koblenz related to the sale of doors (a technical complicated topic), 2016-present
	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red	

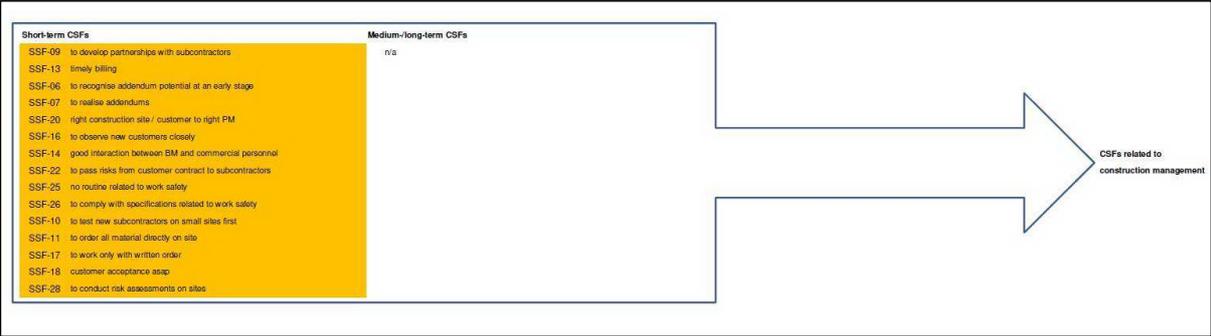
Appendix 15: Summary table of empirical work 5/5

