CRM Success through Enhancing the Project Management Approach

A Factor-Based Approach

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BRIXCRM

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MASTER'S THESIS

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Thomas Raaijen

Abstract

Currently, the success rates of Customer Relationship Management (CRM) implementation are considered below any threshold. Approximately 70 percent of the businesses chose to invest in CRM have experienced a shortfall in improvement. Therefore, it should not come as a surprise that these discouraging findings have questioned the CRM performance nexus. The emergence of CRM has shown to be an elusive phenomena to study in research. The main issue that contributed to the stumbling of CRM is the inability of the field to formulate a consistent conceptualization of CRM. Furthermore, the field has seen some confusion about what is constituted in CRM. The significance is that CRM is much more than IT. Moreover, there is an abundance of important considerations to make due to the multi-disciplinary nature of CRM as a research topic. To that extent, the current experience-based approach to the research of CRM implementation is inadequate to account for the variety of considerations.

The focus of this research is to design a project management approach that provides needed guidance for CRM system implementation to be regarded as successful. Such an approach is motivated by the need of organizations to plan and monitor the CRM implementation in a way that integrates the high-level overview of the project and the detailed reporting of project progress. This research is important in two ways. First, it has a high practical relevance. The number of companies that will focus on the customer needs as an opportunity to enhance business value is predicted to rise significantly in the years to come. This trend emerges due to the large-scale collection of customer data that incurs the opportunity for businesses to improve the service proposition. However, CRM implementation failures show that the field is pressured to pinpoint how to appropriately approach CRM implementations. The availability of a methodology that is able to address the multi-disciplinary nature of CRM will be useful to take away the pains that CRM implementation is confronted with. Second, this research is beneficial to the theory building in a troubled research field of CRM and especially in connecting the theoretical background to the field with the area of managing the implementation initiatives, an area in which a plethora of ideas exists.

The research approach applied includes the Design Science Research Methodology as the guiding research method. In addition, the Grounded Theory Literature Review Method and the Information System Design Theory are applied to respectively review the heretofore literature and thus gather requirements for successful CRM implementation as well as empirically validating the findings in a case study at BrixCRM. To that end, the case study further improves the theoretical relevance of this thesis since there is a towering need of case studies in the field of CRM. An approach to CRM implementation is proposed based on the findings of the literature review about CRM, CRM implementation and the associated factors as well as on the findings of the case study in which five companies were implementing CRM in partnership with BrixCRM. The proposed factor-based approach to CRM implementation, the "consultancy guide", concentrates on the measurement of factor importance. In addition to the theoretical findings, a toolbox of project management controls are proposed which includes instruments such as the Project Initiation Document, the Business Model Canvas and a dashboard for monitoring the performance of implementation initiatives.

The main conclusions are that the consultancy guide accompanied with the toolbox can, in fact, be useful to companies that seek to implement CRM. The case studies showed that the consultancy guide can, in fact, predict the importance of 80% of implementation success factors which is found to provide relevant and understandable lightweight guidelines which can be used on voluntary basis. Therefore, it is recommended for practitioners to cherry-pick the guidelines that suit their needs. If the consultancy guide is followed, the proof-of-concept can be used to create awareness about the topics that do add value to the CRM implementation. The validation was done by interviewing project managers and consultants at BrixCRM. This might have injected some subjectivity bias into the results. Future research is suggested to include experts employed at other companies and other disciplines. The inclusion of more perspectives strengthens the validity of the results. In turn, the theoretical and practical relevance of this research will also improve.

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List of Acronyms

AI²M	Agile Incremental Implementation Methodology
B2B	Business-to-Business
BMC	Business Model Canvas
CBT	Common bond theory
CPM	Critical Path Method
CRM	Customer Relationship Management
CSF	Critical Success Factor
CX	Customer Experience
DBMS	Database Management System
DSRM	Design Science Research Methodology
e-CRM	Electronic Customer Relationship Management
ERP	Enterprise Resource Planning
EPR	End Project Report
FSM	Formal System Model
GPL	General Public License
GNU	GNU's Not Unix
GTLRM	Grounded Theory Literature Review Methodology
HR	Human Resources
IDT	Innovation Diffusion Theory
IS	Information System
ISDT	Information System Design Theory
ISSM	Information System Success Model
IT	Information Technology
KPI	Key Performance Indicator
LLR	Lessons Learned Report
MA	Marketing Automation
MOC	Matrix Of Change
OS	Operating System
PCC	Pearson's Correlation Coefficient
PDCA	Plan, Do, Check, and Act
PERT	Program Evaluation and Review Technique
PID	Project Initiation Document
PMBOK	Project Management Body Of Knowledge
POC	Proof-Of-Concept
PRINCE	Projects In Controlled Environments
SAAS	Software-As-A-Service
SFA	Sales Force Automation
SJR	SCImago Journal Ranking
SME	Small and Medium Sized Enterprise
SNIP	Source Normalized Impact per Paper
SRC	Spearman's Rank-order Correlation
SSE	Sum of Squared Error
TAM	Technology Acceptance Model
TTF	Task-Technology Fit
TTM	Time To Market
UTAUT	Unified Theory of Acceptance and Use of Technology

1. Introduction

The field of CRM has accumulated considerable attention in the last few years. Companies and other institutions show an increasing interest in the usage of CRM systems for them to understand their customers and tailor their services to match the needs of the customer on individual level. However, the implementation of these CRM systems has shown to be rather complex in nature and have resulted in many implementation initiatives to fail. This research aims to design a project management approach that provides needed guidance for CRM system implementation to be regarded as successful. This chapter provides an overview of the context and motivation to this research, as well as a description of the research methodology and structure of this thesis.

1.1 Research context

In this digital age, Information Technology (IT) became increasingly ubiquitous in the fabric of our daily lives. Furthermore, IT has played a critical role in redesigning business processes and to that extent, practitioners have been capable to align IT and the business domain in the recent years. Especially data has accumulated interest, because it serves as a tool for businesses to understand their customers even better (Chen & Storey, 2012) by pinpointing the how and when of customer interactions. In the earlier days of the advancing IT, businesses were aiming to improve internal efficiencies by the implementation of Enterprise Resource Planning (ERP) systems. ERP systems enables businesses to plan on the elusive demand of customers and to that extent improve the efficiency of its business functions as well as reducing its Time To Market (TTM). Recently, due to changes in the business world, customer-oriented perspectives, such as customization and customer retention, became more important for business success (Rahimi & Berman, 2009). All of these developments have led to the rise of so-called Customer Relationship Management (CRM) systems or Electronic CRM (e-CRM) (Kevork & Vrechopoulos, 2009) that aim to strengthen the bond between the business and its customers. Individualized services help to enhance customer satisfaction and loyalty.

CRM systems come in all shapes and sizes, from closed-sourced to open-sourced platforms, and low- to high-technological solutions (Rigby, Reichheld, & Schefter, 2002) with a multitude of examples; *HubSpot CRM, Microsoft Dynamics CRM, Salesforce, SAP Hybris Cloud*, *and SugarCRM*. These platforms provide an overview of the important CRM systems in the market. Despite the large toolset of capabilities that these systems hold, the effectiveness of these CRM systems depends on the actual use by end-users in the CRM-adopting organizations.

This research is conducted at BrixCRM, a Small and Medium-sized Enterprise (SME) and unlisted private company located in the Netherlands. BrixCRM is operating as a CRM system vendor which is focusing on the implementation of CRM systems at its customers in a Business-to-Business (B2B)-context as is illustrated in Figure 1. According to Croteau and Li (2003), less than half of the CRM adopters outsource the development of these systems to CRM vendors. It should be noted that the customers of BrixCRM can both be situated in a B2B or a B2C-context and that the scope of this research should support both scenarios. According to Kotler, Pfoertsch and Michi (2006), B2B and B2C services differ in terms of the nature and complexity of the services, the amount of customers (several businesses or a wealth of individuals), the larger demand of B2B-

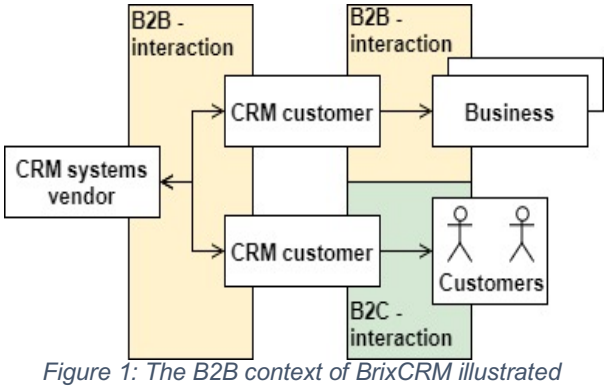

Figure 1: The B2B context of BrixCRM illustrated

customers, and the duration and closeness of the supplier-customer relationships. BrixCRM is a fast-growing company, is has grown from a start-up established by two founders in 2005 to a medium-sized company of around forty employees with varying functional roles, which include human resources, sales, software development, software testing (quality), project management, and consultancy. BrixCRM services around seventy 'active' customers and has serviced around eighty customers in total. Due to its fast-growth, BrixCRM is undergoing some organization changes and reorganization. According to Greiner (1998), organizations undergo phases of evolution (growth) and revolution (crisis) that define the challenges to how an organization works. Currently BrixCRM is undergoing changes in order to improve efficiency – that is part of the *direction* evolution phase (Greiner, 1998). In line with these changes, BrixCRM also envisions to change the way in which CRM is implemented so that efficiency is increased.

BrixCRM's business model is to determine if the integration of CRM contributes to customer's business value. If the integration is doubted to add value, BrixCRM is critically assessing why its customers then need to have the systems in place. The sales department at BrixCRM defines so-called "sweet spot" customers, as they are the customers for whom BrixCRM can add value to the business. The other way around is equally important; appropriate CRM system vendor selection to fit the needs of the business (Schniederjans, Cao, & Ching Gu, 2012). Furthermore, BrixCRM's portfolio consists of short-term projects as well as long-term projects. These shorter-term projects commonly span over three to six months and longer-term projects span over more than six months and can even span over several years.

This research is scoped to studying the shorter-term projects in more detail. The shorter-term projects show higher levels of similarity and therefore are assumed to imply better generalizability to the findings of this research. Nonetheless, this research inquiries common factors to longer and shorter-term projects to assess the applicability for longer term CRM implementations. Moreover, this research includes the operations phase of CRM implementations – post project. The inclusion of the operations phase serves to expand the basic project success measures of budget, scope, and time by including use variables to success (DeLone & McLean, 1992).

BrixCRM builds on top of the open source technology stack and platform "Sugar" as a so-called *Elite Partner* of SugarCRM. Sugar is a Web-based CRM software system for which the non-commercial edition "SugarCE" is freely licensed under the GNU's Not Unix (GNU) General Public License (GPL) version 3 and GNU Affero GPLv3. SugarCRM is one of the pioneers in CRM system solutions and has more than 10 million downloads. SugarCRM provides a complete package of features that support different business roles such as marketing, sales and Human Resources (HR). On a technical level, SugarCRM supports the MySQL and Microsoft SQL Server Database Management Systems (DBMS) and is available for the Operating Systems (OS) Linux, Microsoft Windows, and Unix (Sampaio & Bernardino, 2011). According to Sampaio and Bernardino (2011), Sugar is the best open source CRM solution, compared to competitors like Tryton, CiviCRM and OpenCRX, in terms of its support for sales, marketing, collaborative and information management, reporting, service and support, security, and installation and use.

1.2 Problem statement and research objectives

Currently, BrixCRM realizes that the implementation of their CRM systems is highly dependent on the experience of the individuals. To that extent, the implementation of CRM is based on intangible measurements that reside in expert judgement. Therefore, the factors for success become unmeasurable as expert judgement is subjective in nature. This also results in the fact that controls for CRM implementation are not in place – since expert judgement is the *de facto* control – it is possible that critical factors for success are overlooked by an individual.

As CRM implementations are multidisciplinary in nature, they include a wide variety of technical (development) and business (sales, marketing) disciplines. Therefore, necessity exists to converge these different disciplines, however due to the absence of measurable and tangible controls, the complexity of involving a multitude of disciplines becomes increasingly difficult.

Literature has had the primary focus on why and how to implement CRM, rather than evaluating the performance of implementation activities and projects of these systems (Romano & Fjermestad, 2003). As a matter of fact, Ngai (2005) reviewed the literature on CRM and found that researching performance measurements of these activities is not a prominent area of research by categorizing CRM related research between the years 1992 and 2002. This research aims to incorporate performance measures or controls into the fabric of CRM implementations that on their part seek to improve CRM system utilization rates. Therefore, the scientific relevance of this study is its contribution to the body of knowledge on successful CRM implementation. The contribution is the identification and operationalization of Critical Success Factors (CSFs) for CRM implementation in concrete project cases, showing their influence on implementation success. The main results of this research are presented in this scholarly work to disclose the findings and adding it to the body of knowledge.

The practical relevance of this study is to provide guidelines to businesses on how to implement CRM into their IT-landscape by highlighting and assessing various factors for success. These factors are tailored to function as tangible controls that can be used to steer the implementation process. The identification of these measure for control help to shift the approaches to CRM implementation from experience-based toward methodological control-based approach. The result of this study is twofold. First, on the operational level, the methodology for CRM implementation focusses on identifying factors, and their associated impact and moment of their emergence in the implementation. The introduction of tangible guidelines in the consultancy guide can therefore support novices in the field in executing and managing CRM implementations. On a strategic level, the proposed consultancy guide subsequently is to provide BrixCRM the ability to turn the contact with the customer into a mutual beneficial partnership. As the consultancy guide is to improve the approach to CRM implementations through the provision of a tangible methodology, it is assumed to ensure customer satisfaction and consequently helps to retain customers. Retained customers are those who engage in a long-term relationship with BrixCRM; a *partnership*. To that extent, the main objective of this research is:

"To design a consultancy guide for CRM implementation which identifies and effectively evokes CSFs for CRM implementation with the aim to provide tangible controls for steering these CRM implementations."

In order to achieve this objective, three steps are undertaken. First, the field of CRM is examined. This examination includes the definition of the concept of CRM and the associated IT solutions, how CRM adds value to business, which IT-related solutions relate to CRM, how theory conceptualizes CRM usage, and a market analysis. Second, the factors to CRM implementation success are described. Furthermore, these factors are operationalized to assess their influence on the success of CRM implementations. Third, the current approaches to CRM implementation is described, what tasks are incorporated in the approach to CRM implementation, and how it could be improved.

1.3 Research questions

To achieve the main objective of this research, as stated in the previous section, the following main research question is constructed:

"What constitutes a project management approach that contains both tangible controls and guidelines which effectively evokes CSFs for steering CRM implementations?"

This main research question is decomposed into four sub-questions which serves as basis towards answering the main research question. The following sub questions can be construed:

RQ1. What is the current state and research agenda of CRM?

To understand the current approaches for the implementation of CRM, an unambiguous conceptualization of CRM and the associated systems is necessary. Therefore, this sub question covers the conceptualization of CRM and CRM systems. Moreover, Information Systems (IS) adoption in the context of CRM is investigated to understand what influences usage, and the current state of the CRM market is analyzed.

a. *What is the best alternative to conceptualize CRM, according to literature?*
b. *What is the best alternative to conceptualize CRM systems, according to literature?*
c. *What is the current situation in the CRM software market, and who are the main players in this market?*
d. *What is influencing CRM adoption within the fabric of a company?*

RQ2. What are the CSFs for successful CRM implementation?

This sub-question identifies the CSFs to CRM implementation that determine the success of these implementations. Therefore, the body of knowledge as is found in literature is assessed and reflected on practice to determine which CSFs are to be operationalized.

a. *What is CRM implementation, and how is it approached in practice?*
b. *What CSFs for CRM implementation does literature identify?*
c. *Which of the identified CSFs are regarded as most important in practice?*

RQ3. How are current project management approaches for CRM implementation designed?

To work towards an improved project management approach, the first step is to conduct a comprehensive analysis of the current approach to CRM implementation. Therefore, the current project management approach is defined and synthesized.

a. *What are the activities in current approaches to IT project management, according to literature and practice?*
b. *What are the instruments and tools used for project management?*

RQ4. What is the best alternative to operationalize the identified CSFs in the context of CRM implementation?

In this sub-question, the CSFs will be operationalized in the context of CRM implementations. Therefore, it is necessary to define a set of parameters that serve for the operationalization of the CSFs, suitable project cases are identified that serve as the contextual basis of the study, and controls are established to manage the parameters during the demonstration.

a. *What is the best alternative to incorporate the CSFs into a project management approach for CRM implementations?*
b. *What parameters can be identified for these CSFs?*

RQ5. What is the influence of CSF operationalization on CRM success?

To evaluate and validate whether the operationalization improves the success of CRM implementation, hypotheses of the effects of the operationalization are established which are to be tested, an evaluation scheme is proposed, and external effects are controlled for.

a. *How accurate can the assessment identify the important CSFs?*
b. *How do the different CSFs relate to each other?*
c. *How does the consultancy guide add value for practitioners?*

1.5 Research methodology

The overall structure of this research is designed according to the Design Science Research Methodology (DSRM) as defined by Peffers, et al. (2007) to ensure scientific rigor. The DSRM is depicted in Figure 2. For this project, the DSRM is used from the entry point of designing an objective-centered solution as this research is to aid CRM implementation management. The DSRM prescribes six phases which are the principle guide to conducting this research:

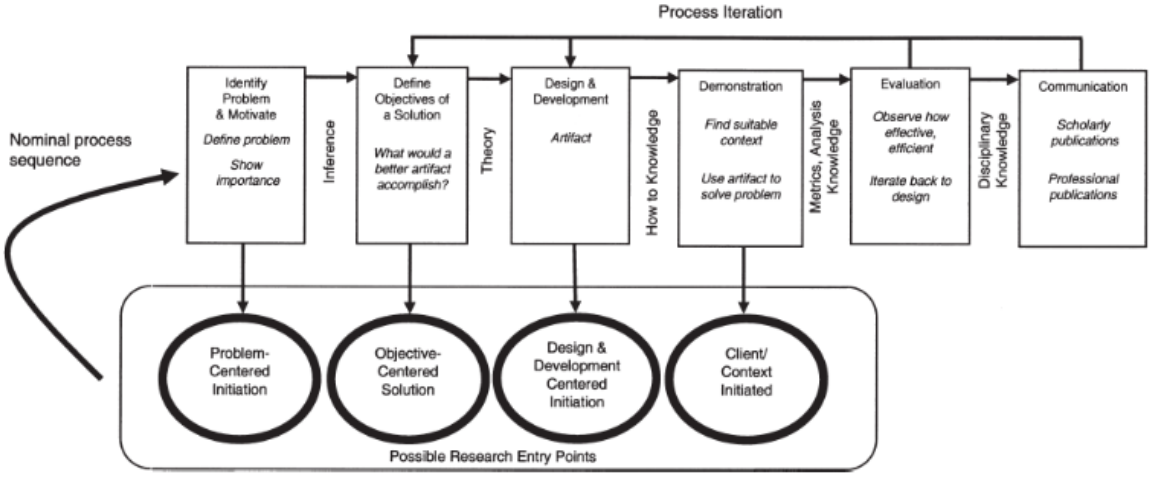

Figure 2: An overview of the DSRM (Peffers et al., 2007)

1. Problem identification and motivation

In this initiation phase, the research problem is identified and motivated. This phase describes why this research is important to the field. The Grounded Theory Literature Review Method (GTLRM) as proposed by Wolfswinkel, Furtmueller and Wilderom (2013) is applied to review the current state of CRM and its implementation as per the literature. The GTLRM is designed in five iterative components according to qualitative research principles from grounded theory (Blumberg, Cooper, & Schindler, 2014; Strauss & Corbin, 1998); define, search, select, analyze, and present – refer to Appendix A for an architectural overview.

The first stage aims to define the scope of this research. To that end, the scope of this systematic literature review is to include what CRM systems are and how these should be implemented. Therefore, it excludes all other ERP systems. Furthermore, the quality of the retrieved literature is guaranteed by excluding master's theses and dissertations as described by Hart (1998). By applying limitation criteria, the data range is limited to find papers in social sciences and computer sciences. The Scopus database was consulted in search for relevant publications. Moreover, the search terms for the first selection of publications are retrieved with an emphasis on the definition and use of CRM. Therefore, each of the search terms are paired with context specific terms for definition as well as for use – refer to Appendix A.

During the *search* stage, articles are searched for in the Scopus database until the search becomes saturated (Wolfswinkel et al., 2013). The GTLRM is iterative in nature for which each search is documented. For the relevant articles, the name of the author, the title of the article, the year of publication, the journal in which the article was published, and the impact factor of that journal are

documented. The purpose of the documentation twofold: tracking the search choices made and making the retrieved results reportable and repeatable.

The third stage is focused on the refinement of the sample by selecting the articles. This includes filter duplicate publications and refining the sample reading the title and abstract of the publications. Subsequently, the sample is respectively refined and supplemented by reading the full texts of these publications and conducting backward and forward citations – refer to Appendix B. If new papers still emerge, this selection process was iteratively repeated. This selection stage is terminated when the sample is saturated (Strauss & Corbin, 1998). The selection process is as following: after filtering duplicate articles, the sample consisted of 107 peer reviewed articles. After reading the titles and abstracts of these articles one search term emerged; 'user accept*'. This search term initiated another search iteration focused on finding articles on user acceptance. This search did not yield new articles nor search terms therefore, the search is saturated. The resulting sample size consisted of 75 unique articles. To control for the quality, the impact factor of the corresponding journals was considered. The journals with an impact factor lower than 0.9 were eliminated from the sample. Both SCImago Journal Rank (SJR) and Source Normalized Impact per Paper (SNIP) ratings were used to calculate the impact factor. To control for undersampling, the articles with one ranking below and above the 0.9 threshold were still added to the sample. Based on this criterion, 47 articles were excluded. Therefore, the final sample size consisted of 28 articles – refer to Appendix B.

The main principles of Grounded Theory are mostly found in the fourth stage of the GTLRM (Wolfswinkel et al., 2013) through the provision of guidelines for analyzing the literature. There are three coding procedures: 'open coding', 'axial coding' and 'selective coding' (Wolfswinkel et al., 2013). Open coding is the first step for analyzing the literature sample, which involves the identification of excerpts, codes, concepts as well as categories (Strauss & Corbin, 1998). In principle, open coding is the procedure of subtracting overarching concepts and categories that are important to answering the research questions. Axial coding is the process of identifying interrelations between these concepts and categories. Selective coding serves to identify the relations between main categories that illustrate the differences between these different categories (Strauss & Corbin, 1998). Ultimately, the resulting categories draft the conceptualization of CRM – the basis to the remainder of this research.

The fifth and final stage of the GTLRM involves structuring and the representation of the content of the literature review (Wolfswinkel et al., 2013). As of the nature of this research, the structure of this research is mostly based on the DSRM by Peffers et al. (2007).

2. Defining the objectives for a solution

During this phase, the objectives for the designed solution are defined. This phase includes the formulation of research questions, a description of CRM, current approach to CRM implementation, and the analyze of the solution. The Information System Design Theory (ISDT) as proposed by Walls, Widmeyer and El Sawy (1992) is applied to structure this study to build upon the findings of the problem identification. Figure 3 depicts the process model of the ISDT.

First, it is determined what theories from natural or social sciences embody kernel theories for this study. For this study, project management theories such as the Formal System Model (FSM) – as depicted in Appendix C – by Fortune and White (2006), CRM literature as well as from behavioral sciences such as the Common Bond Theory (CBT) (Ren, Kraut, & Kiesler, 2007) related to customer relationships, as well as Customer Experience (CX) are considered as kernel theories. The FSM is proposed to illustrate which factors are influencing project success. To that extent, this research builds upon the body of knowledge on project management and tailors it to the context of CRM. Second, the ISDT describes the class of goals to which the theory applies, with the aim to set the boundaries and rules to which the study should apply. Therefore, the meta-requirements are based on the findings of the literature review as previously described. This phase closes with the identification of the objectives and the meta-requirements.

3. Design and development

This phase covers the design of the solution of the project management approach that can be steered based on measurable controls, the CSFs. The third component of the ISDT now comes into play by providing a description of procedure(s) for artefact construction. Therefore, this is the actual artefact that is designed. This design includes a set of instruments help to control for implementation success.

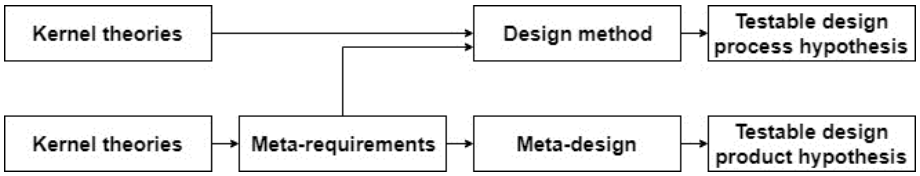

Figure 3: The overview of the ISDT

4. Demonstration

During this phase of demonstration, the design of the improved project management approach is verified by means of a thorough demonstration session and cognitive walkthroughs. During the session, the solution design is presented to experts and validated based on the feedback from the experts, as well as via an assessment form (Blumberg et al., 2014). The final component of the ISDT supports the formulation of testable hypotheses. These hypotheses verify whether the results are consistent with the meta-design. Literally speaking, this means that this component sets the prerequisites to assessing the CSFs and the accompanied project management approach on whether these will improve CRM implementation success.

5. Evaluation

During the phase of evaluation, the solution design is incrementally expanded and improved in several case contexts. This incremental design is grounded on principles of evolutionary development design (Boehm, 1988). The performance of the solution design is evaluated by intervention. This intervention is aimed to accept or reject the hypotheses formulated in the previous phase.

6. Communication

The results of this research are presented in a colloquium that is part of the graduation project and additionally, the main results are processed and presented as this master's thesis.

1.6 Requirements

Several requirements must be identified to which the consultancy guide as well as the study itself should adhere to. The requirements serve to specify the contributions of the artefact – the consultancy guide – to approaching CRM implementations. More specifically, these requirements ensure that the consultancy guide contributes to the business objectives of BrixCRM; adding value for its clients. Hence, the following requirements are formulated:

R1. Completeness of the consultancy guide

The consultancy guide covers all CSFs that influence the implementation of CRM solutions. To this end, it should include what the performance of these CSFs is and in what ways the performance can be improved as a guide for the project team. The goal of the consultancy guide is to provide the instruments that can be useful for practitioners to drive a project home successfully.

R2. Usefulness of the consultancy guide

The consultancy guide has a clear purpose and is appropriate to use in the context of CRM implementations at BrixCRM; that is, it provides a framework to conducting CRM implementations.

R3. Practical feasibility of the consultancy guide

The consultancy guide reflects a feasible CRM implementation approach for the projects at BrixCRM.

R4. Clarity of the consultancy guide

The consultancy guide is providing a clear view on the issues of a CRM implementation and describes the different aspects in these projects; it can explain the concepts at a first glance. The consultancy guide composes large volumes of information into a concise methodology that is to maintain clarity.

R5. Granularity of the consultancy guide

The consultancy guide has an appropriate level of granularity or abstraction. It can provide a holistic view on CRM implementation as well as sufficient detail in approaching these projects.

R6. Alignment with existing project management approaches

The methodology behind the consultancy guide is to reflect upon the existing project management approach of BrixCRM and that of the client which is to facilitate compatibility.

1.7 Empirical data collection

Several interviews and secondary data sources are supplemented to analyze CRM implementations and to triangulate the findings of this research. Semi-structured interviews were conducted to formally report the results of step four to six of the DSRM. These interviews aimed to explore pivotal processes to CRM implementation. The interviews have been held in February, May, and June 2018. Employees with varying roles were interviewed to consider diverging views on CRM implementation. These interviewees have varying tasks that include, but are not limited to, the responsibility of nurturing the relationship with the customer, managing expectations, solution design, planning of projects, allocating resources. Furthermore, the employees have accumulated years of experience on CRM implementations and have been employed for at least one-and-a-half years and with a maximum of seven years at BrixCRM. To that end, it is assumed that the interviewees have a clear view on of the practices in the organization. The topics of discussion are listed in Table 1, how these topics are touched upon differs per interview.

Table 1: Interview topics and interviewees

Interview topic	***Participant***	***Years of employment***	
CRM implementation success	1) Project manager 1 2) Business consultant 3) CTO 4) CRM consultant 1 5) CRM consultant 2	Project manager 1	*Four years of employment*
CRM system implementation process	1) Project manager 1 2) Business consultant 3) CTO 4) CRM consultant 1 5) CRM consultant 2	Project manager 2	*Two and a half years of employment*
CSFs for CRM system implementation	1) Project manager 1 2) Project manager 2 3) Business consultant 4) Management 5) CRM consultant 1 6) CRM consultant 2 7) CRM solution architect	Project manager 3	*One and a half years of employment*
		Business consultant	*Four years of employment*
		CRM consultant 1	*Seven years of employment*
Historical data on failures and successes	1) Project manager 2 2) CRM solution architect	CRM consultant 2	*One and a half years of employment*
Technical and project issues	1) CRM solution architect	Management	*Six years of employment*
Assessment of the project cases	1) Project manager 1 2) Project manager 2 3) Project manager 3 4) Business consultant 5) CRM consultant 1 6) CRM consultant 2 7) CRM solution architect	CRM solution architect	*Eight years of employment*

Secondary data are retrieved from written sources, such as presentations and minutes. The purpose of secondary data is twofold; triangulation of the findings and discovering new insights that did not emerge from the interviews, such as information on internal work procedures.

Table 2: Secondary data sources

Type of data	***Explanation***
E-mail	*1) Data quality management, March 2018* *2) Stakeholder management, April 2018* *3) Tracking innovation projects through insights from the business model canvas, May 2018*
Presentation slides	*1) All-hands day (Quarterly internal day), January 2018* *2) GDPR informational session, by CRM consultant 1, March 2018*
Websites	*1) Website BrixCRM* *2) Website SugarCRM*
Others	*1) Sugar demo environment*

The incorporation of secondary data sources implies several advantages and disadvantages. First, using secondary data sources simply save time to collect data as the data is already available. Second, it serves to provide additional insights into the process of CRM implementation. Hence it helps the triangulation of the findings and the development of a better picture of the context. The initial purpose of the data is considered as a disadvantage, because the data are not specifically structured to answer the question that this study poses.

1.7 Data analysis

The previously explained data collection techniques result in obtaining various kinds of data in multiple formats. To analyze the data correctly, the data is to be processed first. The GTLRM is applied to extract the themes for CRM implementation. The steps of open and axial coding (Strauss & Corbin, 1998) are most prominently used to identify the themes from the empirical data collection and to compare these to the findings of in literature. These themes include the identification of the CSFs as well as the challenges to CRM implementation. Subsequently, a list, confirmed by theory and practice, prioritized CSFs is proposed. This list consequently serves as a ground to propose CRM implementation recommendations for BrixCRM.

1.8 Thesis structure

This remainder of thesis is structured as following: Chapter 2 introduces a conceptualization of CRM to the reader, the concept of CRM systems, what is included in these systems, what current approaches to CRM implementation are, what the determinants for success are, and a market analysis. In Chapter 3, the problem positioned in the wider context of project management. Chapter 4 proposes an integral solution design that converges project management methods and CRM implementation practices that incorporates the CSFs. In Chapter 5, the CSFs are operationalized and the results of the operationalization are provided. The sixth and final section, presents the conclusions of this research and provides answers to the established research questions. Furthermore, this chapter reflects on the work that has been done and provides directions for future research. Table 3 below provides an overview of the research structure:

Table 3: Traceability matrix of the thesis structure

Section	***Applicable DSRM phase***	***Research questions***
1. Introduction	Problem identification & motivation	-
2. An introduction to CRM	Define objectives of a solution	RQ 1 - 2
3. Approach to project management	Define objectives of a solution	RQ 3
4. Solution design	Design & development	RQ 4
5. Results	Demonstration & evaluation	RQ 5
6. Conclusions	*Communication*	All research questions

2. An introduction to CRM

The field of CRM has been around for more than 30 years, but its movement towards it utilization of IT in the form of CRM systems is rather novel. In this chapter, the concept of CRM is reviewed, and the introduction of CRM systems is discussed, with the aim to familiarize the reader to the domain.

2.1 The conceptualization of CRM

During the 1980ties, "Contact Management" practices which involved customer data collection and the usage of the customer data accumulated interests among practitioners. Through the years, these practices increasingly became more sophisticated and are latter termed "Customer relationship management" (Pai & Tu, 2011). CRM ultimately answers the question on how to fit the needs of the customers with the objective of establishing long-term customer relationships. Therefore CRM is based on the principles of relationship marketing which involved attracting, maintaining and enhancing customer relationships (Berry, 1983). In the nineties, relationship marketing had gained interest from a variety of academia and practitioners with an emphasis on so-called "one-to-one" marketing practices that shifted mass marketing to individualized marketing (Payne & Frow, 2006). Nonetheless, before CRM found its way into the operational processes of a company, these companies were implementing ERP into the fabric of their day-to-day business operations and decision-making process with the goal of improving internal efficiencies (Ruivo, Oliveira, & Mestre, 2017). Through the years, as the business domain changed the organizational focus of businesses by the encouragement of advances in IT (Boulding, Staelin, Ehret, & Johnston, 2005), CRM practices extended the value proposition ERP to improve the business process outside of a company's boundaries. According to Lin, Chen and Chiu (2010), there are basically two streams of research to CRM; the process of developing CRM (Reinartz, Krafft, & Hoyer, 2004), and the content presented by CRM. The process of developing CRM involves practices such as internal communication between the CRM implementation team and CRM user (Gefen & Ridings, 2002), while the content of CRM focusses on the question of how to enhance customer relationships (Lin et al., 2010).

In the past, literature failed to provide an unambiguous conceptualization of CRM because of the existence of a varying plethora of definitions (Boulding et al., 2005; Bull, 2003; Garrido-Moreno & Padilla-Meléndez, 2011; Payne & Frow, 2006; Richards & Jones, 2008) that emphasizes on technology, the customer, the business (M. H. Hsieh, 2009) or a combination of these perspectives as is shown Table 4. The main issue is that CRM is incorrectly equated with CRM technology (Reinartz et al., 2004). Venturini and Benito (2015) dived deeper into this problem and identified that the interpretation of CRM ranges from a holistic approach to managing customer relationships with the goal of creating both customer and business value toward the practice of implementing specific technology solution.

Through the years, the domain of CRM luckily has evolved and to that extent richer conceptualizations have emerges with an emphasis on the goals, logistics and the complex characteristics of CRM (Bull, 2003). In their work, Payne and Frow (2005) documented that every business should aim to use CRM as a customer-centric strategy:

> *"CRM is a strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential of relationship marketing strategies and IT to create profitable, long-term relationships with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and cocreate value with them. This requires a cross-functional integration of processes,*

people, operations, and marketing capabilities that is enabled through information, technology, and applications (Payne & Frow, 2005, p. 2)."

Table 4: Other CRM conceptualizations in literature

Reference	Definition
Garrido-Moreno and Padilla-Meléndez (2011)	*"CRM is a business strategy that aims to establish and develop value-creating relationships with customers based on knowledge. Using IT as an enabler, CRM requires a redesign of the organization and its processes to orient them to the customer, so that by personalizing its products and services, the firm can optimally satisfy customer needs and thereby generate long-term, mutually beneficial, loyalty relationships."*
Negahban, Kim and Kim (2016)	*"CRM enables organizations to attract new customers and retain existing ones, improve knowledge about customers, identify and segment customers' needs in order to adopt appropriate business strategies such as personalized products/services and advertisements; hence, businesses can increase customer satisfaction, and establish long-term, arm's length relationships with their customers. These ultimately lead to higher profitability, productivity, and customer satisfaction."*
Nguyen and Mutum (2012)	*"[CRM is] … a critical tool in increasing a firm's profitability by enabling it to identify the best customers and satisfy their needs, in order to make them remain loyal to the firm's activities."*
Shani and Chalasani (1992)	*"CRM is an integrated effort to identify, maintain, and build up a network with individual consumers and to continuously strengthen the network for the mutual benefit of both sides, through interactive, individualized and value-added contacts over a long period of time."*
Soltani and Navimipour (2016)	*"CRM consists of guidelines, procedures, processes and strategies which provide organizations the ability to merge customer interactions and also keep track of all customer-related information."*
Urbanskienė, Žostautienė and Chreptavičienė (2008)	*"CRM is understood as the complex of software and technologies, automating and performing business processes in the following areas: sales, marketing, service, and customer support."*
Richards and Jones (2008)	*"CRM is a set of business activities supported by both technology and processes that is directed by strategy and is designed to improve business performance in an area of customer management."*
Zablah, Bellenger and Johnston (2004)	*"CRM is an ongoing process that involves the development and leveraging of market intelligence for the purpose of building and maintaining a profit-maximizing portfolio of customer relationships."*

Therefore, the purpose of CRM is to acquire and retain customers to the business by selective initiating, building and maintaining customer relationships which result in an improved profitability for the business (Payne & Frow, 2006; Shani & Chalasani, 1992). According to Hsieh (2009), the retention of customers is particularly important to improving business value because the 80/20 rule applies to marketing – 80 percent of a business' sales are accounted for by 20 percent of all customer. Therefore, these profitable customers must be retained in long-term relationships. It is found that regained customers are evenly profitable as newly acquired customers (Becker, Greve, & Albers, 2009), supporting the decision of businesses to focus on engaging in long-term relationships. As a result of a maturing CRM domain, the plethora of conceptualizations begun to converge into a widely acknowledged definition proposed by Boulding et al. (2005, p. 3):

"Specifically, CRM relates to strategy, managing the dual-creation or value, the intelligent use of data and technology, the acquisition of customer knowledge and the diffusion of this knowledge to the appropriate stakeholders, the development of appropriate (long-term) relationships with specific customers and/or customer groups, and the integration of processes across the many areas of the firm and across the network of firms that collaborate to generate customer value"

This study adopts the above definition to emphasize the importance of the holistic view of CRM that includes processes, strategy and technology to add value to the customers as well as the business. Still, the field of CRM and its related phenomena requires further exploration (Zablah et al., 2004). Keramati and Shapouri (2016) argued that the field is not easily evaluated since it involves a multi-fold and oftentimes paradoxical dimensions (e.g. strategy and technology) that hamper the implementation of CRM within a company. This multi-fold of dimensions results in a lack of comprehension and insight in its implications, as well as their implications on the complexity of building customer interactions (B. Nguyen & Mutum, 2012).

