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A PRACTICAL TEST OF A PROCESS MODEL FOR CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM SELECTION WITH AN AUTOMOTIVE SUPPLIER

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Abstract

Selecting suitable customer relationship management systems (CRM) is a decision problem with economic, behavioural, technical and functional implications. It is important to methodically identify an appropriate solution with regard to the various aspects of the decision. In this paper, a practical test of the previously developed customer relationship management system selection (CRMSS) process model is conducted in a case study with an automotive safety goods supplier. The process model used was constructed based on a literature review and further refined by expert interviews and two international online surveys. To test the models applicability and align phases, tasks, roles and deliverables with practical experiences, qualitative interviews were conducted with the different stakeholders in the evaluation project. The CRMSS process model was then further refined according to the conclusions drawn from the presented case study. The first application of the process model suggests that it is considered as relevant for practice and can be understood and applied successfully for a CRM selection and evaluation. In the context of the case study the model was customised to meet the needs of the project.

Keywords: CRM, system selection, system evaluation, automotive industry, case study research, process model.

1 Introduction

The IT systems market has increased significantly in the last years, covering both vertical solutions and integration topics. Therefore, identifying and selecting the most suitable solution for a company has become a complex decision problem (Jadhav and Sonar, 2009). IT departments regularly need to make decisions on investments, required consulting support and other services (Yazgan et al., 2009). Due to high costs of such IT investments and application maintenance, the evaluation of software systems should not be a gut feeling, but needs to be strategically prepared and conducted. The decision of selecting a suitable solution has become a complex problem as the number of available solutions is constantly increasing, the variety of hard- and software incompatibilities need to be taken into account, and decision makers often do not have all the information required to make such decisions (Lin et al., 2006). For this reason, an IT evaluation methodology should be part of IT/IS management in every company. The main decision parameters cover adaptability of the business processes, flexibility in terms of market and strategy changes, IT architecture fit, and implementation, configuration and maintenance costs. Literature reviews (Colombo and Francalanci, 2004; Jadhav and Sonar, 2009) have shown that research findings not only in the area of CRMSS but IT system selection in general are high level and not well aligned with practical experience. On the contrary, companies spend high budgets on consultants to support them with identifying and implementing new applications. Therefore, further research is necessary to elude the topic from a scientific perspective. The authors constructed and evaluated a CRMSS process model to support the evaluation of a new CRM system. Selecting a CRM system is a part of a challenging software engineering process (Jadhav and Sonar, 2009) and the implementation of a CRM system imposes significant changes to business processes and the whole organisation (Chen and Popovich, 2003; Finnegan and Currie, 2009). Although parts of the model can be equally used for other IS selection projects, specific elements like functional criteria and a system selection tool are tailored for CRMSS. The aim of this paper is to test the applicability of the CRMSS process model by conducting practical testing in the context of an automotive case study. As proposed by Rosemann & Vessey (2008), applicability is defined in the three categories: importance, accessibility and suitability. Importance shows whether the research meets the current needs of practice. Accessibility refers to the understandability of research for practice. Suitability describes whether research provides a clear direction and an adequate means for problem solving in practice. The central research question is: *To which extent is the CRMSS process model applicable in practical testing with an automotive supplier and which model elements need to be refined to enhance the model's applicability?*

The paper is structured as follows: The first section explains the overall research design that was applied to derive the CRMSS process model. It includes a description of four of the five completed phases of the research design. The following two sections illustrate the details of the evaluation project and the interviews with the project team. Implications of the case study are given for each project phase and discussed in section four. Section five presents limitations and conclusions.

2 Methodology

There are differing definitions of process models in the literature, all of which refer to the representation of a class of domains (Winter, 2008; Rohloff, 2008) as a starting point for the development of new applications (Braunwarth and Friedl, 2010). The CRMSS process model is based on the methodology suggested by Ahlemann and Gastl (2007) which contains five phases (Figure 1). Phase one included the challenges of problem identification and planning. The model construction of phase two was based on a comprehensive literature review and on expert interviews. In phase three, a second and third empirical study focused on validating the results of the previous phases and refining the CRMSS process model by discussing the model with international CRM experts. This paper

presents the results and conclusions of phase four. The authors applied the CRMSS process model to a case study in the automotive industry using qualitative interviews.

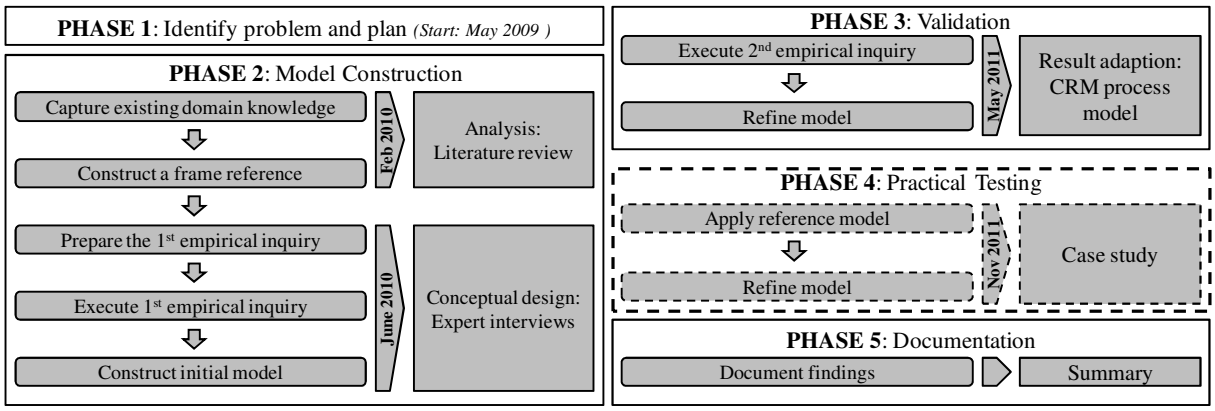

Figure 1. Approach to process model development (Adapted from Ahlemann and Gastl (2007))