Summary of findings from semi-structured expert interviews, analysis of commercial documents, and process/meeting observations 5/5						
Participant	C3	D1	A9	B7		
Position	BM	QM	MD	MD		
Years in current position	9	6	3	5		
Method	Description	Years of experience	>20	>20	>30	>30
Semi-structured expert interviews	Short-term goals (sorted in descending order by entries)	<ul style="list-style-type: none"> STG-01 to reach target sales STG-02 to reach target profit RTGL03 to avoid project with negative margin 	<ul style="list-style-type: none"> to ensure all required certificates (related to work safety / quality) 	<ul style="list-style-type: none"> to maximise sales and profit to identify deviations from target figures (sales / margin) at an early stage 	<ul style="list-style-type: none"> to maximise sales and profit to maximise customer satisfaction related to quality / adherence to schedules to identify deviations from target figures (sales / margin) at an early stage 	
	Medium-term goals (sorted in descending order by entries)	<ul style="list-style-type: none"> MTG-01 to avoid staff turnover MTG-04 to maintain employees' motivation 	<ul style="list-style-type: none"> to optimise the cooperation between branches and head office to implement new IT tools (related to supply chain / subcontractor management) 	<ul style="list-style-type: none"> to build up a "central sales" department 	<ul style="list-style-type: none"> to generate new customers / regular customers to generate additional in-house "subcontractors" in other European countries to promote work safety 	
	Long-term goals	n/a	<ul style="list-style-type: none"> to introduce new certificates 	n/a	<ul style="list-style-type: none"> to counteract the shortage of skilled workers 	
	Number of short-term goals	3	3	1	2	
	Number of medium-term goals	2	2	2	1	
	Number of long-term goals	0	1	0	1	
	CSFs (internal, external, temporary, hard, soft) that underlie the short-term goals (sorted in descending order by entries)	<ul style="list-style-type: none"> SSF-09 to develop partnerships with subcontractors SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-01 permanent sales activity SSF-02 permanent contact person for regular customers SSF-06 to recognise addendum potential at an early stage SSF-07 to realise addendums SSF-20 right construction site / customer to right PM 	n/a	<ul style="list-style-type: none"> to be aware of the single strengths and weaknesses of all branches to appreciate BMs' strengths critically to monitor and work on BMs' weaknesses to know all critical construction sites from a certain size of all BMs to know critical customers (personally) to be aware of critical customers' payment history 	<ul style="list-style-type: none"> to be aware of the strengths and weaknesses of all BMs to appreciate BMs' strengths critically to monitor and work on BMs' weaknesses to know current figures (sales / margins) of all BMs in detail to know all critical construction sites from a certain size of all BMs to show presence in critical branches on a regular basis to know critical customers (personally) to be a contact person for all employees to be aware of critical customers' payment history 	
	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red					
	CSFs (internal, external, temporary, hard, soft) that underlie the medium-long-term goals (sorted in descending order by entries)	<ul style="list-style-type: none"> MSF-01 bonuses for PMs and CMs MSF-11 internal feedback culture MSF-08 team spirit / working atmosphere MSF-12 internal transparency / clearly formulated and communicated competences MSF-13 adequate working hours, working environment MSF-04 regular training of PMs and CMs (technical, legal) MSF-03 adequate number of own construction workers MSF-06 to demand and promote responsible work 	n/a	<ul style="list-style-type: none"> the mentioned goal is limited to the organisation to be studied 	<ul style="list-style-type: none"> an effective support for the BMs from the central sales department the other mentioned goals are limited to the organisation to be studied 	
	Customer-related: green Construction management-related: orange Staff-related: blue Decentralised organisation-related: yellow External: red					
CSFs (internal, external, temporary, hard, soft) that underlie the long-term goals (sorted in descending order by entries)	n/a	n/a	<ul style="list-style-type: none"> the mentioned goal is limited to the organisation to be studied 	<ul style="list-style-type: none"> to be present at school graduate fairs equivalent with medium-term CSFs of participants (BMs) 		
Number of short-term CSFs	8	n/a	n/a	0		
Number of medium-term CSFs	8	n/a	n/a	n/a		
Number of long-term CSFs	0	n/a	n/a	several		
Top-5 short-medium-long-term CSFs (sorted in descending order by importance according to participant)	<ul style="list-style-type: none"> Short-term CSFs <ul style="list-style-type: none"> SSF-01 permanent sales activity SSF-04 market-driven (and customer-driven) price calculations SSF-05 continuous incoming orders SSF-20 right construction site / customer to right PM SSF-09 to develop partnerships with subcontractors Medium-term CSFs <ul style="list-style-type: none"> MSF-01 bonuses for PMs and CMs MSF-11 internal feedback culture MSF-12 internal transparency / clearly formulated and communicated competences MSF-08 team spirit / working atmosphere MSF-06 to demand and promote responsible work Long-term CSFs <ul style="list-style-type: none"> n/a 	<ul style="list-style-type: none"> Short-term CSFs <ul style="list-style-type: none"> n/a Medium-term CSFs <ul style="list-style-type: none"> n/a Long-term CSFs <ul style="list-style-type: none"> n/a 	<ul style="list-style-type: none"> Short-term CSFs <ol style="list-style-type: none"> to know all critical construction sites from a certain size of all BMs to be aware of critical customers' payment history to monitor and work on BMs' weaknesses to know critical customers (personally) to be aware of the single strengths and weaknesses of all branches Medium-term CSFs <ul style="list-style-type: none"> the mentioned goal is limited to the organisation to be studied Long-term CSFs <ul style="list-style-type: none"> n/a 	<ul style="list-style-type: none"> Short-term CSFs <ol style="list-style-type: none"> to be aware of the strengths and weaknesses of all BMs to know current figures (sales / margins) of all BMs in detail to be a contact person for all employees to show presence in critical branches on a regular basis to know critical customers (personally) Medium-term CSFs <ol style="list-style-type: none"> an effective support for the BMs from "central sales" Long-term CSFs <ol style="list-style-type: none"> employees' satisfaction, 2. employer reputation, 3. promotion of young talents 		