2.2 Supportive IT: CRM systems

In turn of CRM primarily being a strategic approach (Bohling et al., 2006), CRM software or systems refer to the technological applications that connects the front office (e.g. sales and marketing) with back office (e.g. finance and HR) business functions. CRM is entangled with the external context of enterprise processes – customer facing processes – while ERP systems encompass the internal enterprise processes, such as resource scheduling (Ruivo et al., 2017). Oftentimes CRM is also erroneously considered as the intertwined concepts of Marketing Automation (MA) and Sales Force Automation (SFA). However, these three concepts differ in the subtlest details. While MA is primarily focused on the getting leads and prospects to the company, SFA and CRM are respectively used by the sales department of a company to organize and manage business contacts and opportunities, and to manage customer information. Moreover, from a systems perspective, there exists a clear divide between MA on the one side and CRM and SFA on the other. The difference between the tooling is best illustrated in the *customer journey*, since the two emerge at different moments in time and serve information needs – refer to Figure 4.

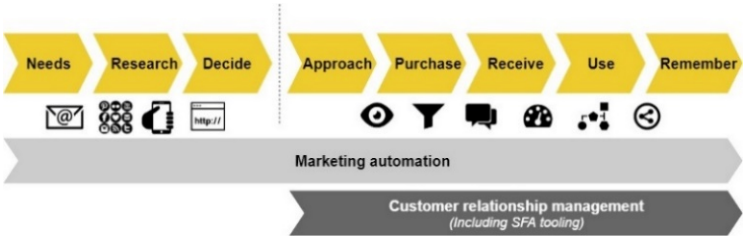

Figure 4: The differences between CRM, MA and SFA in the customer journey

Literature presents an extensive backlog of industries that can benefit from the usage of CRM systems, ranging from healthcare to telecommunication services to manufacturing (Askool & Nakata, 2012; Choi et al., 2013; Hung, Hung, Tsai, & Jiang, 2010; Pedron, Picoto, Dhillon, & Caldeira, 2016; Shanks, Jagielska, & Jayaganesh, 2009; Vella, Caruana, & Pitt, 2013, 2012)

These CRM systems come in all shapes and sizes, from closed- to open-sourced platforms, and low- to higher-tech solutions (Rigby et al., 2002) to tackle the customer's needs. CRM systems can be categorized in three functionality classes (Soltani & Navimipour, 2016; Xu & Walton, 2005); 1) operational-, 2) analytical-, and 3) collaborative systems. The objective of operational systems is to assist and automate business operations (Soltani & Navimipour, 2016), such as sales and marketing operation (Shanks et al., 2009) by collecting data through customer touch points (Xu & Walton, 2005). Operational software applications include MA, SFA, product configuration and contact management solutions (Shanks et al., 2009). Analytical systems are used for the analysis of aggregated customer data (Soltani & Navimipour, 2016; Venturini & Benito, 2015), profiling customers, identifying customer behavior patterns, and tailoring services to better fit the needs of the customer (Xu & Walton, 2005). Therefore, the main goals of analytical systems are to acquire and retain customers. Technical solutions of this category includes data warehouses, and predictive and analytical engines (Xu & Walton, 2005). Collaborative systems are used to manage and integrate customer interaction channels (Soltani & Navimipour, 2016), and the integration with other systems (Xu & Walton, 2005). The integration is aimed to combine the knowledge of different functional lines with the goal to improve on responsiveness of businesses to improve the customer experience (Xu & Walton, 2005). Initially, academia also identified a fourth CRM type; "e-CRM systems". This class is about making customer-centric information ubiquitously available and accessible for everyone in a business via the internet and intranet (Xu & Walton, 2005). However, this latter type has lost relevance due to advances in IT and the emergence of cloud computing solutions. Therefore, CRM systems provide the technological infrastructure that facilitates long-term relationship building with customers (Soltani & Navimipour, 2016) by tracking, capturing, and analyzing customer interactions and transactions. Subsequently, CRM systems convert customer data into insights to attract, retain customers and improve business performance (Croteau & Li, 2003; Engelstätter, 2012; Schniederjans et al., 2012). Improved business performance are

calculated through tangible, intangible measures or a combination of both (Ruivo et al., 2017). Tangible measures are, for example, the generation of revenues from sales, cost reductions (Alshawi, Missi, & Irani, 2011; Payne & Frow, 2005, 2006), and the return of assets, sales and equity (Boulding et al., 2005; Reinartz et al., 2004). On the opposite, intangible value are customer satisfaction and the quality of customer service (Q. Chen & Chen, 2004; Reinartz et al., 2004), which are obtained through system use and subsequently getting to understand the customer (Alshawi et al., 2011; I. J. Chen & Popovich, 2003; Payne & Frow, 2006). The exemplary case of Amazon shows that by introducing personal greetings, among other things, lead to higher customer repeat and thus recurring revenue (Soltani & Navimipour, 2016).

2.3 Market analysis

Research on the CRM market shows a trend in strong investments from companies seeking to incorporate CRM solutions in business operations. Over the years, the CRM market has seen an expansion; in 2003, the market for CRM software was estimated to reach the $9 billion mark (Gefen & Ridings, 2002), whereas the market was estimated to reach worldwide total revenue of $23.9 billion in 2014 (Soltani & Navimipour, 2016) and $26.2 billion in 2015 (Haddara & Constantini, 2017), which is an increase of approximately 191 percent in twelve years. That is, the market expanded by almost ten percent in one year time – in 2014 – while the market had already been growing by twelve-and-a-half percent in 2012 (Soltani & Navimipour, 2016). To that end, it is expected that this trend has pushed through in the years 2016 and 2017, if not even faster. The steep and growing trend is an indication that the technology plays an important role to a business' CRM strategy (Boulding et al., 2005) and oftentimes even is a mandatory investments to benefit from relationship marketing (Venturini & Benito, 2015). In the same year of 2015, the market was dominated by Salesforce, SAP (CRM), Oracle (CRM On Demand), Microsoft (Dynamics 365), and Adobe (Marketing cloud) whom combinedly accounted for forty-five percent of the worldwide CRM cloud and on-premise implementation (Correia, Dharmasthira, & Poulter, 2015). Figure 5 shows the spending on CRM including consultancy fees. The *others* include, but are not limited to, HubSpot CRM, Pipedrive, Insightly and SugarCRM. Furthermore, these parties also dominate the worldwide growth of CRM spending in 2015 compared to 2014. However, it is interesting that SAP and Oracle are lacking behind in this growth with respectively a growth of 0,6 percent and a minus 3.4 percent (Correia et al., 2015) – Figure 6.

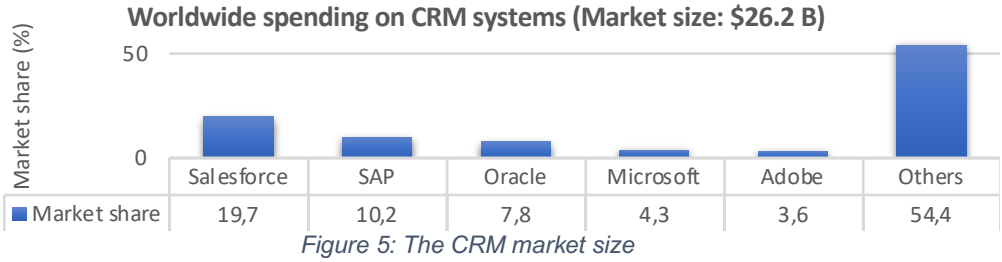

Figure 5: The CRM market size

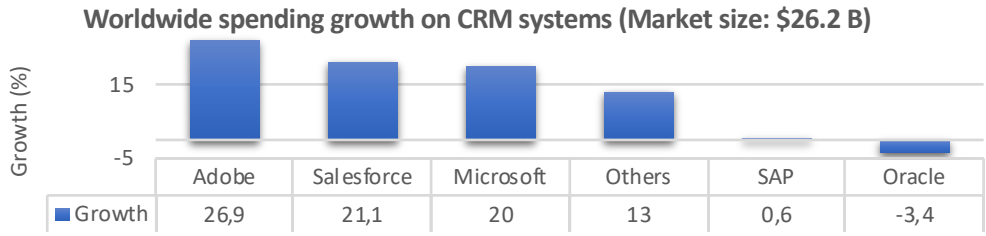

Figure 6: The CRM market growth

Subsequently, the question remains how these figures reflect on the pricing models and more importantly, the ability of these systems to satisfy customer needs. Various CRM systems are offered through monthly licenses; 'Software-As-A-Service' (SAAS). For which both SAP and

Oracle do not disclose the prices of their CRM software licensing. Moreover, the different CRM vendors offer varying solutions that in terms of functionalities and support for different pricing levels. Most of the CRM software solutions are billed per user license, whereas the pricing model of HubSpot CRM does not bill per user license – refer to Table 5. It is found that respectively the solutions of Salesforce and Microsoft are more expensive than the other solutions followed by Sugar. On the other side, the solutions of HubSpot CRM, Pipedrive and Insightly are the least expensive. Therefore, the decision of choosing a CRM vendor should be based on the minutest detailed requirement of a company, since in principle all CRM vendors provide the same functionalities. However, some of the vendors provide an open-source solution, such as Sugar, which provides further opportunities to customize a CRM solution. Moreover, the listed licensing prices do not illustrate a complete picture of the total cost of ownership (TCO) since parties such as Salesforce posit additional hidden costs including upcharges for system usage (e.g. API calls or mobile access). These upcharges may even double the total cost of having a CRM solution operational (Meyers, 2016).

Table 5: CRM system licensing prices

CRM system	**Pricing**				
Salesforce*	*Lightning Essentials €25*	*Lightning Professional €75*	*Lightning Enterprise €150*	*Lightning Unlimited €300*	
SAP	*n/a*				
Oracle	*n/a*				
Microsoft*	*Applications and offers €33,70 to €143,35*	*Customer engagement plan €97*	*Unified operations plan €160,23*	*Dynamics 365 plan €177,10*	
HubSpot CRM**	*Free €0*	*Starter €46*	*Basic €185*	*Professional €740*	*Enterprise €2.200*
Pipedrive*	*Silver €12*	*Gold €24*	*Platinum €63*		
SugarCRM*/ ***	*Sugar Professional $40*	*Sugar Enterprise $65*	*Sugar Ultimate $150*		
Insightly*	*Free $0*	*Plus $29*	*Professional $49*	*Enterprise $99*	

* *Prices are per user/month, billed yearly* ** *Prices are per month, billed yearly* *** *Minimum annual subscription includes 10 user licenses*

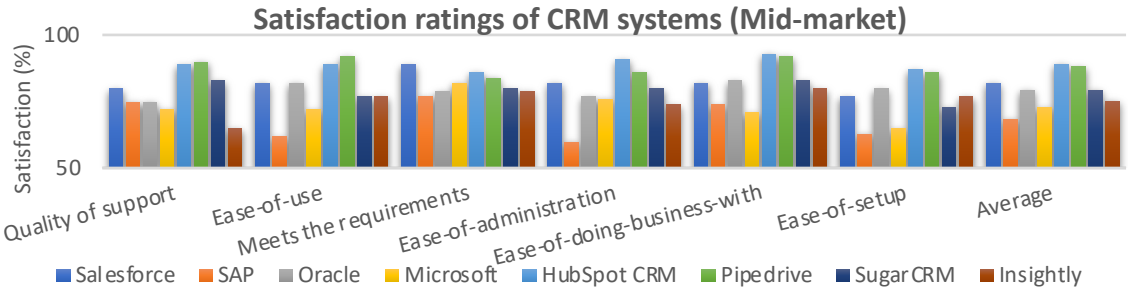

Figure 7: Customer satisfaction of different CRM systems in April 2017

Furthermore, G2 Crowd (G2 Crowd, 2017) publishes an overview of how well the various CRM solutions satisfy the needs of their users according to reviews of the G2 Crowd user community, online sources, and social (online) networks. The performance of the CRM solutions is determined through a six-item assessment; 1) quality of support, 2) ease-of-use, 3) meets the requirements, 4) ease-of-administration, 5) ease-of-doing-business-with, and 6) ease-of-setup. These six determinants for user satisfaction can be considered as important to system adoption, since satisfied users are assumed to accept CRM more easily. Section 2.5 elaborates on the theory of system adoption in more detail. Based on the G2 Crowd Grid (G2 Crowd, 2017), it is found that on average HubSpot CRM and Pipedrive customers are most satisfied, whereas the customers of

SAP are least satisfied with the received service – Figure 7. One possible reason may be that HubSpot CRM and Pipedrive are also the least expensive and thus customers may have lower expectations whereas the customers of the more expensive solutions have higher expectations which reflects customer satisfaction. Furthermore, we see that SugarCRM is performing well in providing satisfactory services to its customers, which on its turn is supportive to BrixCRM's customer services.

SugarCRM is positioned as a 'visionary' on Gartner's 2017 Magic Quadrant for SFA (Travis, Hansen, & Poulter, 2017). As the users of CRM are primarily salespeople, SFA can be regarded as a prominent function to CRM solutions. Therefore, CRM vendors tend to focus their effort in this segment. Visionaries are vendors who are ahead of most competitors in delivering innovative products or models by anticipating on emerging and changing needs of sales. Due to their innovativeness, visionaries have a high potential of influencing the direction in which the market is heading. However, visionaries do lack the ability to execute compared to leaders. As SugarCRM is categorized as a visionary, its status helps BrixCRM also further since it benefits from the innovativeness of SugarCRM. The opportunity to incorporate these innovations will benefit the customers of BrixCRM. A survey by CITE research (2017) has shown that Sugar is the sixth largest used CRM platform in the U.K. and U.S. combined, with a market share of approximately six percent, and three and a half respectively. Therefore, SugarCRM deservedly is situated on the northern region of the "visionaries" box of Gartner's 2017 Magic Quadrant (Travis et al., 2017) as well as in the equivalent box of the G2 Crowd Grid (G2 Crowd, 2017).

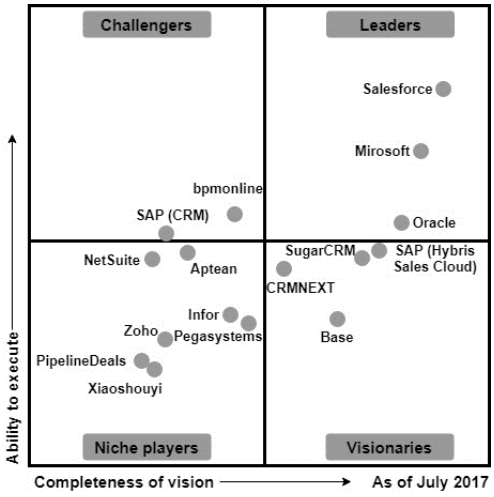

Figure 8: Gartner's 2017 Magic Quadrant for Sales Force Automation adapted from Travis, Hansen and Poulter (2017)

2.4 CRM implementation

To be able to improve CRM implementations, we first need to understand the current practices that are employed in CRM projects. Therefore, both the traditional and agile methodologies to software development are considered as possible approaches. The concept of "CRM implementation" is oftentimes erroneously interpreted due to its ambiguity. Within the field of software development, the concept of "implementation" is regarded as a series of steps that aim for the integration of an IT system within the existing IT-infrastructure of a business. The more general view on the concept of "implementation" is the act of treating some problem with a designed artefact (Wieringa, 2014). These two views imply different meanings to the concept of CRM implementation, respectively 1) how to construct and integrate CRM within the IT-infrastructure of the business and 2) making use of customer-centric data to re-specify business activities which enables a business to act on the demand of its customers. These two views are elaborated on in more detail below.

2.4.1 CRM implementation as a software development project

When it comes to the creation of CRM solutions, the process is generally regarded as a complex integration of hardware, software and applications (Bose, 2002). While most companies adopt this general view of IT integration, it does not suffice for a successful CRM implementation. Successful CRM implementation requires an analysis of the intra-organizational and customer-oriented business processes, that demand for a bundle of diverse knowledge, project management and a comprehensive plan (Bose, 2002). To tick all these boxes, CRM development traditionally incorporates the traditional life-cycle approach – consisting of eight phases – for the development

of IT systems. Yet, in recent years, practitioners are shifting towards agile rather than traditional practices which are based on four fundamental principles from the Agile Manifesto (Sutherland et al., 2001). All these components are listed in Table 6.

The traditional development life-cycle goes back as early as 1956. Experiences from a code-and-fix software development paradigm has resulted in practitioners to acknowledge that software development projects were in need of a plan-based stagewise development model to achieve implementation success (Benington, 1956). However, the term "waterfall model" was not coined before 1976 by Bell and Thayer (1976) as the de facto denominator for traditional software development approaches. In principle, the waterfall model approaches the process of software development in a disciplined sequence of activities that start with the identification of system requirements and ends with the operation and maintenance of a software system – refer to Figure 52 in Appendix D. All the activities in between are only to start if the previous activity has ended. The fundamentals to the waterfall model is that it puts emphasis on extensive pre-project planning as well as thorough documentation of software and process specification (Royce, 1970).

Table 6: Phases of CRM system development

Method	Component	Description
The life-cycle approach (Bose, 2002)	Planning	*In this phase, the promoter is to make a planning of how to proceed during the development of a CRM system*
	Research	*In this phase, the promoter is to identify methods to address the needs of the organization (the client of BrixCRM)*
	System analysis	*In this phase, the promoter is to identify what requirements must be considered for the development of a CRM system*
	Design	*In this phase, the promoter is to create a detailed specification of the to-be developed CRM system*
	Construction	*In this phase, the promoter is to execute the design plan that was specified in the previous phase.*
	Implementation	*In this phase, the promoter is to integrate the CRM system into the fabric of the organization in terms of both technicalities and social aspects*
	Maintenance and documentation	*In this phase, the promoter is to seek ways to learn more about its customers because the industry is highly dynamic*
	Adaptation	*In this phase, the promoter learns more about its customers and because they will change. Because of this change the requirements of the business function of the CRM system will change*
Agile development (Sutherland et al., 2001)	Individuals and interactions	*The involvement of the customers is leading in agile development, because success depend on their belief of success*
	Working software	*Agile development is focusing on efficiency of the deliverance of the product instead of documenting what must be done*
	Customer collaboration	*The involvement of the customer is pivotal in agile development to adapt the implementation on inevitable requirement changes*
	Responding to change	*From an agile perspective it is more important to be flexible and respond to changes than doing extensive planning*

According to the development life-cycle, CRM implementations are initiated by a phase of *planning*. The planning phase for CRM implementation consists of the identification of the points on how, when and where the business is to interact with its customer and to make decisions accordingly. After the phase of planning, the implementation enters a phase of investigation – a *research* phase. During this phase, methods are identified to address the specified CRM requirements. The third phase of *system analysis* identifies what should be contained in CRM to address the needs of the business. Therefore, successful CRM implementations heavily dependent on this phase. There are seven activities to system analysis; 1) identify how to interact with customers, 2) obtaining outside expertise when inside expertise is inadequate, 3) considering how to stage the implementation, 4) re-designing customer data, 5) retaining data to support managerial decision making, 6) system scalability (to address changing needs) and 7) studying the feasibility ad viability of CRM (Bose, 2002). Via the establishment of a set of requirements in the third phase, the fourth phase; *design* serves to formulate a detailed specification of CRM. This phase includes the selection the software packages (e.g. Java Libraries) and core technologies

(e.g. data warehouses) in order to design the CRM solution. In the fifth phase; *construction*, the design plan of the previous phase is to be created. Depending on the choice of software selection, the extent of custom-built features varies. In the case of working with Sugar, an abundance of features is pre-build meaning that the extent of features to be implemented will be less compared starting from scratch. The sixth phase is the *implementation* phase in which the constructed solution is implemented and incorporated in business processes. The latter is rather complex as IT projects are commonly challenged by people-centric adversities, such as the inability of users to recognize the benefits of CRM use (Carlsson & Walden, 2000). Training programs can serve to overcome these setbacks by showing the users how to use CRM and how it supports the business. During operation, the phase of *maintenance and documentation* starts in which the business must seek to learn about its customers. In an industry marked by its dynamic characteristics, CRM requires continuous performance evaluations to meet the needs of the decision makers. Finally, the phase of adaptation is initiated, during which the business is to alter its provided services based on the performance evaluations of the previous phase.

Academia have formulated the evolutionary development model (McCracken & Jackson, 1982) with the aim to deliver faster, better and cheaper solutions (Dybå & Dingsøyr, 2008) as a response to the traditional development life-cycle. The activities in the evolutionary development model do not sequentially follow up on each other but are rather incrementally visited. Fichman and Moses (1999) found that incremental processes for software implementation add to the success of project in numerous ways that include obtaining focus throughout the implementation process. The direction in which the system is to be improved is determined based on the experience of operating the system (Boehm, 1988). Therefore, the evolutionary development model is considered as the earliest resemblance to the nowadays popular Agile Software Development (Sutherland et al., 2001). Agile advocates for early delivery of *least viable products*, iterative product improvement, and the ability for rapid and flexible response to changes that occur (Larman, 2004). These principles are the underpinnings to various development frameworks including Kanban and Scrum (Larman, 2004). Yet, Agile may not be considered as the *silver bullet* to software development as it mirrors the difficulties found in the early code-and-fix model. Researchers have aimed to propose hybrid approaches that converge the positives of both the waterfall model and Agile without their individual difficulties. In his work, Boehm (1988) proposes the spiral model for software development that accommodates both types of software development approaches. Stender (2002) proposed the Agile Incremental Implementation methodology (AI^2M) which incorporates both the traditional and agile approaches with the aim to facilitate incremental system design without compromising the planning of functionalities. The principle of the AI^2M methodology is to divide the project into smaller releases which delineates a combination of linearly specifying requirements and incremental software development.

2.4.2 CRM implementation success and failure

Chalmeta (2006) identified eight causes for CRM failure – refer to Table 7. First, all too often companies assume that more technology is better since CRM strategies should be technology intensive (Rigby et al., 2002). Subsequently, pivotal non-technological considerations are neglected such as change management (Faed, Radmand, & Talevski, 2010). However, it must be noted that well-functioning CRM strategies are found on the entire spectrum of lesser technology-to high technology reliant solutions (Rigby et al., 2002). It is found that a change in organizational mindset is required to bolster CRM success (Gupta & Shukla, 2002). An exemplary case that shows how to approach CRM implementation is that of the tour operating company Grand Expeditions. Grand Expeditions which first vetted the lower end of the CRM technological spectrum. The opportunity for companies is to ramp up the technology incorporated in their solution to fit CRM needs. Therefore, businesses can prevent themselves of making unnecessary expenses.

Table 7: Causes to CRM system implementation failure

Cause of failure	***Description***
Thinking that technology is the solution	*Oftentimes CRM is regarded as the technology instead of a strategic process of doing business. Therefore, practitioners are mistaking the implications of CRM since technology can only be considered as the mean to achieve a business objective*
Lack of management support	*A lack of understanding the opportunities that CRM introduces result in the management's inability to identify the added value of CRM*
No "passion" for the customer	*The organizational culture of the business is not aligned with the aim to support the customer. Customer relations are always two-way streets.*
Lack of vision and strategy	*Businesses commonly lack a well-defined strategic goal for CRM that is measurable through the establishment of business objectives*
Not redefining processes	*As with other IT projects, it is pivotal to redesign business processes that are aiming to tailor the new IT application to create business value*
Poor quality data and information	*Poor data and information quality result in decisions that inaccurately capture the customer of the business, leading to ineffective operations*
Not managing change properly	*As the use of CRM systems is pivotal to get a hold on business value, the users are to adopt the new CRM system. It is required that users are to change their view on the CRM system – which is to be managed effectively*
Not involving the final users in designing the CRM system	*If the final users are not involved in the loop means that the possibility exists that the system brings more problems than solving the problems of the users that are supposed to harness business value*

Second, the study by Bohling et al. (2006) identifies the often cited problem to successful CRM implementation is the lack of required budget, staff and time resources. Since the study by Bohling et al. (2006), the domain of IT has been subject to changes which, among other things, have incurred new business models (e.g. cloud and SAAS solutions). These changes have reduced the need for upfront non-recurring investments in, for example, hardware (e.g. servers). Still the availability of resources remains a topic of concern, since cloud and SAAS solutions exert outsourcing of expertise and recurring licensing costs. Furthermore, it is pivotal to identify who is responsible for the allocation of resources. If the one who is responsible for the tough calls is not closely involved in the project, decisions about resource allocation may incur conflict or are not well understood (CRM software architect, 2018). In-house initiatives CRM implementations suffer from a lack of available expertise and time (Bull, 2003). The lack of available resources results in 60 percent of all in-house CRM initiatives to fail (Bull, 2003). This illustrates that many businesses do not have any alternative other than outsourcing.

Third, Rigby et al. (2002) indicate that relationships are two-way streets. Therefore, it should be understood that relationships aim for mutual benefits. The salience does not reside in these one-to-one relationships with the customer but in the one-to-many relationships captured by CRM. Consequently, another challenge is the "CRM paradox" that argues that by favoring one customer, the other is unfavored (Bose, 2002; B. Nguyen & Mutum, 2012). Customers might spread negativism when they perceive to be unfavored (based on customer value). The problem for businesses is to avoid the perception of being unfavored. To that extent, the business should have the passion to help all its customers.

The fourth and fifth challenge are incurred by a lack in the business' ability to adopt CRM. The cause of this is twofold; 1) a lack of CRM vision and 2) the inability of adapting work procedures to CRM. Simply purchasing an advanced CRM solution does not guarantee that it will be adopted (N. Kim & Pae, 2007). The fact that CRM involves and converges technologies, processes and people (I. J. Chen & Popovich, 2003) incurs that the adoption of CRM is an oftentimes underestimated and diverse procedure (Bull, 2003). Subsequently, Payne and Frow (2006) stated that 75 percent of all businesses are not able to formulate a definition of CRM whereas 61 percent are not able to formulate a CRM strategy. Therefore, it is doubted that these businesses can successfully implement CRM. As a result, it becomes rather impossible to persuade the employees of the business to use CRM without a clear understanding of the added value. The infusion of IT into the activities of employees is also dependent on how well it succeeds in

satisfying the needs of the users. Businesses that are successful in incorporating CRM into the operations are those whom are successful in addressing CRM needs of the business and users.

Sixth, issues with data quality and quantity influence CRM effectiveness (Ryals & Payne, 2001). On the one hand, data quality concerns the effectiveness of data to capture the needs of customers and alter actions accordingly. There are three pillars to data quality; accuracy, confidentiality and integrity (Wang & Strong, 1996). Even minor but underestimated inconsistencies in customer, product or sales attributes can have a severe negative effect on a business' performance (Alshawi et al., 2011). On the other hand, customer data quantity concerns the volume of available data that can be harnessed to tailor individual offerings for the customer. A big part of ensuring data quality is about data migration. Yet, the migrating data tends to be complex which is reflected by a 40 percent migration failure rate (Howard, 2011). In principle, there are three stages to ensure successful data migration from a legacy system (e.g. Excel-sheets or an old DBMS); 1) scoping the migration, 2) catching migration errors, and 3) testing the performance of the migration (Friedlander-Garcia, 2017). These three stages should be adopted into the fabric of developing a CRM (CRM software architect, 2018) to catch issues early. The goal of the first stage is to pinpoint what legacy data needs to be migrated, what purpose the data serves, and identifying the complexity of the migration. Second, it is pivotal to create a database design that reports on log errors (e.g. malformed data rows and contaminated records). For BrixCRM it may be that challenged migration is to reflect upon the satisfaction of the client. Third, a test scheme should be in place which verifies that the migration is complete and accurate. Nevertheless, CRM databases accumulate 30 percent of faulty data on a yearly basis (Merced, 2017). Faulty data is what gives CRM a bad name and which is still reflected in approximately 70 percent (M. Kim, Eun Park, Dubinsky, & Chaiy, 2012) of CRM implementations to fail. There are also three best practices to ensure data quality in general; 1) keeping everyone on the same page about CRM use, 2) integrating CRM with IT solutions, and 3) institute routine data health checks. First, time should be invested to train the users about data protocols, and data collection and verification to aid their understanding CRM use. Second, integration with other systems can help to maintain accurate data; through capturing data and their associated logs and removing human errors. Third, the needs of the customers are subject to change. The quality of the data to support the business objective is affected when the captured data does not capture changed customers' needs. To overcome the problem with customer data quantity, data quality is to be ensured as a first step since ensuring data quality can help to engage in faster and broader data collection.

Seventh, successful CRM initiatives do not necessarily imply an improved productivity; the "IT productivity paradox" (Brynjolfsson & Yang, 1996; Brynjolfsson, 1993). The business should aim to formulate how to come to a change in business operations that are to benefit the business. The paradox argues that the implementation of technology does not necessarily be complementary to a business' productivity and this is due to one sobering conclusion; our understanding of how IT affects business productivity is impaired (D. D. Wilson, 1995). Even now, there is still a divide between what the business desires and what IT may provide. However, Dedrick, Gurbaxani and Kraemer (2003) have empirically shown that the productivity paradox does not exist. Nonetheless, the take home message is that CRM success is not lead and determined through IT.

Finally, the end-users of CRM should be involved in the development of CRM for the design to reflect the needs of the users. The solution does not solve the problem if the users are not involved properly. Instead, a system may even bring more problems to the users that hampers the improvement of business value (Chalmeta, 2006).

2.4.3 Business value creation through CRM

The opposite view considers CRM implementation as the attain business value such as improved sales through enhancing customer relationships. The accumulation of customer data incurs new

opportunities to effective marketing, since the availability of customer data supports the identification of valuable "sweet spot" prospects. According to Faed et al. (2010), there are five sequential steps to the implementation of CRM to enhance the business function. The first step is to identify potential customers and creating a valuable relationship with them, which results in sales leads and prospects. Second, the customer life-time value is to be calculated through sales volumes or profit contribution to identify which types of customers are most profitable (Garrido-Moreno, Lockett, & García-Morales, 2014). Third, Wells et al. (1999) identify that the created customer data profiles can be analyzed to predict customer behavior and subsequently open up opportunities for cross-selling products – *predictive customer support*. The fourth step is to keep in touch with the most profitable customers after they have purchased the business' products or services. Therefore, this step supports CRM users to keep track of customer needs. The obtained customer knowledge can be used to advertise other services to prospects – *reactive customer support*. During the fifth step, the business can dedicate its resources to the gratification of these prospects. However, other views on the customer relationship life-cycle also do exist as Reinartz et al. (2004) define CRM implementation as a process of three stages; 1) relationship initiation, 2) maintenance, and 3) termination. The third stage contradicts what is found to be a continuous evolving relationship as is envisioned by Faed et al. (2010), in order for businesses to attain loyal customers. Therefore, there is an ambiguous view on how prospects become customers.

2.4.4 CRM implementation according to BrixCRM

The goal for BrixCRM is to provide added value to the customer's business through tailoring the implementation approach to fit client needs. Most of the time, the client of BrixCRM consider it to be a CRM vendor which solely is to implement CRM on a technical level:

'You ask, we create'

~ CRM consultant 2

Nonetheless, BrixCRM considers that one should also think about the implications of non-technical considerations (e.g. change management) for CRM implementations to be successful:

> *'We do not see ourselves as a vendor and that our customers ask us to do something and we deliver, we like to see ourselves as the partner of our clients'*
>
> *~ CRM consultant 1*

Yet, the clients do not ask BrixCRM to support them for addressing these issues most of the times. This is simply because the customers do not see the importance of these issues or that they do not consider BrixCRM as a consultancy partner:

> *'The current situation is that we design CRM systems according to what our client demand. We do not fulfil the role of consulting our clients in terms of, for example, change management. We might fulfil that role in the future, but we must admit that we are not there yet. We are no big consultancy firm like [others].'*
>
> *~ Project manager 1*

Nonetheless, BrixCRM wants to assist its clients during CRM implementations in adoption processes as it is a prerequisite for usage which on its turn is to add business value. BrixCRM differentiates three approaches to CRM implementation; "Horizontal", "Vertical", and "Special" approaches which mainly differ in scope. Horizontal approaches are the most straightforward approach for which standard Sugar functionalities are implemented. On top of that, vertical implementations include custom-built system features. The special implementation approach is the most unique approach to CRM implementation since, these include many tailored CRM services. Hence, these need to be approached on a per case basis due to the absence of similarity to other projects.

Table 8: The approach of BrixCRM to CRM system implementation

Phase	*Description*
Kick-off	*During the kick-off phase, the goals of the project are specified, the planning and the process of the system development are defined*
Sugar Workshop	*Key-users of the CRM system and project members are given the opportunity to learn the basics of Sugar. To that extent, the workshop serves to specify the requirements and goals of these key-users and project members in more detail*
Blueprint	*During the blueprint phase, the requirements of the key-users and project members are mapped onto system functionalities; the blueprint of the system*
Apparel of Sugar	*This phase is centered around the implementation of the blueprint and therefore making the alterations to Sugar packages – which will be the prototype of the CRM system*
User Acceptance Testing	*The user tests are to test whether the prototype fulfils the needs of the key-users and project members*
Training	*During a one-day training, the key-users and project members are provided with the tools and means to use the CRM system*
Going live	*The going live phase is the operations phase of the project in which the system is used and maintained*

Yet, the process of staging CRM implementations is designed in a common template that spans over seven consecutive stages as are listed in Table 8. The first stage is the *kick-off,* during which the goals are specified, and the planning are discussed with the client. BrixCRM normally plans the project by drafting a Project Initiation Document (PID) according to the management methodology Projects In Controlled Environments (PRINCE2). The second phase is called *Sugar Workshop*, during which key-users (e.g. sales) of CRM and the project members get the opportunity to learn the basics of Sugar. Therefore, the goal of the customer is to specify its goals and requirements in more detail – this could be related to the system analysis phase of the development life-cycle (Bose, 2002). Capturing the requirements of the customer is an important and complex task of this stage since, there may exist a variety of expectations that lead to diverging requirements as well as due to the inability of the client to accurately formulate requirements. Two interviewees pointed out:

> *'Sometimes it is the case that customers say that they desire [functionality A], but they actually mean [functionality B].'*
>
> *~ CRM consultant 2*

Whereas another interviewee stated the importance of stakeholder analysis since, intra-organizational disagreements between stakeholders cause requirements to be in disparity:

> *'It may be the case that you come to agreement with the top management of the customer, however the moment that you exhibit a demo to the client's employees they want something entirely different.'*
>
> *~ Management*

These two issues result in an increased complexity of planning a CRM implementation, which can cause time or budget overruns that may even lead to project cancellation. The expectations of the stakeholders should therefore be managed closely. If the expectations are managed effectively, the different stakeholders all know how CRM supports the achievement of business goals. Hence, it is important to identify who is involved in the implementation – pre-project, during project, and post-project. After the SugarCRM workshop, a so-called *Blueprint* is designed which maps the required CRM processes onto Sugar packages. The deliverable of this stage is a blueprint document in which adjustments to Sugar are described. After the blueprint is approved, the next stage is initiated; the *apparel of Sugar*. During this stage, the blueprint is implemented – constructed – in Sugar. These functionalities can either be designed in accordance to Agile or stagewise approaches whereas the entire approach to implement CRM resembles a linear process. Several *sign-off moments* are defined which serve to track the progress of the project as

well as providing the client the opportunity to give feedback. The deliverable of this stage is the creation of a prototype which can be used for User Acceptance Testing (UAT). During the user *acceptance testing*, end-users of the customer test the usability of the CRM solution. As a sixth step, it is necessary for the client to receive adequate training in using CRM. During this, often one-day, training, a group of end-users are provided with tools and means necessary to use CRM. The fifth and sixth step altogether share similarities to the sixth phase of the development life-cycle of implementation (Bose, 2002). Finally, the seventh stage is the operations stage; going live. At this stage of the project, the solution is ready for the client to use. Ideally, the business should be seeking to learn about its customers and subsequently to re-design its operations. Even though the implementation approach is defined in full, the 'infill' of these stages is not predetermined but is rather driven by *refinements*. One interviewee stated:

> *'How you are going to approach an implementation is still highly case specific, partly due to the absence of needed guidelines'*
>
> *~ Project manager 1*

Furthermore, as of the 25th of May 2018 a new European regulation on data protection goes in effect; the General Data Protection Regulation (GDPR) (Tikkinen-Piri, Rohunen, & Markkula, 2018). The introduction of this regulation implies two challenges: 1) BrixCRM processes customer data of its clients, and 2) BrixCRM is responsible for the customer data in its own CRM. On the one hand, BrixCRM aims to alter its practices to be compliant to the new regulations. As BrixCRM is the processor of customer data of its clients, the client is responsible for the usage of their customer data. Therefore, BrixCRM is not to blame in case something is amiss in terms of complying to the GDPR. However, still BrixCRM seeks to ensure that in any case the practices are comply with the GDPR through the creation of a standardized contracting template. On the other hand, BrixCRM has externally audited its practices to check whether these comply to the GDPR. One of the things that BrixCRM envisions to do is to get ISO 27001 certified to be afoot of new privacy and security regulations. On top of that, BrixCRM has organized workshops to educate its employees as well as its customers to get them acquainted with the new regulations.