Retrospective of phases 1 & 2 (literature review and model construction): To get an overview of the current research status, a comprehensive, structured review of the literature was performed. The intention was to identify published evidence in journals and conference proceedings that discuss CRM evaluation or IT evaluation in general. Four major databases were selected (ACM Portal, AISNET, Elsevier Science Direct and Springerlink). The terms "IT evaluation", "IT system selection", "CRM evaluation", "CRM system selection", and "CRM strategy" were used as search criteria. In total, 137 papers were identified. Seventy-six hits related to IT evaluation, and 61 contained topics related to CRM evaluation or other associated CRM topics. All papers were reviewed in full for relevance and classified into four categories: methods, criteria, evaluation technique and tools (Jadhav and Sonar, 2009). In the final sample, findings from 60 papers (method (24), criteria (34), evaluation method (14), and tools (2)) were used to construct the initial version of the CRMSS process model.

Retrospective of phases 2 & 3 (validation and model refinement): The expert interviews in phases two and three were conducted in three stages: the first phase included personal interviews, the second and third phases were online interviews. Experts were found in business networks such as xing.com, and then identified and interviewed using partly standardised interview guidelines. People were identified as experts if they had specific knowledge of CRM business topics. The authors limited the personal interviews in phase one to eighteen experts to develop the initial model. The interviews were conducted via phone between March and April 2010 and lasted between 15 and 45 minutes. A normative online survey was conducted in phase two. Invitations to participate in an online survey were sent out in three cycles in June 2010. A total of 1,435 potential respondents in various countries were contacted with a focus on Germany and the US. In total, 125 (8.7%) experts participated. The results are presented in more detail in (Friedrich et al., 2011). The authors reengineered the CRMSS model and conducted a second expert interview round expanding the target audience. In stage three the survey had a stronger focus on international experts. Invitations to participate in an online survey were sent out in eight cycles from January 2011 to March 2011. A total of 1,699 potential respondents were contacted with a focus on the US, Great Britain and Canada. In total, 159 (12%) experts participated in the online survey. Figure 2 illustrates the high level CRMSS process model after all interview rounds. A full description of the method in detail is presented in (Friedrich and Breitner, 2012).

Phase 4 (practical testing - case study): During practical testing, the reference model is used to solve a real-life organisational problem (Ahlemann and Gastl, 2007). To improve acceptance and further refine the CRMSS methodology a single case study was selected. Rosemann and Vessey (2008) argue that "applicability checks could be conducted on emerging IS research outcomes" and "improve future research by incorporating learnings into revisions to theories or models". The CRMSS process model is an emerging IS artefact developed in multiple phases based on expert interviews and surveys (see

Figure 1). Therefore, an applicability check with a single case study is considered an adequate next research step (Ahlemann and Gastl, 2007). The case company is a worldwide vendor of automotive safety goods. With 43,000 employees this company supplies all major automobile manufactures from their 80 facilities in 29 different countries. The major markets are Europe, North America and Asia Pacific. The legacy systems were implemented seven years ago. In the different European affiliates, there are different operative systems, which are gradually being replaced by a standardised solution. In 2010, a pilot project was launched with the German affiliate to select the new system that will be rolled out in all European plants. The CRMSS process model was applied during this project. The company name and in-depth functional criteria are not published for reasons of confidentiality. The rationale behind choosing an automotive supplier was to test the process model in a B2B environment. In the B2B context, the necessary alignment with the CRM systems of the customers can influence selection decisions due to cross-company integration requirements. The company's strategy is linked to direct customers, who are a limited number of large original equipment manufacturers (OEM). The CRM processes can be individualised for each of the large customers while functional CRM requirements can be less diversified. The automotive sector is characterised by industrialised value-adding processes which require deep supply chain integration. Despite these characteristics, the evaluation project represents a typical case for the industry (Yin, 2009).