Analysis of commercial documents	average annual sales in € 2009-2017	2.705.856 €	n/a	55.690.077 €	44.533.892 €	
	average operational gross margin in € 2009-2017	657.716 €	n/a	11.058.256 €	9.849.333 €	
	average operational gross margin in % to sales 2009-2017	24,3%	n/a	19,9%	22,1%	
	average fixed costs in € 2009-2017	511.358 €	n/a	11.181.930 €	7.601.269 €	
	average fixed costs in % to sales 2009-2017	18,9%	n/a	20,1%	17,1%	
	average operational result in € 2009-2017	146.358 €	n/a	-123.674 €	2.248.064 €	
	average operational result in % to sales 2009-2017	5,4%	n/a	-0,2%	5,0%	
	average order value in €	25.852 €	n/a	55.246 €	50.575 €	
	average number of construction sites per business year	105	n/a	1.008	881	
	graph: operational branch results 2009-2017 in € incl. trendline		n/a			
Process/meeting observations	related to customers - mainly BMs' remit (sales activities, customer acquisition, price calculations, order structures, support of regular customers, ...)	<ul style="list-style-type: none"> SSF-03 focus on professional handling of construction sites (always focus on service and expertise), 2010-present SSF-08 focus on a good reputation of his branch in order to generate loyal regular customers (through expertise and services), 2010-pr. SSF-19 balanced order structure (approx. 25.000 € average order value) in order to spread the risks, 2010-present customer in-house trainings related to new norms and technical specifications MSF-24 regular customers' everyday contact person with own budget, 2012-present SSF-30 	n/a	<ul style="list-style-type: none"> SSF-04 focus on the control of BMs' price calculations (in Merix), 2015-pr. offensive regarding the use of the legal department, which sometimes led to customer's mistrust (e.g. project "Porsche", 2018) MSF-24 leaves the task of developing personal relationships to customers mainly to the BMs (generally rarely on cust. appointments), 2015-pr. 	<ul style="list-style-type: none"> focus on personal relationships to all key customers (regular personal visits), (e.g. Bayer, BASF, DOW, RWE, Vattenfall), 2013-present focus on permanent sales activity - also forced by "central sales", which was founded by participant B7, 2015 SSF-15 expects BMs' to negotiate advance payments whenever possible (installation of Excel tool related to advance payments), 2014-present 	
	related to construction management - mainly PMs/CMs' remit (behaviour towards subcontractors, quality/cost/result control, technical handling, billing, ...)	<ul style="list-style-type: none"> SSF-09 long-term partnerships with most subcontractors, 2012-present SSF-13 focus on timely billing (low billable semi-finished works in billing list), 2014-present SSF-20 focus on the choice of the right PM for a new customer (in 2016, it was expected that a PM moved to another city to be close to a new cust.) 	n/a	<ul style="list-style-type: none"> SSF-13 encourages BMs to a timely billing (installation of billing list), 2015-present expects legal knowledge from BMs, PMs, CMs in order to be well prepared for possible lawsuits with customers (e.g. site "Gering-Quartier", Cologne, 2016) 	<ul style="list-style-type: none"> focus on a clear flow of information from sites to managers (management system), 2015-present SSF-06,9 expects all BMs, PMs, and CMs to identify addendum potential at an early stage (e.g. project "LYNN-PM7" in 2009) encourages BMs to a timely billing (installation of billing list), 2015-present SSF-25,28 focus on work safety, support QM at any time (e.g. BM meetings always also related to work safety), 2014-present 	
	related to staff - mainly BMs' remit (internal communication, responsiveness on employees' needs, ...)	<ul style="list-style-type: none"> SSF-23 every year, one PM is allowed to take vacation for three weeks in a row, from 2018 MSF-02 takes the training of apprentices seriously (regular meetings with apprentices to ask for possible apprentices' issues), 2014-present often searches for students as interns with the ulterior motive to find future employees, 2015-present MSF-15 expects identification with the employer from his PMs, CMs to build up a sustained team within the branch, 2010-present MSF-17 	n/a	<ul style="list-style-type: none"> SSF-23 poor responsiveness on employees' private needs (e.g. vacation requests of a PM in summer of 2017) sometimes a tough behaviour towards employees (e.g. salary request of a PM in 2018) MSF-04 focus on the organisation of regular trainings for BMs, PMs, CMs related to legal and/or technical issues, 2015-present 	<ul style="list-style-type: none"> focus on long-term HR development incl. promoting young talents and perspectives for (young) employees, 2014-present expects every branch to train apprentices, 2014-present support for HR development related to the acquisition of apprentices (e.g. installation of a workshop for training purposes), 2015-present tries to take into account employees' private needs (e.g. need for a special company car due to children), 2015-present 	
	related to decentralised organisation - mainly MDR's remit (collaboration with MDs and administration departments in the head office, ...)	<ul style="list-style-type: none"> MSF-09 well connected with other BMs - if there is an technical issue, he asks other BMs to get a solution, 2012-present MSF-20 focus on the compliance of all internal specifications within the internal management system, 2016-present 	n/a	<ul style="list-style-type: none"> SSF-31 includes the central legal department in many questions / issues (e.g. project "Porsche" in 2018) SSF-32 encourages head office to a tough handling of subcontractors (e.g. subcontractor "AS Baueinge" in Hamburg in 2016) SSF-36 usually no quick decisions, as A9 tries to include legal department in many decision-making processes (contract Dämmer in 2016/17) 	<ul style="list-style-type: none"> focus on collaboration between BMs and the central marketing department (e.g. monthly meetings with the central marketing), 2015-present SSF-31 sees the legal office and therefore lawsuits as the last possible option (especially related to regular customers), 2015-present expects a partnership behaviour from head office towards all subcontractors (e.g. related to payments in time), 2015-present support of the installation of the management system in 2016, which aims at optimising all processes between branches and head office MSF-18 	