2.5 Adoption: a determinant for CRM success

Literature has identified the inability of businesses to integrate CRM practices into their day-to-day activities as one of the main causes of CRM initiatives to fail (Garrido-Moreno & Padilla-Meléndez, 2011). To that extent, it is shown that businesses acknowledge the potential of CRM but still do not acknowledge the necessity of altering their business ways; adoption. More generally speaking, actual usage is a key influencer of CRM success. Therefore, end-users of CRM should be empowered to use an IT application to fulfil their daily tasks (H.-W. Kim & Gupta, 2014). Within the IS field, it is thoroughly studied how IS adoption is measured. Earlier research proposed several, and oftentimes overlapping, models to individual's adoption; 1) the Technology Acceptance Model (TAM) (Davis, 1989), 2) Task-Technology Fit (TTF) (Goodhue & Thompson, 1995), 3) the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003), and 4) the Information System Success Model (ISSM) (DeLone & McLean, 1992) – which was updated in 2003 (DeLone & McLean, 2003). Refer to the Appendix for these theories. Moreover, researchers have investigated how innovation is diffused or adopted in the context of individuals and that of an entire enterprise (Askool & Nakata, 2012) through applying the Innovation Diffusion Theory (IDT) (Rogers, 2003). This section provides an overview of how IS adoption theories apply to the field of CRM – which is practically touched upon by the annual study of G2 Crowd (G2 Crowd, 2017) for customer satisfaction. Therefore, this section is to identify a reference framework of heretofore conducted studies to conceptualize what constitutes and conceptualizes CRM success and how this is determined.

Table 9: Previous research on CRM adoption

Adoption level	Research	Type of CRM adoption	Background theory
Individual CRM adoption	Avlonitis and Panagopoulos (2005)	Intention to explore	TAM and ISSM
	Hsieh, Rai, Petter and Zhang (2012)	Intention to explore	ISSM
	Karahanna et al. (2006)	Intention to explore	TAM
	Karjaluoto, Tollinen and Pirttiniemi (2014)	System use	TAM
	Pai and Tu (2011)	Intention to explore	UTAUT and TTF
	Vella et al. (2013)	System use	TAM
	Yang et al. (2011)	System use	TAM
Enterprise wide CRM adoption	Hung et al. (2010)	Intention to explore	IDT
	Nguyen and Waring (2013)	Intention to explore	IDT

2.5.1 System usage

The various IS adoption models issue a plethora of conceptualizations to express the perception of usefulness and ease of use of IS; TAM prompts the terms of *perceived usefulness* and *perceived ease of use*, UTAUT nominates *performance expectancy, effort expectancy* and *social expectancy*, and TTF suggests *fitness* between the task and the technology to predict actual system usage. However, the ISSM expresses success through the impact IS has on the individual and on the organization through *usage* and *satisfaction* on the basis of quality measures. For that reason, this research considers actual CRM usage as the differentiator for CRM implementation success.

Heretofore research studied the applicability of the IS adoption models. The findings of these studies have indicated that sixty-one percent of the variance between the constructs of TAM can be explained for CRM adoption (Avlonitis & Panagopoulos, 2005), whereas the UTAUT and TTF model indicates a significant correlation between its constructs and the effects on CRM usage (Pai & Tu, 2011). Moreover, previous literature has tailored the ISSM to apply to CRM success (Avlonitis & Panagopoulos, 2005; P.-A. J. J. Hsieh et al., 2012). However, a trimmed and parsimonious ISSM – which drew upon the effects of use and user satisfaction on user performance in relation to management support, characteristics and demographics, and market conditions – elicits the absence of a causal relationship between user satisfaction and performance impact as well as a significant effect of acceptance on performance (Avlonitis & Panagopoulos, 2005). For that reason, it is found that solely the TAM, UTAUT and TTF have showed to be applicable for CRM implementations. In addition to these finding, the current research beliefs that the incorporation of *voluntariness of use* in UTAUT is of invaluable importance since oftentimes CRM solution are not business-critical. That is, the use of CRM can be bypassed in these situations and thus can be perceived as voluntary.

In the CRM field, a myriad of studies has aimed to apply these IS adoption models to elicit what influences CRM usage. To that end, the extent of research has inquired how to empower the users of CRM – salespeople – as they are to incorporate CRM practices into their day-to-day activities. The application of TAM singled out the importance of management support as it assists the identification of information needs of the sales employees and thus improves the perceived usefulness of CRM (Vella et al., 2013). Furthermore, the organizational factors of expectation management, user participation, and organizational training are related to the acceptance decision of employees as it is entangled with user beliefs (Avlonitis & Panagopoulos, 2005; Gelderman, 1998). However, the results of the heretofore conducted research shows a lack of consensus on the variance of these factors on CRM adoption. Moreover, a multitude of studies have also investigated the external variables of organizational characteristics, employee demographics, market conditions, and compatibility (Avlonitis & Panagopoulos, 2005; Karahanna et al., 2006; Karjaluoto et al., 2014; Vella et al., 2013). Only the variable of demographics (e.g. age and education) has been identified to influence the adoption of CRM (Avlonitis & Panagopoulos, 2005). One of the reasons may be that it is expected that younger and educated employees are more

likely to be familiar with new technological tools. Heretofore conducted research on CRM which applied UTAUT or TTF have confirmed these findings as empirical inquiries indicated that the existence of a champion with authority and power is an advocate for CRM usage as it creates a certain social expectancy whereas it is also identified that training employees in the practices of CRM positively influences actual CRM usage (Gelderman, 1998; Pai & Tu, 2011).

On top of the individuals to adopt innovations, companies are to adopt new innovations into the fabric of their business processes to eventually enable the individual employee to adopt CRM. the IDT is used to investigate the perceived critical characteristics of innovations on the business level (Askool & Nakata, 2012). Literature has examined enterprise related factors such as the size of a company, the capabilities of a company, as well as the attributes that drive the adoption of CRM innovation (Hung et al., 2010; T. H. Nguyen & Waring, 2013). Literature on enterprise related attributes to the success of CRM identified management characteristics, company characteristics, involvement of employees, the availability of IT resources (T. H. Nguyen & Waring, 2013) which respectively include the size of the organization, IS and knowledge management capabilities of staff, innovativeness of senior executives, relative advantage of the company, and the complexity of the CRM solution (Hung et al., 2010). These factors are used to determine the context of the business for which BrixCRM is to implement the CRM solution.

Table 10: Enterprise adoption factors to CRM

Ref	factor	Description
(Hung et al., 2010)	Size of an organization	*The study investigated whether the size of the organization affects the ability of hospitals to set up additional assets that are required for CRM system adoption*
	IS capability of staff	*The study investigated whether the IS capabilities of the staff and technical skills in an organization are influencing the adoption of CRM systems*
	Innovativeness of senior executives	*The study investigated whether an increase in the willingness of executives implies an increase in willingness to bear the risks in adopting new innovations – which is important to adopting CRM systems*
	Knowledge management capabilities	*Knowledge management capabilities such as knowledge on customers, products and services which is induced through the usage of IT infrastructures.*
	Relative advantage	*According to previous literature, the healthcare industry is competitive in nature. Therefore, the study investigated whether organizations are driven by relative advantages to adopt CRM systems*
	Complexity	*The study seeks to identify whether the adoption of CRM systems is influenced by the perceived complexity of the system*
(T. H. Nguyen & Waring, 2013)	Management characteristics	*It is likely that the adoption of IT is influenced by the extent to which management understands IT. Characteristics are attitude, personality, and values*
	Involvement of employees	*It is assumed that employees play a role in the adoption of IT through their understanding and contribution of IT adoption*
	The availability of IT resources	*IT resources refers to IT related capabilities and capacities contained in the company*
	Company characteristics	*The size of the company influences the scale, scope, and the complexity of the adoption of CRM systems*
		The industry in which the company is operating is assumed to influence the need for CRM capabilities and thus the need for CRM system adoption
		The perceived market position is influencing the belief of a company that CRM practices should be used to improve on the market position or not
		Innovativeness is defined as the willingness and ability of a company to adopt, imitate or implement technologies.

2.5.2 User adoption measures

Sugar provides opportunities to measure whether the solution is successfully adopted by its users. The creation of usage measuring reporting can help to pinpoint, for example, how CRM is used and how often it is used. For instance, Sugar provides a so-called ‘Export module’ and ‘trackers’ which respectively enable a business to extract usage data and log files. The first can be used to create custom-based reports that can identify how CRM is used whereas the latter is useful to create standard ‘Sugar reports’. These reports facilitate the analysis of user acceptance. Whenever it is found that CRM is not used, the business is able to pinpoint the reasons why it is

not used as expected. That is, for instance, CRM is not perceived as easy-to-use or useful, or the solution does not provide the features that were wanted. Consequently, it can be decided to act on these finding by planning extra training sessions, workshops or re-assessing the blueprint – the design.

2.6 CSF-based CRM implementation steering

The acquired knowledge on the domain of CRM implementation as afore provided form the basis to the identification of CSFs that determine the success of CRM implementations. For that reason, this section adopts actual usage as the denominator of CRM success. The body of literature provides an extensive list of 25 CSFs that influence CRM implementation success.

Table 11 provides an overview of these papers with the identified factors respectively. The set of identified papers proposes a mix of conceptual and empirical findings. Businesses that seek to successfully implement CRM can use these factors to fit the specific context of the business (Eid, 2007). That is, the prediction power of these factors differ for varying organizational contexts (Boulding et al., 2005; Zablah et al., 2004). These CSFs for CRM implementation are separated into five categories that contribute to an organization's approach to bolster customer relationships; 1) employee attitude factors, 2) employee skills factors, 3) implementation related factors, 4) organizational design factors, and 5) strategic management factors. Figure 9 depicts the process model of how these categories contribute to the concept of CRM implementation.

Table 11: Critical success factors to CRM implementation

CSF \ Reference	Becker et al. (2009)	Bohling et al. (2006)	Bose (2002)	Chen and Popovich (2003)	Croteau and Li (2003)	Eid (2007)	Eid and El-Gohary (2014)	Faed et al. (2010)	Garrido-Moreno et al. (2014)	King and Burgess (2008)	Lawson-Body et al. (2011)	Lindgreen et al. (2006)	Rahimi and Berman (2009)	Payne and Frow (2005)	Rigby et al. (2002)	Saeed et al. (2011)	Wilson et al. (2002)	Zablah et al. (2004)
Project champion				✓												✓	✓	
Channel integration				✓						✓						✓	✓	
Client system integration						✓	✓			✓				✓			✓	
Align with key stakeholder groups		✓									✓							
Cross-functional cooperation				✓						✓	✓					✓	✓	
Customer data collection			✓				✓			✓		✓						✓
Customer knowledge					✓	✓						✓			✓			✓
Customer segmentation							✓					✓						✓
Information technology	✓			✓	✓		✓	✓		✓	✓	✓	✓		✓	✓	✓	
Company-wide CRM		✓		✓				✓				✓						
CRM capabilities employees				✓				✓	✓		✓	✓						
Customer-oriented processes				✓								✓	✓	✓	✓	✓	✓	✓
Training program			✓	✓			✓	✓	✓		✓	✓						
Internal communication				✓				✓	✓	✓								
Incentive system				✓					✓			✓						
Performance measures				✓			✓											✓
Employee behavior/attitude	✓			✓								✓	✓		✓			✓
Management attitude	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓			✓		
CRM goals / objectives				✓					✓			✓						✓
Customer-centric philosophy			✓	✓			✓	✓										
Organizational alignment	✓								✓						✓	✓		
Market orientation										✓	✓						✓	
Organizational structure										✓	✓	✓	✓			✓		
Customer-centric culture				✓								✓	✓		✓		✓	✓
CRM strategy				✓			✓	✓		✓		✓			✓	✓	✓	✓

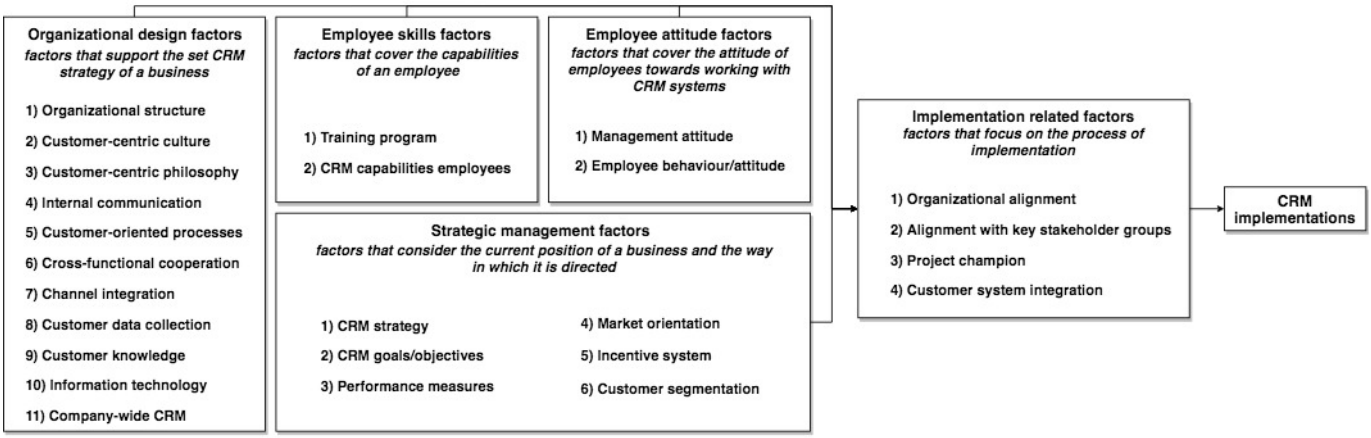

Figure 9: CSFs process model for CRM implementation

Employee attitude factors are pivotal to the success of CRM implementation as employees are the cornerstone of every business. Employees 'make or break' the CRM strategy of the business. It is a prerequisite to have the employees with the right attitude to collaborate to the strategy of the business. The two CSFs that are related to this category are management attitude and employee behavior. First, successful implementation of CRM is subject to the commitment of (top) management to support the CRM implementation (Becker et al., 2009; Bohling et al., 2006; I. J. Chen & Popovich, 2003; Eid, 2007; Eid & El-Gohary, 2014; Faed et al., 2010; Lindgreen et al., 2006; Rahimi & Berman, 2009). Top management support serves two purposes; 1) sponsorship and 2) stewardship (Saeed et al., 2011). Stewardship consists of two aspects: 1) advocacy of change and 2) vision sharing. Croteau and Li (2003), and Markus and Benjamin (1996) identify that top management support serves to influence the impact of CRM and reducing the resistance to change as it also does for other IT systems (Daft, 2010). Second, Rigby et al. (2002) amongst other researchers (Becker et al., 2009; I. J. Chen & Popovich, 2003; Lindgreen et al., 2006; Rahimi & Berman, 2009), identified that the acceptance of the employees and therefore their sensitivity to customer needs is what eventually paves the way for effective CRM implementations because they are the ones to establish valuable customer relationships. Daft (2010) suggests four measures to ensure cooperation of employees and these are; 1) communication and education, 2) participation, 3) negotiation, 4) coercion and top management support. Therefore, the first factor is an influencer of the latter.

It is also important that the employees of a business possess the capabilities to fulfil the tasks that contribute to the CRM strategy of the business. That is, employee skills influences CRM adoption; organizations will not benefit from a new system until it is used (Daft, 2010). There are two employee skills factors; 1) CRM capabilities of employees, and 2) Training program. First, the implementation of CRM stresses the importance of having appropriate skills and knowledge throughout the ranks of the organization (I. J. Chen & Popovich, 2003; Faed et al., 2010; Garrido-Moreno et al., 2014; Lindgreen et al., 2006) that enables CRM to be used to its potential (Bose, 2002). Nonetheless, it cannot be assumed that the appropriate skills and knowledge are owned by every employee. To that end, the entire organization must show commitment to establish an ongoing company-wide training program that aims to educate its employees (Eid, 2007; Garrido-Moreno et al., 2014; Lindgreen et al., 2006). These training programs can help employees to understand the goal of CRM as well as indicating how to be of better service to the customer (Eid & El-Gohary, 2014). As aforementioned, training employees is entangled with the acceptance decision as it improves the user's beliefs (Avlonitis & Panagopoulos, 2005; Gelderman, 1998).

Organizational design factors revolve around the design and development of a business to support a CRM strategy. To that extent, these factors shape the organization which is able contribute to successful CRM implementation. It is pivotal to regard the design of an organization as a continuous process which reflect the alignment of the environment, a business' strategy, and the organizational structure that are subject to ongoing changes (Roberts, 2007). There are eleven

organizational design factors; 1) organizational structure, 2) customer-centric culture, 3) customer-centric philosophy, 4) internal communication, 5) customer-oriented processes, 6) cross-functional cooperation, 7) channel integration 8) customer data collection, 9) customer knowledge, 10) information technology, and 11) applying CRM company-wide. First, an well-functioning organizational structure and hierarchy support the diffusion of a CRM vision as it facilitates the identify employee activities that are required to achieve business objectives (Reinartz et al., 2004). Second and third, Lindgreen et al. (2006) indicate that relationship management requires a strategic change from the product- and process-focused cultures towards a customer-focused culture to reflect customer needs in the service's functionality. The service-dominant logic perspective supports B2B cocreation which enhances service fitness (Vargo & Lusch, 2017). As indicated by Rigby et al. (2002), culture and a customer-centric philosophy may be even the most essential aspects to successfully implementing of CRM as it is a requirement to meet customer expectations (I. J. Chen & Popovich, 2003; Eid, 2007; Lindgreen et al., 2006; Rahimi & Berman, 2009; H. Wilson et al., 2002). Fourth, developing channels for internal communication that facilitate inter-departmental communication, enable managers to diffuse and foster cross-functional knowledge (Garrido-Moreno et al., 2014). Acquiring knowledge, via training programs, is one thing but for CRM implementations to be viable internal communication should support internal consistency required by a CRM strategy (I. J. Chen & Popovich, 2003; Faed et al., 2010; King & Burgess, 2008) as well as ensuring adequate customer interaction (Garrido-Moreno et al., 2014). Fifth, Rahimi and Berman (2009) argue that a customer-oriented organization is a single 'human being' in the sense that it functions as a single unit with the sole purpose to benefit its customers. To that extent, customer orientation enables the business to channel its knowledge and communicate its marketing function into one interaction point which lessens the information overload for the customer. Sixth, traditionally the variety of departments within a business are comfortable working in these so-called 'silos' of activities (Gupta & Shukla, 2002). However, in their study, Saeed et al. (2011) have found that combining activities of functional lines channeled into a single action, or end-point for interacting with the customer, is a determinant for successful customer relationships. Therefore, it is beneficial for businesses to create integrate several customer interaction points to bolster CRM success. Seventh, channel integration towards the customer can be further expanded by means of promoting internal cross-functional cooperation. The expertise of different disciplines that exists within the variety of departments can be combined to solve complex issues (Saeed et al., 2011). Eight, accumulating accurate customer data such as preferences, demographics, and purchasing history is vital for coordinating the marketing function of the business. The collection of customer data allows the employees to purchasing behavior Lindgreen et al. (2006) and subsequently tailor the services to suit customer needs (Eid & El-Gohary, 2014; King & Burgess, 2008). In order for services to mirror customer needs, customer knowledge should be attained (Croteau & Li, 2003). To that extent and as a ninth CSF, customer knowledge supports businesses in satisfying customer needs, which serves as a motivation for customers to return (Rigby et al., 2002). As a result of returning or loyal customers, greater profits can be obtained (Stefanou, Sarmaniotis, & Stafyla, 2003). Subsequently, greater profits influence the belief of success. Ten, IT is frequently pinpointed by the literature as an important component of CRM implementation (Becker et al., 2009; I. J. Chen & Popovich, 2003; Eid & El-Gohary, 2014; King & Burgess, 2008; Rigby et al., 2002; Saeed et al., 2011). For a start, IT architectures determine which systems facilitate and manage business processes and how these interact with each other (Lindgreen et al., 2006). However, a prerequisite for IT-infrastructures to be beneficial is to have a profound understanding of both IT-related and economic considerations (Croteau & Li, 2003). The combination of these consideration serves to obtain customer-centric knowledge. Therefore, IT is the cradle to providing personalized services to the customer. Lastly, by integrating company-wide CRM solutions, CRM penetrates various functional lines within the organization – e.g. sales. Though CRM can be of use for a single

department within the organization, the resulting customer information can be beneficial for the different departments too (Bohling et al., 2006). Customer data profiles can be expanded to enrich customer relationships and interaction that serve an abundance of purposes (Blattberg & Deighton, 1991; I. J. Chen & Popovich, 2003; Lindgreen et al., 2006).

Strategic management factors relate to the decisions and activities which are rooted in the corporate strategy to attain a competitive advantage. It becomes complex, if not impossible, to promote organizational changes induced by CRM implementation if a CRM strategy is absent. Hence, changes in organizational aspects are needed to aid the corporate strategy (Daft, 2010). There are six strategic management factors; 1) CRM strategy, 2) CRM goals and objectives, 3) performance measures, 4) market orientation, 5) incentive systems, 6) customer segmentation. First, it is argued that a CRM strategy – a vision – is the de facto decision-making motivation to implement CRM and to formulating associated objectives (I. J. Chen & Popovich, 2003; Eid & El-Gohary, 2014; King & Burgess, 2008; Lindgreen et al., 2006; H. Wilson et al., 2002). Second, from a project-based perspective, the formulation of CRM goals and objectives depict a far sight towards the implementation of CRM should be directed. To that end, the formulated goals and objectives are the denominators of success as these are the de facto measurement standards. Consequently and as a third factor, it is essential to establishing performance measures (Eid, 2007) as it helps to steer the operations and processes of CRM by adjusting operations when the measurements are indicating poor performance (Harrigan, Ramsey, & Ibbotson, 2011). Fourth, market-oriented businesses are those which are committed to understanding both the needs of their customers and the strategy of their competitors by gathering and analyzing available market information (Slater & Narver, 1998). Therefore, it is necessary for a business to be market-oriented (H. Wilson et al., 2002) as it accompanies CRM solutions with necessary business change processes to deliver intended benefits. Consequently, market orientation is the driving force behind the various aforementioned factors of for example, channel integration and customer orientation. Fifth, in order to ignite the diffusion of knowledge throughout the organization, managers may introduce incentive systems to motivate employees to take their time to acquire knowledge and share their acquired knowledge (Garrido-Moreno et al., 2014). That is, employees who go 'the extra mile' is believed to enhance business performance. To that extent, incentives also extrinsically motivate employees to adopt a customer-focused attitude, because employees tend to be more willing to change their attitude when it is rewarded (I. J. Chen & Popovich, 2003; Lindgreen et al., 2006). Customer segmentation, as a sixth factor, supports the creation of effective relationship management (Rigby et al., 2002). The process of segmentation is to be implemented in two stages; 1) rank customers based on value and 2) differentiating them based on their needs (Lindgreen et al., 2006). These segmentation practices are a first step to and, make fast way for one-to-one marketing; individualizing the marketing effort (Eid, 2007). Therefore, businesses should seek to create customer segments in order to design valuable one-to-one customer relationships.

Implementation related factors focus on the process of implementation and change management whereas employee attitude factors elaborate on the personal beliefs to change management. Successful implementation is a complex process that involves a change in an employee's day-to-day tasks and project management measures to attain user satisfaction and thereby enhance business operations and thus add business value. Goldenberg (2000) identified that companies have continuously found evidence that CRM implementation failure is inevitable if they are solely regarded as a technological solution. Moreover, it is found that if management shows commitment to the implementation, then employees are also likely to contribute to the implementation strategy (Daft, 2010). There are four implementation related factors; 1) organizational alignment, 2) alignment with key stakeholder groups, 3) having a project champion, and 4) customer system integration. First, organizational alignment – which is the process of linking its structure and

resources to the CRM implementation – helps to secure organizational structure, customer orientation and cross-functional cooperation integration (I. J. Chen & Popovich, 2003). Second, the alignment with key stakeholder groups is regarded by business managers as pivotal influencer of implementation success. Especially, businesses should seek to align with customer, shareholder and employee goals (Bohling et al., 2006). The alignment of stakeholders are to take away different expectations such that the solution effectively addresses the inherent issues of all involved parties. Third, project champions drive CRM implementation processes (I. J. Chen & Popovich, 2003) as project champions help to smoothen the implementation process by gaining commitment of the involved parties through 1) facilitating open communication between employees, 2) promoting the initiative and getting the employees involved, and 3) addressing concerns of different stakeholders (Saeed et al., 2011; H. Wilson et al., 2002). Finally, Leverick, Littler, Bruce and Wilson (1998) stress the importance of compatibility and integration with other marketing IT projects, meaning that CRM systems should be able to converge their operations with other IT systems. According to King and Burgess (2008), systems integration between different departments is key to deliver improved service to the customer. Therefore, system integration serves to improve customer relationships (Eid & El-Gohary, 2014).

2.7 CSF importance as perceived by practice at BrixCRM

During the interviews about CRM implementation, the twenty-five aforementioned CSFs were shown to the interviewees and the question was posed which of these CSFs are most important. The interviewees stated that 1) project champion, 2) customer systems integration, 3) align with key stakeholder groups, 4) information technology, 5) CRM capabilities employees, 6) customer-oriented processes, 7) training programs, 8) internal communication, 9) performance measures, 10) employee behavior/attitude, 11) management attitude, 12) CRM goals/objectives, 13) organizational alignment and, 14) CRM strategy are considered most important in the case of BrixCRM. These CSFs spans over all perspectives of people, processes and technological considerations (I. J. Chen & Popovich, 2003). The reason for this holistic view of BrixCRM might be explained by the fact that BrixCRM offers development, consultancy, and project management services that involve different disciplines and thus perspectives. Table 12 illustrates how often these CSFs are considered important and, compared to Table 11, the list of CSFs is shortened to fifteen CSFs. The remainder of this section elaborates on the beliefs of the interviewees.

Table 12: CSFs for CRM implementation according to the interviewees

CSF / Interview	Project champion	Channel integration	Client system integration	Align with key stakeholder groups	Cross-functional cooperation	Customer data collection	Customer knowledge	Customer segmentation	Information technology	Company-wide CRM	CRM capabilities employees	Customer-oriented processes	Training program	Internal communication	Incentive system	Performance measures	Employee behavior/attitude	Management attitude	CRM goals/objectives	Customer-centric philosophy	Organizational alignment	Market orientation	Organizational structure	Customer-centric culture	CRM strategy
CRM consultant 1			✓									✓		✓						✓					✓
CRM consultant 2				✓								✓							✓						✓
Project manager 1	✓			✓					✓				✓	✓			✓	✓	✓		✓				
Business consultant	✓			✓							✓	✓				✓	✓	✓	✓		✓				✓
Management	✓										✓							✓							✓

First, the importance of project champions in the view of the interviewees resided in the aspect of stewardship. One of the interviewees mentioned that the project champion is someone who aims to identify the added value of the CRM and seeks to explain why there is a need for the CRM.

Second, customer system integration has been mentioned by one interviewee to be particularly important. The integration of CRM systems within the IT-landscape of customers should support effective use of the system, because it provides the opportunity to retrieve valuable data from other systems that should be utilized for advertising to the business' customers. Third, three of the interviewees stated the importance of alignment between key stakeholder groups. As mentioned in the previous section, alignment between the expectations of key stakeholders (e.g. end-users and management) is a prerequisite to come to appropriate system functionality that supports a CRM strategy. Fourth, information technology is mentioned once as a particular important factor for the success of CRM implementation. IT should be the tool to achieve the goals that are associated to CRM. Well-functioning IT systems help to retrieve the data that is needed to make CRM-based business decisions. However, this is at the same time the argument of other interviewees not to include IT as an important factor, who regard IT as merely a tool which should be the result of the implementation and not the means to - diminishing its influence on CRM implementation. Fifth, CRM capabilities of the employees of the client has been identified by two interviewees to be important. These interviewees remarked that for CRM to add value, it is required that the employees have the necessary skills for effective use of the systems. Sixth, customer-oriented processes are marked as important, because CRM should be used in order for it to address the problems of the business' customers and to that extent add value. If the use of CRM is not customer-oriented, it remains yet another tool which is not efficiently used. Seventh, the provision of a training program is identified as an important CSF. Training programs are envisioned to help end-users to use the system effectively. Without the necessary skills, a system will not be used which undermines its added value. Eighth, internal communication is indicated as important to address diverging internal requirements and expectations of the implemented CRM. Internal communication helps to reduce misunderstandings and to diffuse a vision of CRM that is to be adopted throughout the entire organization. Ninth, one interviewee stated the importance of performance measures, or Key Performance Indicators (KPIs). KPIs are important to monitor the effectiveness of the CRM and its added value. To that extent, it is seen as the next step to controlling the use of CRM. Tenth, employee behavior and attitude is regarded as an important factor, because is CRM solely effective if the employees or end-users are motivated to use it. If these employees are reluctant to using CRM, the potential of the system is not realized. Eleventh, the attitude of (top) management is important since it directly influences the success of CRM implementation. As one interviewee mentioned, management will not be using the system themselves but will provide it to its employees. Therefore, the system may not be used if management does not motivate its employees. Twelfth, CRM goals and objectives are important since it can be the only guideline one might have during the implementation of CRM. CRM goals and objectives make up the system's requirements. However, the interviewees remarked that it sometimes is hard to differentiate CRM goals and objectives from a business' CRM strategy. Thirteenth, customer-centric philosophy is regarded important by one interviewee. This interviewee regards customer-centric philosophy as a mindset in which you feel responsible to help the customer further. The interviewee recognizes the importance of bundling the expertise of the different roles within the BrixCRM to aid the client to support its customers. Fourteenth, organizational alignment is seen to be important because it should converge the business goals with the utilization of CRM. Change management is seen to be an important facilitator to organizational alignment. Finally, four out of the five interviewees recognized CRM strategy as an important factor to CRM implementation. However, all of them admitted that a CRM strategy is hard to find within the organization of the client of BrixCRM. The one interviewee who did not recognized CRM strategy as an important factor to successful CRM implementation emphasized that;

> *'If a CRM strategy is hard to find at our customers, why would it be an important factor? To that extent, we could do without a CRM Strategy'*

~ Project manager 1

However, the formulation of a CRM strategy can help to make the implementation measurable; is the solution aligned with the strategy. For that reason, it helps to determine whether the system is successful in addressing the needs of the business.

Based on the numbers of the identified CSFs from the interviews, these CSFs are now prioritized. It is believed that fifteen CSFs are still too many to effectively control for CRM implementation on the basis of the human capacity to process limited volumes of information (Miller, 1956). As a next step, a congruent list of prioritized CSFs is created. To do so, a counted threshold is used to differentiate the most important CSFs – which surpass the threshold – from lesser important CSFs. A prioritized CSF is a factor which is mentioned by most of the interviewees - that is by three or more interviewees. Then, the prioritized CSFs are sorted by the number of mentions in descending order. Table 13 lists the prioritized CSFs. Interestingly, all of these CSFs are not situated in the technology domain. Two possible reasons for this may be that IT should solely be considered as a tool to support the business objective and the fact that the provided services of BrixCRM includes also consultancy and project management rather than solely software development as aforementioned.

Table 13: CSF prioritization based on the interviews

CSF *Sorted by # of mentions*	**CSF count** *# of mentions of this CSF*	**CSF domain** *People, Process or Technology*
CRM strategy	4	Process domain
Project champion	3	Process domain
Align with key stakeholder groups	3	People domain
Customer-oriented processes	3	Process domain
Management attitude	3	People domain
CRM goals/objectives	3	Process domain

Moreover, it has come to light that other factors are considered as critical to the success of a CRM implementation on the basis of the interviews. One of these factors can be denoted as change management, meaning that it is important that the client's internal processes are designed such that everyone in the organization understands why and how the CRM solution is to be implemented, and that CRM is adopted in their day-to-day activities. Furthermore, as one of the interviewees stated that data quality is an important influencer of the usefulness of CRM, data quality is considered as a CSF for the implementation of CRM. As previously described, data quality considers, among other things, aspects of migration and integration. Interestingly, data quality is contained in the technology perspective. However, data quality is believed to be entangled with the people perspective as accurate data influences the perceived usefulness of a CRM solution. Finally, since BrixCRM is contracted by its clients for the implementation of CRM, a great part of responsibility is also residing at the client. Therefore, the involvement of BrixCRM's client is to affect the success of CRM implementations. Table 14 lists the conceptualizations of the nine important CSFs in the context of BrixCRM. In the remainder of the current research, these conceptualizations are used to clarify what is understood by the different CSFs.

Table 14: CSF conceptualizations

Critical success factor	**Description**
Change management	*Change management is the factor that inquiries how much the client of BrixCRM should focus on eliciting organizational change and change in business processes to successfully incorporate CRM.*
Data quality	*Data quality is the factor that inquiries how the quality of the data is perceived to influence the ability of CRM to execute the needs of the end-users.*
CRM strategy	*CRM strategy is the factor that describes the long-term vision of the client and how CRM fits into the existing corporate strategy. The question to that end is where the client envisions it to be in the long run.*

Project champion	*Project champion is the factor that inquiries the importance of having someone championing the project in primarily the role of stewardship. A project champion is therefore someone who is to stand for the project and motivate others to contribute.*
Customer involvement	*Customer involvement is the factor that considers the level of involvement of the client and how this involvement impacts the process of CRM implementation.*
Alignment with key stakeholder groups	*Alignment between stakeholder groups helps to elicit expectations and converging these into a (single) view of how CRM is to be used.*
Customer-oriented processes	*Part of the focus of CRM could be to design customer-facing that are aimed to benefit the customer of the business. The focus can either be on customer intimacy or not, but it is pivotal that the design of business processes mirror the business values.*
Management attitude	*Management attitude is the factor that inquiries how the management positions itself towards the implementation of CRM. Therefore, the question is how supportive management is in the process of implementation.*
CRM goals/objectives	*CRM goals/objectives is the factor that describes the short-term gains that the client wants to achieve from the implementation. That is, how should the implementation aid the current procedures of the business functions.*

2.8 Conclusions

This chapter has investigated the field of CRM by 1) elaborating on the backstory of CRM, 2) by identifying how IT is interwoven with CRM, 3) by analyzing the current CRM market, 4) by discussing how literature on IS adoption relates to the question of how to perceive CRM success, 5) by identifying the practices to implementing CRM, and 6) by identifying the plethora of CSFs for CRM implementation as per the literature and which of these apply to the case of BrixCRM. Firstly, it is found that CRM is rooted in practices for contact management and relationship marketing – one-to-one marketing – that aim to mutually benefit a business as well as its customers. It is shown that successful CRM is difficult to practices because it requires a holistic perspective on business, behavioral and technology considerations that are to converge.

Secondly, to improve on the relationship with customers, businesses seek to incorporate CRM into its business operations. To that extent, CRM systems serve a multi-fold of purposes; improving efficiency in a business' operations and supporting comprehensive analyses of data to obtain customer-oriented data that can be used to be the customer of better service. These systems can be categorized as either operational, analytical, collaborative CRM.

Thirdly, this chapter elaborated on the CRM software market as-is. It is found that the CRM software market has seen a significant rise in market size from $9 billion in 2003 to a market size of $26.2 billion in 2015. The advances have resulted in CRM systems to incorporate all categories of CRM under one umbrella as a solution to the customer. However, the prices of the different CRM systems identify a clear distinction between expensive and affordable solutions. Nonetheless, the majority of CRM vendors agree on one thing and that is their business model; providing SAAS solutions that can be licensed by a company through different subscription options.

Fourthly, for CRM solutions to be successful it is important for their users to adopt these into their day-to-day activities. To that extent, this chapter also identified how research in IS predicts actual usage through a process of adoption and behavioral intentions. The identification of factors for successful CRM adoption serves as a starting point to what factors determine successful CRM implementations.

Subsequently, a total of more twenty-five CSFs are identified in literature. Based on the findings of several interviews, six CSFs are indicated as also important to work processes of BrixCRM; 1) CRM strategy, 2) having a project champion, 3) alignment with key stakeholder groups, 4) customer-oriented processes, 5) management attitude, and 6) CRM goals and objectives. These six CSFs are supplemented with three CSFs that were identified through the interviews; 1) change management, 2) data quality, and 3) customer involvement. These nine CSFs are to be operationalized to calculate their predictive power for the success of an individual project.

3. Approach to project management

The artefact of this research is rooted in the domain of project management. The objective of project management is to manage projects from their genesis to their completion by effectively steering the course of action. To do so, practitioners can apply a wide variety of methods, tools and techniques to gain control over project progress and project processes. This chapter sets out the approach to effective project management by the identification of project management theories, well-accepted project management methodologies and tools, as well as the identification of factors for success of project management. The orchestration of these methodologies and tools form the basis of the solution design of this research.

3.1 Project management theory for CSF-based approaches

Probably the best-known approach to address diverging aspects to project is through the use of CSFs. Although CSF-based approaches have an abundance of champions, they are not without critics. The criticism on CSF-based approaches that emerge from literature is twofold. First, literature draws attention to the inability of CSF-based approaches to consider the concordance of different factors. Yet, factor concordance is equally important to successful project management as individual factors (Fortune & White, 2006). Second, a CSF-based approach regards an implementation as a static process rather than as a dynamic phenomenon. Due to this, CSF-based approaches tend to ignore the fact that factors for success can have varying importance during the different stages of an implementation (Fortune & White, 2006). In the example of BrixCRM, three stages are considered for CRM implementation; 1) pre-project (including sales), 2) during project (the actual implementation), and 3) post-project (including support and additions). Exemplary for this issue is data quality which will be more important during user acceptance testing in comparison to the previous development stages of the implementation.