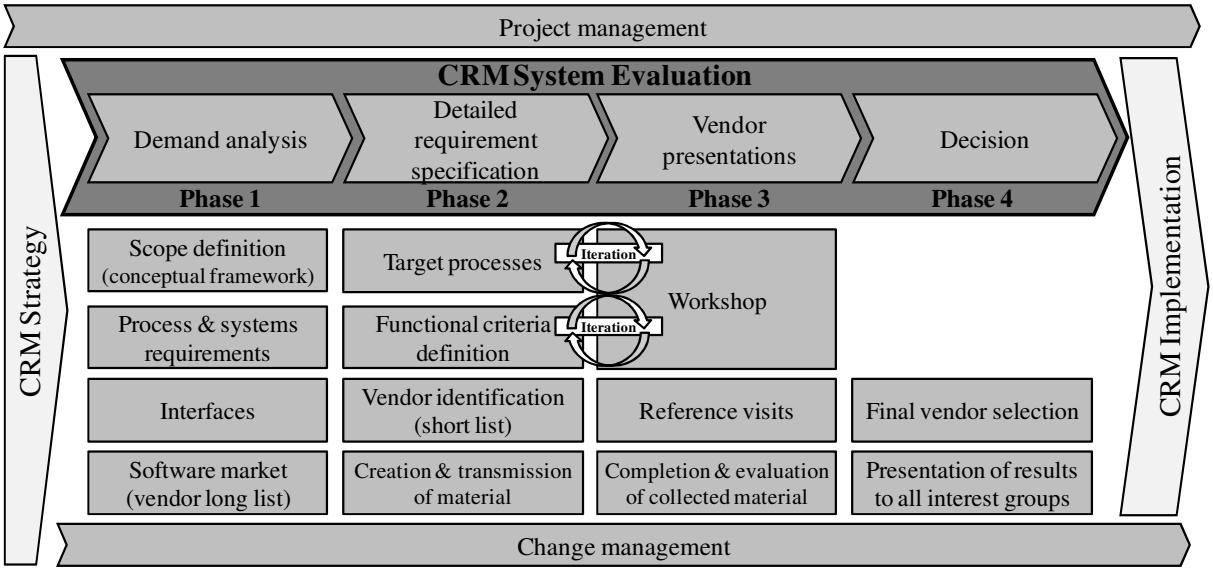

Figure 2. Final CRM System Selection (CRMSS) process model (end of phase 3)

Case study research is applicable to develop and test process models (Radeke, 2010). Data collection in interpretative case study research can be diverse including, for example, observation, archival records, and participation (Yin, 2009). Walsham (1995) argues "that interviews are the primary data source, since it is through this method that the researcher can best access the interpretations" of the participants. For this reason, the authors conducted six focused interviews with different stakeholders from the project team (Yin, 2009; Berg 2009). Before the CRMSS project started, all project members received an introduction to the methodology and its significant milestones in a daily workshop to familiarise them with the approach. In the course of this workshop the accessibility of the CRMSS process model as defined by Rosemann and Vessey (2008) was tested by evaluating the understandability of the presented material. The project management received an additional introduction to the process model and further reading material. The interview guideline was pretested with a researcher who was familiar with the research topic (Berg, 2009) and the wording was adjusted according to his comments. During the interview, a semi-structured interview guideline was used. The interviewees were first asked to elaborate on their qualifications and current role in the company and during the project. The main part of the interview guideline was based on the different phases of the CRMSS process model (Figure 2) and the interviewees were asked to evaluate the applied CRMSS

process model from their perspective (Ahlemann and Gastl, 2007). The interview partners were chosen according to their role in the project to make sure that all perspectives were covered (Yin, 2009). Individual interviews were conducted with the IT project manager, business project manager, key users from sales, controlling and IT, as well as the involved business consultant. The interviews were conducted at the company's site in two subsequent weeks in November 2011, each lasting about one hour. Walsham (2006) states that when the researcher is closely involved with the researched case, interviewees feel that they are making a valid contribution and are more likely to cooperate. At the same time, close involvement potentially means that there can be no fresh perspective on the case (Benbasat et al., 1987). In order to mitigate negative effects, the first and the second authors were present during the interview and the involved author took the role of an investigator while the other author took the role of an observer (Eisenhardt, 1989). Each interview was recorded with the consent of the interviewee and transcribed. Because the investigating author was involved in the implementation project, the interview setting was familiar and open, making it easier for the interviewees to answer the questions truthfully. To ensure objectivity, as recommended by Yin (2009) and Eisenhardt (1989), data triangulation was applied to merge qualitative data from the focused interviews with other data sources, such as documents and presentations from the different project phases. The authors applied content analysis to evaluate the data collected from the case study (Berg, 2009) by independently paraphrasing and deductively coding the material into the category set given by the CRMSS process model. An extended interview guideline served as the set of coding rules for matching paraphrases with categories.

3 Results

The consolidated results of all interviews are mapped to the CRMSS process model and an overview is presented in Figure 3. The following paragraphs illustrate the outcomes in more detail. For each CRMSS phase, a short summary of high-level recommendations is given followed by a description of case study implementation for each phase with corresponding insightful statements of the interviewees and implications for CRMSS applicability.

3.1 Project Management

CRMSS recommendations: The CRMSS process model includes the establishment of a project organisation in the beginning of the evaluation that remains stable also during the implementation project. The full methodology must also be set up and understood by the project management.

Case study implementation: The project organisation in the evaluation project was almost identical to the staffing of the implementation project. Only 20 percent of the initial staff was replaced due to requirements of daily operation. The IT project manager observed: *"In general, we have underestimated the workload for the business organisation, also in the current implementation project. [...] Only now it has ameliorated since we introduced a resource plan per person per day."* The process organisation was established before the selection project started. The business project manager said: *"We have started out early in our company (to define the project organisation). We have established (the role of) the Template Keeper."* This role is necessary to ensure the stability of the system template throughout the rollouts and to prevent country-specific changes that could endanger the robustness of the template. The project management was shared between business and IT. The business project manager explains: *"It is not solely a business or an IT project. Therefore, we have the double head of project management. [...] And when you look at the project set-up, it is cascading down."* The methodology was adapted to the individual requirements of the company, specifically the templates. Not all stakeholders were involved from the beginning. The sales key user stated: *"We put more effort than necessary into some phases and in others we could have got deeper involved. I wished [...] we had received an overview, the way we plan the whole project in our organisation, what*

is the background, what are our goals. And maybe we should have had a workshop in order to have it all clear as users. This has taken a long time for us."