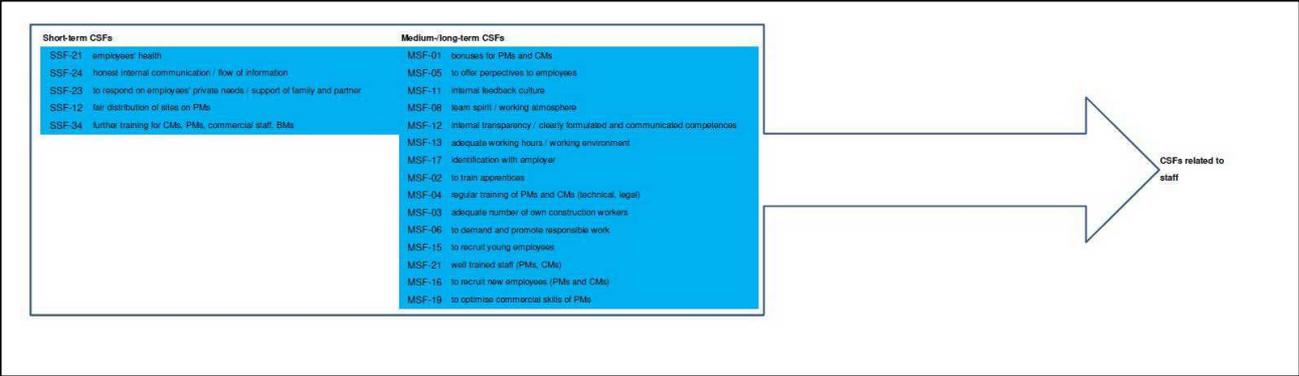
Appendix 16: Customer related CSFs



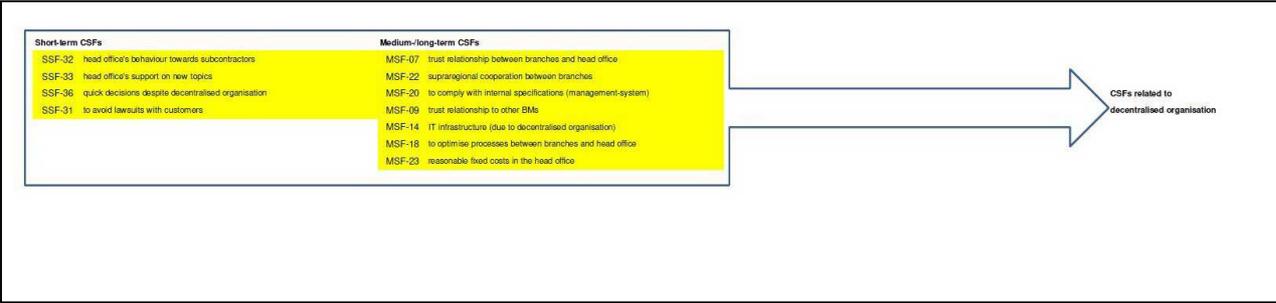
Appendix 17: Construction management related CSFs