As a consequence, Fortune and White (2006) reviewed literature on the topic and refuted the main reservations of the criticizing academia. At the heart of their research, the FSM was proposed which can be used as a framing device to successful project delivery. The core of the FSM consists of a decision-making subsystem, a performance-monitoring subsystem, as well as a set of components that help to control the tasks inherent to the project – refer to Figure 46. The decision-making subsystem is responsible for setting out direction of the activities and by what means and resources the transition ought to happen. The decision-making subsystem exhibits the allowance of making choices, hence it behaves as a purposeful system which is oftentimes embodied by a project manager. Moreover, the performance-monitoring subsystem monitoring is charged with the responsibility of observing the process of transformation processes – processes of for instance change management or changing stakeholder groups – and feeds the decision-making system with the performance findings. The supportive components of the FSM are mirrored by guidance elements that serve as a manual to control for the tasks associated to successful project management. Practically, this subsystem is embodied by project members. These subsystems are contained within an overarching system boundary that is framed within a wider system boundary that is governed by a wider system – oftentimes a project board – that defines an initial design, allocates resources, explicitly formulates expectations and supplies further information (Fortune & White, 2006). The wider system is seated in the environment that exerts disturbances to the system (e.g. legislations such as the GDPR). The FSM addresses the two critiques by respectively enabling practitioners to identify how the different factors correlated as a response and by its ability to dynamically respond to changes in the environment. This two-topic criticism is to be tackled in the

consultancy guide for the implementation of CRM. Therefore, the consultancy guide is to, among other things, build upon the fundament of the FSM by incorporating the core of the FSM.

3.2 Project management methodologies

There are mainly three other popular streams of project management methodologies; 1) The Project Management Body Of Knowledge (PMBOK), 2) PRINCE, and 3) in-house project management methodologies. The sixth and latest version PMBOK (PMI, 2017) enlists five phases to project management; 1) conception and initiation, 2) definition and planning, 3) launch or execution, 4) performance and control, and 5) project closing. In principle, project management is the application of knowledge, skills, tools and techniques to project-related activities which aim to meet the requirements of the project according to the PMBOK. To that end, the PMBOK includes a process standard that is generalizable and can be applied to a wide spectrum of projects. However, this generalizability comes with one prominent downside; the process standard does not recognize that each project is different. Therefore, it is up to the project managers to cherry-pick the tools, techniques, and phases identified in the PMBOK to fit the unique requirements of the project. In order to fit the requirements of CRM implementations, the five phases of the PMBOK are simplified and reduced to the Plan, Do, Check, and Act- (PDCA) cycle. This PDCA-cycle is to retrofit the project life-cycle and subsequently the needs of the approach to CRM implementation. The PDCA-cycle is to define what work is to be accomplished, what is to be delivered, how to effectively control for the progress of the project, and how to improve the project approach accordingly.

PRINCE and its successor PRINCE2 (Murray et al., 2009) is a non-proprietary method that has emerged worldwide as one of the most accepted and adopted methods to project management. The success of the PRINCE2 model can be accredited to the fact that it is truly generic, that is applicable for all projects despite of project scale, type, organization, geography, and organizational culture. PRINCE2 is generic because it has isolated the management aspect to project management from other specialist contributions. In short, PRINCE2 consists of four concepts; 1) principles, 2) themes, 3) processes, and 4) deliverables – refer to Table 15. PRINCE2 is a principle-based model that ensures its generalizability and these principles are characterized as universal to apply to every project type, self-validating in that past practices proof its validity, and empowering because of its ability to give practitioners added confidence and the ability to have an impact on the managing of their projects.

There are seven principles to PRINCE2; 1) the conduction of a project should be justified, 2) practitioners should learn from experience, 3) roles and responsibilities should be identified that engages involved interests, 4) it helps to stay in control over the project at every stage, 5) tolerances should be incorporated to keep track of deviations that aim for project objectives, 6) the project should focus on the delivery of the product to ensure the artefact is delivered at the end, and 7) it is tailored to suit all types of projects. These principles are obligations and best practices, which all should apply to ensure that a project is genuinely managed according to PRINCE2 (Murray et al., 2009). The themes of PRINCE2 are positioned to control for risks, changes to the project, keeping track of the progress, to managing a business case, the organization of the project, to enhance the quality of the delivered product, and to accurately plan the project in terms of time, budget and scope. These themes are; 1) business case creation, 2) project organization, 3) project quality, 4) the creation of plans, 5) risk management, 6) change management, and 7) progress monitoring. PRINCE2 is a process-based approach to project management, which means that the processes are structures are designed to accomplish a given objective. PRINCE2 consists of seven processes that aim to direct, manage and deliver a project successfully; 1) starting up the project, 2) directing a project, 3) initiating a project, 4) managing a stage boundary, 5) controlling a stage, 6) managing product delivery, and 7) closing a project – refer to Figure 51

in the Appendix. The project is initiated by a project mandate of a commissioning organization, which can vary in form and volume such as verbal instructions or an elaborative document. In later stages of the project, a project brief is created in which the scope of the project is defined to assess the viability of the project. The project board is ultimately responsible for reviewing the project brief and should determine whether to initiate the project. These steps are conducted in the pre-project stage of the project. In the latter initiation stage, the project team is to plan the project in more detail which culminates in the team to produce a project initiation document (PID) which involves the development of a business case, the identification of project resources and a project schedule. It must be noted that the described contents of the PID are likely to deviate from the actual project schedule due to continuing insights. After all the stages are conducted the product is delivered and this may be considered as the artefact of the project.

Table 15: PRINCE2 concepts and items

Concept	*Item*	*Description*
Principles	1. Continued business justification 2. Learn from experience 3. Defined roles and responsibilities 4. Manage by stages 5. Manage by exception 6. Focus on products 7. Tailor to suit the project environment	*These principles serve to make PRINCE2 universally applicable to every project type, are self-validating in that these have been proven to work in practice, and these principles are empowering practitioners since these add confidence and the ability to have an impact on the way projects are managed.*
Themes	1. Business case 2. Organization 3. Quality 4. Plans 5. Risk 6. Change 7. Progress	*These themes should be considered as the subject themes to what needs to be considered and answered during a project.*
Processes	1. Starting up a project 2. Directing a project 3. Initiating a project 4. Managing a stage boundary 5. Controlling a stage 6. Managing product delivery 7. Closing a project	*Since PRINCE2 is a process-based approach to project management, it is structured by a set of activities which are designed to accomplish the objective of the project. These seven processes are required during the project to direct, manage and deliver it successfully.*
Deliverables	1. Project mandate 2. Project brief 3. Project initiation document 4. Product delivery	*Throughout the project (including pre-project stages), several deliverables are to be defined. These deliverables vary from in terms of their purpose. The purpose of these deliverables is to propose the definition of the project, defining the scope of the project, defining the planning and resources needed for successful project management, as well as delivering the artefact of the project.*

Furthermore, practitioners have resorted to the development of their own project management methodology – in-house project management methods – that suits the nature of the business's projects as it is oftentimes difficult to map theory one-to-one onto processes in practices. In the study by White and Fortune (2002) it is found that in-house project management methods is the fourth most frequently reported method of choice – with a total of 128 respondents from a sample of 236 respondents. Surprisingly, these methods are mostly reported to have their limitations in terms of 1) over-reliance on heavy documentation, 2) inappropriate emphasis on following the standard, and 3) too constrained and shallow activities that do not allow for a holistic view. These limitations lead to high time consumption by the need of documentation, no space for out-of-the-box thinking since the standard should be followed, and the inability to see beyond the paved activities.

3.3 Project management tools

The DuPont Company introduced a project management tool which was later called the Critical Path Method (CPM). The CPM was at first primarily utilized in the construction and process

industries to manage the complexity of construction projects (Kerzner, 2017). The CPM is a technique used to complete projects in timely fashion by specifically focusing on key tasks. Subsequently, CPM draws one path or process flow through these tasks to identify the fastest route towards the completion of the project. Therefore, CPM focusses on efficiency by reducing wasted effort, inventory and time. CPM serves the purpose of monitoring the project performance by putting emphasis on project scheduling. White and Fortune (2002) show that CPM is moderately adopted and used in practice, as approximately 30 percent of their respondents indicate that they use CPM for managing their projects. Second, the Gantt chart is named after its initial designer Henry Gantt, who designed and proposed the Gantt chart in 1910 (Gantt, 1910). The Gantt chart is a bar chart that illustrates the schedule of a project through the identification of activities, their associated duration, and events. To that extent, Gantt charts can illustrate the start and finish of the main elements of a project that helps to control for its progress. Nowadays, Gantt charts can be created on the fly via plugins for Office PowerPoint – *Office Timeline* – and web-based applications – *Draw.io for Google Drive*. The Gantt chart is one of most widely used project management tools as 64 percent of the surveyed practitioners indicated to use it in practice (White & Fortune, 2002). Third, the Program Evaluation and Review Technique (PERT) was designed and developed in the late 1950s to meet the needs of a rapidly expanding and maturing industry of engineering but has diffused rapidly ever since (Kerzner, 2017). PERT is a method that helps project managers to analyze the tasks involved to complete a project. For these tasks, the minimum time needed to complete them is identified. The main advantages of PERT are; 1) its ability to extensively plan a project by identifying the effort of all tasks that helps to keep the project on track by planning these task efforts in advance, 2) its ability to determine the likelihood of meeting the deadlines of the project by developing alternative routes towards the completion of the project, 3) its ability to evaluate how changes in the project affect the outcome (these changes can be a change in available resources), and 4) its ability to present large volumes of data into one understandable visualization. The main disadvantages of PERT are incurred by the steep learning curve of using it. White and Fortune (2002) showed that PERT is not widely used in practice, as approximately ten percent of the respondents indicate to use CPM. Additionally, the provision of a dashboard supports the ability of practitioners to keep track of the project's progress. A dashboard that illustrates the performance of the project as well as keeping track of budget, scope and time can help to pinpoint the next best step.

3.4 Supplementary tools

An organization that lets loose of old business processes to adopt customer-oriented processes for the benefit of the customer is regarded as innovative in the context of this study. Certain innovativeness entails, but is not limited to, a change of the organization's business model. That is, the rationale of how an organization creates, delivers, and captures value. Osterwalder and Pigneur (2010) described how traditional and bleeding-edge model converges, what techniques help to be innovative, and how to redesign the unique business model in a competitive landscape by capturing these concepts into a single canvas; the "Business model canvas" (BMC). The canvas composes of nine building blocks that provide insights into the nature of value creation by a business for innovation projects (e.g. CRM implementations); 1) customer segments, 2) value propositions, 3) channels, 4) customer relationships, 5) revenue streams, 6) key resources, 7) key activities, 8) key partnerships, and 9) cost structures. Moreover, as the implementation of CRM overhauls the daily tasks of the users, CRM cannot be considered as an insignificant choice. An old saying states that "one cannot cross a chasm (a deep opening between two cliffs) in two steps". This exact wisdom is applicable to the change that accompanies the implementation of CRM since it affects a business' processes as well as its employees. Anticipating on the change incurred by the implementation therefore raises blocks which many organizations may stubble upon. Furthermore, to motivate and smoothen the path to change, practitioners have introduced the "Matrix Of Change" (MOC) (Brynjolfsson, Renshaw, & Van Alstyne, 1997). Specifically, it helps

managers to reengineer business processes by addressing the concerns about feasibility of CRM, sequence of activities to adopt CRM, location of where CRM should be implemented, pace of introducing CRM, and addressing stakeholder interests. Therefore, the matrix provides useful and tangible guidelines to setting clear objectives which aim to guide the transition to using CRM. Moreover, as people are involved in the implementation from the genesis to beyond the completion of the initiative – use and maintenance – the success of the implementation is subject to their involvement. However, the multitude of the stakeholders tend to have different expectations and responsibility that have to be managed. To identify and manage the stakeholders during the entire lifecycle of a CRM implementation (from the pre-project towards the post-project phase), the stakeholder onion is used (Alexander, 2007). The onion differentiates three layers of stakeholders surrounding the project; most important to lesser important stakeholders such as the FSM does in the supportive subsystems and components. These layers order the stakeholder based on the metrics of impact and closeness to the project. The positioning of the stakeholders on the onion helps to identify how to approach the stakeholder needs and in which order. As a follow up step, the stakeholders can be analyzed based on the behavioral characteristics. Understanding stakeholder behavior helps to pinpoint how to interact with them. The behavior style diagram (Bolton & Bolton, 2009) is used to assess the behavior of stakeholders to pinpoint the *do's* and *don'ts* of interaction. Based on this assessment, a communication plan can be formulated and if appropriate a project team can be composed based on individuals' characteristics and preferences as is also a topic of concern for Belbin's team roles theory (Belbin, 2017).

3.5 Project success and failure

The concern as of now is to determine how project success for IT projects is secured. As good project management methodologies and tools are merely a prerequisite managing projects, there still is a need to pinpoint what factors influence project success. Heretofore conducted research has attempted to identify what differentiated successful IT project management from failure by reviewing publications (Fortune & White, 2006; Nasir & Sahibuddin, 2011) as well as surveying practitioners in the field (Bloch, Blumberg, & Laartz, 2012; White & Fortune, 2002) – refer to Table 16. On the basis of eight project attributes, IT project success can be determined; 1) goals and objectives, 2) performance monitoring, 3) decision-makers, 4) transformations, 5) communication, 6) environment, 7) boundaries, and 8) resources (Fortune & White, 2006). These project attributes are framed in the FSM which subsequently enables practitioners to steer the progress of a project. For that reason, it is believed that the usage of the FSM supports the guidance of CRM implementation as it helps to retain a holistic view on what constitutes success. It should be noted that the study by Bloch et al. (2012) specifically dives into large IT projects, which are different from smaller IT projects as these require more rigor control measures. The extent of success differentiators to IT project management are listed in Table 17. The mapping of the success differentiators of IT project management onto the CSFs for CRM implementation indicates that a small proportion of the listed CSFs are accounted by the differentiators of IT project management. One of the reasons of this may be that the focus of the CRM literature is not necessarily consider the success of CRM from a project management perspective and thus, these considerations may be overlooked.

Table 16: Work on IT project success

Reference	*Methodology*	*Number of predictors*
White and Fortune (2002)	Field study *(236 respondents – 23.74% response rate)*	24
Fortune and White (2006)	Literature review *(63 publications)*	27
Nasir and Sahibuddin (2011)	Literature review *(76 publications)*	26
Bloch, Blumberg and Laartz (2012)	Field study *(study: McKinsey-Oxford)*	14

Table 17: IT project success differentiators

Success differentiator	*White and Fortune (2002)*	*Fortune and White (2006)*	*Nasir and Sahibuddin (2011)*	*Bloch et al. (2012)*	*CRM CSFs mapping*
Clear realistic objectives	✓	✓	✓	✓	✓
Strong business case	×	✓	✓	✓	×
Effective monitoring	✓	✓	✓	✓	✓
Planned close down	✓	✓	✓	✓	×
Support from senior management	✓	✓	✓	✓	~
Competent project manager	×	✓	✓	✓	×
Detailed plan kept up to date	✓	✓	✓	×	×
Realistic schedule	✓	✓	✓	✓	×
Good leadership	✓	✓	✓	×	×
Correct choice of project management methods and tools	×	✓	✓	✓	×
Skilled staff	✓	✓	✓	✓	✓
Good communication	✓	✓	✓	×	✓
Political stability	×	✓	×	×	×
Environmental influences	✓	✓	×	×	×
Past experience	✓	✓	×	×	×
Alignment with major stakeholders	×	×	×	✓	✓
Robust vendor contracts with clear responsibilities	×	×	×	✓	×
Organizational adaption, culture, structure	✓	✓	✓	×	✓
Project size, complexity, involved people and duration	✓	✓	✓	×	×
Adequate budget	✓	✓	✓	×	×
Sufficient resources	✓	✓	✓	✓	×
Training provision	✓	✓	✓	×	✓
Proven technology	×	✓	✓	✓	✓
Good performance by stakeholders	✓	✓	✓	×	×
Risk management	✓	×	✓	×	×
Considering multiple views of project	✓	×	×	×	×
Clear requirements and specifications	×	×	✓	×	✓
End user commitment	✓	×	×	✓	×
Good quality management	×	×	✓	×	✓

Yet, the question remains what constitutes project "success". In fact, it has been extensively discussed by academia in the project management field (Pinto & Slevin, 1988). Earlier work has identified that successful projects explicitly concerns three factors; time, budget, and performance. To that extent, a project was considered to be successful if the allocated resources are not overrun and the delivered product does what it is envisioned to do. However, more recent studies have indicated that this three factor-framework cannot be considered as complete. Therefore, more recent studies have incorporated the element of user satisfaction (Pinto & Slevin, 1988) – as is also discussed in the previous chapter through the identification of a variety of adoption models. This means that "success" cannot longer be considered as the output of the project – make sure that the product works and is delivered. Success is rather the outcome – as is also prescribed in the FSM – of the project: providing satisfactory services. Consequently, the customer will be happier which will strengthen the bond. Stronger relationships help to maintain contact with the customer (Pinto & Slevin, 1988). Subsequently, maintained contact can be harnessed to alter contact into a partnership – attaining recurring revenue. In light of CRM implementation, the factors of time and budget are also considered pivotal such as for any IT project. However, in terms of performance it is measured differently which includes 1) customer acquisition rates, 2) customer retention, 3) number of products held per customer, 4) higher profitability, as well as 5) customer satisfaction (Ryals & Payne, 2001). Bohling et al. (2006), and Venturini and Benito (2015) add to this by stating that CRM success not only depends on project-focused criteria but also on internal (e.g. organizational structure and culture) and external-oriented criteria, such as customer involvement and information sharing (Lin et al., 2010). The survey by Bohling et al. (2006) found that CRM success is mainly influenced by customer impact – retention and satisfaction – and

revenue growth. These two factors illustrate the two main streams of how to express the impact of CRM implementation; *marketing* and *financial* factors (Garrido-Moreno & Padilla-Meléndez, 2011). In their work, Lindgreen et al. (2006) provides a different perspective on CRM system success that covers strategic, infrastructural, and process elements such as respectively customer strategy, organizational structure, and knowledge management and learning. The work by Zablah et al. (2004) proposes an even more comprehensive view on CRM success extends the view of , Lindgreen et al. (2006) by describing five distinctive perspectives; process, strategy, philosophy, capability, and technology perspectives. On the flip side, Bloch et al. (2012) reported that of all large IT project (> $15 million) in 2010, 45 percent faced cost overruns, 7 percent overran the schedule and on average these large projects resulted in a benefit shortfall of 56 percent. The size of these projects cannot be compared to these at BrixCRM, still important lessons learned can be drawn from this study. The causes for IT projects to fail are listed in Table 18.

Table 18: Causes for IT projects to fail

Cause of failure	*Description*
Unclear objectives	*The objectives of the project are unclear which implies that the project objectives cannot be measured and/or that the project cannot be closed.*
Lack of business focus	*The project lacks a translation from IT to business value.*
Shifting requirements	*The project is prone to changing requirements, meaning that the scope of the project reduces or expands. These changes may therefore lead to content issues.*
Technical complexity	*Technical complexities may lead to a need of additional resources (e.g. hours of hiring employees) and even the inability to implement certain content in a system.*
Unaligned team	*Unaligned team members can lead to miscommunication that can harm the process of implementation.*
Lack of skills	*Inappropriate skills can lead to the inability to execute the project and to that extent makes it impossible to attain the project objective within the defined criteria.*
Unrealistic schedule	*Whenever a schedule is unrealistic, it becomes impossible to attain the goals set when the resources are not sufficient.*
Reactive planning	*Reactive planning may lead to running into problems without having a plan to tackle these, which makes it harder to overcome these issues.*
Unexplained causes	*Issues that cannot be explained by the above explained causes.*

3.6 Conclusions

In the current chapter, the kernel theories to project management methodologies and tools are identified; the FSM, PMBOK, PRINCE2 and in-house methodologies as well as CPM, the Gantt chart, PERT, the BMC, the MOC, the stakeholder onion and the behavior styles diagram. However, these theories do not completely cover the complexity of CRM implementation. To that extent, the BMC and the MOC, which aim to address the implications of change incurred by CRM, are identified to provide more comprehensive guidelines to practitioners. Furthermore, the kernel theories presented in literature on IT project success are clarified to identify where the focus of practitioners should be on. The consultancy guide to CRM implementation is to aid the management of CRM implementation projects and therefore the design of the consultancy is rooted in the previously described management theories.

4. Solution design

The aforementioned conceptualization of CRM, and the theory on CRM and IT success serve as a fundament to the design of the solution to enhance CRM implementations in the context of BrixCRM. This chapter enlists the components of the solution and how these aid the approach to CRM implementations.

4.1 Solution architectural overview

In the current situation, no tangible control mechanism to achieve CRM implementation success are in place. To that extent, the design of a solution is to include both the theory on CRM implementation and project management. The following sections describe the different parts of the process, the instruments and tools that are incorporated in the design of the solution design as well as the design choices made. In the remainder of this chapter, the solution design is called the consultancy guide. Therefore, these names are used intertwined. A practical description of the consultancy guide can be found in Appendix E.

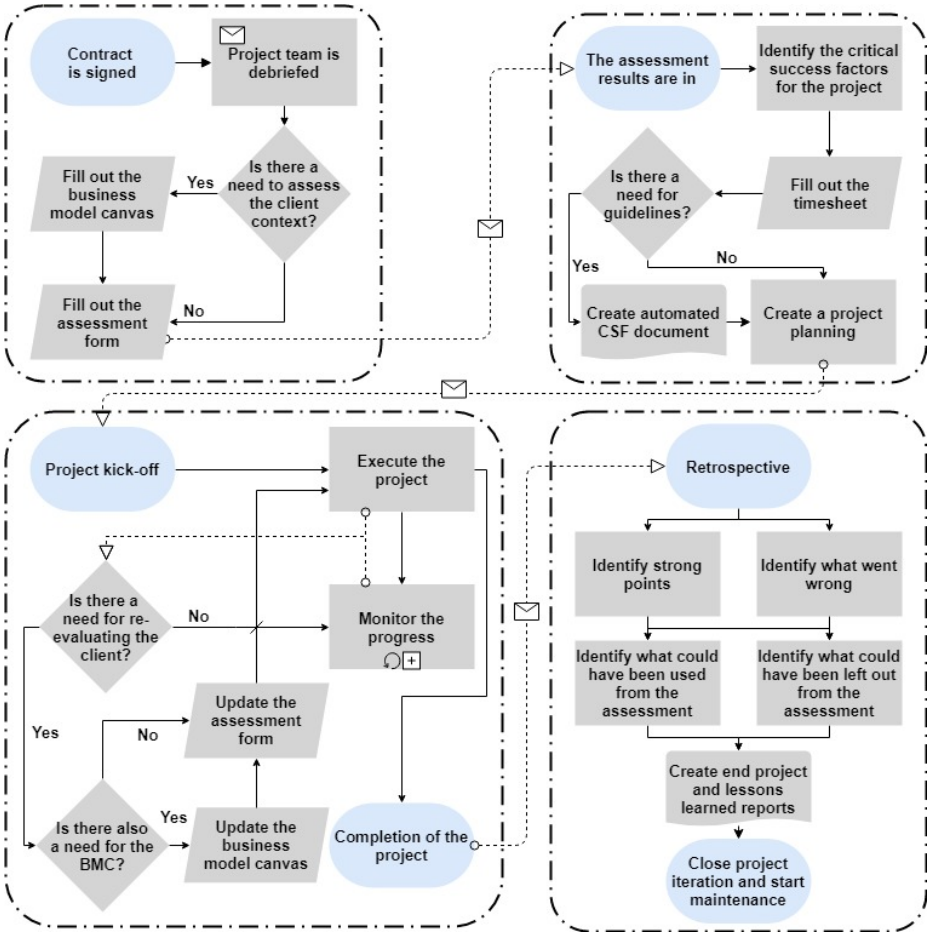

Figure 10: CRM implementation architecture

Globally, there are four distinct steps incorporated in the consultancy guide: 1) clarifying implementation context, 2) project planning, 3) project execution, and 4) reflection – depicted in Figure 10. This workflow is a simplified view of the process. That is, in reality the process facilitates multiple iterations over, a part of, the process. For instance, conducting a retrospective after each of the other three steps. The heart of the consultancy guide resolves around the identification of CSFs – refer to Table 14 – for CRM implementation through an assessment

form. The identified CSFs are subsequently the de facto determinant of what to focus on during the CRM implementation. Moreover, it must be noted that the process is illustrated as a linear process – excluding the assessment iterations in the third step – whereas the lessons learned form the basis for the approach to future CRM implementations. Therefore, the management system of the consultancy guide reflects the core subsystems of the FSM whereas the process of the consultancy guide reflects the PDCA-cycle, as a simplified view on the five phases of the PMBOK, for continuous improvement of the approach to CRM implementation. The first two phases of the consultancy guide altogether represent the planning step, the third phase of monitoring represents the steps of checking the implementation whereas the retrospective aims to elicit ways in practitioners may act in retrospective to findings of the previous phases. In light of the FSM, the identification of the CSFs is the decision-making mechanism to the design of the CRM implementation. The decision on what CSFs to focus ideally influences the tools that are used to bolster success. Monitoring activities is incorporated in the execution step of CRM implementations. The design of a CSF performance dashboard is integral to the monitoring of the performance and progress of the different CSFs. A principle to the design of the consultancy guide is that feedback should be regarded as a virtue. That is, the project context should be assessed once more when the activity of monitoring indicates that the performance is lacking. Therefore, feedback enables practitioners to steer the implementation into the right direction. The tools are used to bolster the performance of the CSFs through the provision of guidance. The PDCA cycle is reflected in the process as it follows the flow of planning the implementation based on the identification of CSFs, the execution of the implementation itself, monitoring the performance and acting accordingly. The last step of the PDCA cycle is twofold; 1) acting internally in an implementation and 2) acting externally for future implementations (lessons learned).

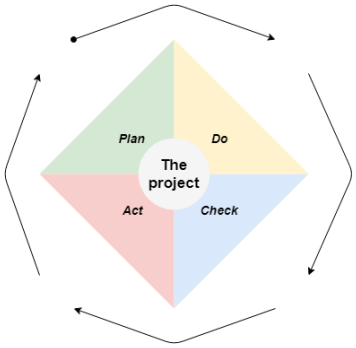

Figure 11: The PDCA cycle

The consultancy guide incorporates several instruments and tools – refer to Table 19 – that aim to support the performance of the identified CSFs. These instruments and tools are designed by using the file editors of Google Drive. The purpose of the instruments is that these are aimed to enhance the understanding of the CRM implementation and to highlight its requirements whereas the tools are designed to aid the practitioner's ability to steer the implementation by means of the CSFs. The tools in italic in Table 19 are automated documents that use placeholders which are filled in by the information from the assessment form. The aim therefore is to relieve the users of dauting tasks to manually retrieve prerequisite information.

Table 19: Incorporated instruments and tools

	Clarifying implementation context	**Project planning**	**Project execution**	**Retrospective**
Instruments	*Business model canvas*	Project timeline	CSF performance dashboard	
	Innovation metrics for the BMC	*Project planning based on the PID*	Business model canvas	
			Innovation metrics for the BMC	
Tools		*Project objective assessment*		End project reports
		Data quality assessment		Lessons report
		Stakeholder analysis		
		Organizational culture assessment		

4.2 CSF design

As the assessment form is to identify the prioritized CSFs for the CRM implementation, the design of the CSFs is according to the different questions posed in the form. The assessment form formulates an extensive inquiry into the business context as well as the context on the project at hand. This list of questions is designed on the basis of a series of two focus sessions with the business consultant and the solution architect. The topics of interest include but are not limited to business culture, CRM goals for the project, and the understanding of IT. For example, the questions posed in the first are inquiring the business characteristics such as size, tendency to adopt innovation (based on the IDT – refer to Section 2.5) whereas the latter identifies the stakeholders. In the Appendix, the topics of interest of the assessment form are identified.

The answers on the questions are then processed into a score that is plotted on a 5-point Likert scale. That is, respectively *1* implies lesser importance whereas *5* implies high importance of the CSF to be actively *considered* during the implementation. To that extent, *3* represents a baseline of importance for the CSFs. For example, the question whether the client understands IT will be processed as a 1 when it is indicated that the client 'speaks IT'. That is, as the client is knowledgeable in the field of IT, the client is assumed to understand the consequences of an IT-related decision. Therefore, it is assumed that there is no need to focus on clarifying the impact of certain decisions. The scores of several questions are combined as parameters to evaluate the importance of the different CSFs. The parameters beneath the nine CSFs are listed in Appendix . On the basis of assigning a weight to the parameters, the importance of the CSFs is calculated. Initially the parameters are assigned an equal weight. However, the design of the CSFs facilitates refining the weights through qualitative assessments – as will be the topic of the next chapter. Hence, the importance of the CSFs is like the parameters determined on the basis of a 5-point Likert scale. The score, from the perspective of BrixCRM, of 1 indicates that there is no need to explicitly focus on the CSF.

4.3 Clarifying implementation context

The first and vital phase in the design of the solution is the analysis of the context. The context of the CRM implementation is assessed in twofold; 1) the context of the client and 2) the context of the project itself. The first is to understand the why and how of the client's business operations whereas the latter is to identify what and who is involved during the project. Remind that the clients of BrixCRM are situated in a wide variety of industries. Therefore, the business operations are dependent on also on a variety of different contexts. The assessment of the context of the clients primary helps to identify how CRM can add value to the client.

The process of clarifying the context – as depicted in Figure 12 – initiates when the contract is signed. After the signing of the contract, the project team that will be involved with the CRM implementation is identified. Since the client may be situated in an entirely different business 'league',

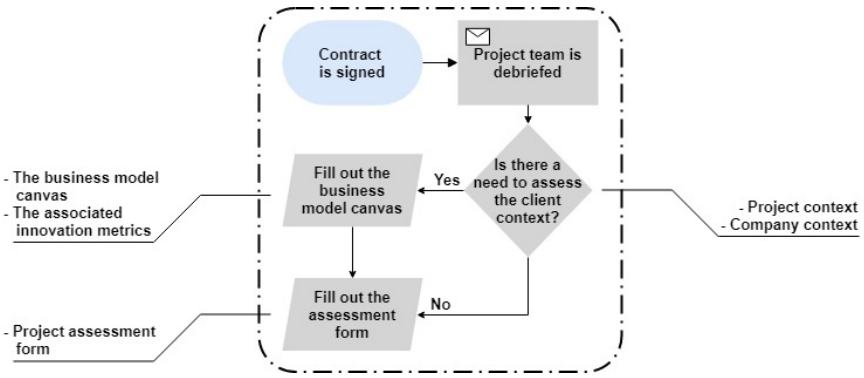

Figure 12: Clarifying implementation project and business context

it is advised to get acquainted with the business operations of the client. To that extent, if it is deemed necessary, the BMC (Osterwalder & Pigneur, 2010) can be used to identify the value proposition of implementing CRM. The BMC aids the identification of the client's value proposition, customer relationships, key resources and activities, cost structures, and distribution channels.

The idea is that the BMC sets the practitioners to re-think about what is important to the business' operations and how CRM would fit into the picture. The practice should focus on the global identification of important considerations to fit CRM into the business rather than extensively and critically assessing the business. That is, having a better 360-degree client view. The latter is also not possible due to the fact that the necessary information is absent for the employees of BrixCRM. The findings of the BMC can be analyzed with the brand new innovation metrics that tracks profitability, risk, total cost and time (Osterwalder, 2018). These metrics helps to identify the extent that a business should be willing to go to implement, in this instance, CRM by identifying imminent trade-off decisions based on hypotheses. Subsequently, the assessment form is prompted. The findings of the assessment are the basis to the design of the CSF-based CRM implementation approach.

4.3 Project planning

Consequently, the information retrieved by assessing the context is the input for planning the CRM implementation. The information serves to identify prioritized CSFs, and subsequently helps to single out how to approach the implementation. The prioritized CSFs therefore are the de facto decision-making system on which the project approach should be designed and managed. It should be noted that the decision on top of which CSF to consider is entirely up to the practitioner. This means that the findings of the assessment are solely indicative in nature.

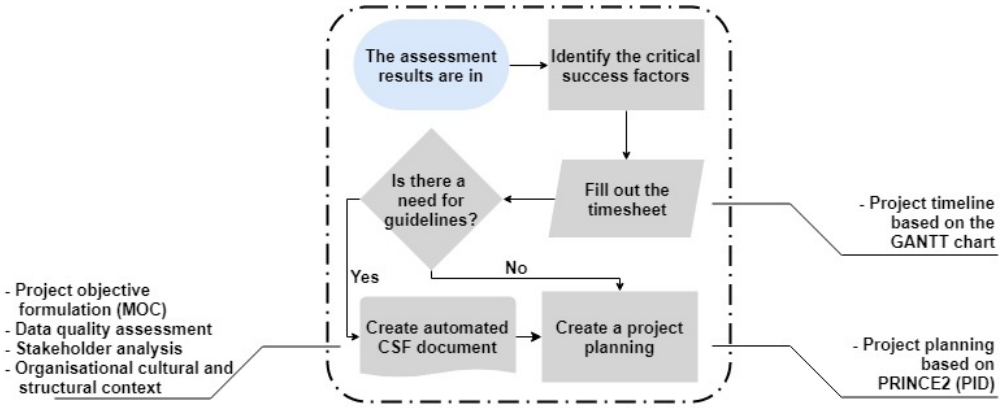

Figure 13: Planning the CRM implementation

The process of planning the implementation – as depicted in Figure 13 – initiates when the assessment form is filled in. The first step is to identify the CSFs to include in the decision making of the implementation. In the timesheet, the project timeline is outlined that identifies when the different CSFs come into play. The timesheet spans over the seven implementation phases as described by BrixCRM – refer to Table 8. The Proof-Of-Concept (POC) timesheet is designed based on the principles of the Gantt chart. Therefore, it includes activities that are associated to a CSF, their duration, their genesis and completion moment (the *emergence*). Furthermore, the timesheet considers how many manhours the activity costs and how much of the activity is already completed. Additionally, the use of the variety of instruments (e.g. the BMC) are plotted on the timeline to illustrate when the use of these instruments are most effective. The use of the timesheet requires the practitioner to fill in the start- and end date of the implementation. Via an automatization script, the activities are plotted on the timeline which helps to assess the progress of the implementation. On the basis of the timesheet, practitioners are able to create a project planning. The planning is drafted on the basis of the PID as specified in PRINCE2. The results of the context assessment serve as a reference to address the variety of topics in the PID. For instance, the assessment identified what software development method is preferred by the client and subsequently, the question on the basis of what method the development should be designed can be addressed. However, the results of the assessment also enable practitioners to ask for

more guidelines when it is hard to determine how to address the different CSFs. To that extent, the solution design includes five guidance templates (excluding a template for the PID) that can be created by a push on the button. The other templates include help to 1) define and formulate a viable CRM objective through using the MOC in combination the McKinsey 7S model, 2) ensure data quality through using the three metrics of integrity, confidentiality and accuracy, 3) identifying and analyzing stakeholders through the stakeholder onion and behavior styles, 4) assessing the organizational culture and how this fits the CRM strategy through the use of business archetypes and value disciplines, and 5) an analysis of the BMC. These templates are particularly useful when a certain topic has not been previously dealt with by the practitioner.

4.4 Project execution

At the heart of the CRM implementation is project execution. The seven tasks to implement CRM as depicted in Table 8 are conducted in this step. These seven tasks are part of the approach to CRM implementation as per BrixCRM. Therefore, the essence of the third step of the consultancy guide does not incur significant adjustments compared to the current approach to CRM implementation. The two most prominent additions to the project execution are the incorporation of 1) the performance monitoring system through the aforementioned CSF performance dashboard and 2) providing feedback to the decision-making system (e.g. project manager).

The process of project execution – as depicted in Figure 14 – is initiated when the project plan is approved. During the execution, a POC CSF performance dashboard is provided which includes the current state of the CSFs in terms of their individual performance and the progress of the associated activities. For each of the CSFs, the importance is indicated on the 5-point Likert scale. Furthermore, the dashboard visualizes the so-called iron triangle to project management control; budget, scope, and time. In total, three two-dimensional graphs are plotted that illustrate the projected course of actions for the iron triangle. Therefore, the dashboard serves the purpose of identifying what the next best action would be to focus on. As the dashboard provides the project team the ability to see into the status of the CRM implementation, new insights are gained which may urge the project team to re-assess the project context and subsequently re-adjust the project execution.