Implications for CRMS applicability: The decision to integrate the same people during selection and implementation has proven to be an important factor. Still the work load needs to be considered and levelled in advance when planning both projects. The allocation of business and IT stakeholders has proven to be a key factor as the responsibility for the success of the project could not be dropped. The early involvement of all project members in the selection phase enhances understanding and acceptance. Due to time restrictions an adequate information flow could not be maintained in practice. This aspect needs to be addressed before the project start or early in the implementation project.

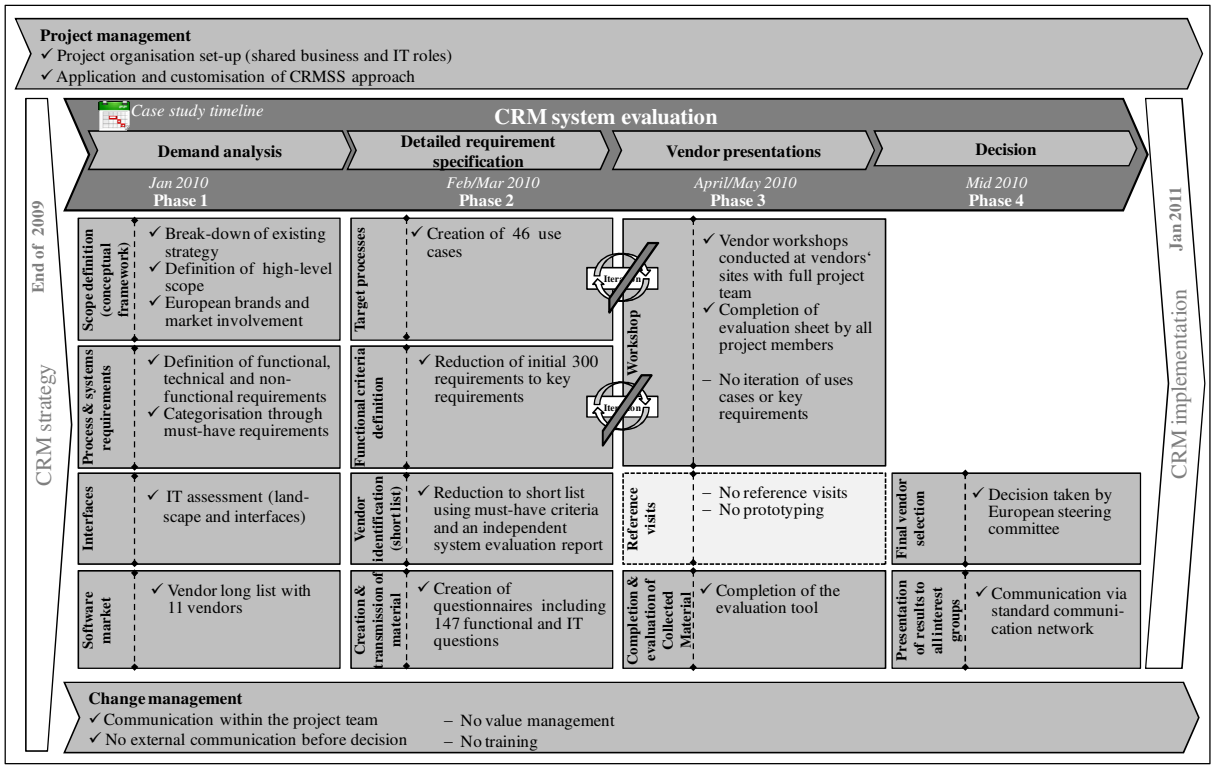

Figure 3. Consolidated results applied CRMSS Process Model

3.2 Demand Analysis

CRMSS recommendations: In the first phase of the CRMSS process model, a conceptual framework must be established that includes a scope definition, critical process and system requirements identification, interface classification and vendor long list creation.

Case study implementation: The initial scope definition was conducted by project management with the consulting partner. Existing strategy documentation was used as an initial input and was broken down for each business area. The scope definition included functional high-level scope, IT assessment, project planning and market strategy. Out of scope were risk management and exit strategies. The consultant stated: *"[The company] had implemented a Europe-wide system before. In principle, it had worked for many countries, but not for all. We were relatively sure that a modern system would work for all countries. Therefore, there was no exit strategy."* The categorisation included must-have and other requirements. The latter were subdivided into important and less important requirements. For all categories, simple or branch-standard requirements were excluded from further analysis. In total, the project team identified 300 specific requirements that included functional, non-function and technical subcategories. They served as input for the questionnaire provided to the vendors in phase two. The architectural assessment was conducted in a prior project by the IT project manager. The vendor long

list included ten vendors identified by the IT project manager and consultants. Other project members were not involved in the vendor reduction process. The IT key user suggests: *"It would have been helpful to be involved from the beginning [...] in order to have a better impression on the short list."* Established standard and industry solutions were considered and subsequently reduced by applying certain general must-have criteria. These criteria consisted of turn-over, existence of an automotive roadmap, legacy systems connectors and availability of independent implementation partners.

Implications for CRMSS applicability: The customisation of the CRMSS process model allows for significant simplification of the selection project. Although risk management is considered an important aspect in CRM systems selection, the case company context suggested low risk probability. Past experiences with the legacy system are influential to the model's customisation. The process model helped the project team to focus on critical areas and quickly start the selection project. The generation of a vendor long list and the subsequent reduction to a vendor short list in phase two was not transparent enough for the project members. During the first phase mainly IT was involved in the project and therefore the vendor long list was predominantly formed by IT. During implementation it became apparent that a business view and transparent communication with project stakeholders is also needed to receive a full picture.