Appendix 18: Staff related CSFs



Appendix 19: Decentralised organisation related CSFs



Appendix 20: External CSFs



Appendix 21: Top 5 CSFs for PMs, BMs, and MDs

PMs		
Customer-related CSFs	Construction management-related CSFs	Staff-related CSFs
SSF-01 permanent sales activity	SSF-09 to develop partnerships with subcontractors	SSF-21 employees' health
SSF-03 to ensure professional handling of first order (new customer)	SSF-13 timely billing	SSF-24 honest internal communication / flow of information
SSF-02 permanent contact person for regular customers	SSF-06 to recognise addendum potential at an early stage	SSF-23 to respond on employees' private needs / support of family and partner
SSF-08 to develop a good reputation	SSF-07 to realise addendums	MSF-05 to offer perspectives to employees
MSF-24 to develop personal relationships to (regular) customers	SSF-16 to observe new customers closely	MSF-11 internal feedback culture
BMs		
Customer-related CSFs	Staff-related CSFs	Construction management-related CSFs
MSF-24 to develop personal relationships to (regular) customers	MSF-01 bonuses for PMs and CMs	SSF-09 to develop partnerships with subcontractors
MSF-10 to develop regular customers from new customers	MSF-05 to offer perspectives to employees	SSF-20 right construction site / customer to right PM
SSF-04 market-driven (and customer-driven) price calculations	MSF-08 team spirit / working atmosphere	SSF-16 to observe new customers closely
SSF-05 continuous incoming orders	MSF-12 internal transparency / clearly formulated and communicated competences	SSF-14 good interaction between BM and commercial personnel
SSF-01 permanent sales activity	MSF-06 to demand and promote responsible work	SSF-22 to pass risks from customer contract to subcontractors
MDs		
Customer-related CSFs	Staff-related CSFs	Decentralised organisation-related
SSF-05 continuous incoming orders	MSF-11 internal feedback culture	MSF-07 trust relationship between branches and head office
SSF-01 permanent sales activity	MSF-12 internal transparency / clearly formulated and communicated competences	MSF-22 supraregional cooperation between branches
SSF-19 balanced order structure	MSF-17 identification with employer	MSF-20 to comply with internal specifications (management-system)
SSF-08 to develop a good reputation	MSF-06 to demand and promote responsible work	MSF-18 to optimise processes between branches and head office
SSF-30 to develop new regular customers	SSF-24 honest internal communication / flow of information	SSF-32 head office's behaviour towards subcontractors

Appendix 22: Exemplary MAS for PMs

MAS for PMs - June 2018

to achieve the intended annual turnover, margin, and operational result

sales, margin, result

	January	February	March	April	May	June	July	August	September	October	November	December	total
target sales (K€)	142	142	142	142	142	142	142	142	142	142	142	142	1.700
actual sales (K€)	133	137	154	169	153	149	142	142	142	142	142	142	1.748
target margin (K€)	33	33	33	33	33	33	33	33	33	33	33	33	391
target margin (%)	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%
actual margin (K€)	33	32	38	42	33	37	33	33	33	33	33	33	412
actual margin (%)	24,6%	23,6%	24,6%	24,8%	21,4%	24,8%	23,2%	23,2%	23,2%	23,2%	23,2%	23,2%	23,6%

Top-5 construction sites (according to order value)

site	order v. (K€)	a. costs (K€)	costs (%)	con. phase	difference	pos. of acc.	diff. c. (K€)
Bayer AG	450	158	35,1%	50,0%	-14,9%	170	-12
RWE GmbH	250	123	49,2%	30,0%	19,2%	140	-17
BASF AG	100	72	72,0%	65,0%	7,0%	50	22
Meier GmbH	50	40	80,0%	90,0%	-10,0%	25	15
Zoth AG	40	27	67,5%	50,0%	17,5%	2	25

Top-5 invoices due (according to amount)

customer	inv. tot. (K€)	due date
Bayer AG	170	10 d. ago
RWE GmbH	85	5 d. ago
BASF AG	50	20 d. ago
Meier GmbH	25	1 d. ago
Zoth AG	2	2 d. ago

realisation of addendums

	January	February	March	April	May	June	July	August	September	October	November	December	total
target addendums (K€)	15	15	15	15	15	15	15	15	15	15	15	15	180
actual addendums (K€)	0	11	22	30	15	40	15	15	15	15	15	15	208
difference (K€)	-15	-4	7	15	0	25	0	0	0	0	0	0	28

work safety

business year	mx. work ac.	ac. work ac.	diff.
2015	2	3	1
2016	2	1	-1
2017	2	0	-2
2018	2	0	-2

to develop successors for CMs

candidate	techn. grade	econ. grade	specf. grade	soft sk. gr.	team-spi. gr.	transpa. gr.	comm. gr.	work sf. gr.	cu. feed. gr.	rel. gr.	reput. gr.	motiv. gr.	total avr. gr.
construction worker Miller	3	3	1	2	2	1	3	2	1	1	3	3	2,1
construction worker Müller	2	2	3	4	1	2	1	3	5	2	3	1	2,4