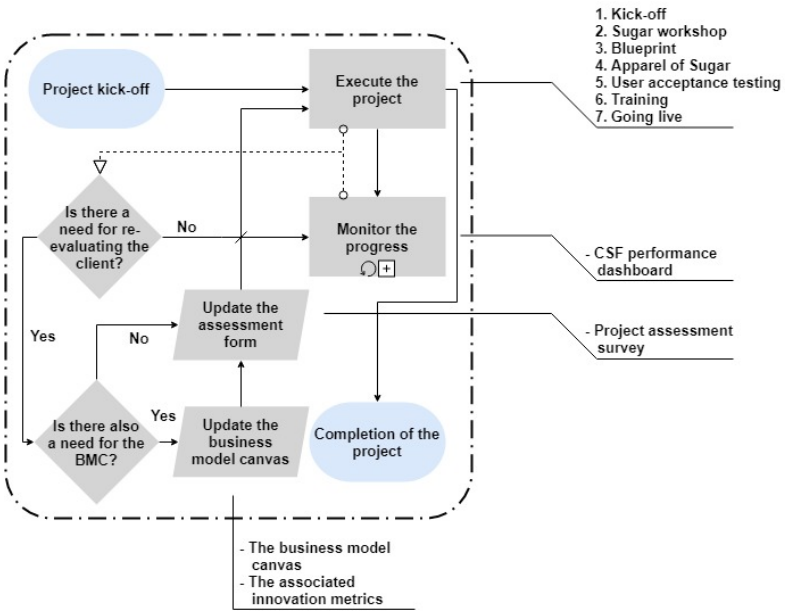

Figure 14: The approach to project execution

4.5 Retrospective

The final step of the consultancy guide is the retrospective. The retrospective is aimed to extract the lessons learned from the CRM implementation. To guide the retrospective, the determinant of CRM implementation success; CRM use should be taken to heart. If the objective of the implementation of CRM is to create happy customers, CRM should be used to aid the needs of the customers. To that extent, the retrospective should touch upon the assessment of how well

the approach of the CRM implementation has addressed the achievement of CRM use. The aim of this retrospective is to introduce two levels of organizational learning; proto and deutero organizational learning. The first level is about single- (evaluation) and double-loop learning (reflection) styles which incorporates action-outcome theories in the practice of BrixCRM (Wijnhoven, 2001). In practical sense, the Situation, Task, Action, Results, Reflections, and Transfer (STARRT) method can be used to guide the retrospective and pinpoint in which ways to conduct the *act* step of the PDCA-cycle. Prominent questions to answer are these that identify what is learned and how to approach the implementation of CRM the next time around. Subsequently, these answers can be the basis to determine which instruments and tools are perceived to be useful for CRM implementation. Therefore, the STARRT-method is useful in continuously learning about how to approach CRM implementations. That is, the first level of learning in the context of this research is to elicit what has to be done in order to be successful in implementing CRM. In practice this means that practitioners should ask themselves what went well and what could have been done better. The second level resolves around continuous and consistent development of organizational learning prototypes that are related to the learning needs of the organization (Wijnhoven, 2001). That is, deutero organizational learning is learning not only what you are supposed to learn – proto organizational learning – but also on something about the context surrounding the subject of learning. For instance, BrixCRM is to learn about how the different CSF occur and influence success besides solely understanding and eliciting which CSFs are important. That is, learning to understand and how the CSFs ought to influence the implementation so that it is understood to which contextual cases the incorporation of the CSFs applies. The findings ideally are reported in an End Project Report (EPR) or a Lessons Learned Report (LLR) which are defined in PRINCE2. This reporting helps to document the findings and to plan follow-up measures.

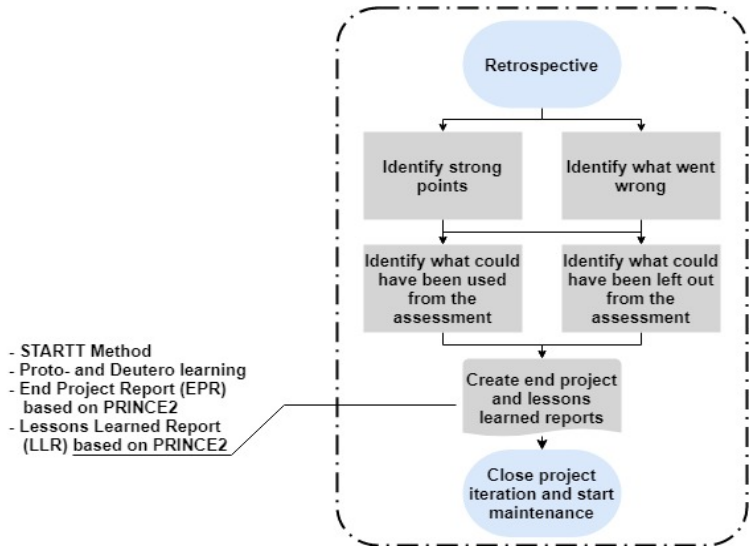

Figure 15: The retrospective step of CRM implementations

4.6 Design choices

The principle to the design of the consultancy guide is that it should not be a complete overhaul of the current approach to CRM implementation by BrixCRM. The reason for this is that BrixCRM already has formulated a well performing approach itself. Nonetheless, the consultancy guide provides the tools to achieve the goals of the practitioners which can be used voluntary and thus will not have a significant impact on the current approach. The argument for this is that a too big adjustment to the current approach will be more difficult to incorporate in the fabric of BrixCRM's approach to CRM implementation.

For the design of the CSFs, it is explicitly chosen to evaluate the importance on a 5-point Likert scale. It is believed that a 5-point Likert scale is the right level of granularity in order for people to express the differences. To that extent, the 5-point Likert scale helps to control for the semantic differentiation. Whenever the scale would expand to, for example, a 10-point Likert scale, the human mind finds it hard to address the differences between a seven and an eight. Since, the evaluation of the consultancy guide is to aid multiple employees at BrixCRM, numerous ways of evaluating and thus scoring the CSFs exists that incurs subjectivity. Through the limitation to a 5-

point Likert scale, this subjectivity is believed to be reduced. Moreover, a five-point granularity ensures a stabilized comparability of project analytics as multiple questions ask the assessors to express to which extent they find themselves in agreement to a statement by means of five categories (*In agreement – Not in agreement*).

Furthermore, four design choices are made that have to be elaborated upon. First, the BMC is used as a tool to identify how the implementation of CRM can bolster business value. As BrixCRM services a wide variety of clients, the BMC is hoped to improve the understanding of the client by creating awareness. The practice of using the BMC should not be focused on filling in the minutest details of the nine elements of the BMC but it should rather focus on getting to know what ticks the boxes of the client. Therefore, it is decided to incorporate the BMC in the first phase of the project as it helps to pinpoint the pivotal topics of interest when implementing CRM. Second, the Gantt chart-based timesheet is designed as a linear process that spans over the seven phases for CRM implementations – as depicted in Table 8. However, this does not mean that the CRM implementation should follow this linear sequence. For example, it can be chosen to conduct multiple UAT and training sessions to improve on change management through an improve user acceptance. It is chosen to design the timeline as a linear sequence in order to simplify the model without compromising its expressiveness. Third, the design of the dashboard is focused on the provision of an overview on the nine CSFs rather than a single-issue display. This choice is made to minimize the decision bias of the practitioner. Since the assessment already indicates on which CSFs emphasis should be put, the dashboard should not also influence the decision. It is believed that the creation of a single-issue would lead to a narrowed view on the implementation. Fourth, the decision is made to create the different parts of the consultancy guide in Google Drive. As Google Drive is already part of the tooling that BrixCRM uses, this decision was evidentially made. However, it also provided the required functionalities to create the consultancy guide. Google Drive provides a complete set of tools to document findings, compute data and collect information which can be orchestrated instantly. That is, files can, by writing scripts in the accompanied editor *Google App Script*, automatically be created and mutated. For example, Google Apps Script enables a project manager to create a PID on the basis of a template with placeholders – the other automated documents also work on the basis of templates. To that extent, Google Drive is chosen due to its ease-of-use and its usefulness (especially when combining the different file types) to create POC tools.

4.7 Conclusions

This chapter has elaborated on the design of the consultancy guide. To that extent, the process of approaching CRM implementations has been identified and the associated instruments and tools are pinpointed to bolster CRM implementation success. The process of the consultancy guide is initiated through the identification of prioritized CSFs, for which the design is described. There are four main steps formulated in the consultancy guide; 1) clarifying implementation context, 2) project planning, 3) project execution, and 4) a retrospective. The fundamental principles of the process of the consultancy guide are rooted in the FSM and the PDCA cycle. Respectively, these principles describe the importance of decision-making, performance-monitoring subsystems and elements to provide the means to these subsystems, as well as the reflected importance of considering lessons learned and altering the CRM implementation approach the next time around. The instruments and tools that are incorporated in the consultancy guide are the BMC, the PID, a Gantt chart-based timeline, a series of document templates (e.g. for the formulation of the project objective), a CSF performance-monitoring dashboard, and the EPR and LLR templates for reflection. The design choices for these instruments and tools are described.

5. Results

This chapter describes the different cycles that are conducted to design, hypothesize and evaluate the incorporation of the CSFs. As the primary focus of this research is to create a factor-based CRM implementation approach, the consultancy guide's ability to identify the prioritized CSFs is key to the success of its incorporation in practice. Moreover, the workflow of the consultancy guide is validated through three cognitive walkthroughs in order to assess the practical applicability of the consultancy guide.

5.1 Design of the critical success factors and cycles

The design of the CSFs is according to a set of characteristics that determine the importance of the nine CSFs; Change Management (CM), Data Quality (DQ), CRM Strategy (CRS), Project Champion (PC), Customer Involvement (CI), Alignment With key Stakeholder groups (AWS), Customer-Oriented Processes (COP), Management Attitude (MA), and CRM Goals and Objectives (CGO) – refer to Table 14. The project cases are studied through assessors (project members) filling in the assessment form. Appendix G lists the parameters that determine the importance of the nine CSFs. The importance of the parameters are calculated by the number of times it is cited as either important or unimportant.

The assessment were conducted in three incremental steps to identify how the model would fit other project instances and thus whether the model is generalizable. For the first increment, the weights of the CSFs are determined based on an equally weighted average of all influencing parameters that are contained for each factor. Therefore, all parameters are given equal predictive power. The second and third increment build upon the findings of the previous increment by re-assigning improved weights – predictive power – of the parameters for each CSF. The evaluation of the CSF operationalization has been done as following:

Step 1: *Studying the results. During this first step, the scores for the nine CSFs are determined by the model. These scores are used to compare the findings of the assessors with theory.*

Step 2: *Inquiring the importance of the CSFs per the assessor. During this second step and after a short introduction on how the importance is expressed, the assessors are asked to provide their view on the importance of the CSFs for the project case that is to be assessed. The scores given by the model were not provided to the assessor before they had to express their findings to reduce the possible occurrence of biased answers.*

Step 3: *Explaining the results to the assessors. After the assessors have provided their findings of the project case at hand, the results of the assessment are explained through describing what the model has found, what the differences are, what a possible explanation of the differences would be, as well as reviewing how CSFs might be correlated.*

Step 4: *Refining the parameters for the nine CSFs. Finally, after the explanation and comparison of the results, the parameters to determine the importance of the CSFs are explained to the assessors. Based on these explanation, the assessors are asked to indicate which parameters are influential for the importance of the CSFs. The most and least important parameters are determined on the basis of the expertise of the assessors.*

Step 5: *Extracting the quantitative results from the scores and the qualitative results from the discussion with the assessors.*

There are possible effect biases that may influence the findings of this study (Rosenthal, 1976). As the findings are subject to the opinion of the assessors of the project cases, one team member that is involved in a project may determine other levels of importance for the set of CSFs. For

example, assessors may perceive that it is required to act in according to some pattern, or attempting to provide answers to satisfy our research expectations – this is the so-called "demand effect" when assessors change their behavior according to the researcher's intention (Charness, Gneezy, & Kuhn, 2012) – which is assumed to be mitigated by asking the experience of the assessor before sharing the results of the model. To account for these subjective biases that threaten internal and external validity, a twofold of instruments is used to reduce the biases; 1) combining between- and within-subject studies, and 2) omni-source project assessment. First, the increments are designed such that these include both a between- as well as a within-subject study (Charness et al., 2012). During an increment there are several project cases studied that serve as a between-subject study that are conducted by other project teams. The between-subject studies help to relate the different projects to each other – in terms of characteristics – and to determine whether there exist subjective biases between the different experts. Furthermore, across the three increments – as within-subject studies - the same project cases are studied to assess the improvement in accuracy of the predictive power of the nine CSFs as a within-subject study without biasing the results over the three increments. Second, the projects are assessed by multiple project members to account for the validity of the subjective perceptions of the project members and to relate these to each other. It is assumed that the different functions within the project do find other factors important based on the tasks that they do during the project. For example, a solution designer can consider data quality as more important compared to a project manager since the solution designer is concerned with data quality in more detail whereas a solution designer is more concerned with a broader overview of the project. These unbiasing instruments are specifically designed for this research and illustrated in Figure 16.

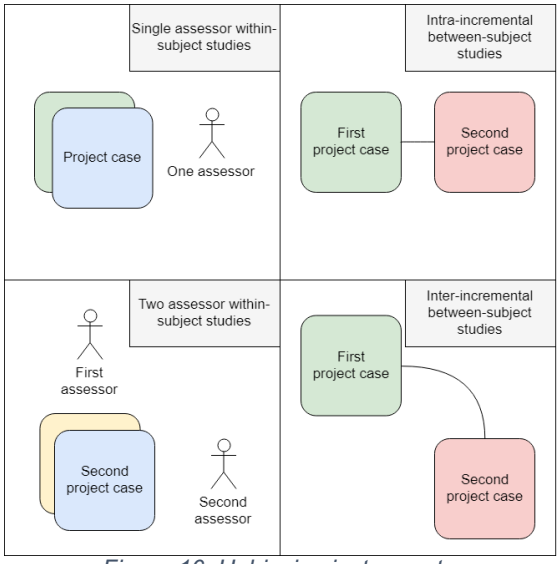

Figure 16: Unbiasing instruments

The aim of the evaluation is two-fold. First, the evaluation assesses the *reliability* of the model to predict which CSFs are most important by relating these to want has been found for the project assessment. For that reason, reliability is the de facto description of random errors and statistical variability which expresses the reproducibility and repeatability of the measurement. The formula to determining the reliability of the model is formulated as:

Equation 1: Reliability measurement

$$\boldsymbol{Reliability} = 1 - \frac{Amount\ of\ erroneous\ identified\ important\ CSFs}{Nine\ CSFs\ \times Number\ of\ project\ cases}$$

The *validity* of the model is expressed by means of identifying the offset of the scores given by the model and those given by the assessors, as well as by its offset in predicting the important CSFs compared to what the assessors have found. In general terms, validity is used to explain how close the measurement is to the true value; "trueness" (JCGM, 2008). The offset between the model and the findings of the assessors are measured by the Point-Differences (PD) as follows:

Equation 2: Point-differences measurement

$$\boldsymbol{PD} = [Importance\ of\ the\ CSF\ as\ per\ the\ assessor\ - Importance\ of\ the\ CSF\ as\ per\ the\ model]$$

To this end, the validity of the model is based on the numbers of false positives and false negatives. A false positive is counted when the model highlights a CSF as considerable important

(Score > ***3***) when the assessor expressed lesser importance, whereas a false negative is counted when the model identifies a CSF as lesser important (Score < ***3***) when the assessor highlights the CSF as considerable important:

Equation 3: Validity measurement

$$\boldsymbol{Validity} = 1 - (Percentage\ false\ positives + Percentage\ false\ negatives)$$

The difference between reliability and validity is best explained by the following: predictions are regarded as valid when the *net* results are on target whereas predictions are reliable whenever the variety of predictions are tightly clustered. Figure 17 depicts these differences.

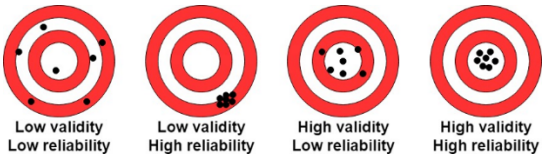

Figure 17: Validity vs. reliability

The average of the reliability and validity of the assessment are considered as the predictive power of the model:

Equation 4: The prediction power of the model

$$\boldsymbol{Predictive\ power} = \frac{Accuracy + Precision}{2}$$

The validity and reliability of the predictive power for the CSFs are assessed through the formulation a hypothesis:

> ***H₁:*** *The validity and reliability, and thus, the predictive power of the model improves through a series of increments by refining the importance of importance determining parameters.*

The null hypothesis is accepted if the others are rejected and thus, this null hypothesis is to be formulated as:

> ***H₀:*** *The design of the assessment is unable to accurately predict the importance of the nine CSFs and thus, the current design is not accurate or complete. Therefore, an alternative to the operationalization is to be found.*

Second, the *concordance* of the nine CSFs are determined. There are three options to these relationships; 1) positive-, 2) zero-, and 3) negative correlation. The Pearson's Correlation Coefficient (PCC) formula (Egghe & Rousseau, 1990) and the Spearman's Rank-order Correlation (SRC) formula (Dodge, 2010) are used to determine whether two CSFs are related:

Equation 5: Pearson's Correlation Coefficient

$$r_p = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{[n\sum x_i^2 - (\sum x_i)^2][n\sum y_i^2 - (\sum y_i)^2]}}$$

- *Where x_i and y_i are the values of the i^{th} observations*
- *Where n is the number of observations*

Equation 6: Spearman's Rank-order Correlation

$$r_s = \frac{6\ \sum d_i^2}{n(n^2 - 1)}$$

- *Where d_i is the difference between the two ranks of each observations $rg(x_i) - rg(y_i)$*
- *Where n is the number of observations*

Both formulas output a correlation coefficient which ranges between -1 to +1. The farther away from zero, the stronger the relationship is and how clustered the variables are. The differences of the Table 20. During the three increments, the PCC is used to identify the different concordances whereas the SRC is used as a comparison to the PCC at the end of the last increment. This comparison serves to triangulate the findings of the PCC.

Table 20: Differences between the PCC and SRC

The PCC	The SRC
Evaluates linear relationships between two continuous variables	Evaluates monotonic relationships between two continuous or ordinal variables
Measures how a change in one variable mirrors the proportional change in the other variable	Measures whether two variables tend to change together but not necessarily at a constant rate
Uses raw data	Uses ranked values for each variable rather than raw data – requires ordering the measurement

For this study, six classes of correlation are considered; 1) no relation, 2) negligible relation, 3) weak relation, 4) moderate relation, 5) strong relation, and 6) very strong relation. The PCC and SRC used to calculate the correlations as per the model as well as per the assessors. Additionally, the correlations between the scores of the model and the assessors for the three operationalizations are calculated. These three correlation tests support the differentiation of the logic of the model with the rationale of the assessors and to determine whether the rationale of assessing the importance between both are in line. It is assumed that a subset of the nine CSFs are correlated at least to some extent – for example, CRM strategy and CRM goals/objectives. Therefore, the following hypothesis is formulated to study the correlation of the CSFs:

H_2: *The results of the assessment form and the findings of the assessors indicate that at least a subset of the CSFs show a correlation. That is, either a positive or a negative correlation.*

However, it is decided to not do more extensive statistical analyses for the assessment of importance as it does not cover a significant sample size. Consequently, the findings of important CSFs as well as the correlation coefficients need to be considered as indicative only.

During various operationalizations, in total, six projects from clients of BrixCRM were assessed. These six projects differ in terms industry, size, current phase of the project as well as the envisioned goals for these projects. In Table 21, the most important demographics of the six projects and the associated business are listed. The assessment in italic were supplemented to the analysis in the second operationalization whereas the entertainment case was supplemented in the third operationalization. The data is anonymized in order to keep it confidential and therefore are not disclosed in this chapter.

Table 21: Assessment demographics

Context	Demographics
Industry	➢ Bakery commodity o assessed by project manager 2 o *assessed by CRM consultant 2* ➢ Electricity o assessed by project manager 3 ➢ Logistics o assessed by project manager 1 ➢ Agriculture o assessed by the business consultant ➢ *Fastening material commodity* o *assessed by the CRM solution architect* ➢ **Entertainment** o **assessed by CRM consultant 1**
Size of the business	➢ Medium-sized enterprise (less than 250 employees, yearly turnover ≤ €50 million) ➢ Large-sized enterprise (more or equal to 250 employees, yearly turnover ≥ €50 million) ➢ Multinational enterprise (a large-sized enterprise with a strong emphasis on worldwide activities)
Current phase	➢ Live ➢ Pre-project (discovery)
Project budget	➢ Bakery commodity: more than €100.000, - ➢ Electricity: more than €100.000, - ➢ Logistics: more than €1.500.000, - ➢ Agriculture: less than €20.000, - ➢ *Fastening material commodity: approximately €500.000, -* ➢ **Entertainment: less than €30.000, -**
Project duration	➢ Between three and six months o *Fastening material commodity*

	○ **Entertainment** ➢ Between six and eleven months ○ Bakery commodity ○ Electricity ➢ More than eighteen months ○ Logistics ○ Agriculture
Project size	➢ Medium (multiple activities, some custom-built functionalities) ○ Bakery commodity ○ Agriculture ○ Entertainment ➢ Large (multiple activities, a lot of custom-built functionalities) ○ Electricity ○ Logistics ○ Fastening material commodity

5.2 First incremental operationalization

For every project case, the resulting scores from the assessment of the model, the scores provided by the assessors, the differences between the assessors and the model, the mean differences, the modus and median, and the count of false positives and negatives are listed in Table 22.

Table 22: Results of the first operationalization

		Critical Success Factors									
		CM	**DQ**	**CRS**	**PC**	**CI**	**AWS**	**COP**	**MA**	**CGO**	***AVG***
Bakery commodity	***Assessment scores***	*3,7*	*2,9*	*2,7*	*3,4*	*2,6*	*3,1*	*3,5*	*2,9*	*2,7*	***3,05***
	Assessor scores	5	3,5	3	3,5	5	4	3	3,5	5	**3,94**
	Difference	*1,3*	*0,6*	*0,3*	*0,1*	*2,4*	*0,9*	*0,5*	*0,6*	*2,3*	
	Mean	1									
Electricity	***Assessment scores***	*3,1*	*2,8*	*3,6*	*2,3*	*2,6*	*2,9*	*3,2*	*3*	*2,9*	***2,93***
	Assessor scores	2,5	4,5	2	5	5	5	5	4	2	**3,89**
	Difference	*0,6*	*1,7*	*1,6*	*2,7*	*2,4*	*2,1*	*1,8*	*1*	*0,9*	
	Mean	1,64									
Logistics	***Assessment scores***	*3,3*	*3,7*	*3,5*	*2,5*	*2,7*	*3,1*	*3,2*	*3*	*3,1*	***3,12***
	Assessor scores	4	5	2	4,5	2	2	2	2	2	**2,83**
	Difference	*0,7*	*1,3*	*1,5*	*2*	*0,7*	*1,1*	*1,2*	*1*	*1,1*	
	Mean	1,18									
Agriculture	***Assessment scores***	*3,5*	*3,4*	*3,6*	*3,3*	*2,5*	*3*	*2,5*	*2,8*	*3,2*	***3,09***
	Assessor scores	4,3	3	3	4,3	3	4	3,3	4	3	**3,54**
	Difference	*0,8*	*0,4*	*0,6*	*1*	*0,5*	*1*	*0,8*	*1,2*	*0,2*	
	Mean	0,72									
AVG of assessments		*3,4*	*3,2*	*3,4*	*2,9*	*2,6*	*3,0*	*3,1*	*2,9*	*3,0*	***3,06***
AVG difference		*0,85*	*1*	*1*	*1,45*	*1,5*	*1,28*	*1,08*	*0,95*	*1,13*	
Mean		1,14									
Mode		*0,6*									
Median		1									
Number of false positives		*1 (25%)*	*0 (0%)*	*2 (50%)*	*0 (0%)*	*0 (0%)*	*1 (25%)*	*1 (25%)*	*0 (0%)*	*1 (25%)*	***6 (17%)***
Number of false negatives		0 (0%)	2 (50%)	0 (0%)	2 (50%)	2 (50%)	1 (25%)	1 (25%)	2 (50%)	1 (25%)	**11 (31%)**

In Figure 19 - Figure 24, the findings of the first operationalization are visually illustrated. Figure 19 shows the error margins of the model compared to the findings of the assessors. As Figure 19 indicates, the assessors, on average, are reluctant to assign higher importance to the variety of CSFs compared to the model. The error margins are expressed on the 5-point scale:

Figure 20 identifies the count of how often a CSF has been identified as important across the four project cases by both the model as well as the assessors. The error percentage between the two

are averaged over the nine CSFs by means of a Pareto line. This line indicates that on average 42% of the CSFs are erroneous identified as either important or lesser important.

Figure 21 and Figure 22 respectively express how the various CSFs are correlated according to the model and the findings of the assessors. Table 23 illustrates that 61% of the CSF combinations show a correlation which is at least moderate according to the PCC for the scores of the model. Of these correlations respectively 54,5% and 45,5% are positively and negatively correlated. One of the combinations shows no correlation and that is *CM x DQ* whereas *CM x PC* shows the strongest correlation (95%). In total, the model shows 20 (55,6%) combinations which are negatively correlated CSFs and 15 (41,7%) which are positively correlated whereas the findings of the assessors indicate 17 (47,2%) negatively correlated CSF and 18 (50%) positively correlated. Interestingly, the correlations of the different CSFs between the model and the assessors show poor correlation scores – as is shown in Figure 18. Ideally, the correlations are strong and positively correlated. Meaning that the predicted importance of the CSFs show a similar trend between the two predictions. There may be two reasons for the poor correlations; 1) different considerations to determine importance, and 2) human bias. The first is to be reduced via the refinement of the importance of the different parameters that determine the importance of the CSFs as per the model, whereas the human bias in assessing the importance of the CSFs is, in part, mitigated by the inclusion of multiple assessments throughout the operationalizations.

CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
95,6%	21,5%	-53,0%	-86,2%	-27,2%	-67,4%	-5,0%	-50,6%	-63,8%

Figure 18: Model x assessors correlations as per the first operationalization

According to project manager one and two, *CRM strategy* and *CRM goals/objectives* are inseparable. The found PCCs as per both the model and the assessors affirm this strong belief by identifying a strong positive relation of 81% and 82%. In case of the model, this strong relation can be explained by the similarity of the CSF design parameters whereas the difference between the two CSFs is oftentimes acknowledged as a grey area for the assessors and therefore may be regarded similarly. The business consultant indicated that for the fourth case, it is believed that the *involvement of the customer* goes hand in hand with the *alignment of the key stakeholders* within the project, because it helps to share expectations and assumptions more effectively. The findings of the assessors confirm this statement by indicating a very strong relation of 95%. Nonetheless, the model shows a weaker relation (43%) between the two. Therefore, these findings add to the quantitive findings of the model. In the following operationalization's, these figures are compared to determine in more detail whether the variety of CSFs are correlated.

Table 23: CSF correlations as per the model of the first operationalization

Very strong relation (.70 to 1)	Strong relation (0.40 to 0.69)	Moderate relation (0.30 to 0.39)	Weak relation (0.20 to 0.29)	Negligible relation (0.01 to 0.19)	No relation (0)
CM x CRS	CM x AWS	*CM x CI*	*CM x CGO*	CM x COP	CM x DQ
CM x PC	*CM x MA*	AWS x COP	DQ x CI	*DQ x PC*	
DQ x CGO	DQ x CRS		*PC x COP*	*DQ x MA*	
CRS x CGO	DQ x AWS		*MA x CGO*	*CRS x CI*	
PC x MA	*DQ x COP*			CRS x MA	
CI x MA	*CRS x PC*			*PC x CGO*	
COP x CGO	*CRS x AWS*			*CI x CGO*	
	CRS x COP			*AWS x MA*	
	PC x CI			*AWS x CGO*	
	PC x AWS				
	CI x AWS				
	CI x COP				
	COP x MA				

7 (19,4%)	13 (36,1%)	2 (5,6%)	4 (11,1%)	9 (25%)	1 (2,8%)

Figure 23 illustrates the number of false positives of the model. In total the model has six false positives – 17%. Furthermore, Figure 24 identifies that the model has eleven false negatives – 31%. Table 23 identifies that six of the in total seventeen false positives and negatives is accounted by a total of 6 (35,3%) false positives and negatives of the electricity company. This high proportion may be due to both a high difference in average scores between the model and the assessor – 2,93 against 3,89 – and that the average of the model scores for the electricity case is below the baseline of 3 whereas the average score of the assessor is above 3. Therefore, false negatives are prone to exist. The difference in numbers as shown Figure 20 and the numbers of false positives and negatives does not assess the difference in importance of a single CSF between the model and the assessor but rather illustrates the count of importance spanning over the assessment totality. The minimum mean difference for a project case is 0,72-point difference whereas the maximum mean is 1,64. The average of the four means is 1,14-point difference. There may be three reasons for these rather high differences; 1) interpersonal subjectivity – one is more reluctant to assign a one or a five than another, 2) project specific context – incapability of the model to capture the most salient details, and 3) inter-functional differences – one may have better insights into pivotal issues. It is believed that the design of the operationalization to include different functional lines, and both between- and within- subject studies supported the identification of these three reasons. The median and modus show that there are outliers with a high difference between the model and the assessor which subsequently heighten the mean. That is, there are more significant differences between the assessor than significant agreements.

As the amount of erroneous identified important CSFs sums up to fifteen times across the four project cases – thus the reliability of the model – these account for *42%* of all instances:

Equation 7: Assessment accuracy of the first operationalization

$$\boldsymbol{Reliability} = 1 - \frac{Amount\ of\ erroneous\ identified\ important\ CSFs}{Nine\ CSFs\ \times Four\ project\ cases} = 1 - \frac{15}{36} \approx 58\%$$

Meaning that *58% (1-42%,* law of total probability*)* of the CSFs are correctly identified as important. Considering the false positives and negatives, the model is able to validly predict *52%* CSFs:

Equation 8: Assessment precision of the first operationalization

$$\boldsymbol{Validity} = 1 - (Percentage\ false\ positives + Percentage\ false\ negatives) = 1 - (17\% + 31\%) \approx 52\%$$

Considering the totality of reliability and validity, the predictive power of the model is *55%*:

Equation 9: Prediction power of the first operationalization

$$\boldsymbol{Predictive\ power} = \frac{Reliability + Validity}{2} \approx \frac{0{,}58 + 0{,}52}{2} = \frac{1{,}1}{2} = 0{,}55 = 55\%$$

These results shows similar performance as a toss of a coin (50/50) in terms of justly predicting the importance of a CSF. Hence, refining the parameters of the CSF is needed to improve the model's accuracy.

As is shown in Table 23, twenty-two combinations out of a total of thirty-six combinations (*61%*) indicate a possible positive or negative correlation of at least a moderate strength as per the model whereas the results of the assessors also indicate twenty-two at least moderately related CSF correlations. Also based on the qualitative data retrieved from the interviews it is believed that, to some extent, CRM strategy and CRM goals/objectives as well as customer involvement and alignment with key stakeholder groups are correlated.

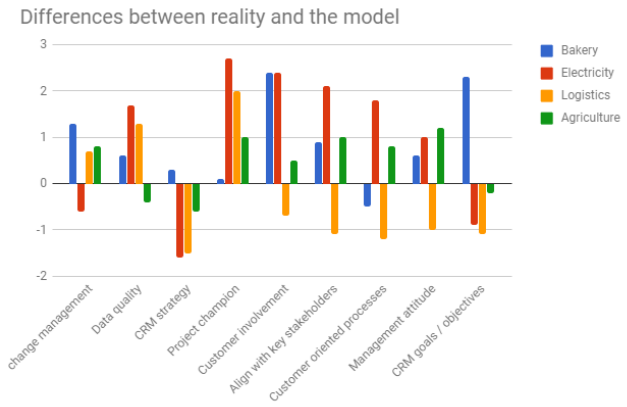

Figure 19: Error margins of the first operationalization

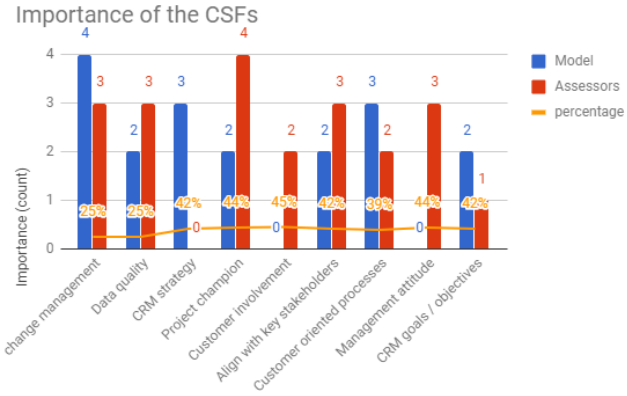

Figure 20: Importance of the CSFs of the first operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	0%								
CRS	-77%	40%							
PC	95%	-4%	-60%						
CI	-32%	29%	-9%	-59%					
AWS	67%	49%	-60%	45%	43%				
COP	6%	-43%	-67%	-20%	67%	33%			
MA	-67%	-8%	12%	-86%	85%	-9%	66%		
CGO	-29%	78%	81%	-14%	-18%	-12%	-85%	-27%	

Figure 21: PCCs of the model in the first operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	-54%								
CRS	77%	-95%							
PC	-94%	56%	-79%						
CI	-18%	-24%	19%	-17%					
AWS	-47%	-14%	0%	14%	95%				
COP	-72%	-9%	-16%	50%	72%	90%			
MA	-21%	-68%	46%	4%	68%	75%	79%		
CGO	78%	-65%	82%	-94%	47%	18%	-19%	25%	

Figure 22: PCCs of the assessors in the first operationalization

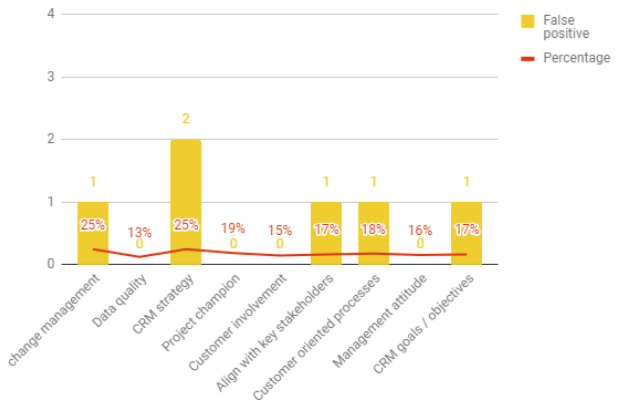

Figure 23: False positives of the model of the first operationalization

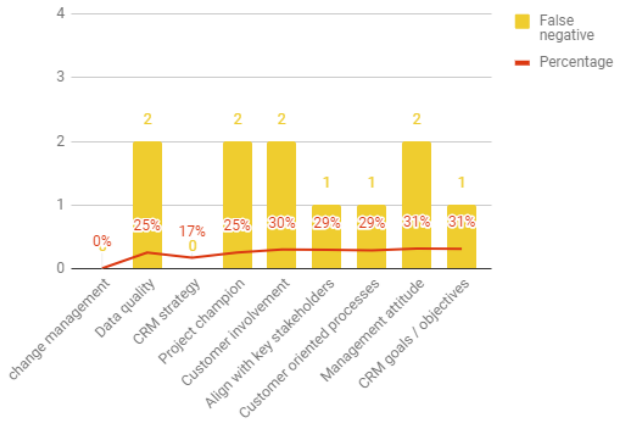

Figure 24: False negatives of the model of the first operationalization

5.3 Second incremental operationalization

The results of the second operationalization are listed in Table 24 below. Compared to the results of the first operationalization, as depicted in Table 22, the second assessment of the bakery commodity company is included as well as the inclusion of an additional company; the fastening material commodity company. The findings of the two assessments of the bakery commodity company are separately listed and the mean of the two together is also listed. The mean of the scores, the number of false positives and the false negatives are recalculated based as these differ from the findings of the first operationalization due to the refinement of the model.

Table 24: Results of the second operationalization

		Critical Success Factors									
		CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO	AVG
Bakery commodity	Assessment 1 scores	3,5	3,1	2,5	3,5	3,2	3,3	3,3	3,2	2,8	**3,16**
	Assessor 1 scores	5	3,5	3	3,5	5	4	3	3,5	5	**3,94**
	Difference 1	1,5	0,4	0,5	0	1,8	0,7	0,3	0,3	2,2	
	Mean	0,86									
	Assessment 2 scores	3,1	3,5	3,2	2,9	3,3	3,3	4,1	3,1	2,6	**3,23**
	Assessor 2 scores	5	4	4	5	4	4	3	3	2	**3,78**
	Difference 2	1,9	0,5	0,8	2,1	0,7	0,7	1,1	0,1	0,6	
	Mean	0,94									
	Combined assessments	3,3	3,3	2,85	3,2	3,25	3,3	3,7	3,15	2,7	**3,19**
	Combined assessors	5	3,75	3,5	4,25	4,5	4	3	3,25	3,5	**3,86**
	Difference assessors	0	0,5	1	1,5	1	0	0	0,5	3	
	Mean difference	0,83									
Electricity	Assessment scores	3,3	3,2	3,4	2,6	3	3,3	3,6	2,8	3,1	**3,14**
	Assessor scores	2,5	4,5	2	5	5	5	5	4	2	**3,89**
	Difference	0,8	1,3	1,4	2,4	2	1,7	1,4	1,2	1,1	
	Mean	1,48									
Logistics	Assessment scores	3,3	3,5	3,2	2,8	3	3,4	3,8	3,5	3,1	**3,29**
	Assessor scores	4	5	2	4,5	2	2	2	2	2	**2,83**
	Difference	0,7	1,5	1,2	1,7	1	1,4	1,8	1,5	1,1	
	Mean	1,32									
Agriculture	Assessment scores	3,4	3,7	3,2	3,4	3,1	3,3	3,1	3	3,4	**3,29**
	Assessor scores	4,3	3	3	4,3	3	4	3,3	4	3	**3,54**
	Difference	0,9	0,7	0,2	0,9	0,1	0,7	0,2	1	0,4	
	Mean	0,57									
Fastening material	Assessment scores	3,2	3,2	3,3	3	3	3,5	4	3,3	2,9	**3,27**
	Assessor scores	3	5	5	5	5	3	2	3	3	**3,78**
	Difference	0,2	1,8	1,7	2	2	0,5	2	0,3	0,1	
	Mean	1,18									
AVG of assessments		3,3	3,37	3,13	3,03	3,1	3,35	3,65	3,15	2,98	**3,23**
AVG difference in total		1	1,03	0,97	1,35	1,27	1,12	1,13	0,73	0,92	
Mean		1,06									
Mode		0,7									
Median		1,0									
Number of false positives		1 (17%)	0 (0%)	2 (33%)	0 (0%)	0 (0%)	1 (17%)	2 (33%)	1 (17%)	2 (33%)	**9 (17%)**
Number of false negatives		0 (0%)	0 (0%)	0 (0%)	3 (50%)	0 (0%)	0 (0%)	0 (0%)	1 (17%)	1 (17%)	**5 (9%)**

In Figure 26 - Figure 31, the findings of the second operationalization are visually illustrated. Figure 26 shows the error margins of the model compared to the findings of the assessors. Compared to Figure 19, Figure 26 also indicates that the assessors are more reluctant to regard the different CSFs as more important than the model. Figure 27 identifies the count of how often a CSF has been identified in the second operationalization as important by both the model as well as the assessors. The Pareto line indicates that on average 33 percent of the CSFs are erroneous identified as either important. Noteworthy is the difference between Figure 20 and Figure 27 which illustrates that in the latter, the model identifies the CSFs as important more often than the assessors. One reason that the model more often identifies several CSFs as important can be accounted to the fact that the assessors did not differentiate between a score of 2.7, 3 or 3.3 whereas the model did. In the case of a 3, the CSF is not regarded as most important – reducing the number of important CSFs.