3.3 Detailed Requirements Specification

CRMSS recommendations: In the second phase of the CRMSS process model, mandatory functional criteria and target processes are derived and specified to narrow the list of potential vendors.

Case study implementation: The initial 300 requirements were reduced to key factors depending on their criticality. The IT project manager stated: *"An example, which we have always stressed, is EDI Selfbilling. We knew this has never really worked with the legacy system; this was a criterion which is important for our industry."* There were 46 use cases derived from functional key requirements. On this basis, a questionnaire of 147 functional and IT-related questions was set up and distributed to the vendors. The template keeper selected and defined the relevant business processes. The topic of user friendliness was also broached during evaluation. The consultant summarises: "*From my point of view, we should have invested more time in the "look and feel" of the software application. [...] In my opinion, we have neglected this a bit and focused more on the purely functional and technical areas."* A few other quality criteria were considered, for example, performance and scalability. Cost and return-on-investment were not part of the evaluation. The consultant emphasised: *"We should have addressed further the readiness of the software vendor for topics which are currently discussed in the market, for example, mobile usage of the system via smart phones [...] and the topic of SaaS."* The short list was defined with the help of general must-have criteria and independent system evaluation by the Aberdeen Group (http://www.aberdeen.com). The questionnaire and the use cases were handed out to the vendors as transmission material. The evaluation sheet was designed by project management and is used internally to collect the opinions of the project team during vendor workshops.

Implications for CRMSS applicability: The chosen scope has been sufficient to receive a good picture of the potential vendors for the workshops. Although part of the CRMSS process model, a detailed evaluation of costs was not feasible due to time restrictions. CRM selection projects usually have a specifically restricted timeline due to smaller budgets. This fact needs to be acknowledged by risk management. A detailed evaluation of costs and benefits is an essential deliverable for a grounded economical decision in phase four.

3.4 Vendor Presentations

CRMSS recommendations: In phase three workshops that focus on obtaining a deeper insight on the degree of scope coverage are scheduled with vendors to present their solutions.

Case study implementation: Vendor workshops were conducted at the vendors' sites with each of the three vendors from the short list. The whole project team of 20 members, including project managers, template keepers, key users/process owners and consultants, participated. Specific expectations were addressed to the vendors prior to the workshops. The controlling key user summarises them: *"The vendors should address our data closely in order for us to see whether they can adjust to our company structure."* The interviewees stated that not all vendors met their expectations and the quality of their presentations varied significantly. The IT key user recapitulates: *"The vendor workshops [were] rather a sales presentation."* The lack of individualised presentations in the workshops made it necessary to conduct many more videoconferences to clarify critical issues. The project members' suggestions were to conduct pre-workshop with a small group or telephones conference prior to the official workshops. Preparation of the workshops was considered very important. The IT key user explains the procedure of the workshops: *"Best-practice processes were shown by the vendors. Based on that, we have asked questions, because we knew the crux of the matter in detail [...] so that at the end we knew whether it would work or not."* The decision criteria remained stable and were not iterated after the first workshop. Because representatives from all relevant departments participated in the vendor workshops, critical business questions could be addressed directly. The controlling key user reflects: *"We were not forced into anything. […] And I think that by sticking to this procedure, we will not fall flat on our faces. There were not only German representatives but from the whole of Europe. Therefore, everyone was able to see what the system is capable of and place their question where they saw their critical points."* During the case study no reference visits were conducted as a thorough preparation could not be integrated into the project timeline. The business project manager explains: *"You don't want to talk to your direct competitors. There are others, who are in the same area, in the automotive branch, but maybe not those dealing with safety goods. And still there are differences in processes."* The same applies to prototyping. There was no sufficient time frame to create prototypes. For the assessment of the vendors from the short list, the consultant collected the results from the evaluation sheets. The evaluation tool was an Excel-based weighting method. The weights were set up by project management and confirmed by the steering committee.

Implications for CRMSS applicability: The thorough preparation of the vendor workshops is an essential input for successful completion of this phase. The quality of transmission material and prior communication with vendors is critical for workshop efficiency and project members' acceptance of the approach. The company size and the international context of the project was supported by the project organisation considering national representatives. In the B2B context of the case study with all major OEMs as customers, the realisation of reference visits is less realistic due to the competitiveness of the market. The decision is highly influenced by the requirements and operating systems of the customers. This fact needs to be addressed. The CRMSS methodology helped to level initial vendor preferences towards a grounded decision.

3.5 Decision

CRMSS recommendations: In phase four, results are summarised and documented before they are presented to the interest groups. Using this approach the decision is justified and demonstrated before the negotiation process with vendors begins.

Case study implementation: The final decision was taken by the European steering committee with feedback coming from both project managers two months later. Within the two months, the vendor negotiations took place. The IT project manager states: *"[After the vendor workshops], we said, we could live with both [vendors] and now it is a financial decision and matter of negotiations. We had an internally preferred partner but we said, if they don't move financially, we can also live with [the other vendor]."* Not only was the decision reached based on the feedback from project management, it was also based on the information from the different business units that were represented by the template keepers. The business project manager said that *"[…] the representatives from the steering committee are also representing [the stakeholder] groups, which participated. This means that they*

did not only rely on the recommendation of the project management but also their staff who were interviewed on site. Based on that, they took a well-grounded decision." The main decision factors in this phase were cost and standardisation with regard to process fit. The selected vendor was officially announced though the general communication channels. The IT key user explains that *"[…] the results were communicated to the line management who forwarded the information further down to the employees."* A large meeting did not take place, as employees are scattered all over Europe.