to improve the liquidity position

timely billing

	max. pref. (90 days)	act. pref.	diff.
January	279	120	-159
February	279	165	-114
March	279	201	-78
April	279	280	1
May	279	306	27
June	279	315	36
July	279		
August	279		
September	279		
October	279		
November	279		
December	279		

to increase future profits

development of a good reputation

Top-5 customers (according to sales)

	sales (K€)	cust. gr.
Bayer AG	250	2,5
RWE GmbH	200	1,7
BASF AG	150	1,9
Meier GmbH	100	2,0
Zoth AG	50	1,7

development of personal relationships to (regular) customers

Top-5 customers (according to sales)

	sales (K€)	cust. event
Bayer AG	250	BBQ in branch, 01/03/18
RWE GmbH	200	n/a
BASF AG	150	Oktoberfest, 30/09/18
Meier GmbH	100	tennis tournament, 24/11/18
Zoth AG	50	football match, 25/08/18

partnerships with subcontractors

business year	total PM's turnover with subc. (K€)	turnover with long-term subc. (K€) (long-term => > 3 years)	turnover with long-term subc. (%) (long-term => > 3 years)
2015	680	156	23%
2016	697	279	40%
2017	765	421	55%
2018	697	481	69%

Appendix 23: Exemplary MAS for BMs

MAS for BMs - June 2018

to achieve the intended annual turnover, margin, and operational result
sales, margin, result

	January	February	March	April	May	June	July	August	September	October	November	December	total
target sales (KE)	542	542	542	542	542	542	542	542	542	542	542	542	6.500
actual sales (KE)	509	525	590	645	585	570	542	542	542	542	542	542	6.676
target margin (KE)	125	125	125	125	125	125	125	125	125	125	125	125	1.495
target margin (%)	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%
actual margin (KE)	125	124	145	160	125	140	125	125	125	125	125	125	1.569
actual margin (%)	24,6%	23,6%	24,6%	24,8%	21,4%	24,6%	23%	23%	23%	23%	23%	23%	23,5%
target fixed costs (KE)	87	87	87	87	87	87	87	87	87	87	87	87	1.040
target fixed costs (%)	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%
actual fixed costs (KE)	90	95	82	82	83	81	87	87	87	87	87	87	1.035
actual fixed costs (%)	17,7%	18,1%	13,9%	12,7%	14,2%	14,2%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	15,5%
target result (KE)	38	38	38	38	38	38	38	38	38	38	38	38	455
target result (%)	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
actual result (KE)	35	29	63	78	42	59	38	38	38	38	38	38	534
actual result (%)	6,9%	5,5%	10,7%	12,1%	7,2%	10,4%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	8,0%

market- and customer-driven price calculations // continuous incoming orders

	January	February	March	April	May	June	July	August	September	October	November	December	total
target total amount of quotes (KE)	5.417	5.417	5.417	5.417	5.417	5.417	5.417	5.417	5.417	5.417	5.417	5.417	65.000
actual total amount of quotes (KE)	4.581	5.023	6.459	6.001	5.852	6.489	5.417	5.417	5.417	5.417	5.417	5.417	66.905
target number of quotes	54	54	54	54	54	54	54	54	54	54	54	54	650
actual number of quotes	45	54	57	56	60	51	54	54	54	54	54	54	647
target hit rate (%)	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%
actual hit rate (%)	10,2%	10,5%	12,1%	5,9%	7,7%	8,9%	10,0%	10,0%	10,0%	10%	10%	10%	9,6%
target incoming orders (KE)	542	542	542	542	542	542	542	542	542	542	542	542	6.500
actual incoming orders (KE)	467	525	780	356	450	577	542	542	542	542	542	542	6.407

to develop successors for PMs

candidate	techn. grade	econ. grade	specif. grade	soft sk. gr.	team-spi. gr.	transpa. gr.	comm. gr.	work st. gr.	cu. feed. gr.	rel. gr.	reput. gr.	motiv. gr.	total avr. gr.
CM Grünwald	3	3	1	2	2	1	3	2	1	1	3	3	2,1
CM Noecker	2	2	3	4	1	2	1	3	5	2	3	1	2,4
CM Miller	2	5	4	1	3	4	2	4	2	4	2	1	2,8
CM Ralfath	1	3	2	4	5	6	3	2	1	4	5	1	3,1
CM Rossenbach	4	3	4	3	4	1	2	3	5	4	1	4	3,2
CM Ribinski	3	2	3	1	1	1	2	4	1	2	1	2	1,9