Figure 28 and Figure 29 express how the various CSFs are correlated for both the model and assessors. The comparison of Table 23 and Table 25 delineates a reduction from strong towards more moderately correlated CSFs. Most of the CSFs appear to be at least moderately correlated – 55,6%. Intriguing is the shift in correlation *CRS x CGO*, which unveils as a strong relation whereas it initially displayed a very strong correlation for the model whereas the results of the assessors indicate that it is weakly correlated. The later fact is surprising, since the assessors could not regard the either of both separately. Also, the comparison spectacles a reduction of very strong correlations. The reason for this may be due to the fact that similar CSF designs – accounted by the same parameters – subsequently materialize in similar importance. As the weights of the parameters are refined as a result of the first operationalization, the importance of the CSFs is then calculated differently. In total, the model shows seventeen (47,2%) combinations which are positively correlated CSFs and nineteen (52,8%) which are negatively correlated whereas the findings of the assessors indicate sixteen (44,4%) negatively correlated CSF and nineteen (52,8%) positively correlated. Interestingly, the various CSFs between the model and the assessors show low correlated scores – as is shown in Figure 25. Surprisingly, the comparison between Figure 18 and Figure 25 elicit a decline in correlation between the model and the assessors' scores. That is, the differences of the scores of both the model and the assessors have been reduced but the importance of the scores shows an opposite trend over the six assessments. The reason behind this may the human error and subjectivity as each assessor assigns importance to the CSFs based on unique considerations. Especially, the correlation scores of change management – 17,8% compared to 95,6% of the first operationalization – causes the decline.

Table 25: CSF correlations as per the model of the second operationalization

Very strong relation (.70 to 1)	Strong relation (0.40 to 0.69)	Moderate relation (0.30 to 0.39)	Weak relation (0.20 to 0.29)	Negligible relation (0.01 to 0.19)	No relation (0)
CM x COP	*CM x CRS*	*CM x AWS*	*DQ x AWS*	*CM x DQ*	
CRS x PC	CM x PC	DQ x CRS	*CRS x MA*	*CM x CI*	
	CM x CGO	CRS x AWS	*PC x AWS*	*CM x MA*	
	DQ x CGO	CRS x CGO		DQ x PC	
	CRS x CI	COP x MA		DQ x CI	
	CRS x COP			*DQ x COP*	
	PC x CI			DQ x MA	
	PC x COP			PC x MA	
	CI x AWS			PC x CGO	
	CI x CGO			CI x COP	
	AWS x COP			*CI x MA*	
	AWS x MA			*AWS x CGO*	
	COP x CGO			*MA x CGO*	
2 (5,6%)	**13 (36,1%)**	**5 (13,9%)**	**3 (8,3%)**	**13 (36,1%)**	**0 (0%)**

CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
17,8%	-33,2%	3,6%	-80,5%	12,5%	-69,4%	-35,3%	-89,6%	-13,3%

Figure 25: Model x assessors correlations as per the second operationalization

Figure 30 and Figure 31 respectively illustrate a total of nine false positives and five false negatives that accounts for 17% and 9% of all predictions. In comparison to the first operationalization, these percentages are respectively an improvement of 0% and 71%. The first is explained by the fact that the refinement has converged the difference between the model and the assessors. That is, the scores of the model were heightened compared to the first operationalization – shown in the average of the scores in Table 22 and Table 24. Therefore, the percentage of false positives remains 17%. The other way around holds for the false negatives. As the average of the model

scores increased compared to the first operationalization, the number of times that the model is to indicate an importance of less than 3 declines. To that end, the instances in which false negatives occur reduces. Intriguingly, the count of false negatives of the CSF *project champion* – 3 times – is significantly higher than the other CSFs. There are two complementary reasons for this; 1) the assessor, on average, give high priority to project championship, and 2) the low average score of the model for project champions – 3,03. Noteworthy to say is the number of false positives and negatives accounted by the individual project cases. Reckon that it was found that the electricity case accounted for a total of 6 false positives and negatives. In the second operationalization, this number was reduced to a total of 5. Whereas the logistics case in this operationalization accounted for a total of 6 false positives and negatives. In the first operationalization, this latter case accounted for a total of 5 false positives and negatives. To this end, these two cases are found to be the most arduous cases to predict.

Noteworthy is the mean difference between the six project case assessments, with a minimum mean over the nine CSFs of 0,57-point difference and maximum mean of 1,48. The average of the six means is 1,06-point difference. Compared to Table 22, these findings show that the refinement, in part, succeeded in converging the scores of the assessors and the model with a percentual improvement of approximately *7,2%* for the mean score. However, still the differences in point-difference between the different assessors are significant. The two highest mean scores are respectively 1,32 and 1,48. With a median and mode score of 1,0 and 0,7 over the individual scores, these mean scores are significantly higher than the average scores. As mentioned previously, there may be three reasons for these high differences; 1) interpersonal subjectivity, 2) project specific context, and 3) inter-functional differences. As the bakery commodity case is assessed by two assessors with different functions, it is therefore a good initial estimate to determine the subjectivity margins. The results indicate that the two assessors had a similar view on the project case as the highest difference in assessment score is 0,8-point and the averaged difference over the nine CSFs being just 0,37-point. Meaning that inter-functional differences is indicated to be insignificant. There is one outlier of assessor score difference and that is for the CSF *CRM goals/objectives* with a 3 point-difference. These findings show that the third previously mentioned reason to the difference is assessment errors is, in a certain degree, refuted. As this is one within-subject study, these findings do not necessarily generalize towards all project cases.

As is stated earlier in this section, the amount of erroneous identified important CSFs sums up to eighteen times across the six assessments – thus the accuracy of the model. These eighteen cases account for 33% of all instances:

Equation 10: Assessment accuracy of the second operationalization

$$\boldsymbol{Reliability} = 1 - \frac{Amount\ of\ erroneous\ identified\ important\ CSFs}{Nine\ CSFs\ \times Six\ project\ assessments} = 1 - \frac{18}{54} \approx 67\%$$

Meaning that 67*% (1-33%,* law of total probability*)* of the CSFs are correctly identified as important. Moreover, the model's performance sums up a total of *74%* valid predictions:

Equation 11: Assessment precision of the second operationalization

$$\boldsymbol{Validity} = 1 - (Percentage\ false\ positives + Percentage\ false\ negatives) = 1 - (17\% + 9\%) \approx 74\%$$

Considering the totality of validity and reliability, the predictive power of the model is *70,5%*:

Equation 12: Prediction power of the second operationalization

$$\boldsymbol{Predictive\ power} = \frac{Reliability + Validity}{2} \approx \frac{0{,}67 + 0{,}74}{2} = \frac{1{,}41}{2} = 0{,}705 \approx 70{,}5\%$$

As is shown in Figure 28, twenty combinations out of a total of thirty-six combinations (*55,6%*) indicate an at least moderate positive or negative correlation.

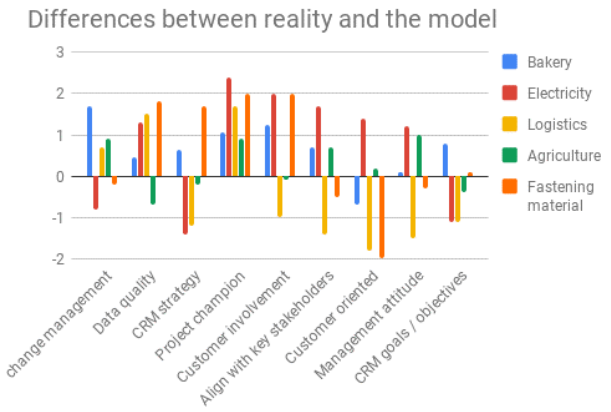

Figure 26: Error margins of the second operationalization

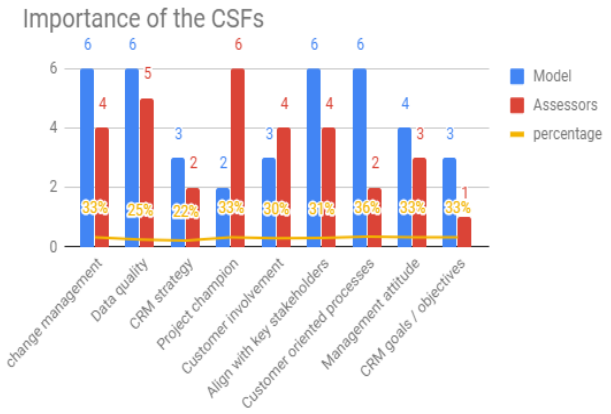

Figure 27: Importance of the CSFs of the second operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	-18%								
CRS	-66%	36%							
PC	65%	7%	-74%						
CI	-11%	14%	-49%	41%					
AWS	-34%	-20%	30%	-20%	-57%				
COP	-90%	-13%	43%	-65%	4%	52%			
MA	-6%	4%	-23%	9%	-13%	64%	35%		
CGO	46%	45%	32%	9%	-62%	-4%	-65%	-19%	

Figure 28: PCCs of the model in the second operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	-60%								
CRS	9%	7%							
PC	-59%	58%	27%						
CI	-28%	0%	41%	5%					
AWS	-11%	-51%	-11%	3%	61%				
COP	-33%	-30%	-47%	13%	39%	90%			
MA	-17%	-65%	-6%	-12%	52%	89%	77%		
CGO	41%	-49%	17%	-85%	41%	11%	-15%	28%	

Figure 29: PCCs of the assessors in the second operationalization

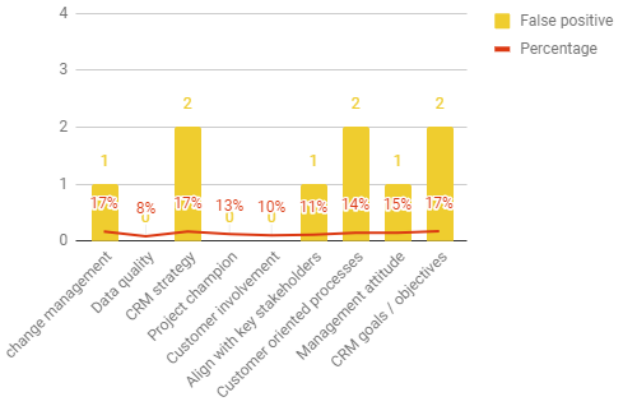

Figure 30: False positives of the model of the second operationalization

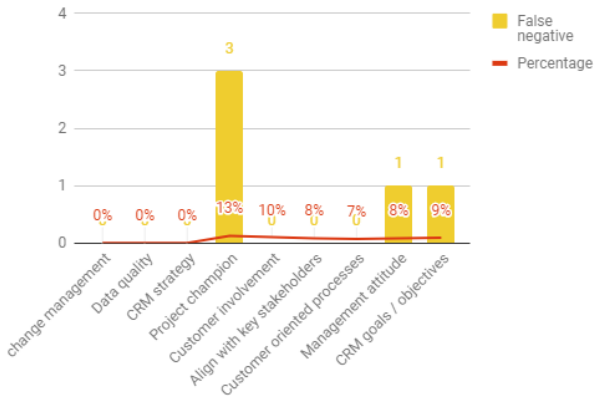

Figure 31: False negatives of the model of the second operationalization

5.4 Third incremental operationalization

In this operationalization, the entertainment case is supplemented to the analysis. The mean of the scores, the number of false positives and the false negatives are recalculated based in Table 26 below as these differ from the first operationalization due to the refinement of the model.

In Figure 33 - Figure 38, the findings of the third operationalization are visually illustrated. Figure 33 shows the error margins of the model compared to the findings of the assessors. Compared to the first two operationalization's, the errors margins between the different assessments remain in the same ratios. Conspicuously is the difference between the entertainment project case and the

others. This difference can be explained through assessing the assessor scores of the project case. In the case of the entertainment case, the assessor has given less priority to the different CSFs as per the context of the project. The assessor acknowledged that the project should not be considered as a CRM implementation. That is, the project focused on the attainment of more insights into pricing and resources – ERP-like solution. For instance, CRM strategy and CRM goals/objectives to this end do not fit in the picture of what construes success for this project whereas the model does not capture this contextual information.

Table 26: Results of the third operationalization

		Critical Success Factors									
		CM	**DQ**	**CRS**	**PC**	**CI**	**AWS**	**COP**	**MA**	**CGO**	**AVG**
Bakery commodity	***Assessment 1 scores***	*3,3*	*3,1*	*2,6*	*3,4*	*3,1*	*3,2*	*3,2*	*3,4*	*2,8*	***3,12***
	Assessor 1 scores	5	3,5	3	3,5	5	4	3	3,5	5	**3,94**
	Difference 1	*1,7*	*0,4*	*0,4*	*0,1*	*1,9*	*0,8*	*0,2*	*0,1*	*2,2*	
	Mean	0,64									
	Assessment 2 scores	*3,1*	*3,7*	*3,6*	*2,9*	*3,2*	*3,4*	*4,2*	*3,3*	*2,9*	***3,37***
	Assessor 2 scores	5	4	4	5	4	4	3	3	2	**3,78**
	Difference 2	*1,9*	*0,3*	*0,4*	*2,1*	*0,8*	*0,6*	*1,2*	*0,3*	*0,9*	
	Mean	0,94									
	Combined assessments	*3,2*	*3,4*	*3,1*	*3,15*	*3,15*	*3,3*	*3,7*	*3,35*	*2,85*	***3,2***
	Combined assessors	5	3,75	3,5	4,25	4,5	4	3	3,25	3,5	**3,86**
	Difference assessors	*0*	*0,5*	*1*	*1,5*	*1*	*0*	*0*	*0,5*	*3*	
	Mean difference	0,81									
Electricity	***Assessment scores***	*3,1*	*3,5*	*3,5*	*2,6*	*3*	*2,9*	*3,6*	*2,7*	*2,5*	***3,04***
	Assessor scores	2,5	4,5	2	5	5	5	5	4	2	**3,89**
	Difference	*0,6*	*1*	*1,5*	*2,4*	*2*	*2,1*	*1,4*	*1,3*	*0,5*	
	Mean	1,42									
Logistics	***Assessment scores***	*3,4*	*3,7*	*3,7*	*3,1*	*3,3*	*3,1*	*3,8*	*3,4*	*3,1*	***3,4***
	Assessor scores	4	5	2	4,5	2	2	2	2	2	**2,83**
	Difference	*0,6*	*1,3*	*1,7*	*1,4*	*1,3*	*1,1*	*1,8*	*1,4*	*1,1*	
	Mean	1,3									
Agriculture	***Assessment scores***	*3,3*	*3,7*	*3,8*	*4*	*3*	*3,1*	*3,2*	*2,7*	*3*	***3,31***
	Assessor scores	4,3	3	3	4,3	3	4	3,3	4	3	**3,54**
	Difference	*1*	*0,7*	*0,8*	*0,3*	*0*	*0,9*	*0,1*	*1,3*	*0*	
	Mean	0,57									
Fastening material	***Assessment scores***	*3,3*	*3,5*	*3,6*	*3,4*	*3,2*	*3,3*	*3,9*	*3,4*	*2,9*	***3,39***
	Assessor scores	3	5	5	5	5	3	2	3	3	**3,78**
	Difference	*0,3*	*1,5*	*1,4*	*1,6*	*1,8*	*0,3*	*1,9*	*0,4*	*0,1*	
	Mean	1,03									
Entertainment	***Assessment scores***	*2,7*	*2,7*	*3*	*1,9*	*2,7*	*2,3*	*3,9*	*3*	*3,1*	***2,81***
	Assessor scores	1	4	1	3,5	2	4	1	1	2	**2,17**
	Difference	*1,7*	*1,3*	*2*	*1,6*	*0,7*	*1,7*	*2,9*	*2*	*1,1*	
	Mean	1,67									
AVG of assessments		*3,2*	*3,4*	*3,4*	*3,04*	*3,07*	*3,04*	*3,69*	*3,13*	*2,9*	***3,21***
AVG difference in total		*1,4*	*0,93*	*1,03*	*1,36*	*1,21*	*1,07*	*1,5*	*0,97*	*0,84*	
Mean		1,15									
Mode		*0,3*									
Median		1,2									
Number of false positives		*1 (14%)*	*0 (0%)*	*2 (29%)*	*0 (0%)*	*1 (14%)*	*1 (14%)*	*3 (43%)*	*1 (14%)*	*2 (29%)*	***11 (17%)***
Number of false negatives		0 (0%)	1 (14%)	0 (0%)	3 (43%)	0 (0%)	2 (29%)	0 (0%)	2 (29%)	2 (29%)	**10 (16%)**

Figure 34 identifies the count of how often a CSF has been identified as important by both the model as well as the assessors. The Pareto line indicates that, on average, twenty-four percent of the CSFs are erroneous identified as either important or lesser important. Noteworthy is the difference between Figure 34 follows the trend of Figure 27, which illustrates that the model identifies the several CSFs as important more often than the assessors. Note that one reason for this finding is that the assessors tend to express the importance of the CSFs with less decimals. For instance, an assessor would provide a 3 whereas the model would indicate a 3,1. In this example, the logic of the CSF design issues that the CSF is regarded as important as per the model whereas unimportant as per the assessor. The model indicates a score of 3 in five cases (7,9%) whereas the assessors indicate a 3 in eleven cases (17,5%).

Figure 35 and Figure 36 express how the variety of CSFs are correlated for both the model and assessors. The comparison of, on the one hand, Table 27 and, on the other hand, Table 23 and Table 25 delineates an similar trend than was found between the first two assessments; a shift from weaker correlations towards stronger correlations. Half of the CSFs appear to be at least moderately correlated. Nonetheless, the number of very strong correlations has increased. The reason for this spectacle may be due to the fact that the refinement resulted in a dissimilar improvements. *CM, CRS, CI,* and *MA* even shows a higher difference in scores between the model and the assessors compared to the second operationalization. Again, *CRS x CGO*, unveils as a weaker correlation compared to the previous operationalization as per the model. What is more is that the correlation of *CRS x CGO* shows a moderate relation according to the scores of the assessors. Since, the assessors do find it hard to depict a clear distinction between the two CSFs, it remains enigmatic that these intuitively strongly correlated CSFs illustrate no strong correlation.

In total, the model shows twenty-two (61,1%) combinations which are positively correlated CSFs and fourteen (38,9%) which are negatively correlated whereas the findings of the assessors indicate 9 (25%) negatively correlated CSF and 27 (75%) positively correlated. Beguiling is the difference of these figures compared to the first two operationalization is that there are significant more positively correlated CSFs as per the third operationalization. Intuitively, this holds true since all of these factors determine success and all of these CSFs are a prerequisite to attain implementation success. Hence, the majority of these CSFs are believed to be complementary. Interestingly, the correlations of the different CSFs between the model and the assessors show poor correlation scores – as is shown in Figure 25. This means that the model still is unable to capture the same rationale – assessment patterns – as the assessors to express the importance of the CSFs. However, Figure 32 shows an improvement in correlation between the model and the assessors compared to Figure 25. Surprisingly, this is again partly a result of a steep increase in correlation for change management.

Table 27: CSF correlations as per the model of the third operationalization

Very strong relation (.70 to 1)	Strong relation (0.40 to 0.69)	Moderate relation (0.30 to 0.39)	Weak relation (0.20 to 0.29)	Negligible relation (0.01 to 0.19)	No relation (0)
CM x PC	CM x DQ	DQ x CRS	*DQ x COP*	*CM x CRS*	
CM x AWS	CM x CI	*CRS x PC*	DQ x MA	CM x MA	
DQ x AWS	*CM x COP*	CRS x COP	CRS x AWS	CM x CGO	
PC x CI	DQ x PC	AWS x MA	CRS x CGO	DQ x CGO	
PC x AWS	DQ x PC		PC x MA	*CRS x CI*	
CI x AWS	*PC x COP*		COP x MA	*CRS x MA*	
	CI x CGO		*MA x CGO*	*PC x CGO*	
	COP x CGO			*CI x COP*	
				CI x MA	
				AWS x COP	
				AWS x CGO	
6 (16,7%)	**8 (22,2%)**	**4 (11,1%)**	**7 (19,4%)**	**11 (30,6%)**	**0 (0%)**

CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
72,2%	-14,9%	13,1%	8,3%	49,9%	-26,0%	-42,5%	-35,6%	-17,4%

Figure 32: Model x assessors correlations as per the third operationalization

Figure 37 and Figure 38 illustrate a total of eleven false positives and ten false negatives which account for 17% and 16% of all predictions. In comparison to the first two operationalization's, these percentages are respectively an improvement of 0% and minus 77,8%. The percentage of false positives follows the trend of the first two operationalization's. The percentage of false negatives have risen steeply. One of the causes of this rise is the inclusion of the *Entertainment* case. This project case accounts for a total of five false positives and negatives – respectively two and three. As previously noted, it is believed that the context of the *Entertainment* case causes the scores to deviate significantly. In accordance to the second operationalization, the count of false negatives of the CSF *project champion* – three times – remains the CSF with the falsest negatives whereas *CRM goals and objectives* accounts for a combined total of four false positives and negatives. Therefore, it is shown to be the most difficult CSF to accurately assess. One reason for this may be that part of the importance of *CRM goals and objectives* is based on the interpretation of the assessor how important the formulated goals are construed by CRM as a project in some cases was not considered as purely CRM-related. Furthermore, it is found that the cases of the electricity, logistics and entertainment companies account for 76,2% of the combined total of twenty-one false positives and negatives. Therefore, the predictive power of the model will strongly improve if the model would be able to capture the contextual information of these cases that differentiate the scores between the model and the assessors.

The mean difference between and over the seven project case assessments is contained within the interval of 0,57-point and 1,67-point difference. The average mean of the seven assessments equals 1,15-point difference. Therefore, this operationalization shows lesser performance than the previous operationalization – 1,15 to 1,04-point difference. However, in-depth analysis of the point differences shows that, in part, the refinement still converges the scores of the model and the assessors with the exception of the CSFs *CM, CRS, CI,* and *MA*. Additionally, the mode of the point-differences is 0,3 whereas the median is 1,2. The combination of the average (1,15), mode (0,3) and median (1,2) indicate that the distribution of the scores is skewed to the left. That is, the mean is pulled down by a long tail of lower scores compared to the median.

As is stated earlier in this section, the amount of erroneous identified important CSFs sums up to fifteen times. These fifteen cases account for 24% of all instances:

Equation 13: Assessment accuracy of the third operationalization

$$\boldsymbol{Reliability} = 1 - \frac{Amount\ of\ erroneous\ identified\ important\ CSFs}{Nine\ CSFs\ \times Seven\ project\ assessments} = 1 - \frac{15}{63} \approx 76\%$$

Meaning that *76% (1-24%,* law of total probability*)* of the CSFs are correctly identified as important. However, the number of the false positives and negatives sums up a just *67%* precise predictions. Hence, the predictive power of the model suffers from a lower validity.

Equation 14: Assessment precision of the third operationalization

$$\boldsymbol{Validity} = 1 - (Percentage\ false\ positives + Percentage\ false\ negatives) = 1 - (17\% + 16\%) \approx 67\%$$

Equation 15: Prediction power of the third operationalization

$$\boldsymbol{Predictive\ power} = \frac{Reliability + Validity}{2} \approx \frac{0{,}76 + 0{,}67}{2} = \frac{1{,}43}{2} = 0{,}715 \approx 71{,}5\%$$

For that reason, the model cannot be improved further through similar follow-up operationalization's. However, the findings of the second and third operationalization can be combined to improve the performance of the model as the CSFs *CM, CRS, CI,* and *MA* have shown better performance in the second operationalization. The following section enlists the performance of the model retrieved from the combination of the findings and additional refinement.

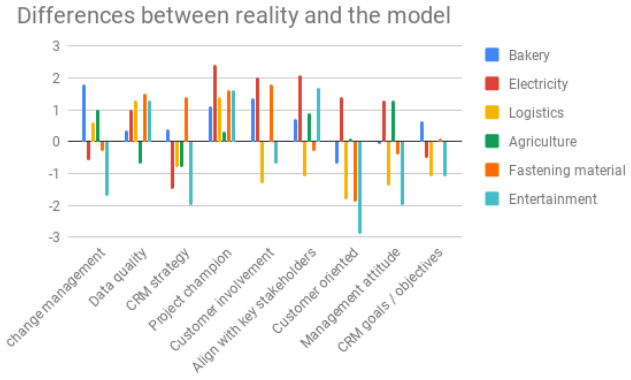

Figure 33: Error margins of the third operationalization

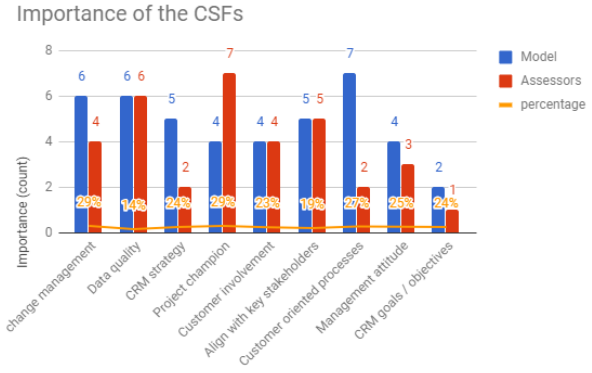

Figure 34: Importance of the CSFs of the third operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	61%								
CRS	-18%	36%							
PC	89%	64%	-30%						
CI	66%	66%	-16%	78%					
AWS	82%	72%	22%	76%	72%				
COP	-65%	-28%	36%	-58%	-18%	-16%			
MA	19%	21%	-18%	25%	12%	36%	26%		
CGO	7%	16%	28%	-8%	-51%	-18%	-57%	-23%	

Figure 35: PCCs of the model in the third operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	-32%								
CRS	51%	11%							
PC	15%	51%	53%						
CI	27%	5%	60%	36%					
AWS	-17%	-52%	-17%	-5%	44%				
COP	30%	-19%	7%	44%	59%	62%			
MA	53%	-34%	44%	40%	70%	46%	86%		
CGO	47%	-44%	30%	-49%	48%	7%	6%	39%	

Figure 36: PCCs of the assessors in the third operationalization

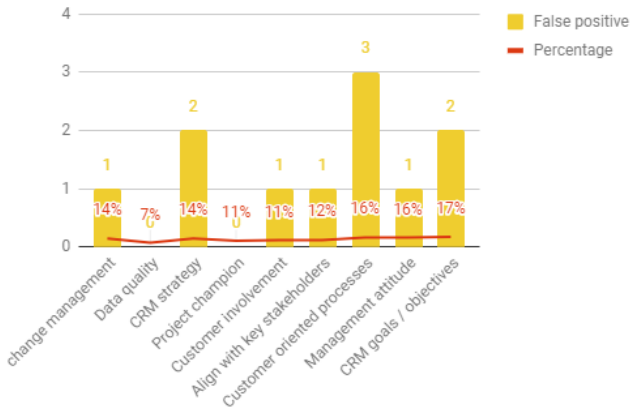

Figure 37: False positives of the model of the third operationalization

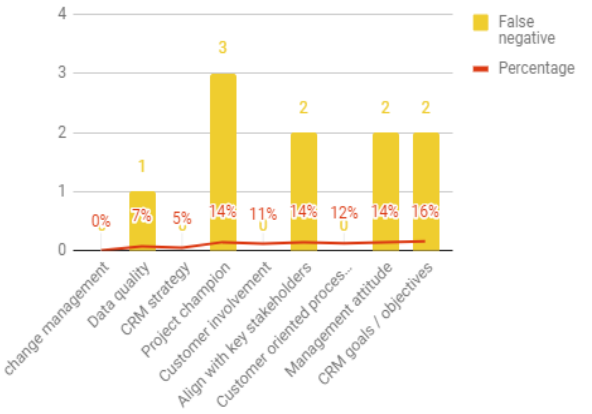

Figure 38: False negatives of the model of the third operationalization

5.5 Improved model performance based on the three operationalization

After the third operationalization, it was found that the method of refinement by means of the qualitative data collection retrieved from the discussions with the assessors. As mentioned earlier, in part, the third operationalization performed worse for the CSFs *CM, CRS, CI,* and *MA* compared to the second operationalization. Therefore, the rationale is to combine the two iterations of the model in order to improve the predictive power.

The qualitative data retrieved from the assessment of the *Entertainment* company is used as an initial estimation to refine the model. After this initial refinement, the model has been refined based on the Sum of the Squared Error (SSE) for regression analysis:

Equation 16: the sum of the squared error

$$SSE = \sum_{i=1}^{n} (\varepsilon_i)^2 = \sum_{i=1}^{n} (y_i - (\alpha + \beta x_i))^2$$

The SSE measures the discrepancy between the scores of the assessors and the estimation of the model. The 'tightness' of the SSE – the difference between the two data sources – expresses the fitness of the model to reality. Based on the SSE, the weights of the parameters were refined – Table 28. As the sample size of the operationalization's are considered to be small, an imminent threat to the generalizability of model overfitting. To that end, not all CSFs underwent the SSE-based refinement as it would issue to many variables to control for.

Table 28: Results after the third operationalization

		Critical Success Factors									
		CM	**DQ**	**CRS**	**PC**	**CI**	**AWS**	**COP**	**MA**	**CGO**	**AVG**
Bakery commodity	***Assessment 1 scores***	*3,6*	*3,3*	*2,6*	*4,3*	*3,3*	*3,3*	*3,3*	*3,6*	*3,2*	***3,39***
	Assessor 1 scores	5	3,5	3	3,5	5	4	3	3,5	5	**3,94**
	Difference 1	*1,4*	*0,2*	*0,4*	*0,8*	*1,7*	*0,7*	*0,3*	*0,1*	*1,8*	
	Mean	0,82									
	Assessment 2 scores	*3,3*	*4,0*	*3,5*	*3,4*	*3,0*	*3,2*	*4,1*	*2,8*	*2,7*	***3,33***
	Assessor 2 scores	5	4	4	5	4	4	3	3	2	**3,78**
	Difference 2	*1,7*	*0*	*0,5*	*1,6*	*1*	*0,8*	*1,1*	*0,2*	*0,7*	
	Mean	0,84									
	Combined assessments	*3,45*	*3,7*	*3,05*	*3,85*	*3,15*	*3,25*	*3,7*	*3,2*	*2,95*	***3,37***
	Combined assessors	5	3,75	3,5	4,25	4,5	4	3	3,25	3,5	**3,86**
	Difference assessors	*0*	*0,5*	*1*	*1,5*	*1*	*0*	*0*	*0,5*	*3*	
	Mean difference	0,65									
Electricity	***Assessment scores***	*2,9*	*3,7*	*3,5*	*3,2*	*3,3*	*3,0*	*3,6*	*3,1*	*2,7*	***3,22***
	Assessor scores	2,5	4,5	2	5	5	5	5	4	2	**3,89**
	Difference	*0,4*	*0,8*	*1,5*	*1,8*	*1,7*	*2*	*1,4*	*0,9*	*0,7*	
	Mean	1,24									
Logistics	***Assessment scores***	*3,3*	*3,9*	*3,7*	*3,7*	*2,9*	*3,0*	*3,7*	*3,0*	*3,0*	***3,36***
	Assessor scores	4	5	2	4,5	2	2	2	2	2	**2,83**
	Difference	*0,7*	*1,1*	*1,7*	*0,8*	*0,9*	*1*	*1,7*	*1*	*1*	
	Mean	1,1									
Agriculture	***Assessment scores***	*3,3*	*4,1*	*3,8*	*4,7*	*3,4*	*3,7*	*3,2*	*3,3*	*3,4*	***3,66***
	Assessor scores	4,3	3	3	4,3	3	4	3,3	4	3	**3,54**
	Difference	*1*	*1,1*	*0,8*	*0,4*	*0,4*	*0,3*	*0,1*	*0,7*	*0,4*	
	Mean	0,58									
Fastening material	***Assessment scores***	*3,4*	*3,8*	*3,6*	*3,5*	*3,0*	*3,5*	*3,9*	*3,1*	*2,5*	***3,37***
	Assessor scores	3	5	5	5	5	3	2	3	3	**3,78**
	Difference	*0,4*	*1,2*	*1,4*	*1,5*	*2*	*0,5*	*1,9*	*0,1*	*0,5*	
	Mean	1,06									
Entertainment	***Assessment scores***	*2,5*	*3,0*	*3,0*	*3,1*	*2,9*	*2,1*	*4,1*	*3,2*	*3,0*	***2,99***
	Assessor scores	1	4	1	3,5	2	4	1	1	2	**2,17**
	Difference	*1,5*	*1*	*2*	*0,4*	*0,9*	*1,9*	*3,1*	*2,2*	*1*	

	Mean	1,66								
AVG of assessments		*3,19*	*3,71*	*3,39*	*3,7*	*3,11*	*3,11*	*3,7*	*3,16*	*2,93*	***3,33***
AVG difference in total		*1,01*	*0,77*	*1,19*	*1,04*	*1,23*	*1,03*	*1,37*	*0,74*	*0,86*	
Mean		1,03									
Mode		*1*									
Median		1									
Number of false positives		*0 (0%)*	*0 (0%)*	*2 (29%)*	*0 (0%)*	*0 (0%)*	*0 (0%)*	*3 (43%)*	*1 (14%)*	*0 (0%)*	***6 (9,5%)***
Number of false negatives		0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (14%)	0 (0%)	0 (29%)	0 (0%)	**1 (1,6%)**

The findings of the additional refined are illustrated in Figure 40 - Figure 45. The most eye-catching finding of this additional refinement is the significant reduction of the number of false positives (6) and negatives (1). This, in part, is explained by the fact that the model estimates the importance of the CSFs more often with a 3. Meaning that the prediction of the model is neither considered as a false positive or negative. Still, the CSF *Customer-Oriented Processes* remains convoluted to accurately predict as three of the seven predictors have been falsely indicated as important. Moreover, CRM strategy is identified as difficult to position as two of the predictions have been erroneous identified as important. First, the errors of predicted scores for *Customer-Oriented Processes* is believed to be due to the fact that CRM is commonly referred to as being intertwined with customer-orientation. Therefore, the model give a stage to the customer intimacy values. However, oftentimes the CRM implementation in which BrixCRM is involved does not necessarily focus on customer-oriented business operations. Second, as mentioned in the previous section, a CRM strategy may not be important for every CRM implementation as the context of the initiative is not the result of the company's vision. The findings also indicate that the *Entertainment* case issues a majority of the false positives and negatives with a combined total of four (57%) erroneous identified important CSFs.

In comparison to the third operationalization, the found correlations show an increase in found correlation strengths. In total, twenty-four at least moderate correlations are found (66,7%) whereas in the third operationalization whereas twenty CSFs were at least moderately correlated (55,6%). It is believed that these correlations depict a smaller discrepancy between reality and the model as the correlated between the model and the assessors show higher correlation (17,3%) compared to the third operation (0,8%). *Customer-Oriented Processes* shows disconcordance with seven of the eight CSFs, with the exception of *CRM Strategy.* The reason for this finding is due to the fact that CRM implementations do not necessarily focus on customer intimacy as is indicated by various interviewees. Furthermore, *Data Quality* and *Project champion* show the strongest concordance with the other CSFs. That is, these CSFs can be considered as the most important CSFs. Still, this finding is not significant as other CSFs – *Change management* and Alignment with key stakeholder groups – also indicate strong concordance. Moreover, the found PCCs are triangulated with the SRCs to assess the trueness of the found concordances. Discrepancies are found between the PCCs and the SRCs. For instance, *CM x PC* show a clear difference from respectively 64% and minus 43%. In part, the differences can be explained by the smaller size of the study, and that the data is skewed or contains outliers. As PCC are determined based on the raw data, these outliers may heavily influence the proportional change found in a small size study.

CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
87,8%	6,4%	25,5%	-29,3%	47,3%	-9,2%	-49,1%	23,0%	53,3%

Figure 39: Model x assessors correlations after the third operationalization

Table 29: CSF PCCs as per the model of the third operationalization

Very strong relation (.70 to 1)	Strong relation (0.40 to 0.69)	Moderate relation (0.30 to 0.39)	Weak relation (0.20 to 0.29)	Negligible relation (0.01 to 0.19)	No relation (0)
CM x AWS	CM x DQ	CM x CI	CM x MA	CM x CRS	
DQ x CRS	CM x PC	DQ x PC	DQ x CI	CM x CGO	
DQ x AWS	*CM x COP*		*DQ x COP*	*DQ x CGO*	
PC x COP	*DQ x MA*		*CRS x CGO*	CRS x PC	
PC x CGO	CRS x AWS			*CRS x CI*	
CI x COP	*CRS x MA*			*CRS x COP*	
COP x MA	PC x CI			AWS x MA	
	PC x AWS			AWS x CGO	
	PC x MA				
	CI x AWS				
	CI x MA				
	CI x CGO				
	AWS x COP				
	COP x CGO				
	MA x CGO				
7 (19,4%)	**15 (41,7%)**	**2 (5,6%)**	**4 (11,1%)**	**8 (22,2%)**	**0 (0%)**

As a result of the previously described improvements, the findings of this refinement show a smaller difference between the scores. The mean difference over all assessments sums up to 1,02. Compared to the third operationalization (1,15), the mean difference has been improved by 9,6%. The inability of the model to differentiate and express the importance of the CSFs that significantly deviates from 3 and the assessors' tendency to express the importance of the CSFs with close to the extremes – 1 or 5 – explains a big proportion found mean differences. To that extent, it is believed that in the current research, this discrepancy between the scores cannot be narrowed. Additionally, the mode and median have converged towards the mean with both being 1. Therefore, the found differences between the model do not indicate a skewness to the left as it did the last operationalization. That is, the entirety of found differences follow a, by approximation, normal distribution. Note that due to the size of the sample, this finding is not scientifically rigor.