Implications for CRMSS applicability: The omission of a cost calculation in phase 2 can lead to prolonged negotiation with vendors and to less grounded decisions. The information intensity varies depending on the communication channels chosen by the selection project members. Not all employees received the details on the decision through the usual communication channel of the case company. A detailed communication via other channels could improve transparency and acceptance.

3.6 Change Management

CRMSS recommendations: Change management spans across all phases of the CRMSS process model and includes communication, business transformation, training and organisation enablement.

Case study implementation: In the case study, all change management topics were less prioritised. The sales key user said: *"[The employees] did not hear anything about it. This is the way it should be, that not everyone is involved immediately into all the details […]. But the people that need to be in the boat should have been involved earlier."* Project management made use of the usual communication channels. Before the final decision was taken, the intention was to not spread unconfirmed information that could lead to rumours and false assumptions. In the area of business transformation, IT initiated organisational change in the form of a second support team. The IT project manager recommends: *"At the time of project initiation, I have campaigned for hiring secondary support people in order for them to receive process training. It was an early investment."* Other business transformation topics were not addressed during evaluation. This was handled similarly in the areas of value management and training. Training was only roughly accounted for in the project cost calculation, but not considered important during the selection process. The most essential change aspect in the case study was to get buy-in from the organisation by getting buy-in from representatives from the different departments.

Implications for CRMSS applicability: Change management aspects which were omitted in the selection project lead to difficulties in the implementation. For example, user training was identified as critical during implementation and planning had to be outsourced to consultants. Key users confirmed that system training could improve their ability to judge the vendors during phase three. It is a challenge to offer further system training in the selection project because various systems are still under discussion. Training becomes inevitable during preparation of the implementation to enable key users for fit gap analysis. The omission of value management including business readiness was not regarded as critical as CRM processes were already well established. Project management has to evaluate the risk associated with neglecting certain areas of change management and identify critical issues for selection while shifting less critical aspects to implementation.

4 Discussion

The practical application of the CRMSS process model has proven its operational fit. In the area of project management one important deliverable to plan and level resource workload was missing. The CRMSS process model did not include a resource plan. Not only is this deliverable relevant for acquiring project members with the right skills and capacity, it is necessary for managing project member expectations with regard to their workload and responsibilities. When selecting project members, it is essential to involve staff from all affected groups, in this case all key users from the different sales departments. Early participation increases their understanding of the project activities and significantly improves their outcome. The project organisation must be established before the first

phase of the evaluation project. In the case study, some project members were involved at a later stage, and initially struggled to fully participate in the workshops. A valuable outcome of the case study is to split each project organisation role between an IT and a business representative to ensure the coverage of all aspects. It is important to involve business experts early to account for all angles. For example, from the perspective of the interviewed key users, user friendliness is a critical factor to acceptance of the software later in implementation. In the case study and the earlier research with experts showed that this aspect was neglected. When the strategy is incorporated into the project scope, it is necessary to not only consider business aspects, but also to incorporate IT strategy. This ensures that future readiness of the vendors is considered. In the area of interface analysis for CRMSS, it is specifically crucial to analyse the integration of ERP and BI system to be able to achieve synergy effects.

Phase	CRMSS Task	CRMSS selected activities	Roles	Deliverables	Additional deliverables
Phase 1: Demand analysis	Scope definition	Definition of functional high-level scope , system portfolio and IT architecture, available budget, time planning and economic demands, risk management, exit strategies	Steering committee, project management	✓Business and IT strategy documents ✓Categorization criteria	+ Exit strategies
	Process & system requirements	Define main functionality, create business processes, non-functional requirements	Template keeper (per business unit)	✓ High level process definition ✓ Initial requirements list ✓ Selection criteria	+ Business operations plan + Roll-out plan
	Interfaces	Analysis of all affected systems, technical requirements and restrictions	IT project manager	✓ Architectural Assessment	
	Software market	Standard and industry solutions, consulting support	IT project manager	✓ Vendor long list	+ Vendor assessment
Phase 2: Detailed requirement	Target process	Define high level target processes	Template keeper, business experts, IT and business key users	✓ Key requirements ✓ Decision criteria and weights	
	Functional criteria definition	Account management, call centre, campaign management, contact & customer management, customer service, field service, industry specifics, internet, lead & opportunity management, relationship management, reporting, sales management	Template keeper, business experts, IT and business key users	✓ Evaluation sheet	
	Vendor identification	Company and CRM project overview, requirement specifications, total cost calculation	Business project manager, IT project manager	✓ Criteria for vendor short list ✓ Vendor short list	
	Creation & transmission of material	Functional fit list, questionnaire for stakeholders	Business project manager, IT project manager, template keeper, business experts, IT and business key users	✓ Use cases ✓ Questionnaire ✓ Prototype	+ Company and project overview + Detailed standardized scope of expectations
Phase 3: Vendor	Workshops	Workshop planning and organization	Business project manager, IT project manager, template keeper, business experts, IT and business key users	✓ Evaluation sheet (filled out)	+ Interview guideline for reference visits
	Completion & evaluation of collected material	Collection of relevant material	Business project manager, IT project manager	✓ Evaluation tool	+ Cost calculation
Phase 4: Decision	Final vendor selection	Stakeholder management	Steering committee		
	Presentation of results to all interest groups	Stakeholder communication	Project management	✓ Presentation	
Change management		Initiating IT and business transformation, communication, value management, training	Business project manager	✓ Communication package	+ Stakeholder analysis + Business assessment
Project management		Project organization, implementation methodology set up	Business project manager, IT project manager	✓ Project plan ✓ Project organisation chart	+ Resource plan + Business case