to improve the liquidity position

	target maximum prefinancing (KE) <small>(work in progress + bills outstanding)</small>	actual prefinancing (KE) <small>(work in progress + bills outstanding)</small>	difference (KE)
January	1.300	1.423	123
February	1.300	1.220	-80
March	1.300	1.341	41
April	1.300	1.125	-175
May	1.300	1.103	-197
June	1.300	1.002	-298
July	1.300		
August	1.300		
September	1.300		
October	1.300		
November	1.300		
December	1.300		

to increase future profits

development of personal relationships to (regular) customers

Customer	annual sales (KE)	customer event
Miller Ltd.	1.000	football match, 25/05/18
Bowm Ltd.	750	BBO in branch, 01/03/18
Obama Ltd.	500	n/a
BP Ltd.	200	Oktoberfest, 30/09/18
AIG Ltd.	200	tennis tournament, 24/11/18

development of new customers

business year	number of new customers	sales with new customers (KE)	average sales with new customers (KE)
2015	5	51	10
2016	5	71	14
2017	4	40	10
2018	6	75	13

development of regular customers from new customers

business year	sales (KE)	sales with regular c. (KE)	sales with regular c. (%)
2015	6.244	1.998	32%
2016	6.258	2.566	41%
2017	6.314	2.841	45%
2018	6.432	3.216	50%

bonuses for PMs/CMs

PMs/CMs	target bonus (KE)	actual bonus (KE)	difference
PM Müller	20	18	-2
PM Meier	20	14	-6
PM Kettner	30	28	-2
PM Becker	25	32	7

partnerships with subcontractors

business year	total branch's turnover with subc. (KE)	turnover with long-term subc. (KE) <small>(long term = > 3 years)</small>	turnover with long-term subc. (%) <small>(long term = > 3 years)</small>
2015	2.498	574	23%
2016	2.503	1.001	40%
2017	2.526	1.389	55%
2018	2.573	1.775	69%

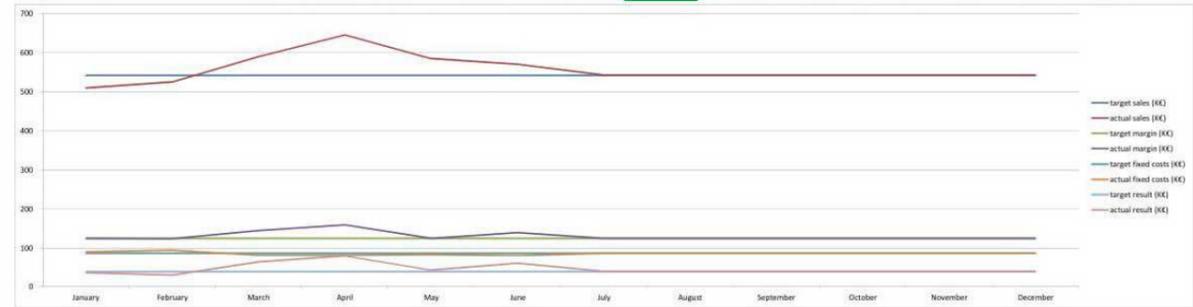
Appendix 24: Exemplary MAS for MDs

MAS for MDs - June 2018

to achieve the intended annual turnover, margin, and operational result

sales, margin, result

	January	February	March	April	May	June	July	August	September	October	November	December	total
target sales (KE)	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
actual sales (KE)	4,726	4,923	5,139	5,268	5,378	6,122	5,000	5,000	5,000	5,000	5,000	5,000	61,556
target margin (KE)	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	13,800
actual margin (KE)	987	999	1,021	1,157	1,258	1,289	1,150	1,150	1,150	1,150	1,150	1,150	13,611
target margin (%)	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%
actual margin (%)	20,9%	20,3%	19,9%	22,0%	23,4%	21,1%	23,0%	23,0%	23,0%	23,0%	23,0%	23,0%	22,1%
target fixed costs (KE)	800	800	800	800	800	800	800	800	800	800	800	800	9,600
actual fixed costs (KE)	790	795	812	788	805	811	800	800	800	800	800	800	9,601
target fixed costs (%)	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%	16,0%
actual fixed costs (%)	16,7%	16,1%	15,8%	15,0%	15,0%	13,2%	0	0	0	0	0	0	15,6%
target result (KE)	350	350	350	350	350	350	350	350	350	350	350	350	4,200
actual result (KE)	197	204	209	369	453	478	350	350	350	350	350	350	4,010
target result (%)	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
actual result (%)	4,2%	4,1%	4,1%	7,0%	8,4%	7,8%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	6,5%