To conclude, the reliability and validity of this additional refinement are calculated:

Equation 17: Assessment accuracy after the third operationalization

$$\boldsymbol{Reliability} = 1 - \frac{Amount\ of\ erroneous\ identified\ important\ CSFs}{Nine\ CSFs\ \times Seven\ project\ assessments} = 1 - \frac{14}{63} \approx 77{,}8\%$$

Meaning that *78% (1-22%,* law of total probability*)* of the CSFs are correctly identified as important. This means that the amount of erroneous identified important CSFs has been improved by one – 2,6% – in total compared to the third operationalization. The validity of the model sums up to *89%:*

Equation 18: Assessment precision after the third operationalization

$$\boldsymbol{Validity} = 1 - (Percentage\ false\ positives + Percentage\ false\ negatives) = 1 - (9{,}5\% + 1{,}6\%) \approx 88{,}9\%$$

Hence, the precision of the model has improved by *32,7%* compared to the third operationalization. Hence, the precision of the model has improved significantly by the additional refinement. As a result, the predictive power of the model sums up to *83%*.

Equation 19: Prediction power after the third operationalization

$$\boldsymbol{Predictive\ power} = \frac{Reliability + Validity}{2} \approx \frac{0{,}778 + 0{,}889}{2} = \frac{1{,}667}{2} = 0{,}833 \approx 83{,}3\%$$

Note that the difference between the reliability and validity due to the fact that the model and the assessors have indicated a CSFs as neither important nor unimportant in twenty-one instances.

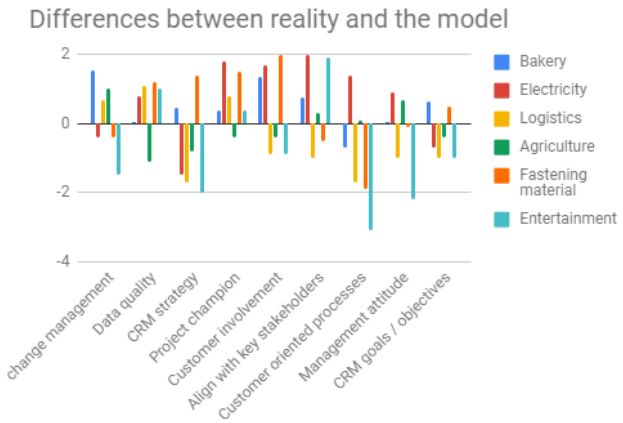

Figure 40: Error margins after the third operationalization

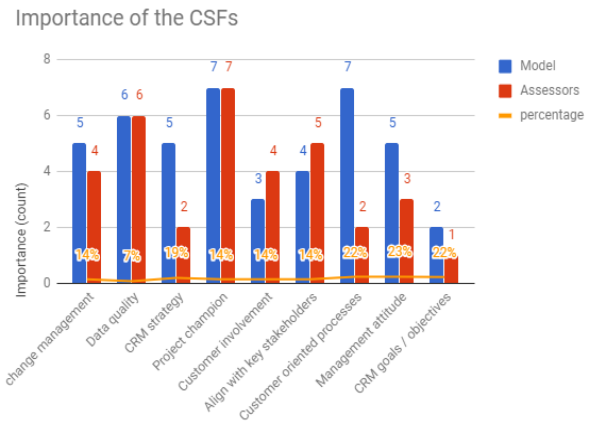

Figure 41: Importance of the CSFs after the third operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	50%								
CRS	5%	85%							
PC	64%	33%	3%						
CI	30%	20%	-5%	65%					
AWS	84%	74%	40%	69%	56%				
COP	-48%	-21%	3%	-85%	-85%	-58%			
MA	21%	-49%	-64%	60%	58%	12%	-70%		
CGO	11%	-9%	-21%	77%	47%	9%	-69%	63%	

Figure 42: PCCs of the model after the third operationalization

	CM	DQ	CRS	PC	CI	AWS	COP	MA	CGO
CM									
DQ	21%								
CRS	4%	81%							
PC	-43%	54%	43%						
CI	-37%	33%	32%	65%					
AWS	-24%	58%	44%	90%	70%				
COP	-29%	-22%	-26%	-67%	-73%	-52%			
MA	26%	-37%	-21%	28%	54%	33%	-59%		
CGO	13%	11%	8%	76%	38%	21%	-58%	68%	

Figure 43: SRCs of the model after the third operationalization

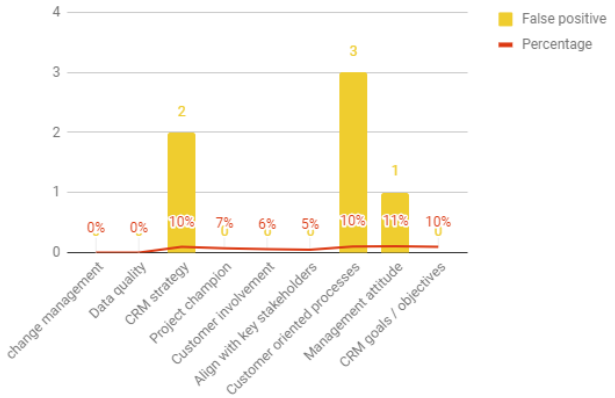

Figure 44: False positives of the model after the third operationalization

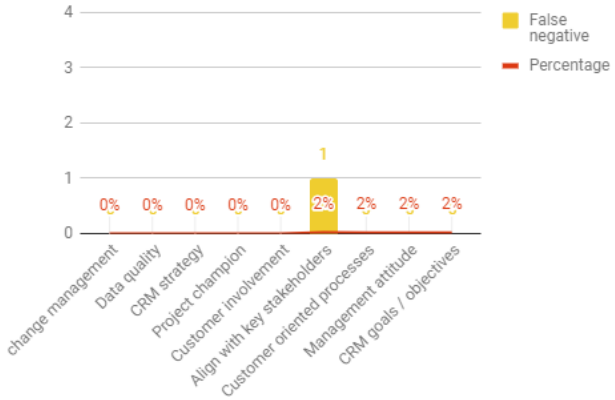

Figure 45: False negatives of the model after the third operationalization

5.6 Consultancy guide evaluation

Besides the CSF design, the consultancy guide in its entirety is evaluated. This evaluation followed a multi-method approach. First the assessment form was evaluated via two demonstration sessions. Expert input was used to assess the applicability of the questions posed in the form. Second, the cognitive walkthrough method is used to evaluate the consultancy guide (C. Wilson, 2014). To that end, the requirements as described in Section 1.6 Requirements are assessed. This cognitive walkthrough involved four assessors; the project managers and the CRM solution architect. The assessors were motivated to speak what was on their minds through the application of the think-aloud method (van Someren, Barnard, & Sandberg, 1994) to understand the cognitive problem-solving processes of the interviewees. It is believed that these assessors are a true depiction of the population of end-users as they are part of the project teams that use the

consultancy guide. The use of the cognitive walkthrough is the first introduction of the consultancy guide for the assessors based on small process exploration rather than via training sessions. Subsequently, the initial experience of the assessors with the solution is subtracted from the test.

Table 30: Requirements of the consultancy guide

	Requirements
R1	Completeness of the consultancy guide
R2	Usefulness of the consultancy guide
R3	Practical feasibility of the consultancy guide
R4	Clarity of the consultancy guide
R5	Granularity of the consultancy guide
R6	Alignment with existing project management approaches

The assessors worked through the steps prescribed by the consultancy guide. It was chosen to start with the planning stage of the consultancy guide as the assessment form was already evaluated in demonstration sessions. The cognitive walkthrough is used during the design of the solution. The strength of the cognitive walkthrough in light of this research is that it enables us to evaluate the design before it is operational. It was purposefully chosen not to formulate the tasks of the consultancy guide in much detail as the consultancy guide is to pinpoint the users to the needed information. Action sequences are defined based on use scenarios to provide an overview of the orderliness of tasks – refer to Table 31. The design of these tasks could also include other automated documents – other than the PID – to approach the cognitive walkthrough broader. However, as the task sequences reflect similar use scenarios, these tasks are not included. The two-question approach that assesses whether the end-user will know what to do at the current step and whether the conducted steps aid the attainment of the goal (C. Wilson, 2014).

Table 31: Task description of the cognitive walkthrough

Task: Plan a CRM implementation, monitor the current status and reflect on the implementation	
"As project manager, I would want to create a feasible and accurate planning. How can the consultancy guide help me to achieve this goal?"	
1	Go to the *timesheet* sheet.
2	Select the CSFs you want to plan.
3	Fill in the start- and end-date of the project and click on *Save dates*.
4	Evaluate the timesheet that is created
5	Click on the menu-button *Create documents*.
6	Choose the right button to create a PID.
7	Go to the drive folder *action plans* and open the planning document of the project.
8	Assess the contents of the PID.
9	Share the PID with the project team.
"One of my clients called me that their solution does not exert the needed information. I want to see the current status of the solution's data quality in terms of integrity, validity and confidentiality. I will take a look at the performance-monitoring dashboard."	
10	Go to the *dashboard* sheet.
11	Assess the current status of the solution's data quality.
12	Pinpoint what the problem is and respond swiftly to the client.
"One of my clients came up with additional requirements during our latest UAT however, I do not know whether the budget allows me to put a developer on the case. I will take a look at the performance-monitoring dashboard."	
13	Go to the *dashboard* sheet.
14	Assess current budget and determine whether there is still enough budget.
15	Allocate required resources.
"Now that the CRM solution is implemented at our client, we want to reflect on the implementation. I do not know how to reflect on the CRM implementation. How can the consultancy guide help me to reflect on the implementation?"	
16	Start by applying the STARRT method to reflect on the implementation.
17	Write down what is learned from the implementation in an LLR (PRINCE2).
18	Close the CRM implementation by reporting the findings in an EPR (PRINCE2)

The cognitive walkthroughs showed that the design of the consultancy guide's process follows up on the formulated requirements – refer to Table 32. Requirements 1, 2, 4 and 6 have been

accepted on the basis of the walkthrough of use scenarios. First, the consultancy is considered to be *complete* as it contains all aspects considered to be associated to the known CRM implementation approach. Additionally, it puts emphasis on the checking and acting stages of the PDCA-cycle which are oftentimes overlooked in practice according to the solution architect. For that reason, the formulation of these stages in the consultancy guide elicits the importance of these stages to practitioners. Second, the consultancy guide is considered *useful* as it helps to capture needed information to manage CRM implementations effectively. As the use scenarios are believed reflect actual scenarios, this finding is supported by the assessors. Third, the consultancy guide is considered to formulate *clear* task descriptions as the tasks related to the use scenarios were acknowledged to be easily accomplished through the provision of graphically and textually instructions. However, the language poses a minor uptake barrier as the consultancy guide is written in English. Fourth, the consultancy guide is in *alignment* with existing project management approaches as it in part tailors the heretofore practiced procedures of PRINCE2. For that reason, it is believed that the consultancy guide in potential can swiftly be adopted as it does not overhaul known practices but rather expands and improves on the known practices.

Table 32: Requirement acceptance of the cognitive walkthrough

RQ	Accepted	Reason
1	Yes	Various assessors remarked the timesheet as a valuable addition to elicit the next best step. The automated documents were regarded as strong facilitators for addressing inherent issues to CRM implementation as well as providing guidelines to creating project management associated decisions and documentation. Especially the PDCA-cycle is considered as a powerful measure that is incorporated in the consultancy guide as it spans over the four main activities of a CRM implementation. As the two latter activities of checking and acting are oftentimes overlooked in practice, it is valuable that these are communicated in a formulated approach according to the solution architect.
2	Yes	The consultancy guide is acknowledged as being a useful guide for CRM implementations. All of the assessors recognize the usefulness of the consultancy guide as it is able to capture the information needed to project-related decisions (e.g. what is the next best step, what hampers success?). The use scenarios are believed to reflect actual scenarios as all assessors have identified and as the guide has provided the means to accomplish the scenarios, the provided guidance is considered as being usefulness by the assessors. The toolbox provided in the consultancy guide supports the expert-based approach towards evidence-based.
3	Partly	In part, the consultancy guide provides practical feasible guidance. As the solution architect remarked, the guidelines do not largely alter the steps of the implementation but rather enhance the decisions how to approach the implementation. That is, it rather explains what to focus on than altering the established work procedures. Additionally, the voluntariness of use makes it more practical feasible as it does not unnecessarily prescribe activities that do not add value for the practitioners. Still, project manager 3 elicit that the guide may be time-consuming to use the full extent of tools if it is unknown whether the use of the tools add value before implementing CRM.
4	Yes	The consultancy guide provides clear instructions and figures as found by the assessors. In particular, the illustrations of various steps in the consultancy guide helps to clarify what is meant and how the consultancy guide is to be used. During the walkthrough of the use scenarios, the consultancy guide supported the assessors to accomplish the task. Several remarks were made that it was easy to find where to look for to achieve the goals of the use scenarios. For that reason, the consultancy guide is considered as being clear. As BrixCRM is a Dutch company and the consultancy being written in English has been identified as a minor barrier to the adoption as it may not be assumed that each and every one understands the language.
5	Partly	The granularity of the consultancy guide is considered as appropriate as per the assessors. The combination of mapping various activities and the performance-monitoring dashboard support the acquisition of a broad overview whereas the tools help practitioners to go into depth for specific topics (e.g. data quality). For that reason, project manager 1 acknowledges the granularity of to be good. However, the granularity of the consultancy is accepted based on individual preferences as project manager 2 remarked. In the case of project manager 2, it was preferred to have a single-issue dashboard instead of all CSFs altogether as it felt as cognitively overloading.
6	Yes	According to the project managers, the consultancy guide supports the already existing project management approach at BrixCRM. Especially the document templates and their automated filling in of important questions in known project management documentation serves to align with existing procedures. The project managers specifically liked use scenario as it helped them to create viable PIDs on the fly which may be a daunting task in the current situation.

Moreover, requirement 3 and 5 have been accepted in part. First, the consultancy guide is believed to be *practical feasible* to some extent. As the guide does not largely alter the approach to CRM implementations and the fact that the provided tools can be used on voluntary basis, the consultancy guide does not prescribe infeasible measures (e.g. time-consuming, complex). Still,

the guide formulates a wide range of tools. Project manager 3 identified that it may be difficult to differentiate what tools to use without upfront knowledge of their added value. As a result, the use of the consultancy guide can become unnecessary voluminous. Second, the *granularity* of the consultancy guide is in part acknowledged as being on point. The timesheet and the dashboard are considered as prerequisites to attaining a broad overview of the CRM implementation whereas the tools provide enough in-depth to elicit how to address imminent issues of the implementation. However, in the case of project manager 2 it was preferred to scale down the overview provided by the dashboard as the came across as being to cognitively overloading. Therefore, the granularity of the consultancy guide should reflect on the preferences of the individual.

5.7 Conclusions

This chapter has elaborated on the findings of the empirical study of the current research. It was found that an incremental design that includes both between- and within-subject studies in semi-structured interviews is best fitting to evaluate the importance of the nine CSFs over the, in total, seven project assessments. The reason of this approach to be best fitting is its mitigation of the demand bias and its ability to identify and tackle human bias. First, the demand bias was mitigated as the assessors were not informed about the findings of the model afore providing theirs. Second, the human bias includes individual subjectivity, project contextual differences, and differences between the different functional lines. It is believed that the individual subjectivity is addressed through the inclusion of different perspectives – that is, multiple assessments. The inter-functional differences is reduced by the within-subject study of the bakery commodity company, as it identified an insignificant difference between the two assessors with different roles. Nonetheless, more empirical studies should be conducted to validate this statement. The project contextual differences are difficult to capture as this requires a complete and thorough assessment of contextual considerations that go beyond the scope of this research.

The empirical study has been conducted in twofold. First, the CSF designs were tested and refined in three operationalization increments. The first operationalization began with the CSFs to be determined by varying parameters that were given equal weights in determining the importance of the individual CSFs. The weights of these parameters for the different CSFs were refined after each operationalization. The different refinements were to obtain higher prediction power of the model to identify the important CSFs through reliability and validity, and to identify how the population of CSFs are correlated. Respectively, the reliability and validity of the model were evaluated based on the number of erroneous identified important CSFs and the number of false positives and negatives. The prediction power of the model has shown to be 71,5% whereas 55,6% of the CSF combinations indicate an at least moderate positive or negative correlation. These findings of the third operationalization have shown lesser performance than the second operationalization. Subsequently, the combination of the findings of the second and third operationalization indicated that the performance of the model could further be improved through converging the two designs of the operationalization's – as the third operationalization showed lesser performance for the CSFs *CM, CRS, CI,* and *MA*. Furthermore, the model is improved through additional refinement of the weights of the parameters on the basis of calculating the SSE. Consequently, the new model shows a reliability of approximately 78% and a validity of approximately 89% which combined lead to a prediction power of 83%.

Second, the process of the consultancy guide is evaluated on the basis of a cognitive walkthrough and four use scenarios with four assessors. This walkthrough evaluated whether the consultancy guide adheres to the formulated requirement of Section 1.6 Requirements. It is found that the consultancy guide adheres to the requirements of *completeness, usefulness, clarity* and *alignment with existing project management approaches*. Whereas the consultancy guide adheres in part to the requirements of *practical feasibility* and *granularity.*

6. Discussions and Conclusions

In the previous chapters, an approach to CRM implementation is proposed. This chapter encompasses the last step of this research by answering the discussing the research and the research questions stated in the first chapter and the contributions to both practice and research are indicated. To conclude this thesis, this chapter identifies the limitations and provides directions for future research.

6.1 Discussion

During this research, it has come to light that the in-depth study of the attained literature, the pinpointing the important CSFs and designing especially the design of the consultancy guide took more effort than anticipated. The fact that literature often discusses multiple and incomplete perspectives on the multi-disciplinary nature of CRM with its own unique interconnections, implied that the articles had to be studied in greater detail to gain more insights into used terms, terminology and overlapping topics besides differences in language and writing styles. Furthermore, integrating the findings of the assessment also required an impactful intervention and in order to mitigate the risk of influencing current CRM implementation projects interfering these implementations is chosen not to be done. This decision was made based on the belief that the current approach to CRM implementation can also be negatively affected. Nonetheless, the ISDT-based empirical study has proven to be beneficial in terms of interspersing with the reviewed literature and triangulating its findings and to translate it to fit actual practice. To that end, the combination of studies allowed for theory, from literature, and practice, from expert input, to converge into a single CRM implementation approach.

It was averse differentiating the various perspectives based on the primary addressed topic in literature. A variety of articles discuss multiple sub-domains in some degree. To the best of our knowledge, thorough research that provide a complete overview of the body of CSFs is absent in the CRM literature. The absence of certain research in literature sets to question the scientific rigor of the findings in literature which, in turn, again motivates our multi-method approach. One reason of this could be that the multi-disciplinary nature of CRM makes it complex to construe a complete list of CSFs that incorporate each important consideration, as well as the field of CRM to attract lots of attention towards the technical aspects compared to the business-, strategy-, and process-oriented perspectives on CRM. Yet, due to the exclusion criteria that narrow the scope of searching for literature within the fields of computer science and business studies, it could be that these topics of study have accumulated more interest in other areas of expertise.

During the CSF operationalization's, it came to light that it was not as straightforward to formulate a consistent understanding of what is subsumed in the conceptualization of the CSFs for the interviewees. For instance, the interviewees often question themselves what is considered to be CRM goals and objectives, and when something is accounted for as a strategy. As it was purposefully chosen not to aforehand explain what parameters are covered in the formulation of the CSFs, the conceptualization was prone to the subjectivity of a practical notion of the concept from the perspective of the interviewee. It was aimed to reduce the proliferation of different perspective between the separate interviewees through the formulation of the CSF description as per this research – as described in Table 14. Even more so important is having consensus about interpreting the variety of parameters. The discussion with the interviewees has shown the complexity of getting a clear view of how the parameters are influencing the CSFs. Varying opinions and beliefs are to exist, however to elicit insights from the discussion on the importance of these parameters, an in-depth understanding of causal relationships between the parameters

and CSFs was needed. In the moments of a lack of understanding, the concepts as described in Appendix F – CSF parameters were considered to come to a consensus.

The small sample size of the empirical study poses a validity threat to the retrieved results. It was averse to expand the scope of the empirical study in light of the size of BrixCRM and the time period of this research. It should be evident that a large intervention would pose a significant pressure on resources for a medium-sized company whereas the time period of this research also constrained the sophistication of the intervention of the project assessments. As a result, it is chosen to scope the intervention smaller. Moreover, the findings of the empirical study should be approached with delicacy as bias may be injected in the results at three points; 1) during the importance calculation of the different parameters, 2) in the interpretation of the CSFs by assessors, and 3) the possible incompleteness of the CSF design. First, as practical logic is the de facto rationale behind the importance of the parameters, it is possible that the calculation erroneously converts the answers to the assessment form into an importance expressed on a 5-point Likert scale. Second, the interpretation of what is contained within a CSF and how the importance of the CSFs should be explained deviates from assessor to assessor. That is, the expressed importance score of the different assessors is based on varying considerations. Third, the CSF designs may be incomplete. That is, the designs do not capture all the considerations that are found important for the assessors. The latter is believed to be, in part, reduced through the two focus sessions with respectively the business consultant and the CRM solution architect as the aim of these sessions was to evaluate the questions in the assessment form.

The aim of the consultancy guide is to support CRM implementation teams. However, the consultancy guide can work out differently for the different experts in the field. It is necessary for practitioners unfamiliar with the domain to establish a clear depiction of the activities that CRM implementations entail first. When practitioners become knowledgeable with the domain and its practices, it is important to retain the freedom of approaching CRM implementations in their preferred way. The consultancy guide does not decide on what factors to put emphasis and how to tackle these factors. More importantly, practitioners should determine for themselves which factors to address and how to approach them for which the consultancy guide should only be considered as indicative. Therefore, the aim of the consultancy guide can be regarded to set practitioners to re-think their CRM implementation approach from a methodological point of view.

6.2 Answering the research questions

As defined in Chapter 1, the main question of this research is as following:

"What constitutes a project management approach that contains both tangible controls and guidelines which effectively evokes CSFs for steering CRM implementations?"

This research is decomposed into several sub-questions to answer the abovementioned main research question. The supplementation of these smaller research questions has been done in four steps. The first step focused on the assessment of the research and practical agenda of CRM. Consequently, the following research questions are formulated:

RQ1. What is the current state and research agenda of CRM?
RQ2. What are the CSFs for successful CRM implementation?

Second, the aim of this research was to conceptualize the applicable project management theories form the basis of the solution design. Therefore, the following question is posed:

RQ3. How are current project management approaches for CRM implementation designed?

Third, the best alternative to CSF operationalization is identified by proposing a solution design for CRM implementations. The solution design incorporates the tools needed for CRM implementations based on the identification of the important CSFs.

RQ4. What is the best alternative to operationalize the identified CSFs in the context of CRM implementation?

The final step of this research focused on the evaluation of the proposed solution design. To evaluate the solution design in a practical setting, expert interviews have been conducted in association to case studies. This evaluation approach is to answer the following sub-question:

RQ5. What is the influence of CSF operationalization on CRM success?

This section briefly summarizes the answers to these research questions according to the four steps; 1) the assessment of the research agenda, 2) project management theory applicability, 3) solution design development and 4) solution design evaluation. Subsequently, this section concludes with answering the main research question.

6.2.1 The assessment of the research agenda

To answer RQ1, a systematic literature review according to the GTLRM (Wolfswinkel et al., 2013) was performed. Peer-reviewed scientific literature as consulted to depict a clear view the CRM field. In order to draft a complete view on the field, the following sub-questions are formulated:

a. *What is the best alternative to conceptualize CRM, according to literature?*
b. *What is the best alternative to conceptualize CRM systems, according to literature?*
c. *What is the current situation in the CRM software market, and who are the main players in this market?*
d. *What is influencing CRM adoption within the fabric of a company?*

From the literature review it is found that the multi-disciplinary nature of CRM has led to a plethora of CRM conceptualizations. In total 10 conceptualizations were identified for CRM. These conceptualizations were emphasizing the importance of different perspectives. That is, technology, business operations or strategy. In order to draft a complete overview of the domain, this research has adopted a holistic perspective that originates from a strategy and process for which IT is supportive. To that end, CRM systems are the systems that enable the sales department to improve the customer-facing operation that are to improve customer experience. The CRM market is assessed to create a practical view of the domain and to highlight how CRM vendors are approaching CRM. The question that is also of concern is on how CRM success can be achieved. Therefore, an often-cited determinant for success in IS research is studied in the context of CRM – usage. Within the domain of CRM, the best-known models to usage, and thus adoption, research are TAM, UTAUT, TTF, ISSM and IDT. This inquiry into CRM adoption was aimed to identify the basis on how CRM implementations should be assessed. In order to create a better view on CRM implementations and what is factors influence their success, necessity exists to answer following sub-questions for RQ2:

a. *What is CRM implementation, and how is it approached in practice?*
b. *What CSFs for CRM implementation does literature identify?*
c. *Which of the identified CSFs are regarded as most important in practice?*

As is illustrated in literature, the word “implementation” for IS research can have a twofold of meanings; 1) software development and 2) the act of treating a given problem. The latter is interesting since it defines how the solution design is to treat the problem of this research. However, CRM implementation, in light of this research, is to be perceived as the process towards the creation of a CRM solution to improve on current practices. Literature highlights two

methodologies for software development; 1) stagewise methodologies and 2) agile software development. In practice, the implementation of CRM is approached on a per case basis that tailors agile development methodologies such as SCRUM and Kanban which are situated in a pre-defined sequence of seven phases. The genesis of these phases is a kick-off and it is completion lies in the going-live of the CRM solution. In addition to the software development, four, unique to CRM, considerations are to be made to successfully implement CRM. However, this approach does not consider the dynamic importance of implementation-related CSFs. To that end, a set of twenty-five, in the literature identified, CSFs are proposed to provide needed tools to manage and focus the implementation effectively. Several interviews were performed to pinpoint to most prominent CSFs to the context of BrixCRM. These interviews identified six prominent CSFs that were supplemented with three CSFs that were not included in studied literature. These nine CSFs are change management, data quality, CRM strategy, project championship, customer involvement, alignment with key stakeholder groups, customer-oriented processes, management attitude, and CRM goals/objectives. These CSFs are the de facto decision-making system for the solution design.

6.2.2 Project management theory applicability

To answer RQ3, the body of knowledge on project management is studied. To pinpoint how project management theory is able to project CRM implementation, the following sub-questions required answering:

a. *What are the activities in current approaches to IT project management, according to literature and practice?*
b. *What are the instruments and tools used for project management?*

The extent of practices of project management can be narrowed down to two prominent methodological project management methodologies; 1) PRINCE2 and 2) in-house project management methodologies. Oftentimes standards do not fit the needs of practice and therefore practitioners seek to retrofit several components of, for instance, PRINCE2. The decision of what methodology to use directly influences the activities in the implementation. In addition, The FSM identifies the components of decision-making, performance-monitoring and control mechanisms to manage a project on the basis of a factor-based approach. Two categories of tools are identified in the context of CRM implementations; 1) project management tools and 2) supplementary analysis tools. The first category includes CPM, Gantt charts, PERT and a performance-monitoring dashboard whereas the latter includes the BMC, MOC, stakeholder onion and behavior styles frameworks.

6.2.3 Solution design development

The solution design development was performed by eliciting the findings of the CRM field and project management theories. The development of the so-called “consultancy guide” was structured around answering the two sub-questions of RQ4:

a. *What is the best alternative to incorporate the CSFs into a project management approach for CRM implementations?*
b. *What parameters can be identified for these CSFs?*

First, a process workflow is created to incorporate a decision-making and performance-monitoring system into the approach to CRM implementation. At first, the process describes how to identify the important CSFs for the specific implementation on the basis of which a thorough project plan, a PID, which is supported by a Gantt chart-based timeline. During the execution of the project, CRM is to be implemented and the performance is monitored through a dashboard. When the implementation is completed, the process prescribes a phase of reflection that is to identify what when well and what could have been done better through the creation of EPRs and LLRs. In

addition, a variety of document templates, for example for data quality, serve to facilitate practitioners to address the different CSFs. Second, the parameters of beneath the CSFs are identified based on the findings of a focus group. These CSFs were based on the questions posed in the assessment form and these parameters have been included in the initial design of the CSFs.

The question remains how this solution design is generalizable to other CRM solutions as well as to other enterprise systems (e.g. ERP). The PDCA-cycle is generalizable to other CRM solutions, however the proportion of customization of Sugar is different from other solutions. This difference will not differentiate the identified CSFs rather it is reflected by the activities associated to implementation. Workshops, CRM trainings and acceptance testing are likely to be similar for other solutions but rather the solution specification will differ as the *blueprint* in this case mirrors no standard packaging as, for example, Salesforce or Microsoft Dynamics. Moreover, the approach to implementing other enterprise systems is to some extent generalizable. However, the CSFs are tailored to fit the CRM context. However, there are common CSFs such as *Data Quality* and *Change Management* that can be translated to other context areas however, CSFs *CRM Strategy* and *Customer-Oriented Processes* do not fit other areas. Therefore, the de facto control mechanisms of these implementations differ.

6.2.4 Solution design evaluation

The evaluation step of this research is conducted through a series of follow-up iterations with various client cases of BrixCRM. The different interviewees have been asked to fill in the assessment form and to evaluate the findings in the interview. This step aimed to answer the sub-questions of RQ5:

a. *How accurate can the assessment identify the important CSFs?*
b. *How do the different CSFs relate to each other?*
c. *How does the consultancy guide add value for practitioners?*

The predictive power of the assessment is designed to evaluate the reliability and validity. These two measures are expressed respectively in the ability of the assessment to highlight the important CSFs and by the number of false negatives and positives. The evaluation indicates that the assessment can rightly predict the importance of CSFs in 76 percent of the times whereas the numbers of false negatives and positives sum up to 21 times (33%). These numbers have resulted in rejecting the third hypothesis of the analysis. Consequently, an additional refinement has been done to improve the predictive power of the model by combining the model of the second and third operationalization – as the performance of the model to predict the CSFs *CM, CRS, CI,* and *MA* has shown to be better in the second operationalization. This additional refinement has been done through the incorporation of qualitative data retrieved in the third operationalization and by the calculation of the sum of the squared errors which helped to minimize the discrepancy between scores of the model and the assessors. This additional refinement resulted in an accuracy of 78 percent and a precision of 89 percent. That is, the model attained a predictive power of 83 percent. As the sample size was rather small, there exists a change of model overfitting. Therefore, these additional refinement concludes the refinement steps. Due to the perceived subjectivity of the assessors, the differences between the importance of the CSFs as per the assessment and the interviewees have given less priority in the assessment. The problem is that people differently assess the importance of CSFs. That is, were one will say that the CSF is highly important (5 points), the other may express lesser importance (e.g. 4 points) for the same beliefs. Also, it has shown to be complex to accurately predict the importance of the CSF “CRM strategy” as it is sometimes not even needed based on the project context. For instance, a client is moving from one CRM vendor to SugarCRM without the need for overhauling the features in the CRM solution. That is, the strategy is already existent in the organization and therefore is of lesser importance to steer upon. However, due to the parameters, it may be the case that the assessment identifies

CRM strategy as highly important. Therefore, the findings of the evaluation show that the assessment should play a supportive role in identifying and addressing the different CSFs rather than be the de facto source of decision-making.

Additionally, the concordances of the different CSFs are identified by means of applying the PCC and SRC formulas. Based on the identified importance of the CSFs, it is found that all CSF combinations have shown some correlation over the different incremental operationalization's. However, these findings should solely be regarded as indicative, since the parameter-design of the CSFs is prone to similarity as several parameters are included in the calculation of multiple CSFs and the small sample size of the study.

Four assessors were asked to walk through four use scenarios. The findings of the walkthrough aimed to identified whether the consultancy guide adheres to the requirements of Section 1.6 Requirements. It is found that the consultancy guide adheres to the requirements of *completeness, usefulness, clarity* and *alignment with existing project management approaches* whereas the requirements of *practical feasibility* and *granularity are partly adhered to.*

6.2.5 Answering the main research question

Reckon that the main research question has been formulized as:

> *"What constitutes a project management approach that contains both tangible controls and guidelines which effectively evokes CSFs for steering CRM implementations?"*

As the sub-questions are progressive in nature, each of the underlying considerations and topics have been covered in the respective aforementioned paragraphs. The multi-disciplinary field of CRM and the approach to implementing CRM culminate into a clear view of what is constituted in the topic. The identification of the applicable CSFs, by reviewing the body of literature on the topic as well as comparing the findings with expert input, has resulted in a short-list of nine CSFs. These CSFs are the tangible measures to guide CRM implementations towards success. By incorporating the prominent CSFs and the associated tools into the project current management approach of BrixCRM, the consultancy guide is proposed.

6.2 Contributions

The contribution of this research to the scientific body of knowledge is threefold. First, a clear depiction of the multi-disciplinary field of CRM is created, which provides the needed insights into the plethora of concepts and perspectives covered in the field. In light of CRM implementation, both scientific and industry literature has shown to fall short in construing a complete list of CSFs. To that end, a better view on the field has provided support in the identification of the set of CSFs for CRM implementation. Second, a more methodological CRM implementation approach is developed as the outcome of this research. The consultancy guide is an invaluable addition to the body of knowledge that covers a holistic perspective on the matter and is driven by a factor-based approach that tackles the shortcomings of the current expert-based approaches. The multi-method approach to the development of the consultancy guide has served to address these issues in practice which are scarcely, if at all, been covered in scientific literature. These issues are rooted in the combinatorial existence of both technical- and non-technical considerations. Therefore, the third contribution is accounted for by the consultancy guide to address several knowledge gaps on how CRM is much more than IT, as it should be considered as a strategy or process, which evokes and requires both organizational business and change. Subsequently, this research contributes the areas of IT development and governance, corporate strategy and project management.

Moreover, this research contributes to practice. First, this research offers new insights into the current state of the CRM field by providing a comprehensive view on the multi-disciplinary

considerations. It has provided insights into the conceptualization of CRM and its associated implementation practices. Second, when considering the consultancy guide, the contextual assessment tool and its means of representation, it is believed to provide an easy-to-understand and complete overview of the considerations that influence CRM implementation success and, as side effect, consequently sets to re-think practitioners to adapt the approach to implementing CRM. Third, and assumable most important, the guidelines provided by the consultancy guide helps new entrants (e.g. CRM consultants) in the field in identifying how to really tick the boxes prerequisite to successful CRM implementations. As the consultancy guide provides a multitude of instruments to identifying what to do and the means, the tools, to do so, practitioners are able to pinpoint and execute dire activities and tasks.

6.3 Limitations of this research

This work has the following limitations. First, concerning the systematic review, the search was limited to the Scopus database. Next, the language of literature is limited to English, which might mean that our list of included papers is incomplete. However, we think this risk is reduced since CRM is a ubiquitous experienced topic for business around the globe. Therefore, it is believed that researchers are to publish their most important results in English. Second, concerning the empirical study, the fact that we focused on one CRM company, BrixCRM, implies limited generalizability. Other CRM companies may as well encounter other challenges while working similar CRM implementations (e.g. implementing Salesforce may include lesser emphasis on custom-made features as it is an off-the-shelf value proposition). As BrixCRM is limited in its ability to execute, since it is a smaller company in terms of size, the case study may not reflect the full extent of considerations. In turn, our results could be considered as indicative only. More case studies are therefore necessary, if wanted, to triangulate and consolidate an overall guide. Third, concerning the CSFs, we think that it could be possibly generalizable across various context, as it was derived based on the empirical study and on the body of reviewed literature. As methodologists suggest (Seddon & Scheepers, 2012), including multiple sources of case study data improves the external validity of an artefact such as the list of CSFs. However, to know this, more research is needed to provide more empirical findings from more sizeable sample sizes and other CRM companies contexts beyond this hereby published. Fourth, the operationalization of the consultancy guide was limited to evaluating it based on expert opinions instead of experimental design. Therefore, the findings of the are not triangulated onto hands-on practice. Therefore, more research is needed to solidify the scientific rigor of this research.

6.4 Future research directions

The results of this research identify that the proposed solution design needs to be validated, the tools should be assessed on their applicability in other settings, and the body of literature should construe a clear and concise list of CSFs. Within the scope of this research, it was not possible to put the consultancy guide into practice as the tool to identify how a CRM implementation should be approached. Therefore, in the extension of this research, the solution design can be improved further through its evaluation in other CRM companies with a different context. Follow-up studies should also focus on evaluating the applicability of the tools in practice. That is, the question is how the tools apply to other context areas. Only then, applicability of the tools can be judged. Moreover, the under-researched topic of CSF identification needs extra attention to mature. The domain of CRM-related CSF offers uncharted territory for researchers to come up with a complete and holistic perspective on what constitute successful CRM solution proposals. Furthermore, the adoption of CRM has been touched upon in the context of the implementation lifetime. However, no research has been done to address the concerns of user adoption when the CRM solution is live. That is, this current research did not aim to address the issue of assessing actual usage of the implemented solutions. Therefore, the road to expand this research is wide-open in terms of studying the entire lifetime of CRM and its usage.