Table 1. Overview of roles and deliverables derived from the case study

In the detailed requirement phase, despite sending out detailed material with company-specific information not all vendors prepared accordingly. Relying solely on transmitted material has proven to be an insufficient method of explaining expectations. For a more efficient preparation, interviewees suggested pre-workshops with a smaller team to prevent misunderstandings. Material summarizing expectations towards the vendor presentation can be provided. In this regard, CRM evaluation can be distinguished from other standard software evaluations, e.g. ERP systems, because functional requirements of CRM are less complex and smaller budgets are available. The iteration of processes and decision criteria were not necessary in the case study because sufficient effort was applied during the development of decision criteria. According to previous research with CRM experts, iterations are important. This subject requires further practical investigation through a field study. Reference visits and prototyping can be considered an optional element of the process model. In this specific case, the project timeline was short and both tasks require preparation. The area of change management retreated to the background during the evaluation which had an impact on the information level of the stakeholder groups. This is addressed differently in the implementation project, and positively affected opinions about the new system. Overall, the involvement of the different stakeholder groups already positively affected acceptance from the organisation. The CRMSS process model was refined based on the results of and conclusions from the cases study. Table 1 illustrates relevant activities and roles in

each phase and distinguishes which deliverables were applied in the case study and which were identified as requirements afterwards (see column "additional deliverables").

5 Conclusion and Limitations

The purpose of this paper was to test the applicability of the CRMSS process model with a case study from the automotive industry. The research includes valuable contributions to the area of software evaluation. A detailed process model for CRM system selection is presently not available in scientific literature and therefore contributes to knowledge in this field and IT system selection. The paper answers the research question as follows. *Is the CRMSS process model applicable in practical testing and which model elements need to be refined to enhance the model's applicability?* The CRMSS process model illustrated in this paper is grounded and pragmatic and the process model can be used for CRM system selection according to a company's specific requirements. The process model was judged as applicable for the selection project by all project members. They perceived it as a good instruction for the selection project. The evaluation of the three categories of applicability by Rosemann and Vessey (2008) shows: The level of *importance* was judged as high and reflects the existing needs of practice. The process model helped the project members consider the critical factors throughout the different project phases. As prior expert surveys showed, for companies with less than 50 employees the CRMSS process model could be too complex and therefore less relevant. All project participants were able to comprehend the model based on the presented material thus supporting *accessibility*. A lesson learned was that it was not sufficient to only give detailed instructions to the project managers, but also to provide the big picture to other project members. As described in the section 3.1, it is necessary to train project members more intensively in the methodology. The case study shows that an early and comprehensive explanation of the methodology improves the general understanding and motivation of project members. Interviewees agreed that a CRMSS project prior to the implementation is a key factor to base the chosen system on solid grounds and receive buy-in from stakeholder groups. The proposed methodical approach fulfilled their needs. Therefore *suitability* is given. The model is suitable not only for CRMSS but also for other IT system selection projects in regard to most model components (e.g. method or cost criteria). Due to the level of detail provided by CRMSS process model, it can be adjusted for individual requirements. Major refinements of the model included adding roles matching the tasks of the model phases and enhancing the deliverables catalogue. Furthermore, neglecting quality criteria, such as user friendliness, has a negative impact on CRM system acceptance. Another important aspect is the preparation of the vendor workshops that, in part, were not entirely helpful in the investigated case. In addition, to complete transmission material, communication with the potential candidates before the workshops is an important way to convey the expectations. From an economic perspective, reference visits and prototyping are optional elements of the model and are especially useful when the complexity of the individual CRM processes is high or when the company has limited experience with CRM processes.

The research is subject to the following limitations. A single case study cannot generalise the findings of a process model but it is useful to evaluate the applicability in a practical setting. From the perspective of the qualitative interviews, the first author is currently involved in the implementation project, which could possibly bias the results of the interviews. To account for that, the second author took the role of an external observer and actively participated in the coding process. In the case study, the fact that the company is an automotive supplier limits generalisation of results. Because the process model was tested from the procedural perspective and not from the viewpoint of the functional criteria, this limitation is mitigated. At the same time, as functional criteria were not investigated in detail, conclusions cannot be drawn as to whether the criteria in the process model are complete. This research study can serve as input for subsequent case studies to compare the process model's application and contrast differences. The authors plan to conduct further validation, as a theory is only "generalisable to other settings when it is actually tested against the empirical circumstances of these

other settings" (Lee, 1989). Further case studies will focus on functional selection criteria for CRM system evaluation.

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Appendix A - Interview Guideline

General Questions

- Which role do you have in the company?
- Which *prior experience* did you have with CRM system selection?
- What was your *role / position* in the *evaluation project*?
- How long have you been involved in the project / working with the company?