market- and customer-driven price calculations // continuous incoming orders

	January	February	March	April	May	June	July	August	September	October	November	December	total
target total amount of quotes (KE)	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
actual total amount of quotes (KE)	45,851	50,021	64,523	60,024	58,501	64,813	50,000	50,000	50,000	50,000	50,000	50,000	643,733
target number of quotes	500	500	500	500	500	500	500	500	500	500	500	500	6,000
actual number of quotes	40	49	66	55	585	648	500	500	500	500	500	500	4,443
target hit rate (%)	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%
actual hit rate (%)	10,2%	10,5%	12,1%	5,9%	7,7%	8,9%	10,0%	10,0%	10,0%	10,0%	10,0%	10,0%	9,6%
target incoming orders (KE)	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
actual incoming orders (KE)	4,672	5,253	7,801	3,560	4,501	5,779	5,000	5,000	5,000	5,000	5,000	5,000	61,566

balanced order structure

(see far acquired in current business year)

	branch 1	branch 2	branch 3	branch 4	branch 5	branch 6	branch 7	branch 8	branch 9	branch 10
orders betw. 1 and 20 KE	10	8	9	3	12	13	15	11	12	9
orders betw. 20 and 100 KE	8	6	4	2	4	9	5	3	3	3
orders betw. 100 and 250 KE	2	3	5	3	2	1	1	2	2	1
orders betw. 250 and 500 KE	1	0	1	2	2	1	3	1	1	2
orders above 500 KE	1	2	2	1	2	1	3	4	5	1
sum of orders	22	19	21	11	22	25	27	21	23	16

to develop successors for BMs

candidate	techn. grade	econ. grade	specf. grade	soft sk. gr.	team-spi. gr.	transpa. gr.	comm. gr.	work sf. gr.	cu. feed. gr.	rel. gr.	reput. gr.	motiv. gr.	total avr. gr.
PM Palfraith	3	3	1	2	2	1	3	2	1	1	3	3	2,1
PM Meier	2	2	3	4	1	2	1	3	5	2	3	1	2,4

to improve the liquidity position

	target maximum prefinancing (KE) (work in progress + bills outstanding)	actual prefinancing (KE) (work in progress + bills outstanding)	difference (KE)
January	12,000	14,234	2,234
February	12,000	12,221	221
March	12,000	13,410	1,410
April	12,000	11,257	-743
May	12,000	11,033	-967
June	12,000	10,028	-1,972
July	12,000		
August	12,000		
September	12,000		
October	12,000		
November	12,000		
December	12,000		

to increase future profits

development of new customers

business year	number of new customers	sales with new customers (KE)	average sales with new customers (KE)
2015	50	512	10
2016	49	713	15
2017	42	398	9
2018	51	752	15

to develop regular customers from new customers

business year	sales (KE)	sales with regular c. (KE)	sales with regular c. (%)
2015	62,440	19,981	32,0%
2016	62,589	25,661	41,0%
2017	63,145	28,415	45,0%
2018	64,323	32,162	50,0%

superregional cooperation between branches

business year	sales (KE)	internal sales betw. branches (KE)	internal sales betw. branches (%)
2015	58,791	2,646	4,5%
2016	59,723	2,449	4,1%
2017	60,148	3,007	5,0%
2018	61,556	3,570	5,8%

partnerships with subcontractors

business year	total branch's turnover with subc. (KE)	turnover with long-term subc. (KE) (long-term => > 3 years)	turnover with long-term subc. (%) (long-term => > 3 years)
2015	24,976	5,744	23%
2016	25,036	10,014	40%
2017	25,258	13,892	55%
2018	25,729	17,753	69%

bonuses for BMs / PMs / CMs

branch	target bonus (KE)	actual bonus (KE)	difference
branch 1	200	181	-19
branch 2	200	142	-58
branch 3	300	282	-18
branch 4	250	321	71
branch 5	250	321	71
branch 6	250	178	-72
branch 7	250	287	37
branch 8	275	259	-16
branch 9	250	247	-3
branch 10	300	297	-3