Appendix

Appendix A – GTLRM process and search terms

Table 33: the steps of the GTLRM

Number	**Task**
1. Define	
1.1	Define the criteria for inclusion and exclusion
1.2	Identify the fields of research
1.3	Determine the appropriate sources
1.4	Decide on the specific search terms
2. Search	
2.1	Search
3. Select	
3.1	Refine the sample
4. Analyze	
4.1	Open coding
4.2	Axial coding
4.3	Selective coding
5. Present	
5.1	Refinement and structure the content
5.2	Structure the article

Table 34: Overview of used search terms

CRM system definition	***CRM system use***
*CRM system definition**	*CRM system utili**
Customer relation management definition**	*Customer relation* management utili**
*CRM system description**	*CRM system us**
Customer relation management description**	*Customer relation* management us**
-	*CRM system adopt**
-	*Customer relation* management adopt**
-	*CRM system oper**
-	*Customer relation* management oper**

Note: The context specific terms that are included in the search for literature are *definition* and *description* to draw a clear conceptualization of CRM, as well as including *utilization, usage, use, adoption,* and *operation* for the use of CRM. Furthermore, to expand the retrieval of data, asterisks (*) are applied for allowing the search to find further non-specified synonyms.

Appendix B – Publications in the systematic literature review

Table 35: An overview of the selected papers

Number	Authors (Year)	Journals
1	*Askool and Nakata (2012)*	International Conference on Information Society
2	*Avlonitis and Panagopoulos (2005)*	Industrial Marketing Management
3	*Chalmeta (2006)*	Journal of Systems and Software
4	*Choi et al. (2013)*	Healthcare informatics research
5	*Engelstätter (2012)*	Economics of Innovation and New Technology
6	*Gefen and Ridings (2002)*	Journal of Management Information Systems
7	*Hsieh et al. (2012)*	MIS Quarterly
8	*Hsieh (2009)*	International Journal of Information Management
9	*Hung et al. (2010)*	Decision Support Systems
10	*Karahanna et al. (2006)*	MIS Quarterly
11	*Karjaluoto et al. (2014)*	Industrial Management & Data Systems
12	*Keramati and Shapouri (2016)*	Information Systems and e-Business Management
13	*Kim and Gupta (2014)*	IEEE Transactions on Engineering Management
14	*Kim and Pae (2007)*	Journal of the Academy of Marketing Science
15	*Kim (2004)*	IEEE Software
16	*Lawson-Body et al. (2011)*	Journal of Computer Information Systems
17	*Negahban et al. (2016)*	International Journal of Human-Computer Interaction
18	*Nguyen and Waring (2013)*	Journal of Small Business and Enterprise Development
19	*Pai and Tu (2011)*	Expert Systems with Applications
20	*Pedron et al. (2016)*	Industrial Management & Data Systems
21	*Ruivo et al. (2017)*	Industrial Management & Data Systems
22	*Saini et al. (2010)*	Marketing Letters
23	*Schniederjans et al. (2012)*	International Journal of Production Research
24	*Shanks et al. (2009)*	Communications of the Association for Information Systems
25	*Vella et al. (2012)*	International Journal of Bank Marketing
26	*Vella et al. (2013)*	Journal of Management Development
27	*Xu and Walton (2005)*	Industrial Management & Data Systems
28	*Yang et al. (2011)*	European Journal of Information Systems

Table 36: An overview of the backward citations

Number	Article (Year)	Journal
1	*Alshawi et al. (2011)*	Industrial Marketing Management
2	*Becker et al. (2009)*	Business Process Management Journal
3	*Bohling et al. (2006)*	Journal of Service Research
4	*Boulding et al. (2005)*	Journal of Marketing
5	*Bull (2003)*	Business Process Management Journal
6	*Chen and Popovich (2003)*	Business Process Management Journal
7	*Croteau and Li (2003)*	Canadian Journal of Administrative Sciences
8	*Garrido-Moreno and Padilla-Meléndez (2011)*	International Journal of Information Management
9	*Gelderman (1998)*	Information and Management
10	*Grönroos (1990)*	Journal of Business Research
11	*Jain (2005)*	Journal of Strategic Marketing
12	*Kevork and Vrechopoulos (2009)*	Marketing Intelligence & Planning
13	*Lindgreen et al. (2006)*	Industrial Marketing Management
14	*Nguyen and Mutum (2012)*	Business Process Management Journal
15	*Reinartz et al. (2004)*	Journal of Marketing Research
16	*Rigby et al. (2002)*	Harvard Business Review
17	*Shani and Chalasani (1992)*	Journal of Services Marketing
18	*Urbanskienė et al. (2008)*	Engineering Economics
19	*Wilson et al. (2002)*	Journal of Marketing Management
20	*Zablah et al. (2004)*	Industrial Marketing Management

Table 37: An overview of forward citations

Number	Article (Year)	Journal
1	*Chen and Chen (2004)*	Journal of Database Marketing & Customer Strategy Management
2	*Kim et al. (2012)*	Journal of Services Marketing
3	*Lin et al. (2010)*	Industrial Management & Data Systems
4	*Payne and Frow (2005)*	Journal of Marketing
5	*Soltani and Navimipour (2016)*	Computers in Human Behavior
6	*Venturini and Benito (2015)*	Journal of Knowledge Management

Appendix C – Theory models

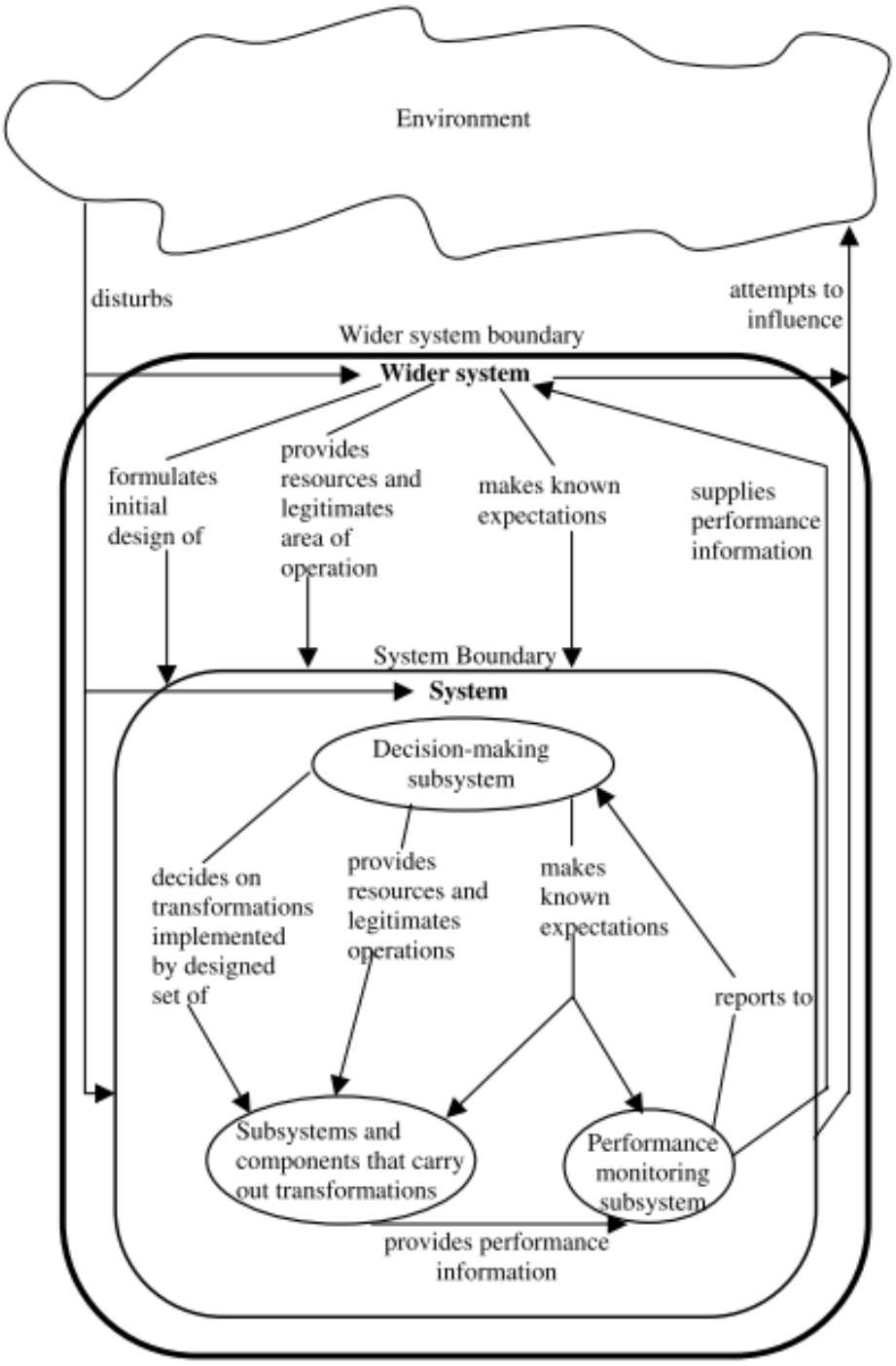

Figure 46: The Formal System Model

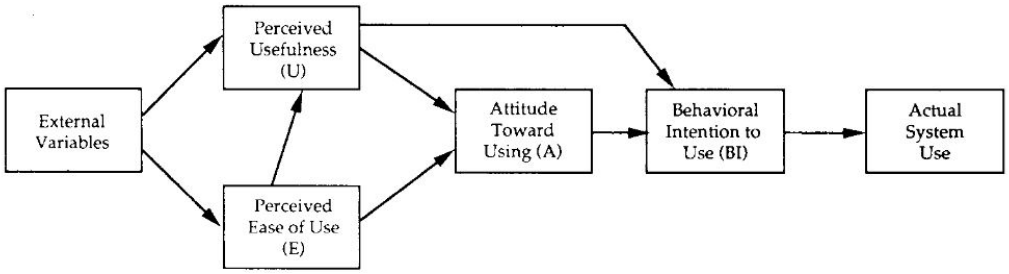

Figure 47: The Technology Acceptance Model

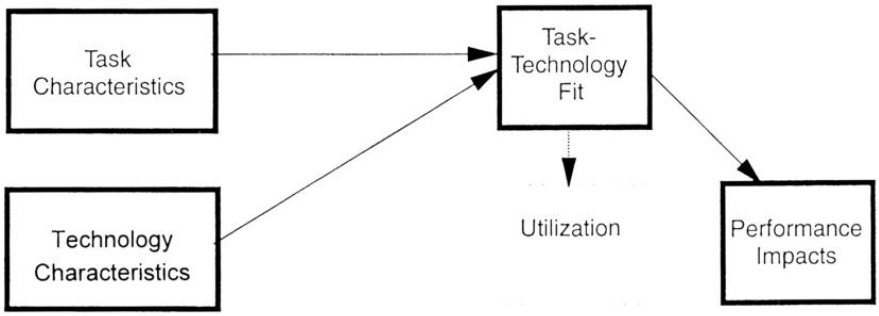

Figure 48: The Task-Technology Fit model

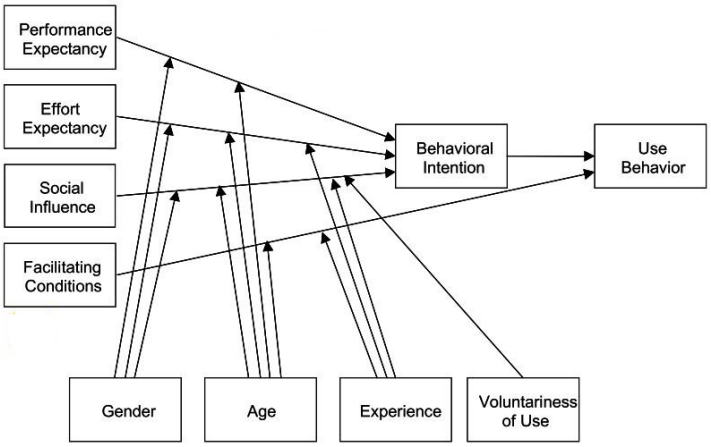

Figure 49: The Unified Theory of Acceptance and Use of Technology model

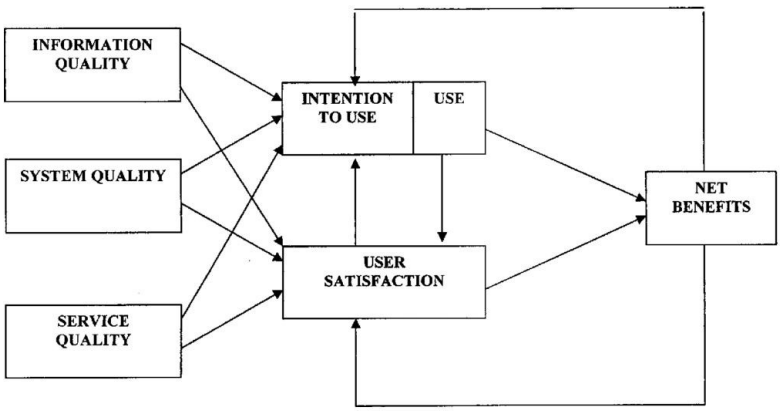

Figure 50: The Information System Success Model

Appendix D – PRINCE 2 process

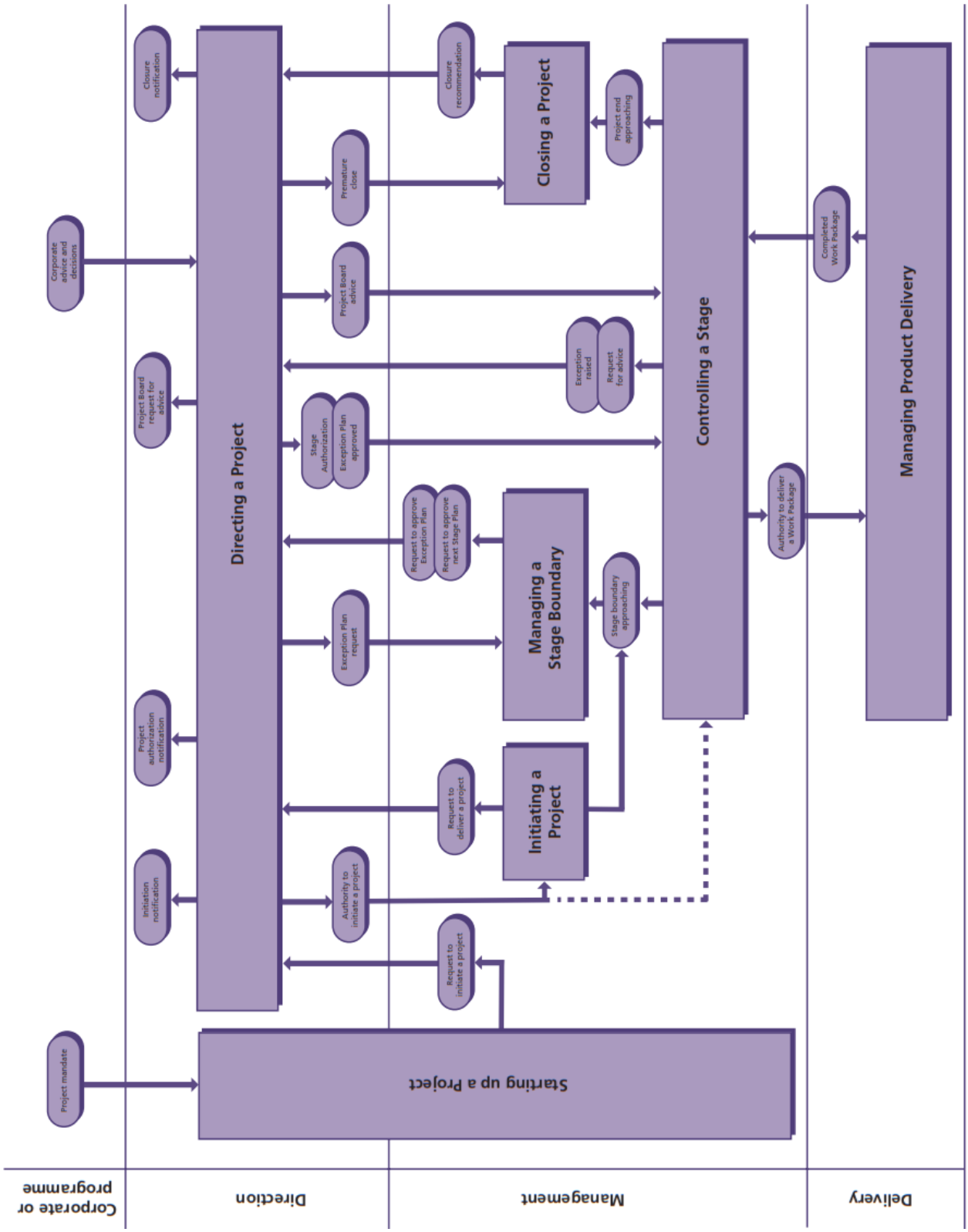

Figure 51: The process-model of PRINCE2

Appendix E – Implementation approaches

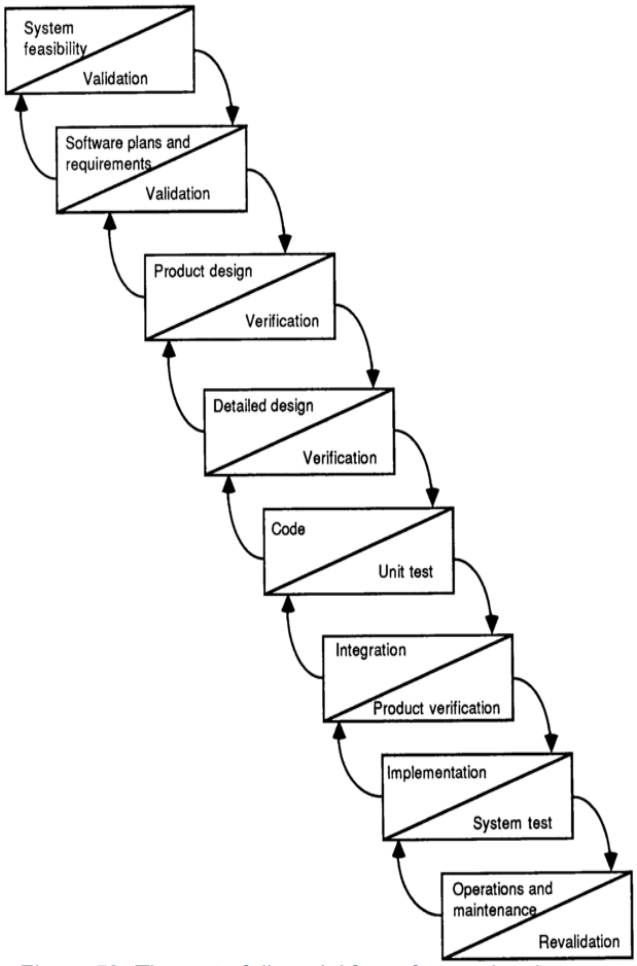

Figure 52: The waterfall model for software development

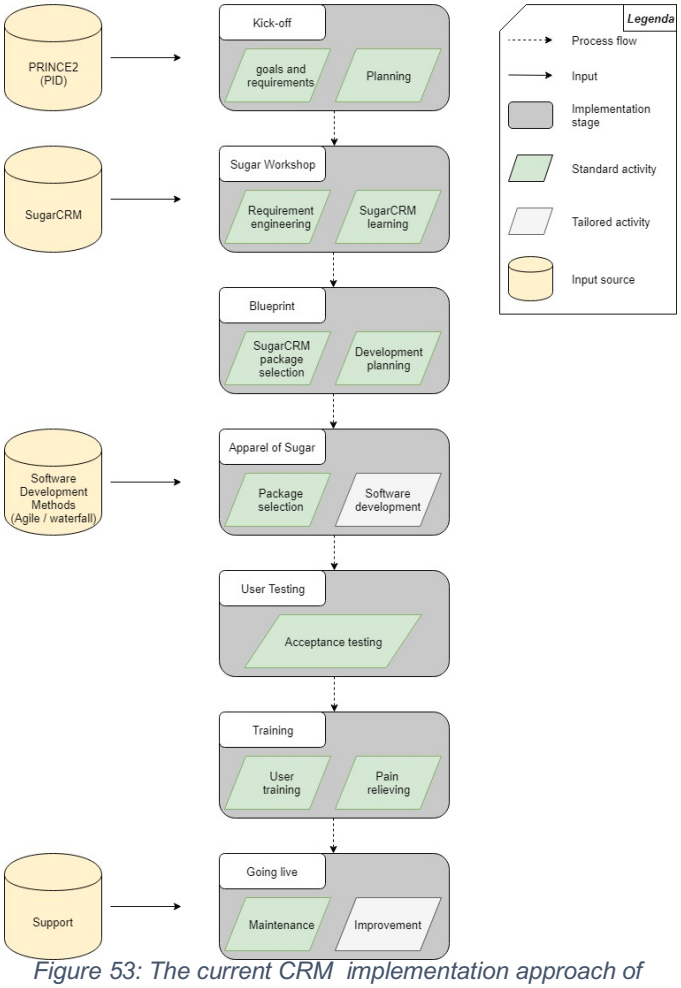

Figure 53: The current CRM implementation approach of BrixCRM

The consultancy guide can be found via the QR code below. This QR code links to the Consultancy guide in which the instruments and tools are depicted and the practical workflow is described.

Scan me

Appendix F – CSF parameters

Table 38: Change management parameters

	Change management		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Facilitate change	To which extent the project can facilitate change to address change management issues.	0	1	1
2	Integration	The extent to which the CRM solution should be integrated into the (IT) infrastructure of the client of BrixCRM.	1	2	2
3	Quotation type	The type of quotation, thus "what is contained in the budget?". Therefore, it is the question if change management activities are considered.	1	0	0
4	Non-functional requirements	The number of non-functional requirements.	1	1	1
5	Business size	The size of the business; how much people are involved in the change?	-2	-2	-3
6	(In)formal culture	The culture of the client influences how information is shared within a company, in which an informal culture can help to remove barriers.	2	3	4
7	Adoption	Adoption is determined by the likelihood of employees to adopt a new (IT) solution; based on the IDT by Rogers (2003).	-1	0	1
8	Stakeholder analysis	The identification and analysis of the stakeholders help to understand who are to be involved in the change and it can help to identify how reluctant these stakeholders may be.	-2	-2	-2
9	Project success	The willingness of the stakeholders to incorporate the new CRM solution in their tasks should determine the success of a project. If this is not given priority, it could harm the process of change management.	1	1	1
10	Project schedule flexibility	The flexibility of the project schedule determines whether additional resources can be used to address change management if needed.	2	2	3

Table 39: Data quality parameters

	Data quality		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Data quality checks	The frequency of data quality checks that are planned during the CRM implementation.	2	3	3
2	CRM use	The extent to which everyone is on the same page about CRM use; determines whether the data is used for which it was designed.	-1	-2	-2
3	IT skills	The extent to which the client of BrixCRM has adequate IT skills in-house to understand what needs to be considered for data quality.	2	0	0
4	Information intensity	The intensity of information needed for the client to operate in the industry and manage its customer relations effectively.	0	1	2
5	Integration	The extent to which the CRM solution should be integrated into the (IT) infrastructure of the client of BrixCRM.	0	2	2
6	Migration	The complexity of the data migration into the new CRM solution for the client.	2	4	5

Table 40: CRM strategy parameters

	CRM strategy		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Business age	The age of the business is assumed to affect the maturity of the corporate strategy, which includes its ability to formulate a CRM strategy.	0	-1	0
2	Business size	The size of a business is assumed to affect the complexity of diffusing a vision; the CRM strategy.	1	0	0
3	Business maturity	The maturity of a business is assumed to affect the extent to which the business focusses on doing its formulation of strategy on point.	0	-1	-1
4	Business structure	The structure of a business is assumed to affect the complexity of diffusing a vision; the CRM strategy.	0	1	2
5	Project objectives	The objectives of the project are illustrative for the strategy that a business envisions by implementing CRM.	0	1	0
6	Project objective measurability	The measurability of the objectives is assumed to affect the CRM strategy since the measurability implies to which extent the strategy is aligned with the results of the implementation.	-1	1	1
7	Project success	The formulated definition of success illustrates whether the project is assumed to be a success if the project management criteria (budget, scope and time) are met or that the project should fulfil a higher (strategic) objective.	-1	-1	0
8	Envisioned partnership	To which extent does the client think of the "next step" to improve on its strategy and maybe want to partner up with BrixCRM.	1	2	2
9	Mature marketing and sales function	The maturity of marketing and sales depicts the ability to execute the strategy that is set by the implementation of the CRM solution.	1	2	2
10	Willingness to risk strategically	To which extent is the business willing to risk strategically by betting on a CRM system (that can overhaul a corporate strategy of a business).	-1	-1	-1

Table 41: Project champion parameters

	Project champion		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	IT skills	The extent to which the project champion can oversee the implications of IT and how much it will cost.	1	0	0
2	(In)formal culture	The organizational culture is assumed to affect the ability of a project champion to diffuse certain ideas and direction of the CRM implementation	1	2	2
3	Work procedures	The work procedures are assumed to affect the way and effectiveness in which certain ideas and direction can be diffused.	-1	-1	-1
4	Adoption	The extent to which the business can adopt new ideas and direction provided by the project champion.	0	1	2
5	Business size	The size is assumed to affect the extent to which the project champion can reach the different stakeholders in the project.	-1	-2	-2
6	Project team size	The extent of people that need to be involved and cooperate with the project champion.	1	0	0
7	Geographical dispersion	The geographical dispersion of a business is assumed to affect the extent to which the project champion can involve and reach the stakeholders.	0	0	0
8	Project success	The willingness of the stakeholders to incorporate the new CRM solution in their tasks should determine the success of a project. If this is not given priority, it could harm ability of a project champion to push new ideas into existence.	0	0	1
9	Expectations management	The extent to which the different people do have diverging ideas that the project champion should be aware of.	2	3	4
10	Stakeholder participation	The extent to which the different stakeholders are willing to participate in helping the project forward; the effort expectancy of the project champion to get everyone's input.	1	2	2
11	CRM use	The extent to which everyone is on the same page about CRM use; the project champion should be supportive to achieve common ground.	0	1	2
12	Quotation type	The quotation type is assumed to affect the extent to which the project champion is able to execute the project.	-1	-1	-1

Table 42: Customer involvement parameters

	Customer involvement		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	IT skills	The extent in which the client of BrixCRM can think about the implications of its requirements on IT considerations.	1	1	1
2	Business size	The size of a business is assumed to affect the ability of the client to be involved and make the hours needed in the project.	-1	-2	-1
3	Business maturity	The maturity of the business is assumed to affect the client's intention to be involved in the project since it acknowledges the importance of involvement.	-1	1	1
4	Chosen method	The chosen methods (Agile vs. Waterfall and Prince2) have an impact in the extent to which the client is (wanting) to be involved.	1	1	2
5	Willingness to risk financially	The willingness to risk financially is assumed to affect the extent to which the client is involved since it may or may not want to make the tough calls.	-1	-1	-1
6	Willingness to risk operationally	The willingness to risk operationally is assumed to affect the extent to which the client is involved since it may or may not want to make the tough calls.	1	1	2
7	Willingness to risk strategically	The willingness to risk strategically is assumed to affect the extent to which the client is involved since it may or may not want to make the tough calls.	0	0	0
8	Business focus on innovation	The extent to which the client is focusing on innovating the business and therefore it is assumed that more innovative businesses want a say in the project.	1	3	3
9	Work procedures	The work procedures of the client are assumed to influence the extent to which it is involved.	1	0	0
10	Adoption	The willingness of a client to adopt a new system is assumed to affect its involvement since client with higher willingness are likely to be more enthusiastic about innovation.	2	3	3
11	Project team	The client's involvement is based on the attitude of the project team.	2	2	2
12	Project objective measurability	If the objective of the project is less measurable, the client should consider to be more involved to keep track of the extent to which the CRM solution is addressing its objective.	-1	-1	0
13	Stakeholder communication	The communication between the stakeholders affects the way in which the client is and wants to be involved.	0	0	0
14	Stakeholder participation	The attitude of the client towards participating affects its extent of involvement.	0	1	1
15	Quotation	The quotation of the project is assumed to affect the involvement of client since it addresses the activities in which it may or may not participate.	0	-1	-1
16	Number of sign-off moments	The number of sign-off moments, the number of contact moments, affects the involvement of the client.	0	1	1

Table 43: Customer-oriented process parameters

	Customer-oriented processes		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Customer intimacy	The extent to which the business is focused on aiding its customers.	2	3	3
2	Chosen method	The chosen methods affect the how the client is approaching its customers.	-1	-1	-1
3	Business maturity	Being customer-oriented is not something that a business is by default, it should be an explicit decision that is assumed to be based on the longer term.	0	1	1
4	Customer cost reductions	The extent to which the business gives priority to the perspective of its customers in terms of 'making business'.	-2	-3	-3
5	Maturity of marketing and sales	The maturity of the marketing and sales department(s) determines the processes to manage customer relationships.	2	3	4
6	Understand customer requirements	The extent to which a business is able see what CRM means through the eyes of its customers.	2	2	2

Table 44: Alignment with key stakeholder groups parameters

	Alignment with stakeholder groups		Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Business size	The size of the business affects the possibility of the stakeholders to communicate their beliefs towards the project with each other.	0	-1	-1
2	Business maturity	The maturity of a business affects the way in which the stakeholders can share their expectations.	0	0	1
3	Organizational structure	The organizational structure is assumed to affect the ability of the stakeholders to reach each other.	1	1	2
4	Geographical dispersion	The geographical dispersion is assumed to affect the ability of the stakeholders to reach each other.	1	1	1
5	(In)formal culture	The organizational culture is assumed to affect the ability of the stakeholders to reach each other.	1	2	3
6	Stakeholder analysis	By means of analyzing the stakeholders helps to identify who are involved and when they need certain information.	-1	-1	-1
7	Expectations management	The extent to which expectations vary affects the complexity of aligning the stakeholders.	1	2	3
8	Stakeholder communication	The way in which stakeholders are communicating affects the ability to align their ideas and thoughts effectively.	0	1	1
9	Stakeholder participation	The extent to which stakeholders are participating helps to make varying perspectives explicit and to take away troubles.	0	1	2
10	CRM use	The extent to which the stakeholders are on the same page when it comes to CRM use affects the complexity of understanding each other's perspectives.	-1	-1	-1
11	Project closure	The project closure is affecting the alignment of stakeholders since it influences what the different stakeholders envision to be the end of the project.	-1	-2	-3
12	Project objective facilitates change	If the project objective can be changed to some extent, it helps to fit the objective to a varying set of perspectives.	0	0	0
13	Project objectives	The project objective influences the expectations of the stakeholders	1	1	1
14	Project objective measurability	If the objective is measurable, it is assumed that stakeholders can be convinced by the results of the project.	0	1	1
15	Project success	The definition of project success can help to align stakeholders if it is formulated to obtain a higher strategic goal.	-1	-2	-2
16	Chosen methods	The chosen methods affect the way in which the stakeholders are involved in the project and thus the way in which they can address their concerns.	1	1	2
17	Issue solving	The way in which issues are solved influences on which the stakeholders can adapt to each other's beliefs.	1	1	1
18	Documentation and communication	The way in which important things are documented and communicated influences how the stakeholders are to be convinced.	1	1	1
19	Functional requirements	The number of functional requirements that are subject to the interpretation of the stakeholders.	1	0	1
20	Non-functional requirement	The number of non-functional requirements that are subject to the interpretation of the stakeholders.	1	0	0
21	Number of sign-off moments	The number of moments that the stakeholders can discuss and provide feedback.	0	1	1
22	Type of sign-off moments	The type of moments that stakeholders may come to getter influences what type of information is diffused.	0	2	2
23	Tasks budgeted	The extent to which the budget facilitates activities that are to achieve alignment.	2	2	2

Table 45: Management attitude parameters

Management attitude			Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Organizational structure	The organizational structure influences how the management can be reached by the project team and to that extent influences how management is possibly involved in the project.	0	1	2
2	IT skills	The IT skills of the management influences its understanding of the implications that non-functional requirements have on IT.	1	0	0
3	(In)formal culture	The culture of a business influences how the project team can reach its management and how ideas are shared.	-1	0	0
4	Willingness to risk financially	The willingness to risk financially influences the extent that the management is eager to make the extra step.	1	1	2
5	Willingness to risk operationally	The willingness to risk operationally influences the extent that the management is eager to make the extra step.	1	1	2
6	Willingness to risk strategically	The willingness to risk strategically influences the extent that the management is eager to make the extra step.	1	0	0
7	Project success	The definition of success for the project influences the way in which the management likes the project to be steered.	0	1	1
8	Adoption	The tendency of the management to adopt new systems influences the attitude of the management towards innovation.	0	2	2

Table 46: CRM goals/objectives parameters

CRM goals/objectives			Increment		
#	Characteristic	Description	1st	2nd	3rd
1	Custom-built functionalities	The number of custom-built functionalities influences the goals and objectives of the new CRM solution.	1	1	2
2	Integration	The extent to which the solution should integrate with other IT systems influences what goals are set for the solution.	1	2	2
3	Non-functional requirements	The number of non-functional requirements influences the goals and objectives of the CRM solution.	1	2	2
4	Project duration	The duration of the project is assumed to influence the nature of goals and objectives of the project.	-1	2	3
5	Type of sign-off moments	The type of sign-off moment, feedback moments, determine how the goals are evolving during the project.	1	0	0
6	Project budget	The budget of the project determines the nature of the set goals.	0	0	0
7	Tasks budgeted	The tasks budgeted (e.g. consultancy, development) are linked to the goals and objectives.	1	1	1
8	Business maturity	The maturity of the business determines the nature of the goals.	-1	0	0
9	The business understanding of CRM	The understanding of CRM by the business determines what the solution is envisioned to do.	1	1	0
10	Industry maturity	The maturity of the industry is assumed to influence the nature of the goals set for the project.	0	1	1
11	Willingness to risk financially	The willingness to risk financially determines the risk that the business is willing to take to achieve the goals of the project.	1	1	1
12	Willingness to risk operationally	The willingness to risk operationally determines the risk that the business is willing to take to achieve the goals of the project.	1	1	1
13	Willingness to risk strategically	The willingness to risk strategically determines the risk that the business is willing to take to achieve the goals of the project.	-1	-1	-1
14	Project closure	The closure criteria are influencing the extent to which the goals of the project are to be met.	0	-1	-1
15	Project objective facilitates change	The extent to which the objectives facilitate change influences the goals during the progress of the project.	0	0	0
16	Project objectives	The objectives of the project are influencing the goals of CRM.	0	1	1
17	Project objective measurability	The measurability of the project objectives influences the way in which the goals of the new CRM solution are assessed.	-1	1	1
18	Project success	The goals of the new CRM solution are influenced by the definition of success by determining whether the project is directed by a strategic goal or main project control mechanisms.	1	1	2
19	Expectations management	The expectations need to be managed to control for the process of achieving the goals.	1	2	3

Appendix G – Assessment form questions

https://drive.google.com/open?id=1AkPA7IjYT2wbMXyxacwgZe4PV4PDP58RcytrugOOkvY

Table 47: Business characteristics assessment

Question	*Aspect*	*Type of answer*
Business name (of the client)	Identification of the project	Short answer
Business size (of the client)	Identification of the context	Multiple choice
Business maturity	Identification of the context (based on maturity levels)	Likert scale
Job description of the employees	Identification of specialism	Likert scale
Business age	Identification of the context	Multiple choice
CRM skills of the business	Identification of understanding	Multiple choice
IT skills of the business	Identification of understanding	Multiple choice
IT integral to decision making	Identification of how integral IT is in decision making	Likert scale
Information intensity	Identification of how much information is needed to be operational	Likert scale
Industry maturity	Identification of how mature work processes are defined on an industrial level	Likert scale
Willingness to risk	Identification of the risk appetite	Likert scales
Business structure	Identification of how ideas are shared	Likert scale
Geographical dispersion	Identification of the ease-of-communication	Likert scale
Organizational culture	Identification of how (in)formal the culture is	Likert scale
Focus on innovation	Identification of how focused a business is on innovating	Likert scale
Work procedures	Identification if the client is used to work project-based	Likert scale
Adoption of innovation	Identification of how easily the client is to adopt innovation	Multiple choice
Business strategy	Identification of the corporate strategy	Likert scales

Table 48: Project characteristics assessment

Question	*Reason*	*Type of answer*
Project objective	➢ Closure criterium ➢ Facilitating change ➢ Objective level (strategic or operational) ➢ Objective measurability ➢ Success definition	➢ Likert scale ➢ Likert scale ➢ Multiple choice ➢ Multiple choice ➢ Multiple choice
Stakeholder analysis	Identification of stakeholders and their importance based on a role ➢ Pre-project ➢ During project ➢ Post-project	Long answer
Expectations	Identification of the multitude of different expectations	Likert scale
Communication	Identification of how stakeholders are communicating	Multiple choice
Participation	Identification of how eager stakeholders are in participating	Multiple choice
CRM usage	Identification of how eager the business is to align stakeholder in terms of CRM usage	Likert scale
Software method of choice	Identification of the preferred software development method by the business	Multiple choice
Project management method of choice	Identification of the preferred project management method by the business	Multiple choice
Project management tools of choice	Identification of the preferred project management tools by the business	Multiple choice
Solving issues	Identification how the business prefers to solve issues	Likert scale
Documentation communication	Identification of how information is documented and communicated	Likert scale
Data quality	Identification of how data quality is ensured ➢ Data quality checks ➢ Data migration	 ➢ Likert scale ➢ Multiple choice
Project scope	Identification of how large the scope of the project is ➢ Number of custom-built functionalities ➢ CRM system integration ➢ Quotation type ➢ Number of (non-)functional requirements	 ➢ Multiple choice ➢ Likert scale ➢ Multiple choice ➢ Likert scale
Project time	Identification of how long the project will take and what the conditions are ➢ Project duration ➢ Project schedule ➢ Number of sign-off moments ➢ Type of sign-off moments ➢ Time dependencies	 ➢ Multiple choice ➢ Likert scale ➢ Multiple choice ➢ Multiple choice ➢ Likert scale
Project budget	Identification of how the budget is allocated ➢ Project budget ➢ Tasks budgeted	 ➢ Short answer ➢ Multiple choice

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