1. Demand Analysis

- Scope Definition: Did you define your overall scope? Which *dimensions* did you use? Which dimensions from the CMSS methodology did you use?
- Process and System Requirements: Did you define *process and system requirements*? Which *dimensions* did you use considering the CRMSS methodology?
- Interfaces: How did you generate *interface requirements* and which IT architectural decisions did you make?
- Software Market (Vendor Long List): Did you have a *vendor long list* and how did you derive this list? How many vendors did you initially consider and how did you get to the *vendor short list*?

2. Detailed Requirement Specification

- Did you define *high level target processes*? Which *use cases* were critical?
- Did you define *decision criteria*? In which areas did you define criteria?
- Did you provide *transmission material* as input for the vendors? Which ones and with which intentions?
- Did you create *further material during vendor workshops* for internal use and decision making? Which ones?

3. Vendor Presentation

- Did you conduct *workshops with your vendors* from the short list? How many and in which setting?
- Did you *revise your criteria* and / or target process definition after workshops?
- Did you conduct *reference visits*? What kind of reference did you choose and from how many vendor customers?
- Did you do prototyping?
- Did you *evaluate the vendors* and how did you do the evaluation? Did you use an evaluation tool? Did you use the criteria as input for an *evaluation tool*?

4. Decision

- How did you get to your *final vendor selection / decision*?
- Which *stakeholders* were involved and how? How did you ensure objectivity?
- Did you *present the results* to all interest groups?

5. Change Management

- Did you initiate a *transformation*? In which areas?
- Did you start *communication*? With which stakeholder groups?
- Did you define *KPIs*? In which areas and how?
- Did you check the *business readiness* of your organization? How? Which *mitigation strategies* were initiated?
- Did you evaluate *training* needs? How were those needs met?

6. Project Management

- When and how did you define your *project organization*? How were the project members chosen??
- Did you set up and implement a *methodology*? When and how?
- Which *project management tools* did you initially set up?

7. General Questions

- Did you define an *overall IT / CRM strategy* in the beginning?
- How much did the evaluation project *influence* the implementation?
- Was it useful to start with the evaluation project first? What would have been the alternative?
- Do you agree with the presented methodology? Would the CRMSS methodology deliver better or worse results than the approach chosen by your company?
- Which aspects would have been useful in your specific case?
- Which aspects are not useful and why?

Appendix B – CRMSS Evaluation Criteria Catalogue (see Friedrich and Breitner, 2012)

1. Functional Criteria

Criteria	Description
Account Mgmt	Sales support, contract management
Call Center	Complaint management, query & feedback management, call logging, communication support e.g. automated phone systems, help desk
Campaign Management	Design, implement and monitor campaigns for marketing information, catalogues, magazines or newsletter through diverse channels, group or segment data, programs for loyalty, retention or promotions
Contact & Customer Mgmt	Customer data incl. basic data and transaction data (sales data), information for the customer, services and campaigns, customer feedback including complaints, inquiries, suggestions
Customer Service	After-sales-service, maintenance and repair management, SLAs
Field Service	Mobility technology and options (data synchronization) incl. laptop, handheld, mobile phones, route planning, synchronization capabilities, offline functionality, work without a corporate network connection
Industry Specifics	Industry specific requirements not found in general CRM systems
Internet	Customer self-service (including e-cash), intranet with front-office company functions, web-based decision systems (DSS), Internet presentation of products and services, e-commerce
Lead & Opportunity Mgmt	Workflow to track and trace leads, acquisition management
Relationship Mgmt	Customer retention or exit management, partner (network) management, loyalty programs, scheduling
Reporting	Supporting strategic decision making, processing queries, forecasting and statistics, tools and engines for information retrieval, optimizing or profiling data, strategic and daily business analysis, monitoring, data mining, business intelligence or ad-hoc reporting
Sales Mgmt	Quotation management (including tracking and tracing), product configuration, pricing and financing options, cross- or up-selling

2. Technical Criteria

Criteria	Description
Data Integration	Data structure (models), information quality, data access, conversion and movement, actuality, central data base, tools (e.g. data mining)
Deployment	Technical transformation from old hard- and software environment to the new setting including # of releases, update tools
Integration & Infrastructure	data handling, interface definition, development environments and stages, system (e.g. operating system, legacy applications, security) and hardware (e.g. server, network) environment and groupware
Mobility	Available tools and hardware integrations to use the CRM system outside the company's main infrastructure
Modifiability (Scalability) & Maintainability	Degree of configuration, individual changes and adjustments, availability of source code, personalization (design, reports)
Performance & Practicability	Execution time, responsiveness, efficiency, design principles (e.g. SOA)

Reliability & Robustness	Ability to keep operating, troubleshooting, reproduction of its functions over a period of time
Scalability	Management of growing data and functionality requirements
Software & Hardware Requirements	technical standards, compatibility

3. Quality Criteria

Criteria	Description
Popularity	Reputation, credentials, market share, product age, risk overspending budget (lifecycle)
Portability	Compatible platforms, integration into existing landscape (e.g. ERP), available interfaces
Project Management	Document management, status tracking and methodology toward achieving set objectives.
Resources	Experience and availability of external consultants and internal personnel
Security	Security levels (data and/or functional), resisting unauthorized access
Timeliness	Implementation time and duration
Training & Support	Training material, documentation (user and technical), support and services, available tools
Usability	Usefulness, user friendliness (ease of use)
User Acceptance	Acceptance of system by user

4. Cost Criteria

- Maintenance
- Migration
- Preparation and installation
- Resources
    - Consulting
    - Internal
- System
    - Hardware
    - Software
- Training and support
- Upgrade